



# Tabulated Data for FREDYN Simulations of HALIFAX for Determining Helicopter Securing Loads

*Doug Perrault*

*Kevin McTaggart*

**Defence R&D Canada – Atlantic**

Technical Memorandum  
DRDC Atlantic TM 2004-044  
March 2004

This page intentionally left blank.

# **Tabulated Data for FREDYN Simulations of HALIFAX for Determining Helicopter Securing Loads**

Doug Perrault

Kevin McTaggart

**Defence R&D Canada – Atlantic**

Technical Memorandum

DRDC Atlantic TM 2004-044

March 2004

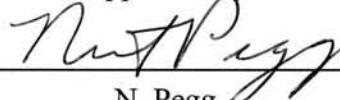
Author



---

Doug Perrault and Kevin McTaggart

Approved by

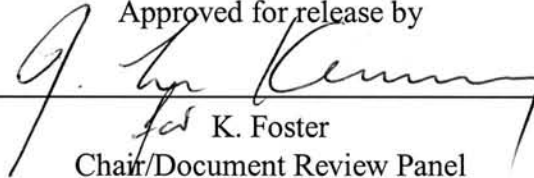


---

N. Pegg

Head, Warship Performance

Approved for release by



---

for K. Foster

Chair/Document Review Panel

Her Majesty the Queen as represented by the Minister of National Defence, 2004

Sa majesté la reine, représentée par le ministre de la Défense nationale, 2004

## Abstract

---

In support of procurement of new maritime helicopters, DRDC Atlantic was tasked to simulate motions of the HALIFAX class in seaways. The data produced will aid in the determination of helicopter securing loads, which are highly dependent upon the motions of the ship. The present work reports a systematic series of simulations modelling a HALIFAX class frigate with nominally steady speed and heading (course-keeping) in a variety of seaway conditions. This memorandum provides the data in a tabulated format for quick reference. A companion report (DRDC TM 2004-043) describes the simulation conditions and key results.

## Résumé

---

En appui à l'acquisition des nouveaux hélicoptères maritimes, RDDC Atlantique a reçu le mandat de simuler les mouvements d'un navire de la classe HALIFAX en mer. Les données produites permettront d'aider à déterminer des charges d'arrimage sécuritaires pour les hélicoptères, qui sont extrêmement dépendantes des mouvements des navires. Le présent travail présente la série systématique de simulations utilisées pour modéliser une frégate de la classe Halifax croisant à une vitesse régulière et selon une certaine orientation (conservation de cap) en présence de diverses conditions maritimes. Le mémoire présente les données sous forme de tableau pour consultation rapide. Un rapport d'accompagnement (RDDC TM 2004-043) comprend une description des conditions de simulation et des données résultantes.

This page intentionally left blank.

# **Executive summary**

---

## **Introduction**

When onboard ship, maritime helicopters are secured to the deck using either a landing probe or a combination of the landing probe and chains. The loads required for securing the helicopter depend on the ship's motions. To assist with specification of design loads for the securing devices, DRDC Atlantic was tasked to compute motions of the HALIFAX class frigate at the location where the helicopter would be secured. The simulations cover a range of sea conditions, ship speeds and headings.

## **Principal Results**

A systematic series of simulations was carried out for HALIFAX in the operational light condition, at various speeds and headings, and with a specific variation of seaway parameters for both open ocean and coastal waters. The operational light loading condition for HALIFAX was selected as a likely conservative case because motions tend to become greater as displacement decreases. The principle results are files of time series data for each simulation run, as well as statistical analyses of the motion parameters.

## **Significance of Results**

The data provide numerical values for the key parameters (roll angle, pitch angle, accelerations of the ship at two specific securing points) for determining the design loads for securing devices. This memorandum provides the data in a tabulated format for quick reference. A companion report (DRDC TM 2004-043) describes the simulation conditions and resulting data. Care is required in using the data provided: Since motions are dependent on the displacement and mass distribution of the ship, significant changes from the operational light condition specified herein will influence the validity of the data.

## **Future Plans**

The data presented in this report will likely be used for developing design loads for the Maritime Helicopter Project. The data could also be used for a wide variety of other purposes, such as to investigate the feasibility of specific deck operations under various combinations of seaway, ship's speed and relative heading.

Doug Perrault, Kevin McTaggart; 2004; Tabulated Data for FREDYN

Simulations of HALIFAX for Determining Helicopter Securing Loads;  
DRDC Atlantic TM 2004-044; Defence R&D Canada – Atlantic.



# Sommaire

---

## Introduction

Les hélicoptères maritimes embarqués sont arrimés au pont au moyen d'un sabot d'atterrissage ou d'une combinaison de ce dernier et de chaînes. Les charges requises pour arrimer l'hélicoptère dépendent des mouvements du navire. Pour aider à la spécification des charges d'échantillonnage des dispositifs d'ancrage, RDDC Atlantique a été mandatée de calculer les mouvements d'une frégate de la classe HALIFAX à l'endroit où l'hélicoptère est arrimé. Les simulations couvrent toute une gamme de conditions maritimes, de vitesse de navire et de caps.

## Principaux Résultats

Une série systématique de simulations a été effectuée pour la classe HALIFAX en conditions opérationnelles à l'état lège, selon divers vitesses et caps, ainsi qu'avec une variation spécifique des paramètres de navigabilité en haute mer et en eaux côtières. Les conditions opérationnelles à l'état lège pour la classe HALIFAX ont été sélectionnées en retenant des valeurs vraisemblablement conservatrices car les mouvements tendent à devenir plus importants lorsque que le déplacement diminue. Les principaux résultats sont des fichiers de séries de données chronologiques pour chaque essai de simulation, de même que des analyses statistiques des paramètres de mouvement.

## Portée des Résultats

Les données fournissent des valeurs numériques des paramètres clés (angle de roulis, angle de tangage, accélérations du navire à deux points d'attaches spécifiques) pour déterminer les charges d'échantillonnage des dispositifs d'ancrage. Le mémoire présente ces données sous forme de tableau pour consultation rapide. Un rapport d'accompagnement (RDDC TM 2004-043) comprend une description des conditions de simulation et des données résultantes. La prudence est de mise avec les données fournies : les mouvements étant dépendants du déplacement et de la distribution de la masse du navire, tout changement important des conditions opérationnelles à l'état lège spécifiées ici influencera la validité des données.

## Recherches Futurs

Les données présentées dans ce rapport seront vraisemblablement utilisées pour développer les charges d'échantillonnage pour le projet d'hélicoptère maritime. Ces données pourront également être utilisées à d'autres fins, notamment pour étudier la

faisabilité des opérations de pont spécifiques en présence de diverses combinaisons de navigabilité, de vitesse et de cap relatif de navire.

Doug Perrault, Kevin McTaggart; 2004; Tabulated Data for FREDYN Simulations of HALIFAX for Determining Helicopter Securing Loads; DRDC Atlantic TM 2004-044; Defence R&D Canada – Atlantic.

# Table of contents

---

Abstract . . . . .	i
Résumé . . . . .	i
Executive summary . . . . .	iii
Sommaire . . . . .	v
Table of contents . . . . .	vii
List of figures . . . . .	x
List of tables . . . . .	xxi
1 Introduction . . . . .	1
2 Coordinate Systems . . . . .	1
3 Simulation Conditions . . . . .	3
4 Simulation Results . . . . .	6
5 Conclusions . . . . .	8
References . . . . .	9
Symbols . . . . .	10
Annexes . . . . .	13
A Polar Plots of Maximum Absolute Roll Angle – Bretschneider Spectra (Open Ocean) . . . . .	13
B Polar Plots of Maximum Absolute Roll Angle – JONSWAP Spectra (Coastal Waters) . . . . .	19
C Polar Plots of Maximum Absolute Pitch Angle – Bretschneider Spectra (Open Ocean) . . . . .	23
D Polar Plots of Maximum Absolute Pitch Angle – JONSWAP Spectra (Coastal Waters) . . . . .	29
E Polar Plots of Maximum Absolute Longitudinal Force Estimator at Hangar Deck – Bretschneider Spectra (Open Ocean) . . . . .	33

F	Polar Plots of Maximum Absolute Longitudinal Force Estimator at Hangar Deck – JONSWAP Spectra (Coastal Waters) . . . . .	39
G	Polar Plots of Maximum Absolute Lateral Force Estimator at Hangar Deck – Bretschneider Spectra (Open Ocean) . . . . .	43
H	Polar Plots of Maximum Absolute Lateral Force Estimator at Hangar Deck – JONSWAP Spectra (Coastal Waters) . . . . .	49
I	Polar Plots of Maximum Absolute Vertical Force Estimator at Hangar Deck – Bretschneider Spectra (Open Ocean) . . . . .	53
J	Polar Plots of Maximum Absolute Vertical Force Estimator at Hangar Deck – JONSWAP Spectra (Coastal Waters) . . . . .	59
K	Polar Plots of Maximum Absolute Longitudinal Force Estimator at Flight Deck – Bretschneider Spectra (Open Ocean) . . . . .	63
L	Polar Plots of Maximum Absolute Longitudinal Force Estimator at Flight Deck – JONSWAP Spectra (Coastal Waters) . . . . .	69
M	Polar Plots of Maximum Absolute Lateral Force Estimator at Flight Deck – Bretschneider Spectra (Open Ocean) . . . . .	73
N	Polar Plots of Maximum Absolute Lateral Force Estimator at Flight Deck – JONSWAP Spectra (Coastal Waters) . . . . .	79
O	Polar Plots of Maximum Absolute Vertical Force Estimator at Flight Deck – Bretschneider Spectra (Open Ocean) . . . . .	83
P	Polar Plots of Maximum Absolute Vertical Force Estimator at Flight Deck – JONSWAP Spectra (Coastal Waters) . . . . .	89
Q	Tables of Motion Maxima – Bretschneider Spectrum (Open Ocean) . . . . .	93
R	Tables of Motion Maxima – JONSWAP Spectrum (Coastal Waters) . . . . .	165
S	Tables of Hangar Deck Accelerations – Bretschneider Spectrum (Open Ocean) . . . . .	209
T	Tables of Hangar Deck Accelerations – JONSWAP Spectrum (Coastal Waters) . . . . .	281
U	Tables of Flight Deck Accelerations – Bretschneider Spectrum (Open Ocean) . . . . .	325

V	Tables of Flight Deck Accelerations – JONSWAP Spectrum (Coastal Waters) . . . . .	397
W	NATO Sea State Table . . . . .	441

# List of figures

---

1	FREDYN Relative Sea Convention . . . . .	2
2	MHP Relative Sea Convention . . . . .	2
A.1	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 8.3$ s. . . . .	14
A.2	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 15.5$ s. . . . .	14
A.3	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 10.3$ s. . . . .	15
A.4	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 16.2$ s. . . . .	15
A.5	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 13.1$ s. . . . .	16
A.6	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 18.5$ s. . . . .	16
A.7	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 16.4$ s. . . . .	17
A.8	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 18.6$ s. . . . .	17
A.9	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 20.0$ s. . . . .	18
A.10	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 25.7$ s. . . . .	18
B.1	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 8.2$ s. . . . .	20
B.2	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 13.6$ s. . . . .	20
B.3	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 9.3$ s. . . . .	21

B.4	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 13.6$ s. . . . .	21
B.5	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 11.0$ s. . . . .	22
B.6	Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 17.1$ s. . . . .	22
C.1	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 8.3$ s. . . . .	24
C.2	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 15.5$ s. . . . .	24
C.3	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 10.3$ s. . . . .	25
C.4	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 16.2$ s. . . . .	25
C.5	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 13.1$ s. . . . .	26
C.6	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 18.5$ s. . . . .	26
C.7	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 16.4$ s. . . . .	27
C.8	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 18.6$ s. . . . .	27
C.9	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 20.0$ s. . . . .	28
C.10	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 25.7$ s. . . . .	28
D.1	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 8.2$ s. . . . .	30
D.2	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 13.6$ s. . . . .	30

D.3	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 9.3$ s. . . . .	31
D.4	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 13.6$ s. . . . .	31
D.5	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 11.0$ s. . . . .	32
D.6	Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 17.1$ s. . . . .	32
E.1	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 8.3$ s. . . . .	34
E.2	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 15.5$ s. . . . .	34
E.3	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 10.3$ s. . . . .	35
E.4	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 16.2$ s. . . . .	35
E.5	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 13.1$ s. . . . .	36
E.6	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 18.5$ s. . . . .	36
E.7	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 16.4$ s. . . . .	37
E.8	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 18.6$ s. . . . .	37



E.9	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 20.0$ s. . . . .	38
E.10	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 25.7$ s. . . . .	38
F.1	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 8.2$ s. . . . .	40
F.2	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 13.6$ s. . . . .	40
F.3	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 9.3$ s. . . . .	41
F.4	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 13.6$ s. . . . .	41
F.5	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 11.0$ s. . . . .	42
F.6	Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 17.1$ s. . . . .	42
G.1	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 8.3$ s. . . . .	44
G.2	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 15.5$ s. . . . .	44
G.3	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 10.3$ s. . . . .	45

G.4	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 16.2$ s. . . . .	45
G.5	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 13.1$ s. . . . .	46
G.6	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 18.5$ s. . . . .	46
G.7	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 16.4$ s. . . . .	47
G.8	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 18.6$ s. . . . .	47
G.9	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 20.0$ s. . . . .	48
G.10	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 25.7$ s. . . . .	48
H.1	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 8.2$ s. . . . .	50
H.2	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 13.6$ s. . . . .	50
H.3	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 9.3$ s. . . . .	51
H.4	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 13.6$ s. . . . .	51

H.5	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 11.0$ s. . . . .	52
H.6	Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 17.1$ s. . . . .	52
I.1	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 8.3$ s. . . . .	54
I.2	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 15.5$ s. . . . .	54
I.3	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 10.3$ s. . . . .	55
I.4	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 16.2$ s. . . . .	55
I.5	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 13.1$ s. . . . .	56
I.6	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 18.5$ s. . . . .	56
I.7	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 16.4$ s. . . . .	57
I.8	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 18.6$ s. . . . .	57
I.9	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 20.0$ s. . . . .	58

I.10	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 25.7$ s. . . . .	58
J.1	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 8.2$ s. . . . .	60
J.2	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 13.6$ s. . . . .	60
J.3	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 9.3$ s. . . . .	61
J.4	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 13.6$ s. . . . .	61
J.5	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 11.0$ s. . . . .	62
J.6	Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 17.1$ s. . . . .	62
K.1	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 8.3$ s. . . . .	64
K.2	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 15.5$ s. . . . .	64
K.3	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 10.3$ s. . . . .	65
K.4	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 16.2$ s. . . . .	65

K.5	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 13.1$ s. . . . .	66
K.6	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 18.5$ s. . . . .	66
K.7	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 16.4$ s. . . . .	67
K.8	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 18.6$ s. . . . .	67
K.9	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 20.0$ s. . . . .	68
K.10	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 25.7$ s. . . . .	68
L.1	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 8.2$ s. . . . .	70
L.2	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 13.6$ s. . . . .	70
L.3	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 9.3$ s. . . . .	71
L.4	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 13.6$ s. . . . .	71
L.5	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 11.0$ s. . . . .	72

L.6	Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 17.1$ s. . . . .	72
M.1	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 8.3$ s. . . . .	74
M.2	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 15.5$ s. . . . .	74
M.3	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 10.3$ s. . . . .	75
M.4	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 16.2$ s. . . . .	75
M.5	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 13.1$ s. . . . .	76
M.6	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 18.5$ s. . . . .	76
M.7	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 16.4$ s. . . . .	77
M.8	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 18.6$ s. . . . .	77
M.9	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 20.0$ s. . . . .	78
M.10	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 25.7$ s. . . . .	78

N.1	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 8.2$ s. . . . .	80
N.2	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 13.6$ s. . . . .	80
N.3	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 9.3$ s. . . . .	81
N.4	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 13.6$ s. . . . .	81
N.5	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 11.0$ s. . . . .	82
N.6	Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 17.1$ s. . . . .	82
O.1	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 8.3$ s. . . . .	84
O.2	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 4.0$ m and $T_P = 15.5$ s. . . . .	84
O.3	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 10.3$ s. . . . .	85
O.4	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 6.0$ m and $T_P = 16.2$ s. . . . .	85
O.5	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 13.1$ s. . . . .	86

O.6	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 9.0$ m and $T_P = 18.5$ s. . . . .	86
O.7	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 16.4$ s. . . . .	87
O.8	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 14.0$ m and $T_P = 18.6$ s. . . . .	87
O.9	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 20.0$ s. . . . .	88
O.10	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with $H_S = 17.7$ m and $T_P = 25.7$ s. . . . .	88
P.1	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 8.2$ s. . . . .	90
P.2	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 4.0$ m and $T_P = 13.6$ s. . . . .	90
P.3	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 9.3$ s. . . . .	91
P.4	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 6.0$ m and $T_P = 13.6$ s. . . . .	91
P.5	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 11.0$ s. . . . .	92
P.6	Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with $H_S = 9.0$ m and $T_P = 17.1$ s. . . . .	92



# List of tables

---

1	FREDYN Output Parameters . . . . .	3
2	FREDYN Output Accelerations . . . . .	4
3	Main Particulars for HALIFAX Class Frigates, Operational Light Loading Condition . . . . .	4
4	Seaway Conditions Investigated – Bretschneider Spectra . . . . .	5
5	Seaway Conditions Investigated – JONSWAP Spectra . . . . .	5
6	General Symbols . . . . .	10
7	FREDYN Symbols . . . . .	11
Q.1	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship’s speed is 0.0 Knots .	94
Q.2	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship’s speed is 5.0 Knots .	95
Q.3	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship’s speed is 10.0 Knots .	96
Q.4	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship’s speed is 15.0 Knots .	97
Q.5	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship’s speed is 20.0 Knots .	98
Q.6	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship’s speed is 25.0 Knots .	99
Q.7	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship’s speed is 30.0 Knots .	100
Q.8	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship’s speed is 0.0 Knots .	101
Q.9	Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship’s speed is 5.0 Knots .	102

- Q.10 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 10.0 Knots 103
- Q.11 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 15.0 Knots 104
- Q.12 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 20.0 Knots 105
- Q.13 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 25.0 Knots 106
- Q.14 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 30.0 Knots 107
- Q.15 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 0.0 Knots . 108
- Q.16 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 5.0 Knots . 109
- Q.17 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 10.0 Knots 110
- Q.18 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 15.0 Knots 111
- Q.19 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 20.0 Knots 112
- Q.20 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 25.0 Knots 113
- Q.21 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 30.0 Knots 114
- Q.22 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 0.0 Knots . 115
- Q.23 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 5.0 Knots . 116
- Q.24 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 10.0 Knots 117

- Q.25 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 15.0 Knots 118
- Q.26 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 20.0 Knots 119
- Q.27 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 25.0 Knots 120
- Q.28 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 30.0 Knots 121
- Q.29 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 0.0 Knots . 122
- Q.30 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 5.0 Knots . 123
- Q.31 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 10.0 Knots 124
- Q.32 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 15.0 Knots 125
- Q.33 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 20.0 Knots 126
- Q.34 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 25.0 Knots 127
- Q.35 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 30.0 Knots 128
- Q.36 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 0.0 Knots . 129
- Q.37 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 5.0 Knots . 130
- Q.38 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 10.0 Knots 131
- Q.39 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 15.0 Knots 132

- Q.40 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 20.0 Knots 133
- Q.41 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 25.0 Knots 134
- Q.42 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 30.0 Knots 135
- Q.43 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 0.0 Knots 136
- Q.44 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 5.0 Knots 137
- Q.45 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 10.0 Knots 138
- Q.46 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 15.0 Knots 139
- Q.47 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 20.0 Knots 140
- Q.48 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 25.0 Knots 141
- Q.49 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 30.0 Knots 142
- Q.50 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 0.0 Knots 143
- Q.51 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 5.0 Knots 144
- Q.52 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 10.0 Knots 145
- Q.53 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 15.0 Knots 146
- Q.54 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 20.0 Knots 147

- Q.55 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 25.0 Knots 148
- Q.56 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 30.0 Knots 149
- Q.57 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 0.0 Knots 150
- Q.58 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 5.0 Knots 151
- Q.59 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 10.0 Knots 152
- Q.60 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 15.0 Knots 153
- Q.61 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 20.0 Knots 154
- Q.62 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 25.0 Knots 155
- Q.63 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 30.0 Knots 156
- Q.64 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 0.0 Knots 157
- Q.65 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 5.0 Knots 158
- Q.66 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 10.0 Knots 159
- Q.67 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 15.0 Knots 160
- Q.68 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 20.0 Knots 161
- Q.69 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 25.0 Knots 162

- Q.70 Course-Keeping Ability and Motion Parameters: Bretschneider  
Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 30.0 Knots 163
- R.1 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 0.0 Knots . 166
- R.2 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 5.0 Knots . 167
- R.3 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 10.0 Knots . 168
- R.4 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 15.0 Knots . 169
- R.5 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 20.0 Knots . 170
- R.6 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 25.0 Knots . 171
- R.7 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 30.0 Knots . 172
- R.8 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 0.0 Knots . 173
- R.9 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 5.0 Knots . 174
- R.10 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 10.0 Knots 175
- R.11 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 15.0 Knots 176
- R.12 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 20.0 Knots 177
- R.13 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 25.0 Knots 178
- R.14 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 30.0 Knots 179

- R.15 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 0.0 Knots . 180
- R.16 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 5.0 Knots . 181
- R.17 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 10.0 Knots . 182
- R.18 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 15.0 Knots . 183
- R.19 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 20.0 Knots . 184
- R.20 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 25.0 Knots . 185
- R.21 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 30.0 Knots . 186
- R.22 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 0.0 Knots . 187
- R.23 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 5.0 Knots . 188
- R.24 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 10.0 Knots 189
- R.25 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 15.0 Knots 190
- R.26 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 20.0 Knots 191
- R.27 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 25.0 Knots 192
- R.28 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 30.0 Knots 193
- R.29 Course-Keeping Ability and Motion Parameters: JONSWAP  
Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 0.0 Knots . 194

R.30	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 5.0 Knots .	195
R.31	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 10.0 Knots	196
R.32	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 15.0 Knots	197
R.33	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 20.0 Knots	198
R.34	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 25.0 Knots	199
R.35	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 30.0 Knots	200
R.36	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 0.0 Knots .	201
R.37	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 5.0 Knots .	202
R.38	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 10.0 Knots	203
R.39	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 15.0 Knots	204
R.40	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 20.0 Knots	205
R.41	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 25.0 Knots	206
R.42	Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 30.0 Knots	207
S.1	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s =$ $4.0$ m and $T_p = 8.3$ s; Ship's speed is 0.0 Knots . . . . .	210
S.2	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s =$ $4.0$ m and $T_p = 8.3$ s; Ship's speed is 5.0 Knots . . . . .	211



S.3	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 10.0 Knots . . . . .	212
S.4	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 15.0 Knots . . . . .	213
S.5	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 20.0 Knots . . . . .	214
S.6	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 25.0 Knots . . . . .	215
S.7	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 30.0 Knots . . . . .	216
S.8	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 0.0 Knots . . . . .	217
S.9	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 5.0 Knots . . . . .	218
S.10	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 10.0 Knots . . . . .	219
S.11	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 15.0 Knots . . . . .	220
S.12	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 20.0 Knots . . . . .	221
S.13	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 25.0 Knots . . . . .	222
S.14	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 30.0 Knots . . . . .	223
S.15	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 0.0 Knots . . . . .	224
S.16	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 5.0 Knots . . . . .	225
S.17	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 10.0 Knots . . . . .	226

S.18	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 15.0 Knots . . . . .	227
S.19	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 20.0 Knots . . . . .	228
S.20	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 25.0 Knots . . . . .	229
S.21	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 30.0 Knots . . . . .	230
S.22	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 0.0 Knots . . . . .	231
S.23	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 5.0 Knots . . . . .	232
S.24	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 10.0 Knots . . . . .	233
S.25	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 15.0 Knots . . . . .	234
S.26	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 20.0 Knots . . . . .	235
S.27	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 25.0 Knots . . . . .	236
S.28	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 30.0 Knots . . . . .	237
S.29	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 0.0 Knots . . . . .	238
S.30	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 5.0 Knots . . . . .	239
S.31	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 10.0 Knots . . . . .	240
S.32	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 15.0 Knots . . . . .	241

S.33	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 20.0 Knots . . . . .	242
S.34	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 25.0 Knots . . . . .	243
S.35	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 30.0 Knots . . . . .	244
S.36	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 0.0 Knots . . . . .	245
S.37	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 5.0 Knots . . . . .	246
S.38	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 10.0 Knots . . . . .	247
S.39	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 15.0 Knots . . . . .	248
S.40	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 20.0 Knots . . . . .	249
S.41	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 25.0 Knots . . . . .	250
S.42	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 30.0 Knots . . . . .	251
S.43	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 0.0 Knots . . . . .	252
S.44	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 5.0 Knots . . . . .	253
S.45	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 10.0 Knots . . . . .	254
S.46	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 15.0 Knots . . . . .	255
S.47	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 20.0 Knots . . . . .	256

S.48	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 25.0 Knots . . . . .	257
S.49	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 30.0 Knots . . . . .	258
S.50	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 0.0 Knots . . . . .	259
S.51	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 5.0 Knots . . . . .	260
S.52	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 10.0 Knots . . . . .	261
S.53	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 15.0 Knots . . . . .	262
S.54	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 20.0 Knots . . . . .	263
S.55	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 25.0 Knots . . . . .	264
S.56	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 30.0 Knots . . . . .	265
S.57	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 0.0 Knots . . . . .	266
S.58	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 5.0 Knots . . . . .	267
S.59	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 10.0 Knots . . . . .	268
S.60	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 15.0 Knots . . . . .	269
S.61	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 20.0 Knots . . . . .	270
S.62	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 25.0 Knots . . . . .	271

S.63	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 30.0 Knots . . . . .	272
S.64	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 0.0 Knots . . . . .	273
S.65	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 5.0 Knots . . . . .	274
S.66	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 10.0 Knots . . . . .	275
S.67	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 15.0 Knots . . . . .	276
S.68	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 20.0 Knots . . . . .	277
S.69	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 25.0 Knots . . . . .	278
S.70	Accelerations at Hangar Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 30.0 Knots . . . . .	279
T.1	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 0.0 Knots . . . . .	282
T.2	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 5.0 Knots . . . . .	283
T.3	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 10.0 Knots . . . . .	284
T.4	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 15.0 Knots . . . . .	285
T.5	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 20.0 Knots . . . . .	286
T.6	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 25.0 Knots . . . . .	287
T.7	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 30.0 Knots . . . . .	288

T.8	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 0.0 Knots . . . . .	289
T.9	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 5.0 Knots . . . . .	290
T.10	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 10.0 Knots . . . . .	291
T.11	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 15.0 Knots . . . . .	292
T.12	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 20.0 Knots . . . . .	293
T.13	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 25.0 Knots . . . . .	294
T.14	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 30.0 Knots . . . . .	295
T.15	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 0.0 Knots . . . . .	296
T.16	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 5.0 Knots . . . . .	297
T.17	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 10.0 Knots . . . . .	298
T.18	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 15.0 Knots . . . . .	299
T.19	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 20.0 Knots . . . . .	300
T.20	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 25.0 Knots . . . . .	301
T.21	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 30.0 Knots . . . . .	302
T.22	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 0.0 Knots . . . . .	303

T.23	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 5.0 Knots . . . . .	304
T.24	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 10.0 Knots . . . . .	305
T.25	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 15.0 Knots . . . . .	306
T.26	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 20.0 Knots . . . . .	307
T.27	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 25.0 Knots . . . . .	308
T.28	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 30.0 Knots . . . . .	309
T.29	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 0.0 Knots . . . . .	310
T.30	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 5.0 Knots . . . . .	311
T.31	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 10.0 Knots . . . . .	312
T.32	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 15.0 Knots . . . . .	313
T.33	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 20.0 Knots . . . . .	314
T.34	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 25.0 Knots . . . . .	315
T.35	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 30.0 Knots . . . . .	316
T.36	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 0.0 Knots . . . . .	317
T.37	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 5.0 Knots . . . . .	318

T.38	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 10.0 Knots . . . . .	319
T.39	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 15.0 Knots . . . . .	320
T.40	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 20.0 Knots . . . . .	321
T.41	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 25.0 Knots . . . . .	322
T.42	Accelerations at Hangar Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 30.0 Knots . . . . .	323
U.1	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 0.0 Knots . . . . .	326
U.2	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 5.0 Knots . . . . .	327
U.3	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 10.0 Knots . . . . .	328
U.4	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 15.0 Knots . . . . .	329
U.5	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 20.0 Knots . . . . .	330
U.6	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 25.0 Knots . . . . .	331
U.7	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 8.3$ s; Ship's speed is 30.0 Knots . . . . .	332
U.8	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 0.0 Knots . . . . .	333
U.9	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 5.0 Knots . . . . .	334
U.10	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 10.0 Knots . . . . .	335



U.11	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 15.0 Knots . . . . .	336
U.12	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 20.0 Knots . . . . .	337
U.13	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 25.0 Knots . . . . .	338
U.14	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 4.0$ m and $T_p = 15.5$ s; Ship's speed is 30.0 Knots . . . . .	339
U.15	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 0.0 Knots . . . . .	340
U.16	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 5.0 Knots . . . . .	341
U.17	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 10.0 Knots . . . . .	342
U.18	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 15.0 Knots . . . . .	343
U.19	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 20.0 Knots . . . . .	344
U.20	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 25.0 Knots . . . . .	345
U.21	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 10.3$ s; Ship's speed is 30.0 Knots . . . . .	346
U.22	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 0.0 Knots . . . . .	347
U.23	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 5.0 Knots . . . . .	348
U.24	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 10.0 Knots . . . . .	349
U.25	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 15.0 Knots . . . . .	350

U.26	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 20.0 Knots . . . . .	351
U.27	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 25.0 Knots . . . . .	352
U.28	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 6.0$ m and $T_p = 16.2$ s; Ship's speed is 30.0 Knots . . . . .	353
U.29	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 0.0 Knots . . . . .	354
U.30	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 5.0 Knots . . . . .	355
U.31	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 10.0 Knots . . . . .	356
U.32	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 15.0 Knots . . . . .	357
U.33	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 20.0 Knots . . . . .	358
U.34	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 25.0 Knots . . . . .	359
U.35	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 13.1$ s; Ship's speed is 30.0 Knots . . . . .	360
U.36	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 0.0 Knots . . . . .	361
U.37	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 5.0 Knots . . . . .	362
U.38	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 10.0 Knots . . . . .	363
U.39	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 15.0 Knots . . . . .	364
U.40	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 20.0 Knots . . . . .	365

U.41	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 25.0 Knots . . . . .	366
U.42	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 9.0$ m and $T_p = 18.5$ s; Ship's speed is 30.0 Knots . . . . .	367
U.43	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 0.0 Knots . . . . .	368
U.44	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 5.0 Knots . . . . .	369
U.45	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 10.0 Knots . . . . .	370
U.46	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 15.0 Knots . . . . .	371
U.47	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 20.0 Knots . . . . .	372
U.48	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 25.0 Knots . . . . .	373
U.49	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 16.4$ s; Ship's speed is 30.0 Knots . . . . .	374
U.50	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 0.0 Knots . . . . .	375
U.51	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 5.0 Knots . . . . .	376
U.52	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 10.0 Knots . . . . .	377
U.53	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 15.0 Knots . . . . .	378
U.54	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 20.0 Knots . . . . .	379
U.55	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 25.0 Knots . . . . .	380

U.56	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 14.0$ m and $T_p = 18.6$ s; Ship's speed is 30.0 Knots . . . . .	381
U.57	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 0.0 Knots . . . . .	382
U.58	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 5.0 Knots . . . . .	383
U.59	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 10.0 Knots . . . . .	384
U.60	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 15.0 Knots . . . . .	385
U.61	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 20.0 Knots . . . . .	386
U.62	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 25.0 Knots . . . . .	387
U.63	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 20.0$ s; Ship's speed is 30.0 Knots . . . . .	388
U.64	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 0.0 Knots . . . . .	389
U.65	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 5.0 Knots . . . . .	390
U.66	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 10.0 Knots . . . . .	391
U.67	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 15.0 Knots . . . . .	392
U.68	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 20.0 Knots . . . . .	393
U.69	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 25.0 Knots . . . . .	394
U.70	Accelerations at Flight Deck: Bretschneider Spectrum with $H_s = 17.7$ m and $T_p = 25.7$ s; Ship's speed is 30.0 Knots . . . . .	395

V.1	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 0.0 Knots . . . . .	398
V.2	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 5.0 Knots . . . . .	399
V.3	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 10.0 Knots . . . . .	400
V.4	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 15.0 Knots . . . . .	401
V.5	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 20.0 Knots . . . . .	402
V.6	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 25.0 Knots . . . . .	403
V.7	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 8.2$ s; Ship's speed is 30.0 Knots . . . . .	404
V.8	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 0.0 Knots . . . . .	405
V.9	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 5.0 Knots . . . . .	406
V.10	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 10.0 Knots . . . . .	407
V.11	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 15.0 Knots . . . . .	408
V.12	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 20.0 Knots . . . . .	409
V.13	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 25.0 Knots . . . . .	410
V.14	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 4.0$ m and $T_p = 13.6$ s; Ship's speed is 30.0 Knots . . . . .	411
V.15	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 0.0 Knots . . . . .	412

V.16	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 5.0 Knots . . . . .	413
V.17	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 10.0 Knots . . . . .	414
V.18	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 15.0 Knots . . . . .	415
V.19	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 20.0 Knots . . . . .	416
V.20	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 25.0 Knots . . . . .	417
V.21	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 9.3$ s; Ship's speed is 30.0 Knots . . . . .	418
V.22	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 0.0 Knots . . . . .	419
V.23	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 5.0 Knots . . . . .	420
V.24	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 10.0 Knots . . . . .	421
V.25	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 15.0 Knots . . . . .	422
V.26	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 20.0 Knots . . . . .	423
V.27	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 25.0 Knots . . . . .	424
V.28	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 6.0$ m and $T_p = 13.6$ s; Ship's speed is 30.0 Knots . . . . .	425
V.29	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 0.0 Knots . . . . .	426
V.30	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 5.0 Knots . . . . .	427

V.31	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 10.0 Knots . . . . .	428
V.32	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 15.0 Knots . . . . .	429
V.33	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 20.0 Knots . . . . .	430
V.34	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 25.0 Knots . . . . .	431
V.35	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 11.0$ s; Ship's speed is 30.0 Knots . . . . .	432
V.36	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 0.0 Knots . . . . .	433
V.37	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 5.0 Knots . . . . .	434
V.38	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 10.0 Knots . . . . .	435
V.39	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 15.0 Knots . . . . .	436
V.40	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 20.0 Knots . . . . .	437
V.41	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 25.0 Knots . . . . .	438
V.42	Accelerations at Flight Deck: JONSWAP Spectrum with $H_s = 9.0$ m and $T_p = 17.1$ s; Ship's speed is 30.0 Knots . . . . .	439
W.1	NATO Sea State Table (After Table D-1 in NATO STANAG 4194) . . . . .	441

This page intentionally left blank.



# 1 Introduction

---

The Department of National Defence's Maritime Helicopter Project (MHP) is responsible for procurement of new ship-borne helicopters, including the full integration of the helicopter and on-board support systems with the ship. During operation in heavy seas, ship-borne helicopters are secured to the deck using either a landing probe or a combination of the landing probe and chains. The loads required for securing the helicopter are highly dependent upon the motions of the ship. To assist with specification of design loads, the Maritime Helicopter Project tasked DRDC Atlantic to compute motions of the HALIFAX class (aka Canadian Patrol Frigate, or CPF for short) in terms of accelerations of the helicopter parked at locations either in the hangar or on the flight deck over a range of sea conditions, ship speeds and headings. MHP asked for a comprehensive set of data to include several seaway conditions that affect the securing of helicopters in the hangar of a HALIFAX. This memorandum provides the tabulated data from simulations for a HALIFAX class frigate with nominally steady speed and heading (course-keeping) in each seaway. Also included are polar plots of the maximum absolute values of the most relevant (to the MHP) parameters. A companion report describes the simulation conditions and resulting data [1].

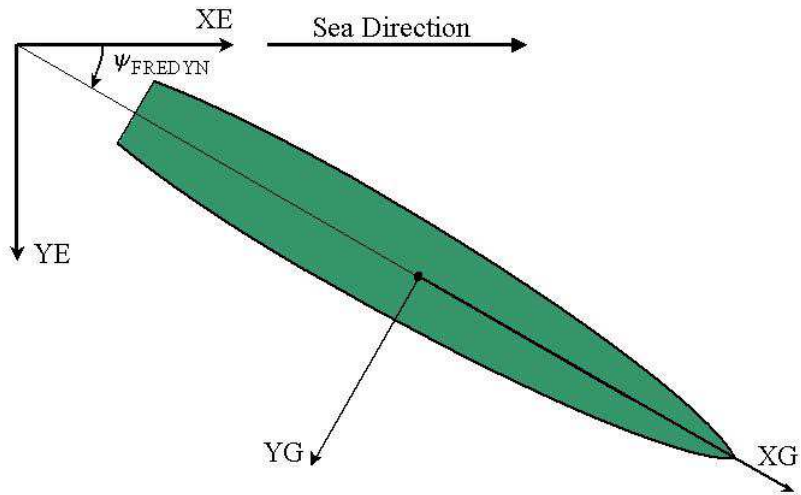
## 2 Coordinate Systems

---

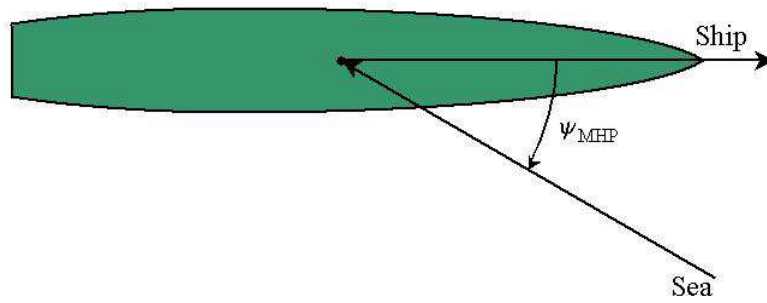
FREDYN uses an earth-fixed axis system  $(x_e, y_e, z_e)$  and a ship-fixed axis system  $(x_g, y_g, z_g)$ , as shown in Figure 1. The plane  $x_e - y_e$  lies in the still waterplane, with the  $z_e$  axis pointing downward. The ship-fixed system  $(x_g, y_g, z_g)$ , which has its origin at the ship center of gravity, rotates and translates as the ship moves. When the ship is at rest in a calm water, the  $z_g$  axis points downward. Note that in the FREDYN output, these axes and all other parameters are represented by capital letters, as in Figure 1. Translations in position, as well as velocities and accelerations are positive in the direction of the axes. Rotations and rotational velocities and accelerations are positive when they are in accordance with the right-hand rule (with the right hand thumb pointing along the axis, the fingers curl in the direction of a positive rotation).

It should be noted that in the FREDYN program astern seas are considered to have zero relative angle (see Figure 1), which is different from the MHP convention where head seas are considered to be at zero relative angle (see Figure 2). The FREDYN convention is converted to the MHP convention in the data tables.

Table 1 gives some of the main FREDYN output parameters. Note that the output value for ZE, the vertical displacement of the ship CG, is given relative to its value



**Figure 1: FREDYN Relative Sea Convention**



**Figure 2: MHP Relative Sea Convention**

when the ship is at rest in calm water. Table 2 gives some of the acceleration

**Table 1: FREDYN Output Parameters**

Parameter	Units	Description
T	(s)	Time relative to beginning of simulation
ZETAG	(m)	Wave surface displacement at ship CG
ALFAY	(deg)	Beamwise component of wave slope at ship CG
XE	(m)	Displacement of ship CG along $x_e$ axis
YE	(m)	Displacement of ship CG along $y_e$ axis
ZE	(m)	Displacement of ship CG along $z_e$ axis (relative to calm water value)
PHI	(deg)	Ship roll angle about $x_e$ axis, positive starboard side down
THETA	(deg)	Ship pitch angle about $y_e$ axis, positive bow up
PSI	(deg)	Ship yaw angle about $z_e$ axis, positive bow to starboard (also represents ship heading relative to $x_e$ )
PSI - PSIO	(deg)	Ship heading relative to initial heading, positive bow to starboard
UG	(m/s)	Speed of ship CG in direction $x_g$
VG	(m/s)	Speed of ship CG in direction $y_g$
WG	(m/s)	Speed of ship CG in direction $z_g$
P	(deg/s)	Roll velocity about $x_g$ , positive starboard side down
Q	(deg/s)	Pitch velocity about $y_g$ , positive bow up
R	(deg/s)	Yaw velocity about $z_g$ , positive bow to starboard
DEL(1)	(deg)	Rudder angle, positive trailing edge to port

parameters also generated by FREDYN.

### 3 Simulation Conditions

---

The conditions for the simulations were specified by the Maritime Helicopter Project. The operational light loading condition<sup>1</sup> for HALIFAX (see Table 3) was selected as a likely conservative case because motions tend to become greater as displacement decreases.

Several seaway conditions were investigated in order to give a comprehensive set of data. Bretschneider spectra were used to simulate deep water seaways, and JON-SWAP spectra (with a Gamma value of 2) were used to simulate littoral seaways. Tables 4 and 5 give the respective particulars of the specific seaways modelled. As can be seen in these tables, each sea state has two corresponding wave periods,

---

<sup>1</sup>The operational light loading condition used herein is the best estimate of what that condition will be when the helicopters are put into service. The actual condition at that time will likely be somewhat different.

**Table 2: FREDYN Output Accelerations**

Parameter	Units	Description
XCOG	(m/s <sup>2</sup> )	Acceleration of ship CG in direction $x_g$
YCOG	(m/s <sup>2</sup> )	Acceleration of ship CG in direction $y_g$
ZCOG	(m/s <sup>2</sup> )	Acceleration of ship CG in direction $z_g$
PDOT	(deg/s <sup>2</sup> )	Roll acceleration about $x_g$ , positive starboard side down
QDOT	(deg/s <sup>2</sup> )	Pitch acceleration about $y_g$ , positive bow up
RDOT	(deg/s <sup>2</sup> )	Yaw acceleration about $z_g$ , positive bow to starboard
X1	(m/s <sup>2</sup> )	Acceleration of 1 <sup>st</sup> point on ship, parallel to $x_g$
Y1	(m/s <sup>2</sup> )	Acceleration of 1 <sup>st</sup> point on ship, parallel to $y_g$
Z1	(m/s <sup>2</sup> )	Acceleration of 1 <sup>st</sup> point on ship, parallel to $z_g$
X2	(m/s <sup>2</sup> )	Acceleration of 2 <sup>nd</sup> point on ship, parallel to $x_g$
Y2	(m/s <sup>2</sup> )	Acceleration of 2 <sup>nd</sup> point on ship, parallel to $y_g$
Z2	(m/s <sup>2</sup> )	Acceleration of 2 <sup>nd</sup> point on ship, parallel to $z_g$

**Table 3: Main Particulars for HALIFAX Class Frigates, Operational Light Loading Condition**

Length, $L$	124.5	m
Beam, $B$	14.8	m
Midships draft, $T_{mid}$	4.967	m
Trim by stern, $t_s$	0.0	m
Displacement, $\Delta$	4700	tonnes
Longitudinal centre of gravity, $\overline{LCG}$ , aft of midships	2.8	m
Vertical centre of gravity, $\overline{KG}$	6.70	m
Metacentric height, $\overline{GM}_{fluid}$	0.89	m

**Table 4: Seaway Conditions Investigated – Bretschneider Spectra**

Sea State	Seaway Type	$H_S$ (m)	$T_P$ (s)	Notes
5	Bretschneider	4.0	8.3	$T_P = \text{OONA } 5\%$
			15.5	$T_P = \text{OONA } 95\%$
6	Bretschneider	6.0	10.3	$T_P \simeq \text{OONA } 5\%$
			16.2	$T_P = \text{OONA } 95\%$
7	Bretschneider	9.0	13.1	$T_P \simeq \text{OONA } 5\%$
			18.5	$T_P = \text{OONA } 95\%$
8	Bretschneider	14.0	16.4	$T_P \sim \text{OONA } 5\%$
			18.6	$T_P = \text{OONA } 95\%$
>8	Bretschneider	17.7	20.0	$T_P = \text{OONA } 5\%$
			25.7	$T_P = \text{OONA } 95\%$
$H_S$ – Significant Wave Height; $T_P$ – Peak Wave Period;				
OONA – Open Ocean North Atlantic (ref NATO Sea State Table)				

**Table 5: Seaway Conditions Investigated – JONSWAP Spectra**

Sea State	Seaway Type	$H_S$ (m)	$T_P$ (s)	Notes
5	JONSWAP	4.0	8.2	$T_P = \text{LECC } 5\%$
			13.6	$T_P = \text{LECC } 95\%$
6	JONSWAP	6.0	9.3	$T_P = \text{LECC } 5\%$
			13.6	$T_P = \text{LECC } 95\%$
7	JONSWAP	9.0	11.0	$T_P = \text{LECC } 5\%$
			17.1	$T_P = \text{LECC } 95\%$
$H_S$ – Significant Wave Height; $T_P$ – Peak Wave Period;				
LECC – Littoral East Coast Canada (ref TDC Wind and Wave Atlas, East Coast of Canada)				

each representing roughly a practical limit of wave period for that particular sea state. The selected wave periods represent the 5<sup>th</sup> and 95<sup>th</sup> percentiles, given the significant wave height. In all cases the significant wave height is the upper value for the associated sea state. The last two Bretschneider seaways (Sea State > 8) are based on the HALIFAX performance requirements for survivability without serious damage to mission-essential systems in a seaway with  $H_S > 17.7$  m.

Long-crested irregular seaways were simulated using linear superposition of 20 sinusoidal components to form a unidirectional seaway. Unidirectional seaways tend to be conservative (i.e. they generally represent the worst case) since all the energy flux is flowing in the same direction. Simulated motions vary with seed numbers used to generate the random phases. However, the variation of motion statistics with input phase seeds is usually very small when the ship does not approach capsizing.

For each seaway simulations were conducted for a matrix of ship speeds and headings:

Ship Speed: 0 to 30kts in 5kt increments

Ship Heading: 0° to 345° in 15° increments

For each wave height the corresponding mean wind speed at 19.5 m elevation is assumed to be from the starboard beam (regardless of wave direction) and given by

$$v = 1.823H_S + 3.45$$

in  $m/s$ .

For simulations representing a nominal ship speed, the propeller RPM was set to a value such that FREDYN would give the desired ship speed in calm water. The propeller RPM used to give a desired ship speed with FREDYN will differ from the actual propeller RPM for the HALIFAX class due to assumptions made in numerical modelling.

It should be noted that FREDYN does not model variable pitch propellers, and that the present results are for the HALIFAX propellers set to a specified pitch value.

The program FREDYN requires average wave period,  $T_{wa}$ , as an input parameter. The following relationship, based on a Bretschneider spectrum, was used to determine average wave period as a function of a given peak wave period:

$$T_{wa} = 0.772T_P$$

The simulation time step was  $0.1s$  for all runs, and the duration of each simulation was one hour ( $3620s$  including a ramp-up time for eliminating integration start-up transients), which is considered adequate for providing enough motion data for meaningful statistical analysis.

## 4 Simulation Results

---

Additional processing was performed to extract the statistical data (mean value, standard deviation, minimum value and maximum value) for the following parameters:

- Speed;
- Heading (converted to MHP convention);

- Heave (position);
- Roll (angle); and
- Pitch (angle).
- Longitudinal (with respect to the ship centerline) acceleration at the hangar
- Lateral (with respect to the ship centerline) acceleration at the hangar
- Vertical acceleration at the hangar
- Generalized longitudinal force estimator at the hangar
- Generalized lateral force estimator at the hangar
- Longitudinal (with respect to the ship centerline) acceleration at the flight deck
- Lateral (with respect to the ship centerline) acceleration at the flight deck
- Vertical acceleration at the flight deck
- Generalized longitudinal force estimator at the flight deck
- Generalized lateral force estimator at the flight deck

For an explanation of the generalized force estimators, see [1].

A complete set of polar plots for roll and pitch angles, as well as all force estimators at the flight deck and hangar deck locations are included in annexes A through P. The polar plots can be read intuitively by imagining oneself on the ship facing the bow (top of plot) with the port to the left. Each of the radial lines represents the relative direction of the incoming seaway. The radial lines are shown for 30° increments on the polar plots, with 90° to the starboard and 270° to the port.. The rings in the plots represent (less intuitively) the ships speed in 10 knot increments. The plots are colour coded such that blue represents a low magnitude of the parameter being plotted, and red represents a high value.

Tabulated data is presented in annexes Q and R for heave, roll, and pitch for each seaway simulated. Further data are given in annexes S through V for the accelerations at the flight deck and hangar deck locations<sup>2</sup>. In both cases, the data reported are the maximum absolute value of the parameter in a given simulation run, and the standard deviation associated with the mean value of the parameter for that run.

---

<sup>2</sup>Actual securing points may not be on the centerline of the ship. The current proposed securing device allows for variances of ±0.5 m fore and aft, and ±0.5 m athwartships. Slightly higher loads (accelerations) may occur with off-center securing points.

The maximum absolute value is the most important value for determining securing loads, while the standard deviation gives an indication of the variability of the motion parameter.

## **5 Conclusions**

---

A comprehensive study was carried out to define the motion characteristics of HAL-IFAX in a broad variety of sea states. The results provide data for determining the loads induced on a secured helicopter by the moving ship.



## References

---

1. D. Perrault and K. A. McTaggart. FREDYN Simulations of HALIFAX for Determining Helicopter Securing Loads. Technical Memorandum DRDC Atlantic TM 2004-043, Defence Research and Development Canada - Atlantic, 2004.

# Symbols

**Table 6: General Symbols**

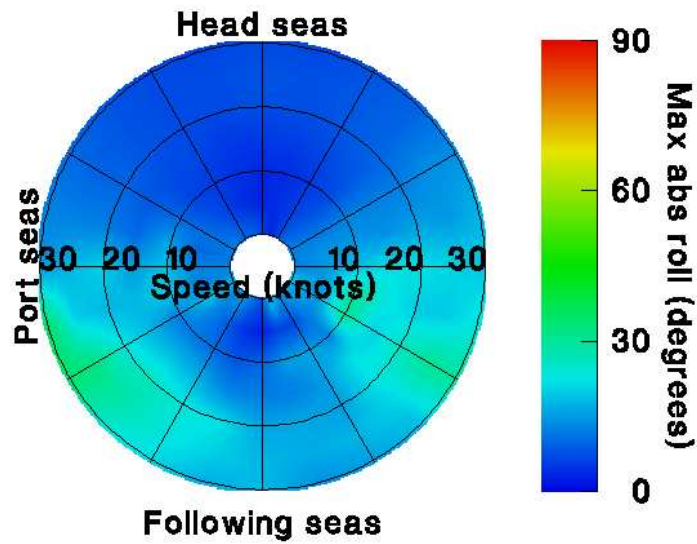
Symbol	Description
$\phi$	Roll angle
$\theta$	Pitch angle
$\psi$	Yaw (heading) angle
$\psi_{FREDYN}$	Yaw angle of ship with respect to sea direction - FREDYN convention
$\psi_{MHP}$	Sea direction with respect to ship - MHP convention
$\mu$	Coefficient of friction
$\Delta$	Displacement
$t_s$	Trim by stern
$x_e, y_e, z_e$	earth-fixed axes
$x_g, y_g, z_g$	ship-fixed axes (fixed at CG)
$B$	Beam
$\overline{GM}_{fluid}$	Metacentric height, corrected for free surface
$H_S$	Significant wave height
$\overline{KG}$	Vertical centre of gravity above baseline
$L$	Length between perpendiculars
$\overline{LCC}$	Longitudinal centre of gravity, aft of midships
$T_{3f}, T_{3v}$	Coordinate transformation from earth-fixed reference frame to ship-fixed reference frame for translational velocities and rotational velocities respectively
$T_{mid}$	Midships draft
$T_P$	Peak wave period

**Table 7: FREDYN Symbols**

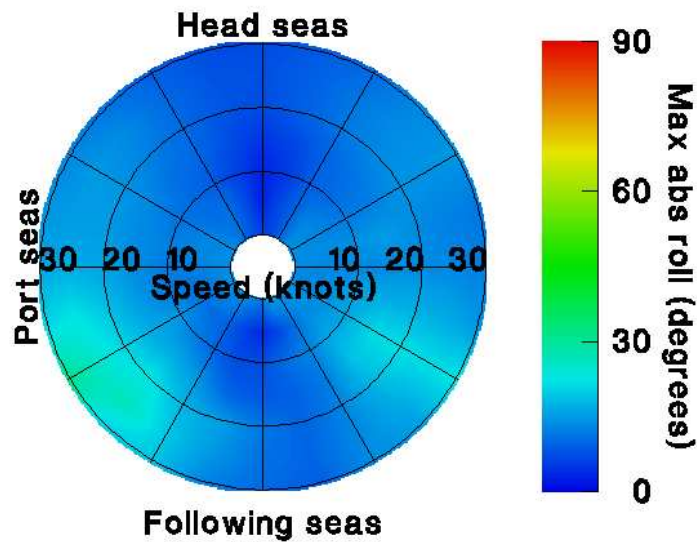
<b>Symbol</b>	<b>Description</b>
ALFAY	Beamwise component of wave slope at ship CG
DEL(1)	Rudder angle
P, Q, R	Roll, pitch, yaw velocities about $x_g, y_g, z_g$ resp.
PDOT, QDOT, RDOT	Roll, pitch, yaw accelerations about $x_g, y_g, z_g$ resp.
PHI, THETA, PSI	Roll, pitch, yaw (heading) angles
PSI - PSI0	Ship heading relative to initial heading
T	Time relative to beginning of simulation
UG, VG, WG	Speed of ship CG in direction $x_g, y_g, z_g$ resp.
X1, Y1, Z1	Accel. of 1 <sup>st</sup> pt. on ship, parallel to $x_g, y_g, z_g$ resp.
X2, Y2, Z2	Accel. of 2 <sup>nd</sup> pt. on ship, parallel to $x_g, y_g, z_g$ resp.
XCOG, YCOG, ZCOG	Accel. of ship CG in direction $x_g, y_g, z_g$ resp.
XE, YE, ZE	Displacement of ship CG along $x_e, y_e, z_e$ resp.
ZETAG	Wave elevation at ship CG

This page intentionally left blank.

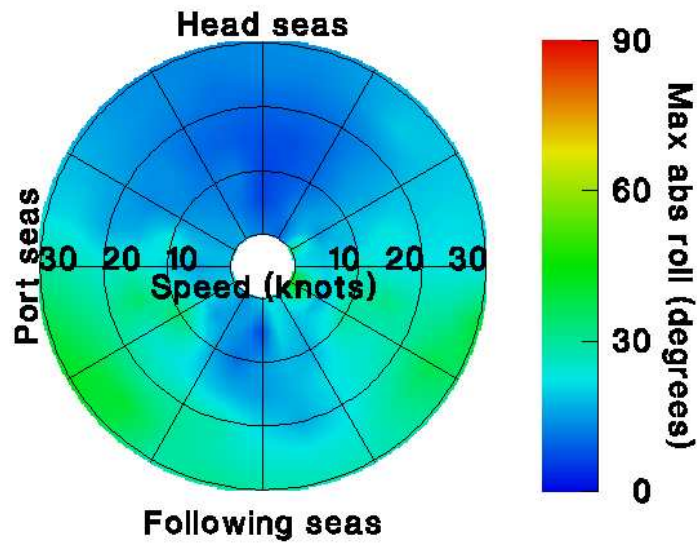
**Annex A**  
**Polar Plots of Maximum Absolute Roll Angle**  
**– Bretschneider Spectra (Open Ocean)**



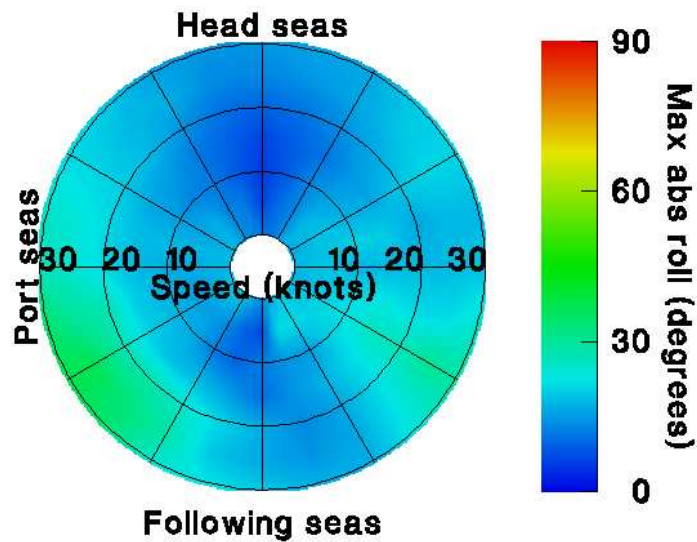
**Figure A.1:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 8.3$  s.



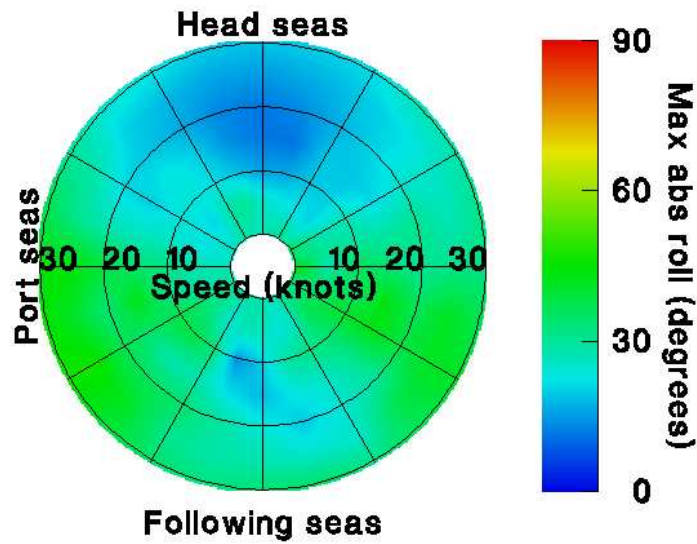
**Figure A.2:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 15.5$  s.



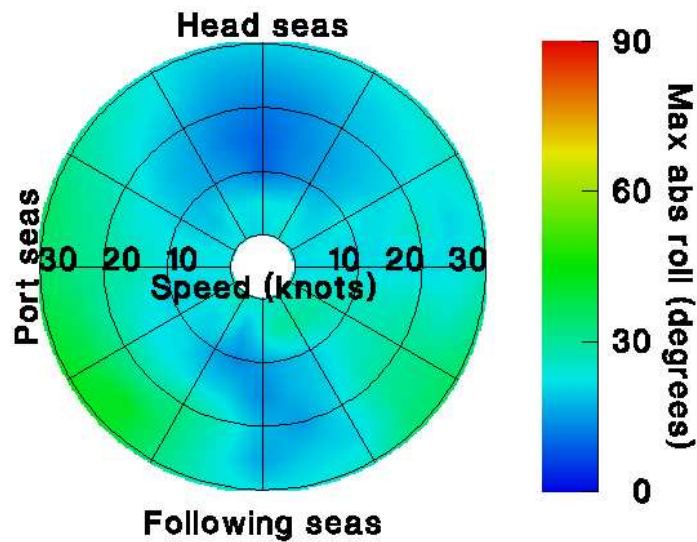
**Figure A.3:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 10.3$  s.



**Figure A.4:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 16.2$  s.

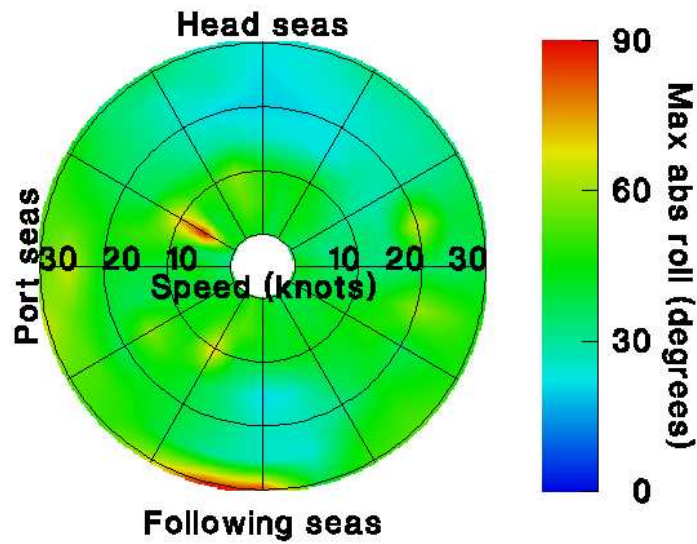


**Figure A.5:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 13.1$  s.

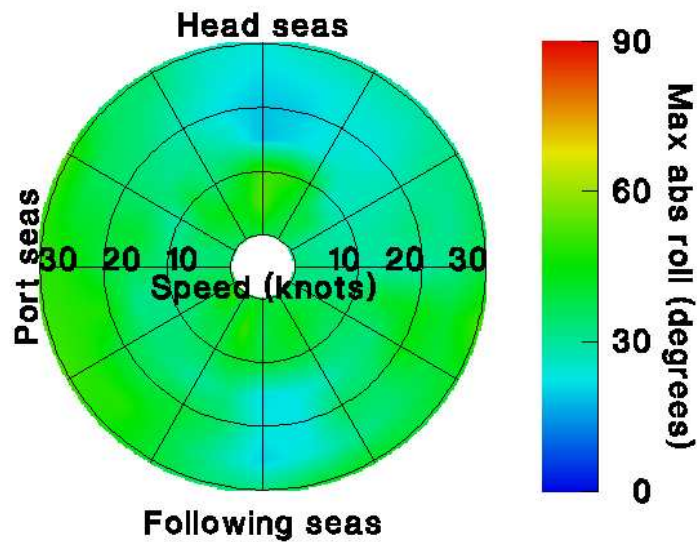


**Figure A.6:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 18.5$  s.

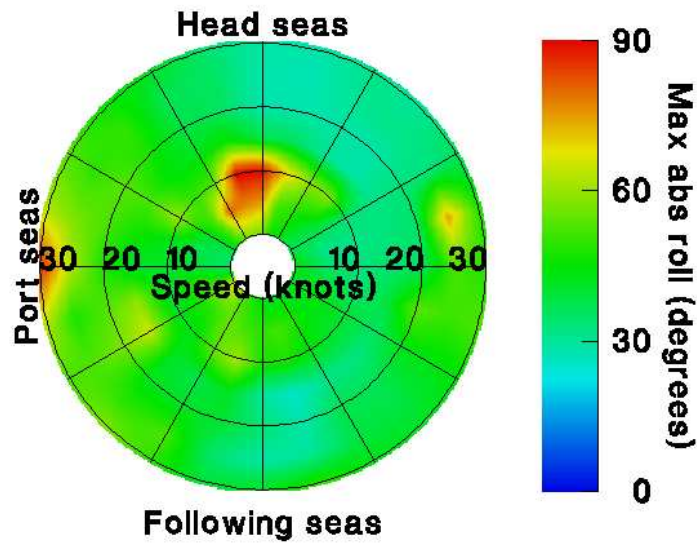




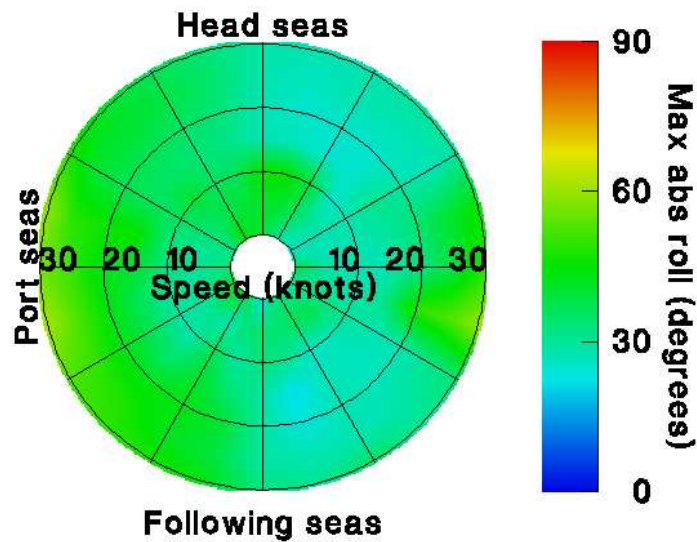
**Figure A.7:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 16.4$  s.



**Figure A.8:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 18.6$  s.



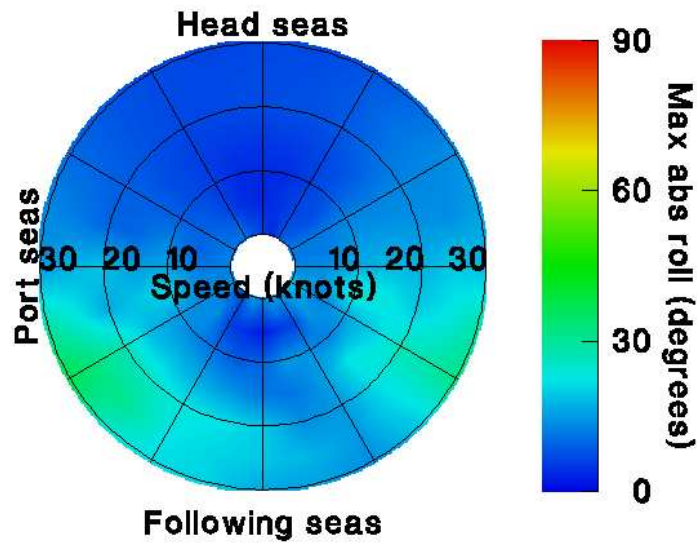
**Figure A.9:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 20.0$  s.



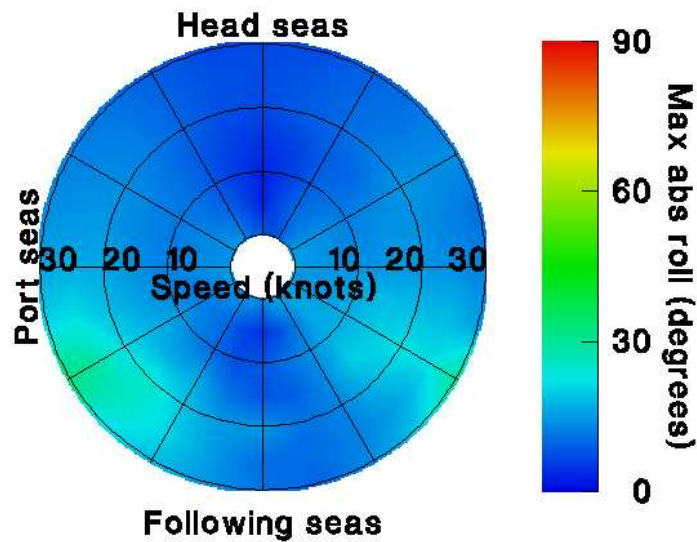
**Figure A.10:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 25.7$  s.

**Annex B**  
**Polar Plots of Maximum Absolute Roll Angle**  
**– JONSWAP Spectra (Coastal Waters)**

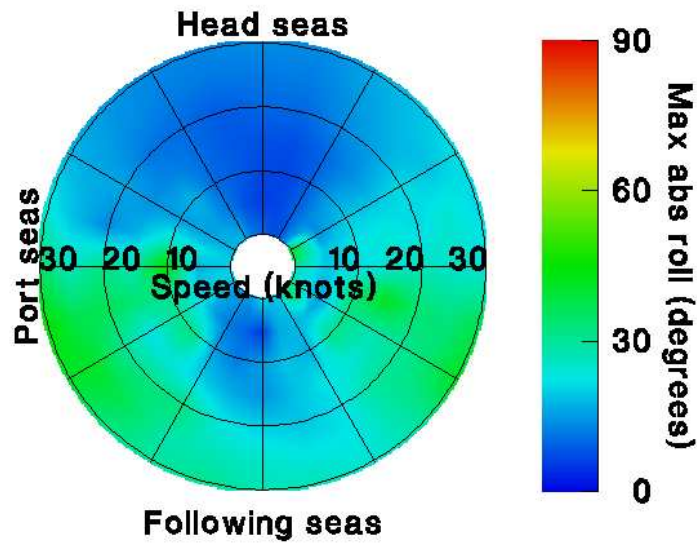
---



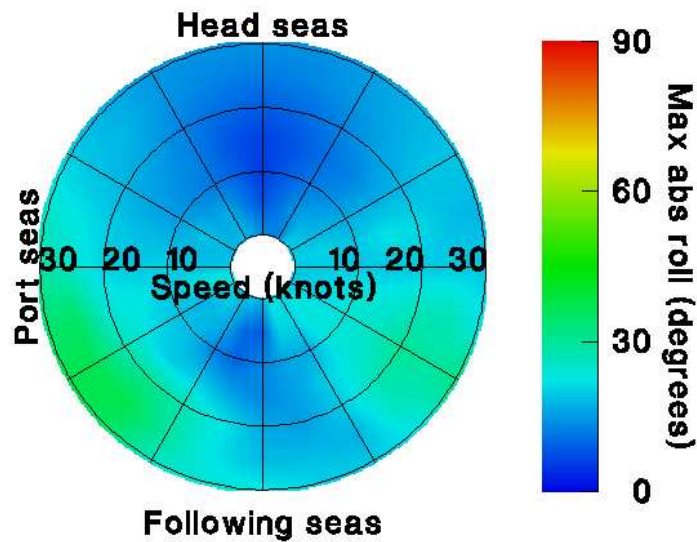
**Figure B.1:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 8.2$  s.



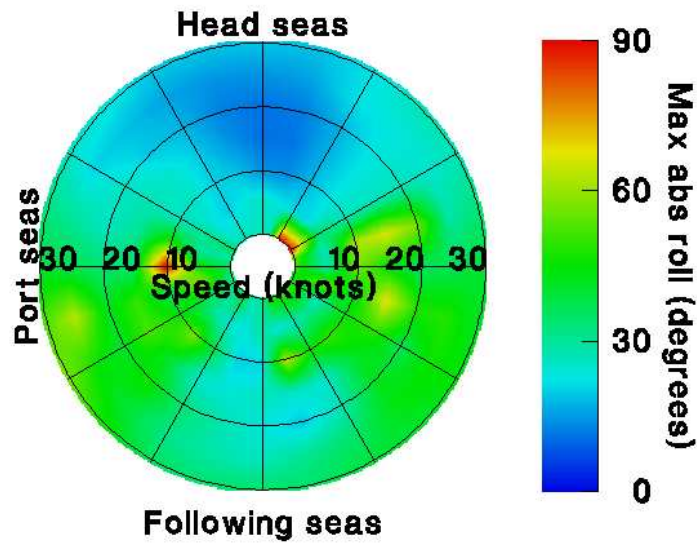
**Figure B.2:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 13.6$  s.



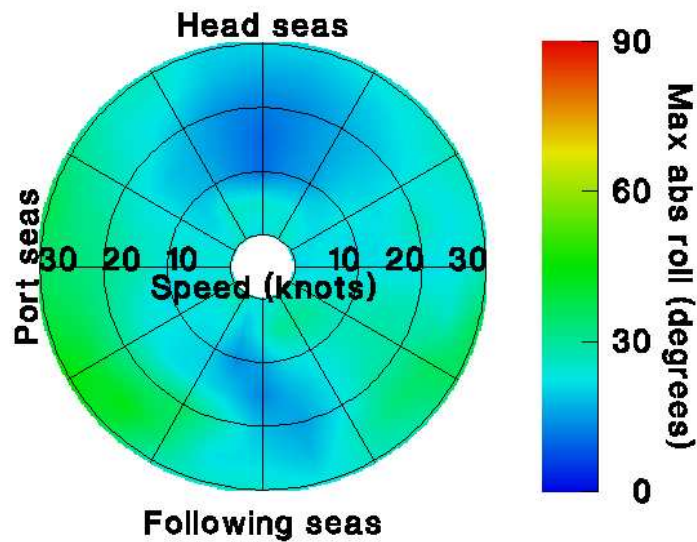
**Figure B.3:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 9.3$  s.



**Figure B.4:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 13.6$  s.



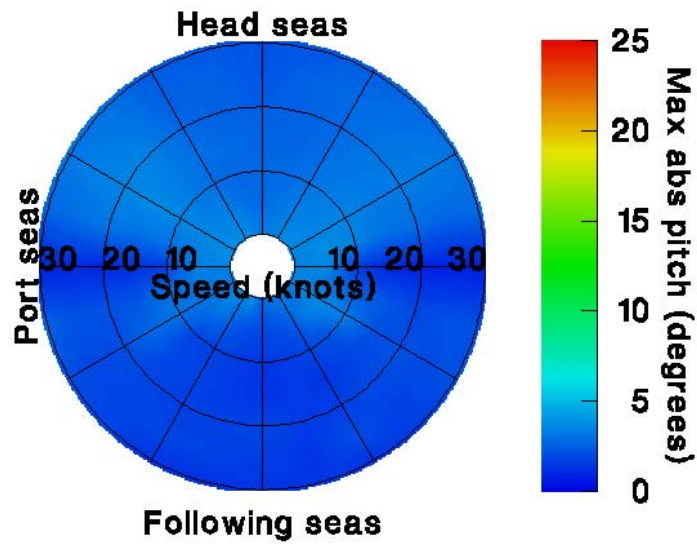
**Figure B.5:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 11.0$  s.



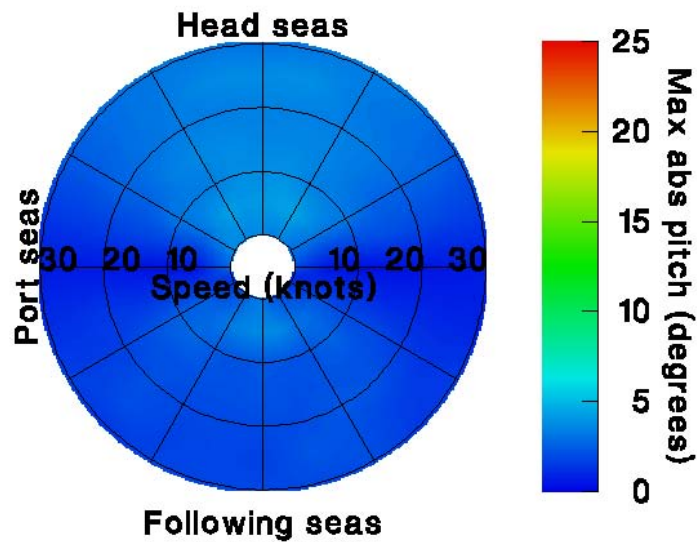
**Figure B.6:** Max. Abs. Roll Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 17.1$  s.

**Annex C**  
**Polar Plots of Maximum Absolute Pitch**  
**Angle – Bretschneider Spectra (Open Ocean)**



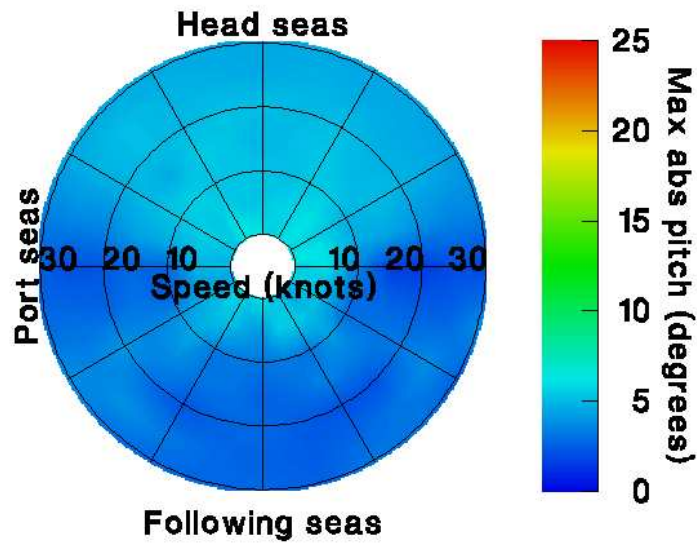


**Figure C.1:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 8.3$  s.

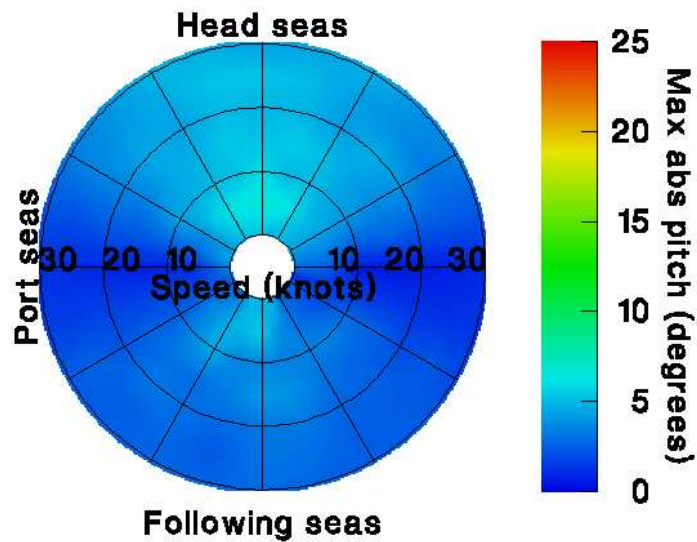


**Figure C.2:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 15.5$  s.

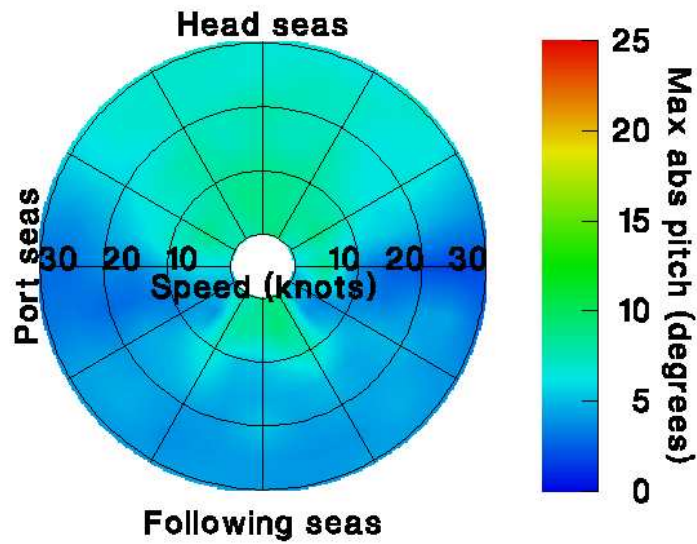




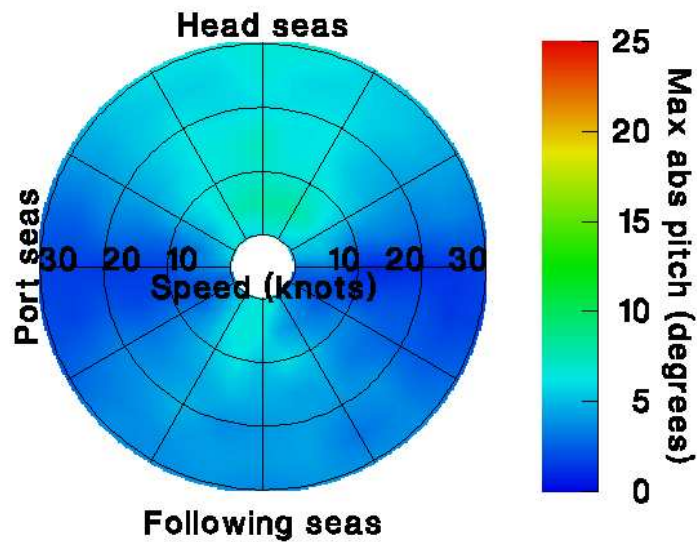
**Figure C.3:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 10.3$  s.



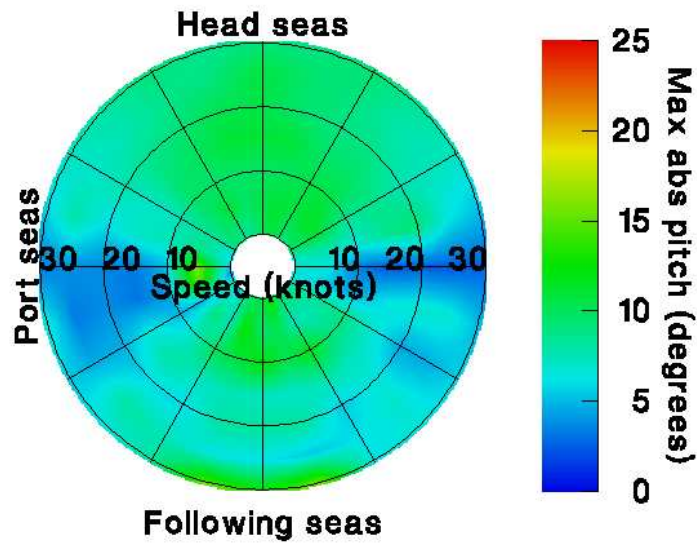
**Figure C.4:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 16.2$  s.



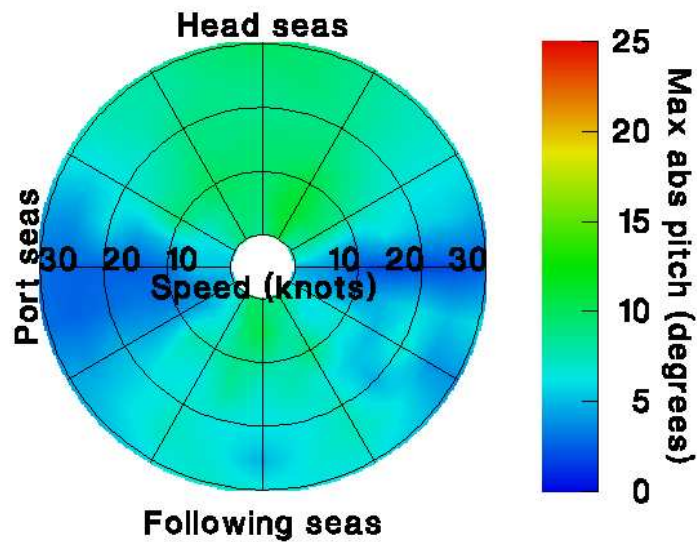
**Figure C.5:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 13.1$  s.



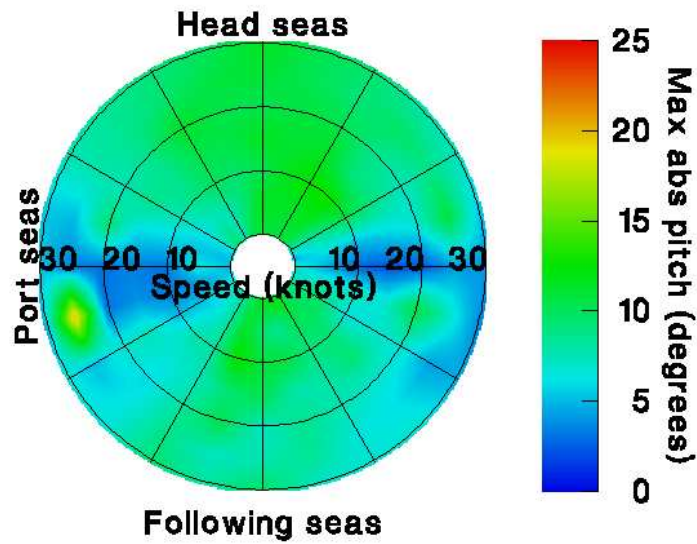
**Figure C.6:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 18.5$  s.



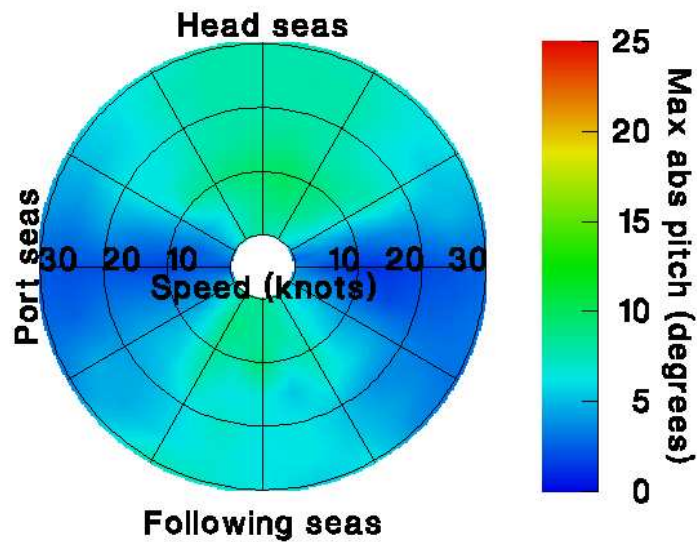
**Figure C.7:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 16.4$  s.



**Figure C.8:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 18.6$  s.

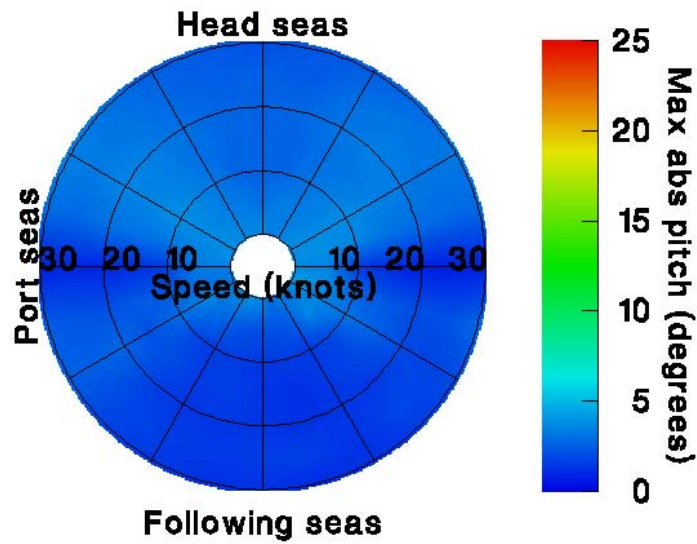


**Figure C.9:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 20.0$  s.

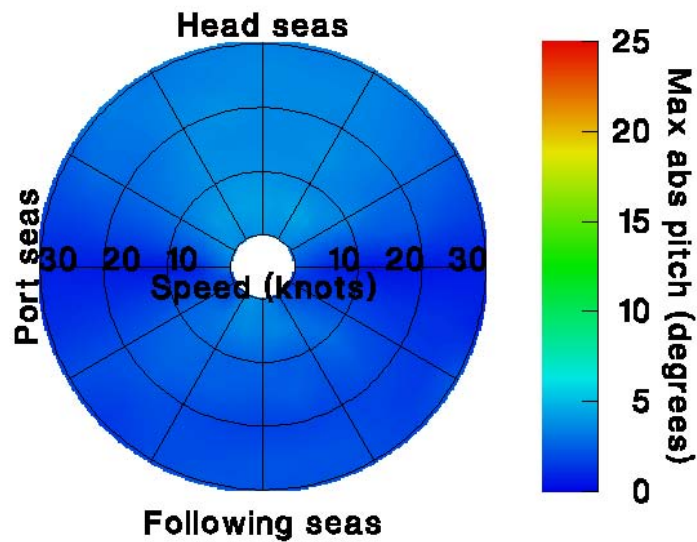


**Figure C.10:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 25.7$  s.

**Annex D**  
**Polar Plots of Maximum Absolute Pitch**  
**Angle – JONSWAP Spectra (Coastal Waters)**

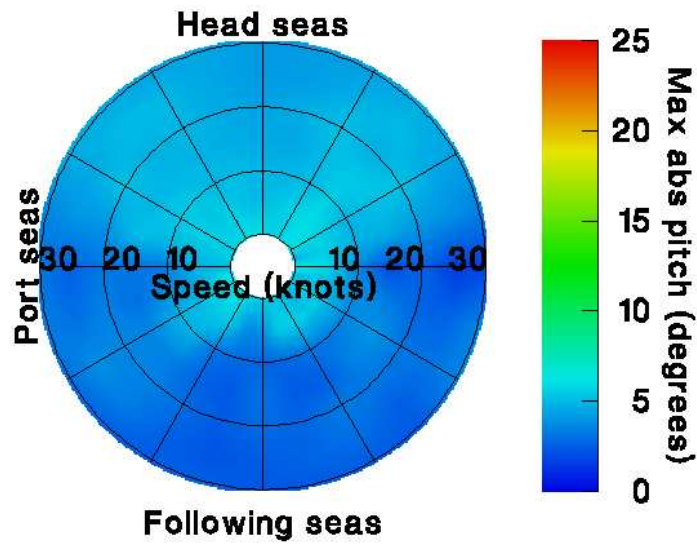


**Figure D.1:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 8.2$  s.

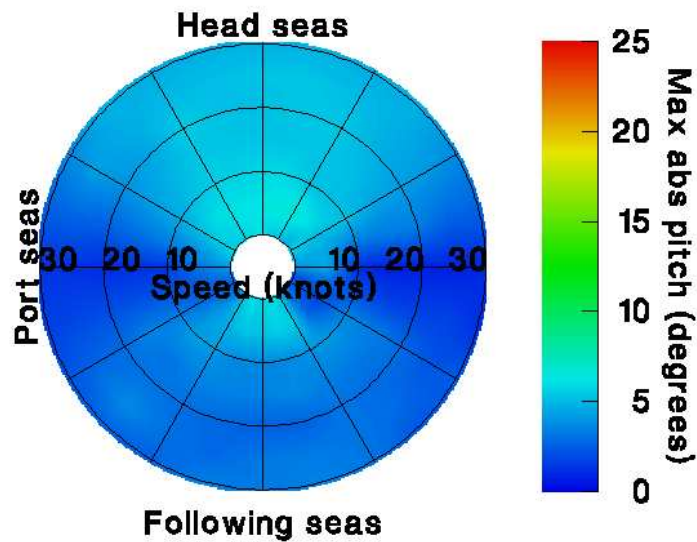


**Figure D.2:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 13.6$  s.

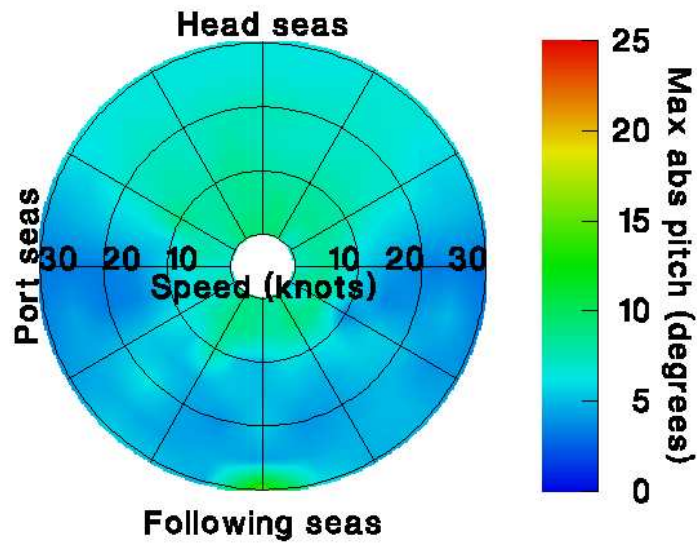




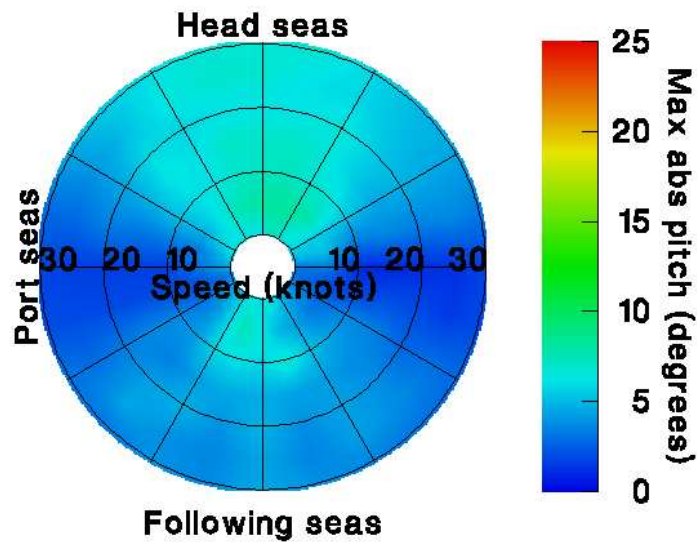
**Figure D.3:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 9.3$  s.



**Figure D.4:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 13.6$  s.



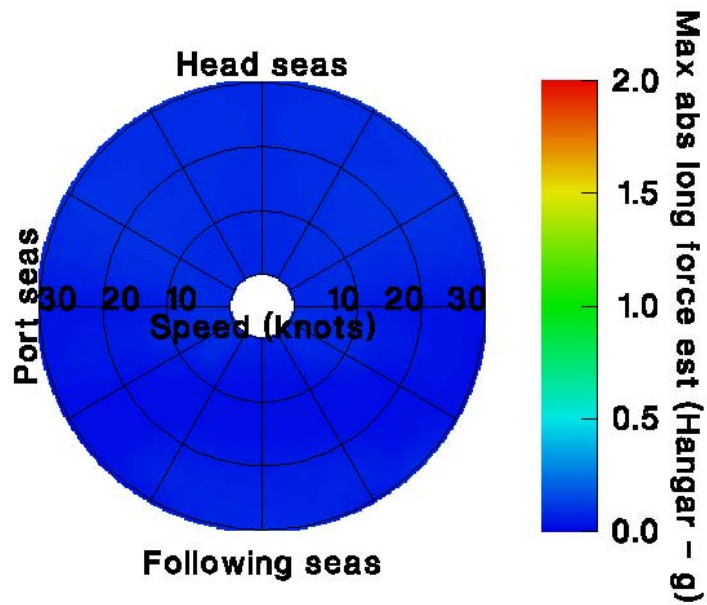
**Figure D.5:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 11.0$  s.



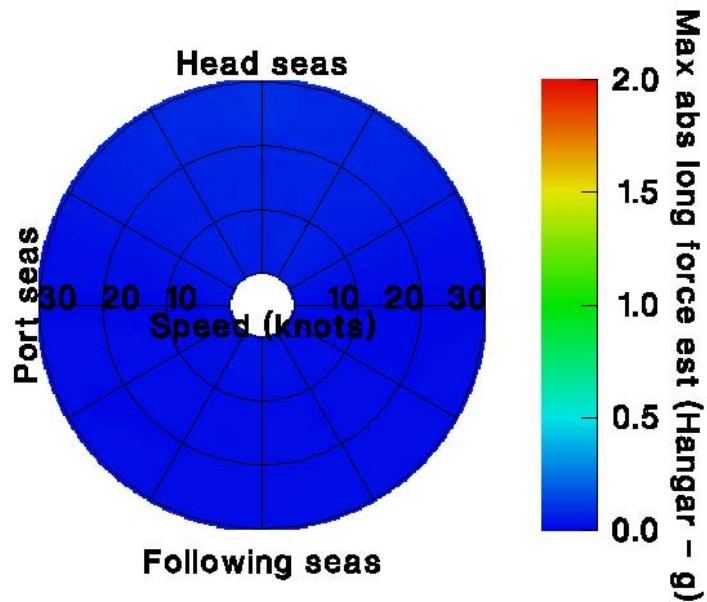
**Figure D.6:** Max. Abs. Pitch Angles with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 17.1$  s.



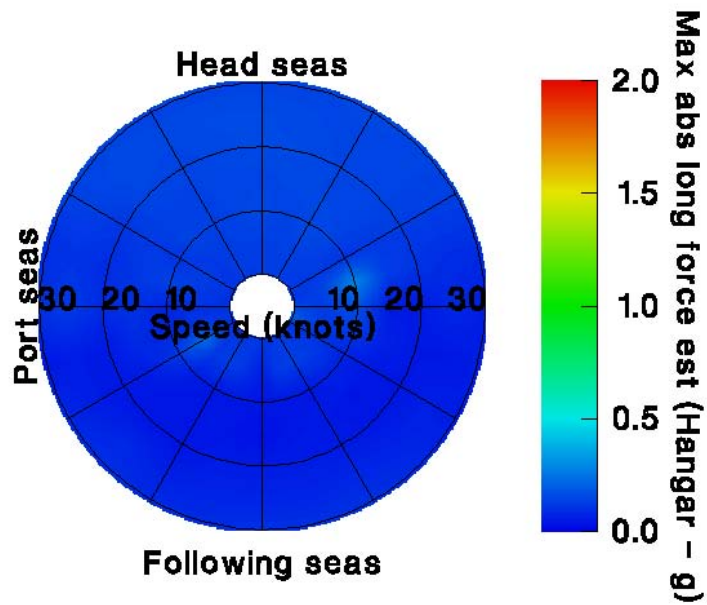
**Annex E**  
**Polar Plots of Maximum Absolute**  
**Longitudinal Force Estimator at Hangar**  
**Deck – Bretschneider Spectra (Open Ocean)**



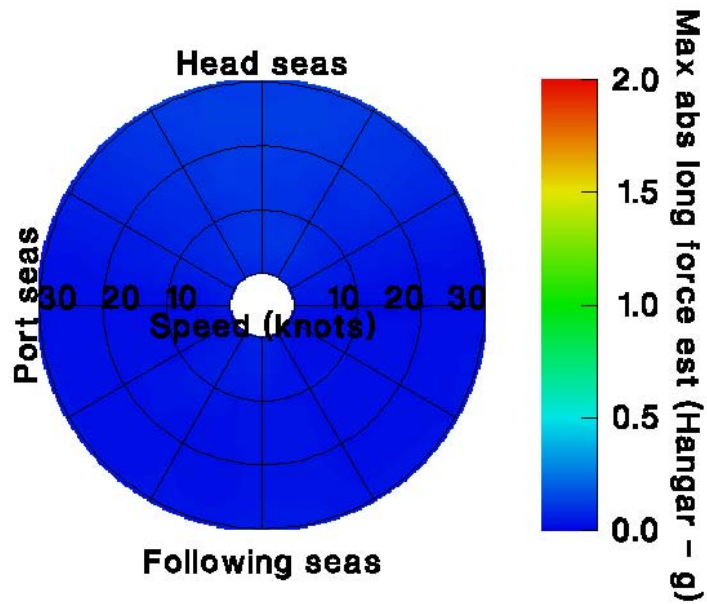
**Figure E.1:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 8.3$  s.



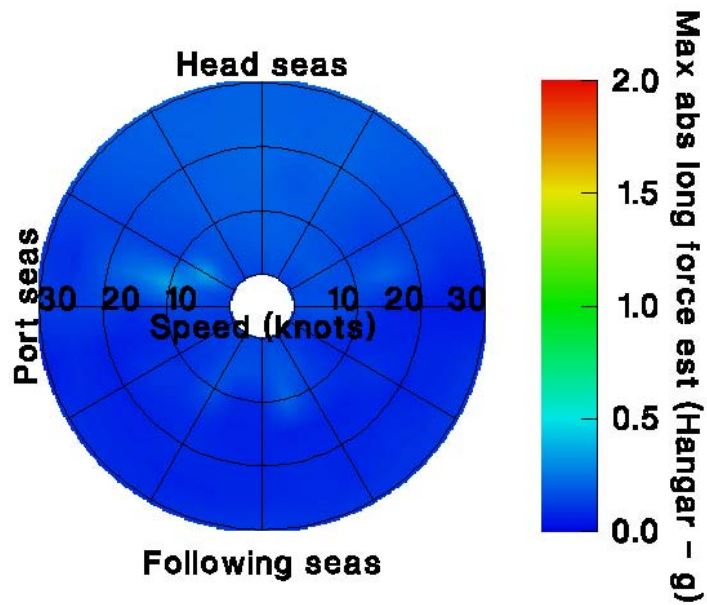
**Figure E.2:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 15.5$  s.



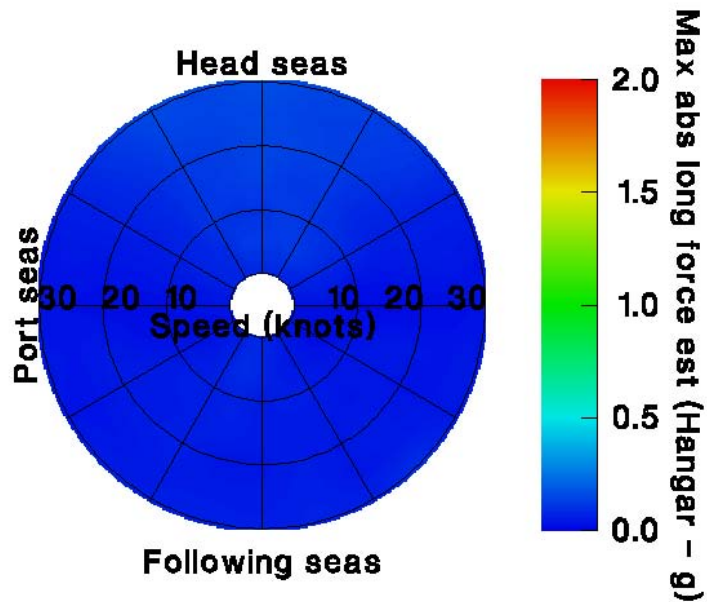
**Figure E.3:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 10.3$  s.



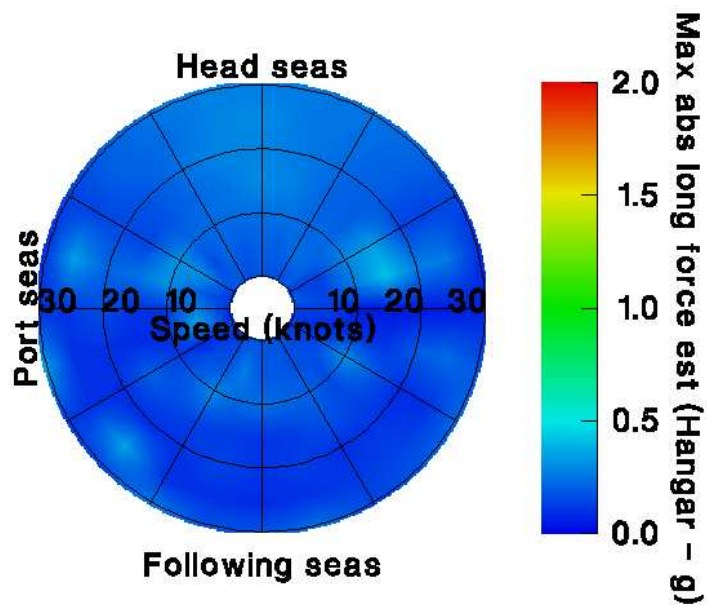
**Figure E.4:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 16.2$  s.



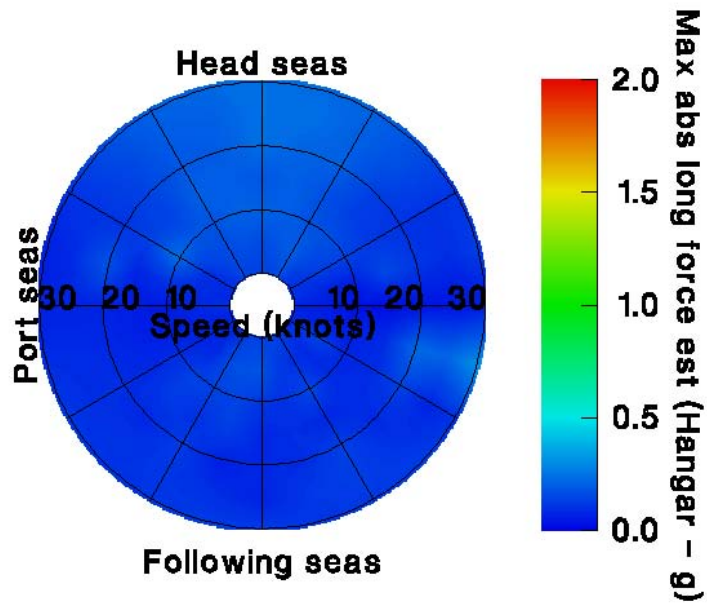
**Figure E.5:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 13.1$  s.



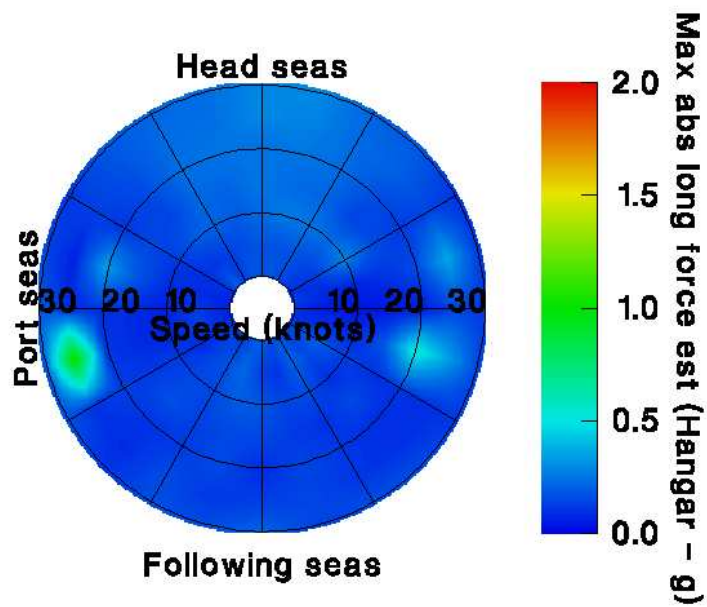
**Figure E.6:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 18.5$  s.



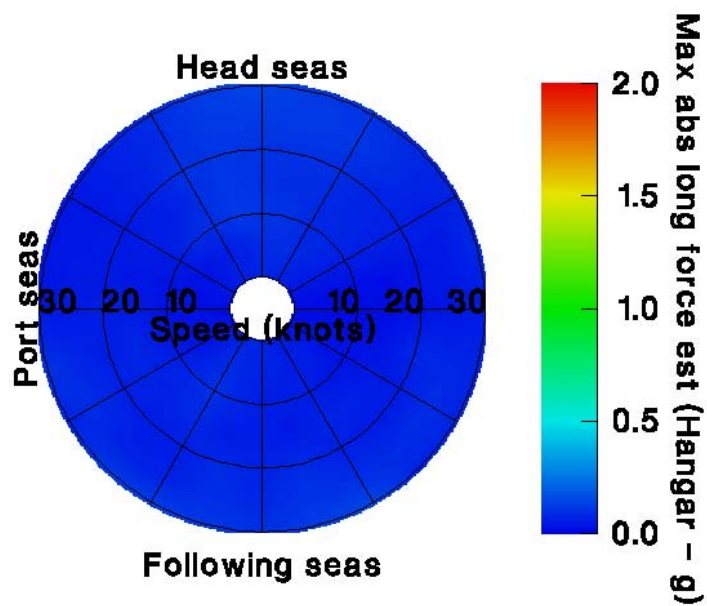
**Figure E.7:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 16.4$  s.



**Figure E.8:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 18.6$  s.



**Figure E.9:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 20.0$  s.

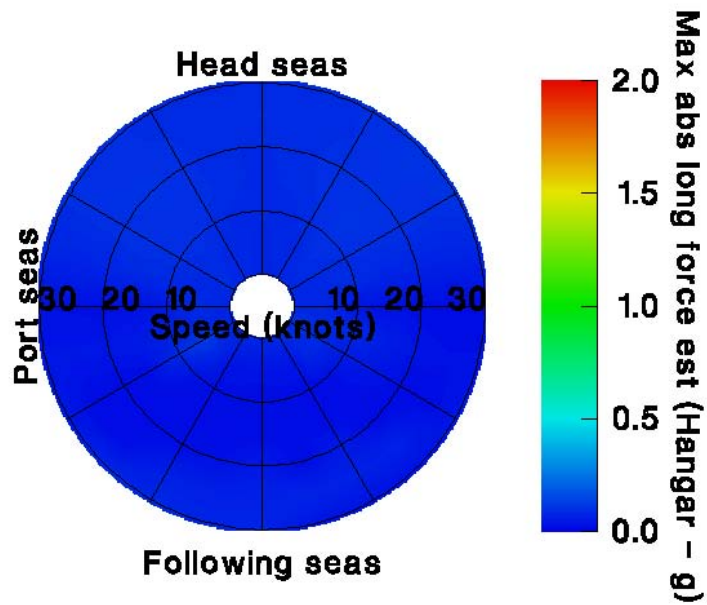


**Figure E.10:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 25.7$  s.

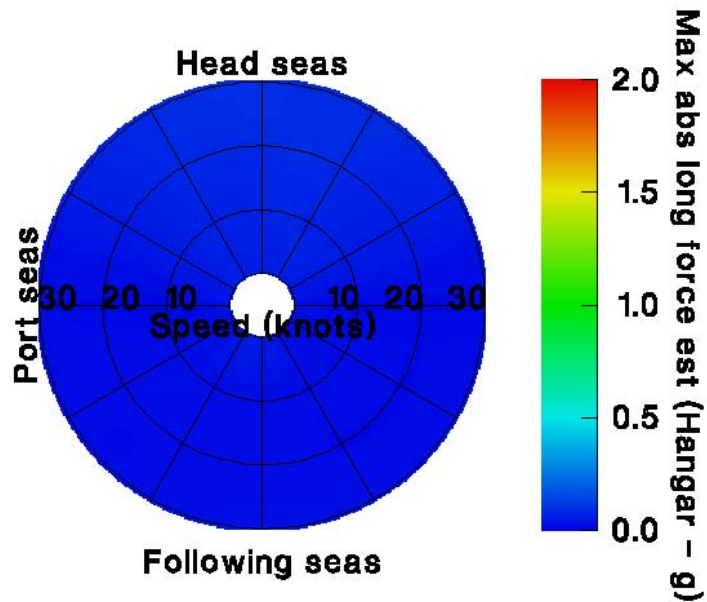
**Annex F**  
**Polar Plots of Maximum Absolute**  
**Longitudinal Force Estimator at Hangar**  
**Deck – JONSWAP Spectra (Coastal Waters)**

---



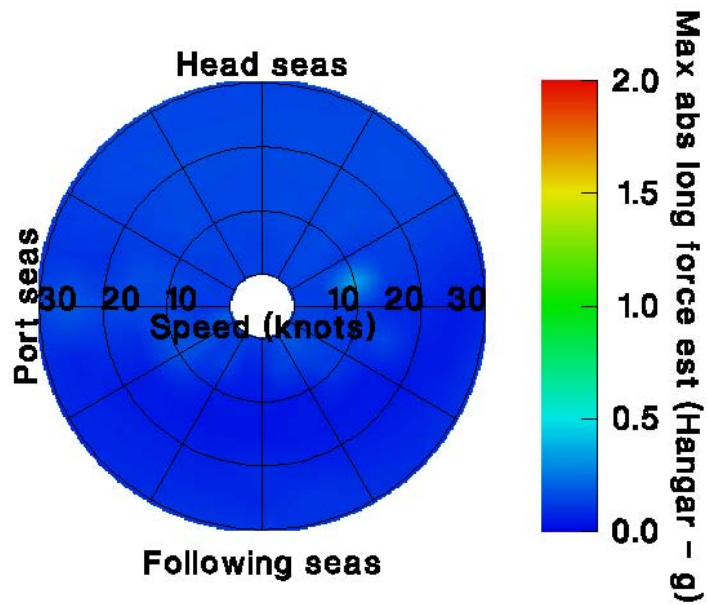


**Figure F.1:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 8.2$  s.

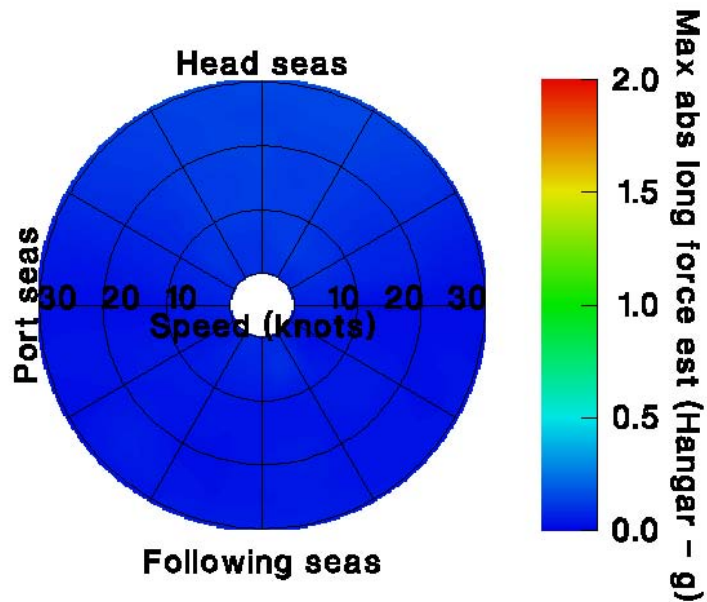


**Figure F.2:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 13.6$  s.

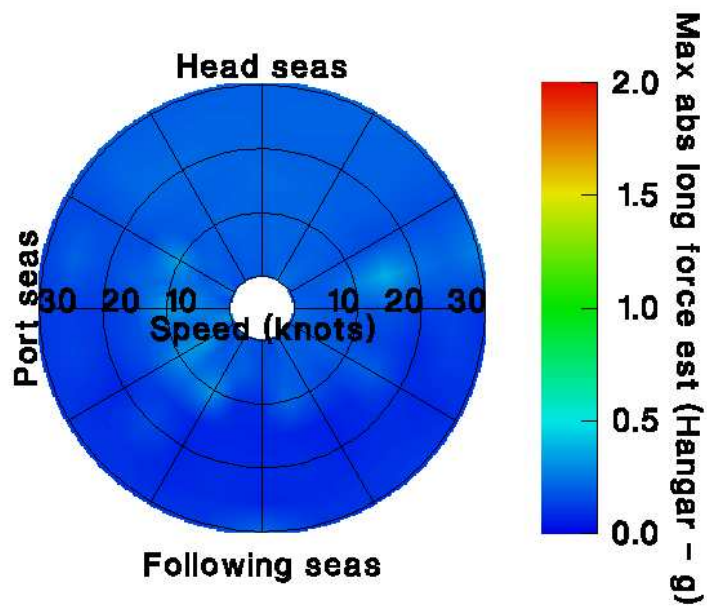




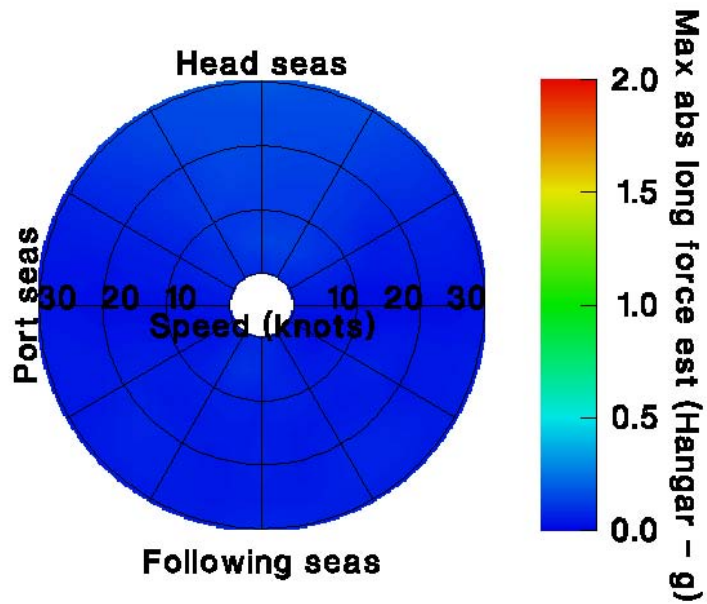
**Figure F.3:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 9.3$  s.



**Figure F.4:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 13.6$  s.



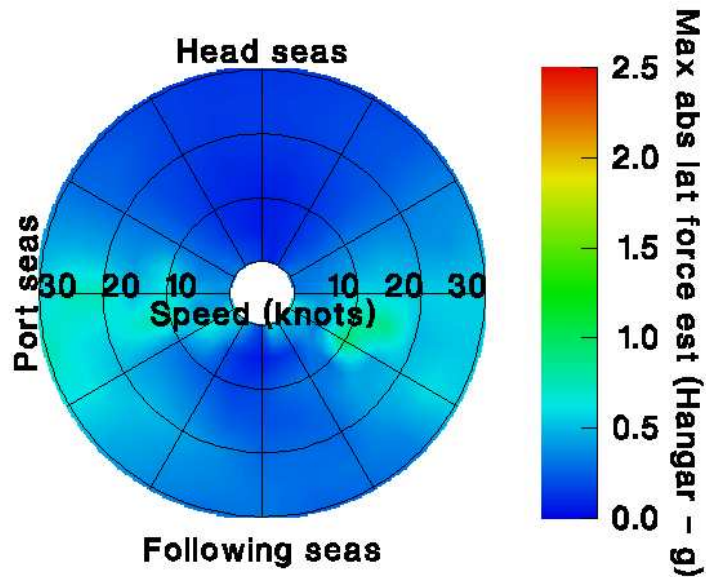
**Figure F.5:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 11.0$  s.



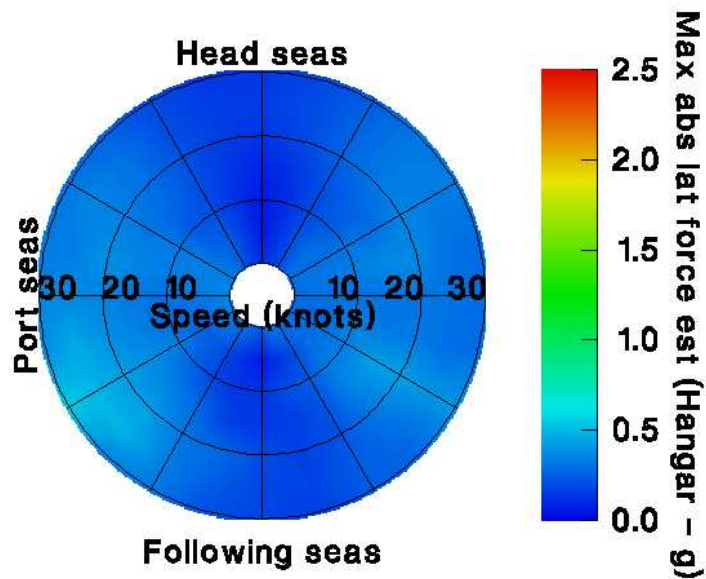
**Figure F.6:** Max. Abs. Long. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 17.1$  s.

**Annex G**  
**Polar Plots of Maximum Absolute Lateral**  
**Force Estimator at Hangar Deck –**  
**Bretschneider Spectra (Open Ocean)**

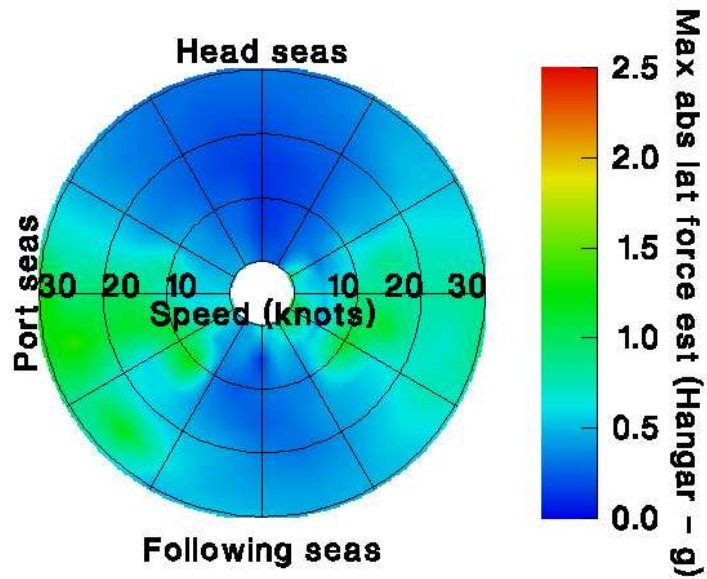
---



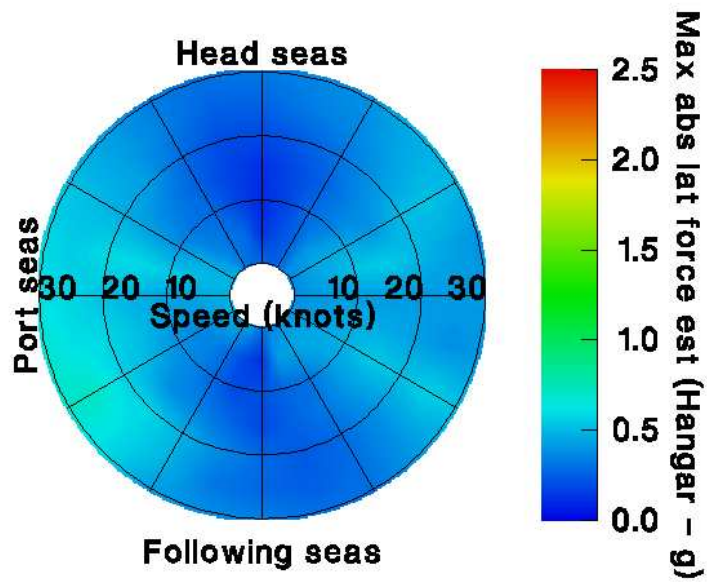
**Figure G.1:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 8.3$  s.



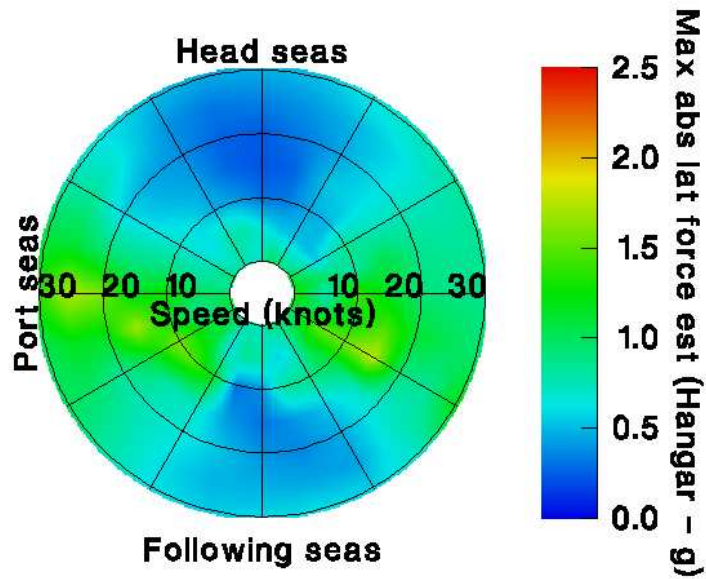
**Figure G.2:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 15.5$  s.



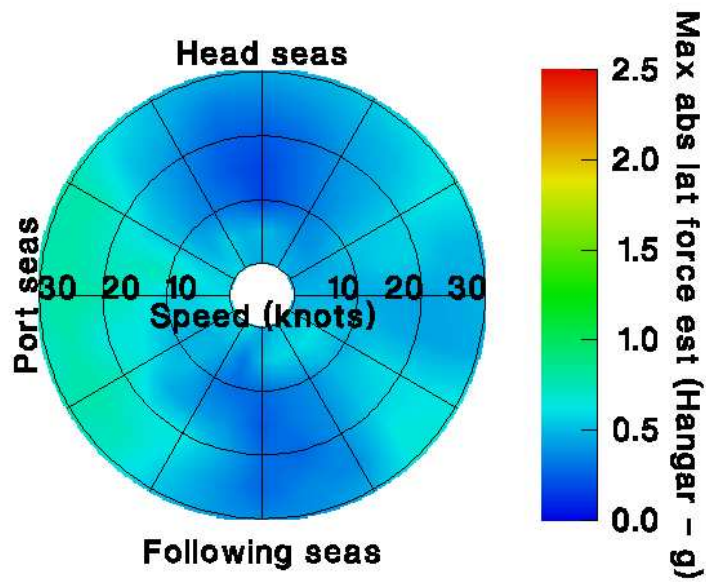
**Figure G.3:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 10.3$  s.



**Figure G.4:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 16.2$  s.

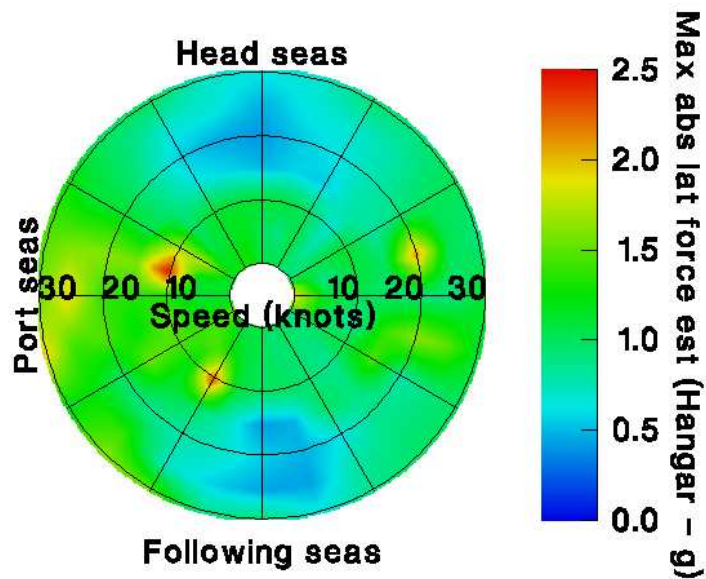


**Figure G.5:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 13.1$  s.

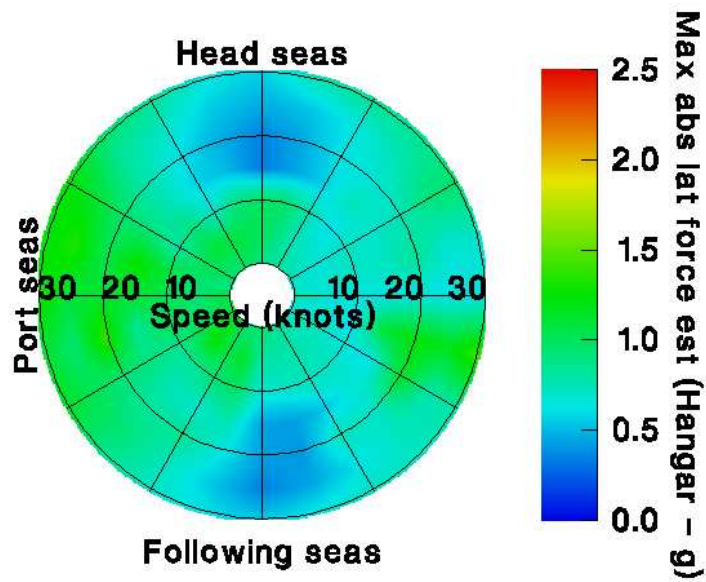


**Figure G.6:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 18.5$  s.

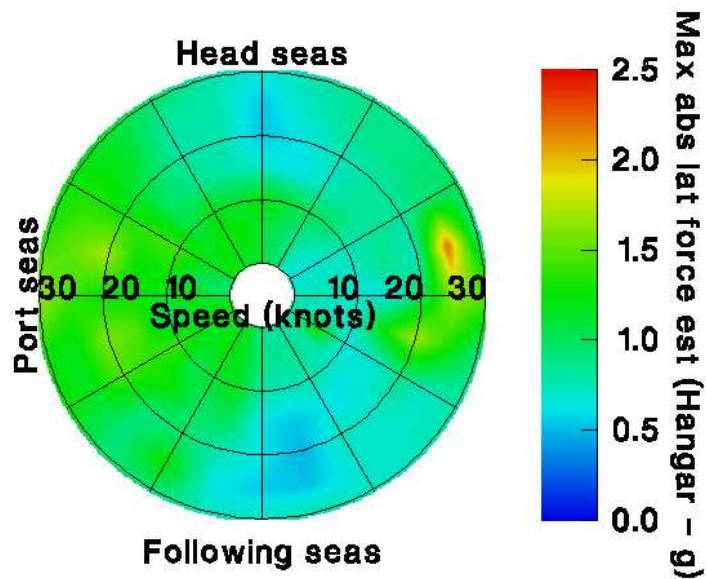




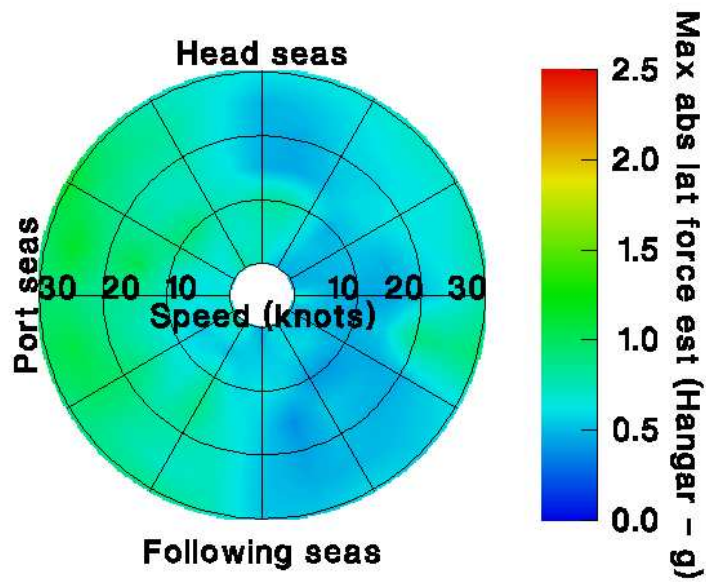
**Figure G.7:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 16.4$  s.



**Figure G.8:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 18.6$  s.



**Figure G.9:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 20.0$  s.

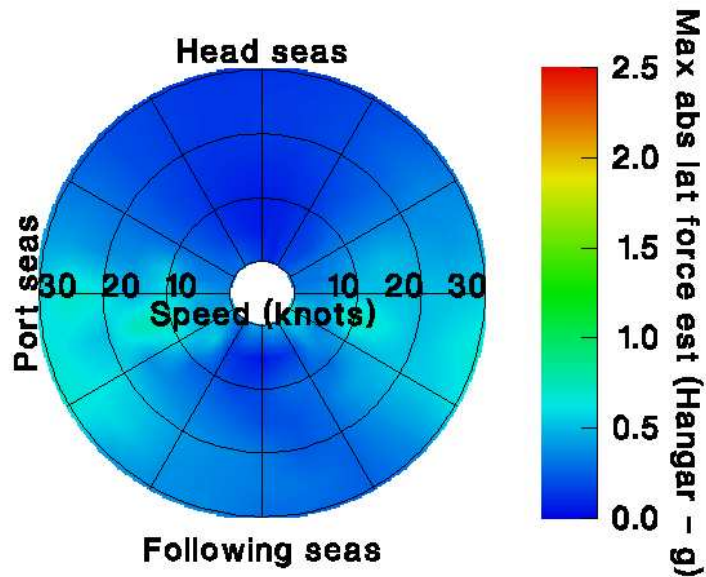


**Figure G.10:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 25.7$  s.

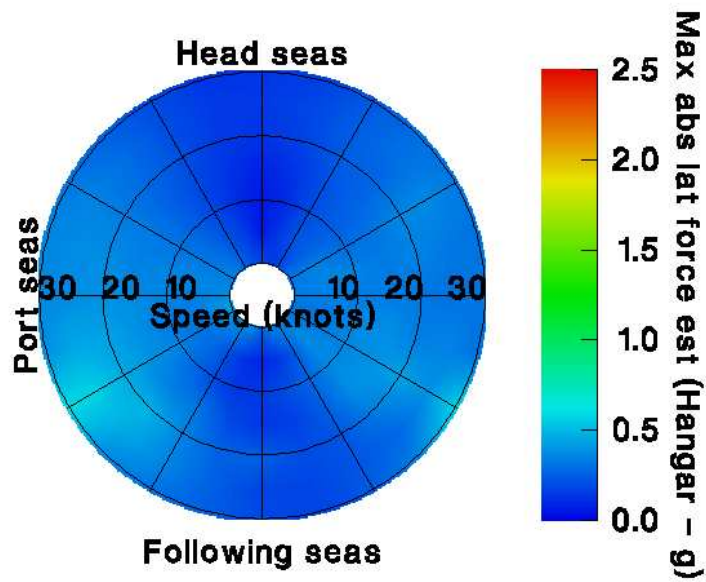


**Annex H**  
**Polar Plots of Maximum Absolute Lateral**  
**Force Estimator at Hangar Deck – JONSWAP**  
**Spectra (Coastal Waters)**

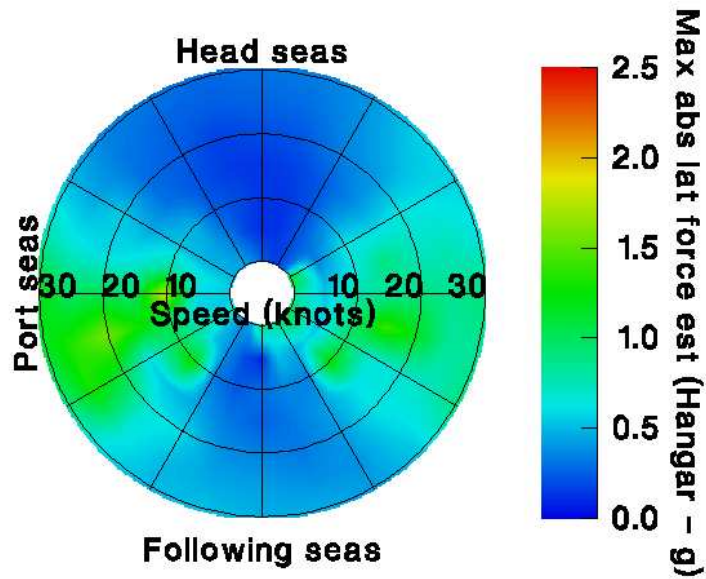
---



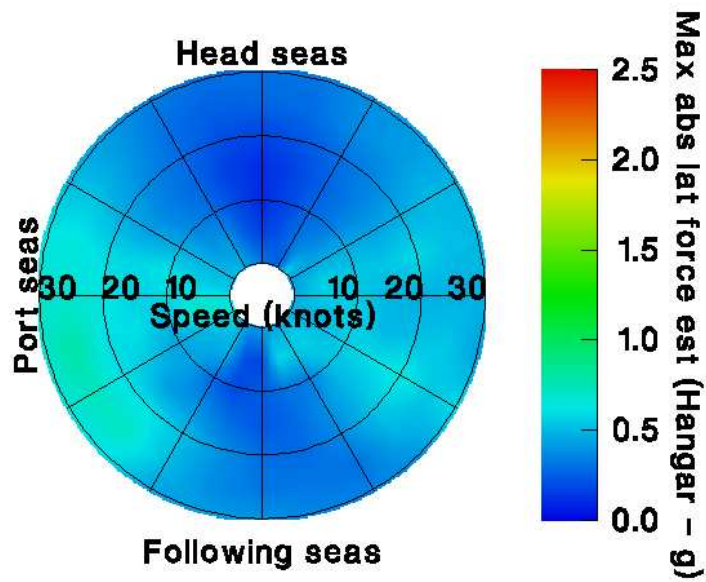
**Figure H.1:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 8.2$  s.



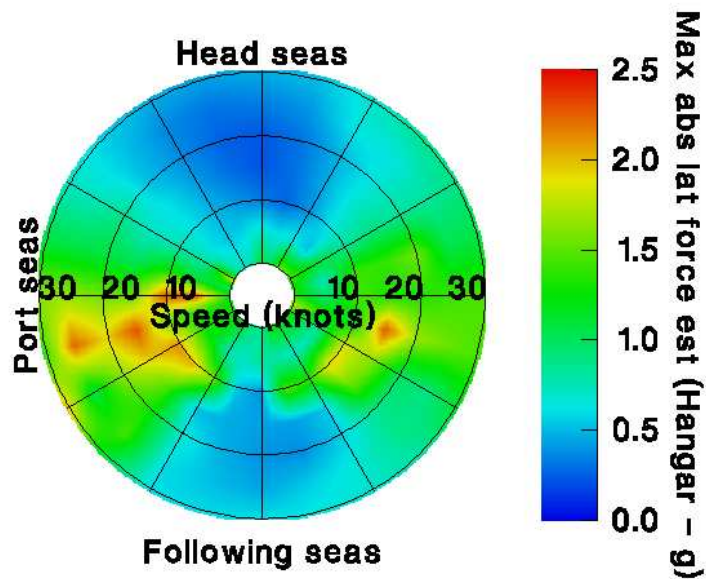
**Figure H.2:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 13.6$  s.



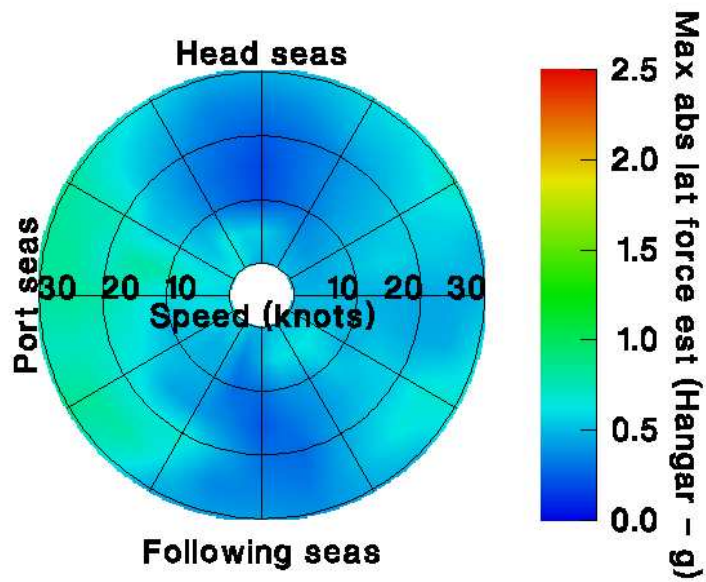
**Figure H.3:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 9.3$  s.



**Figure H.4:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 13.6$  s.



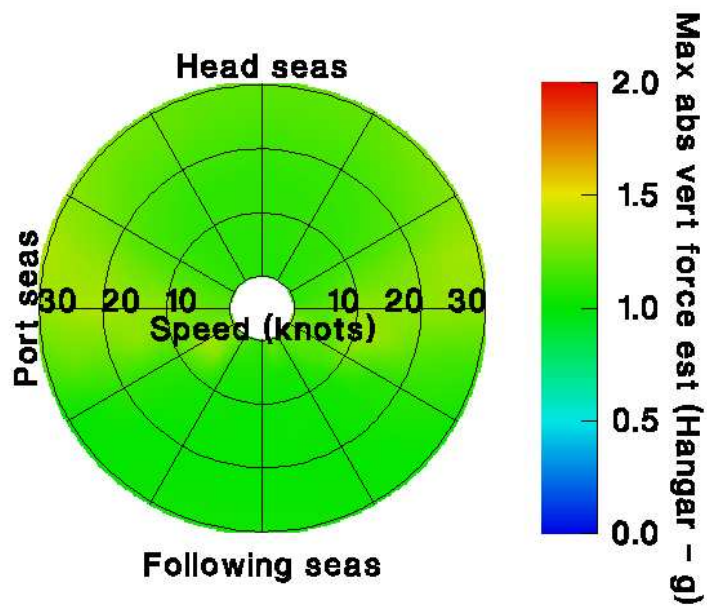
**Figure H.5:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 11.0$  s.



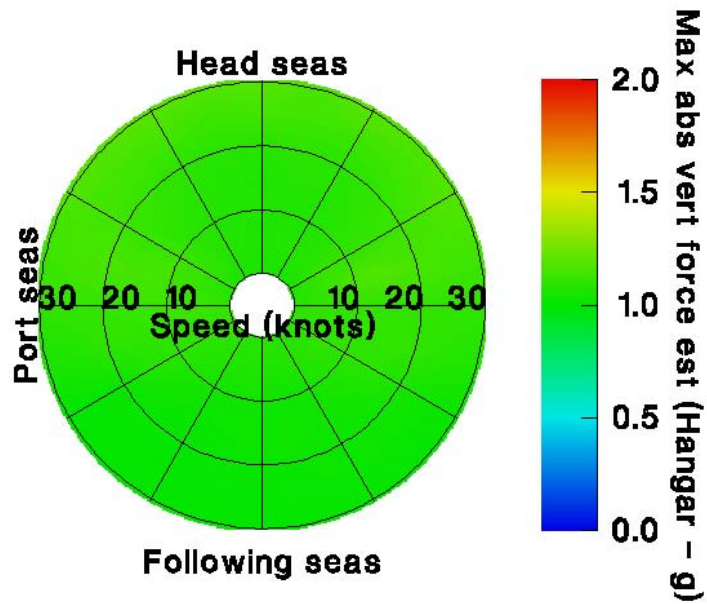
**Figure H.6:** Max. Abs. Lat. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 17.1$  s.

**Annex I**  
**Polar Plots of Maximum Absolute Vertical**  
**Force Estimator at Hangar Deck –**  
**Bretschneider Spectra (Open Ocean)**

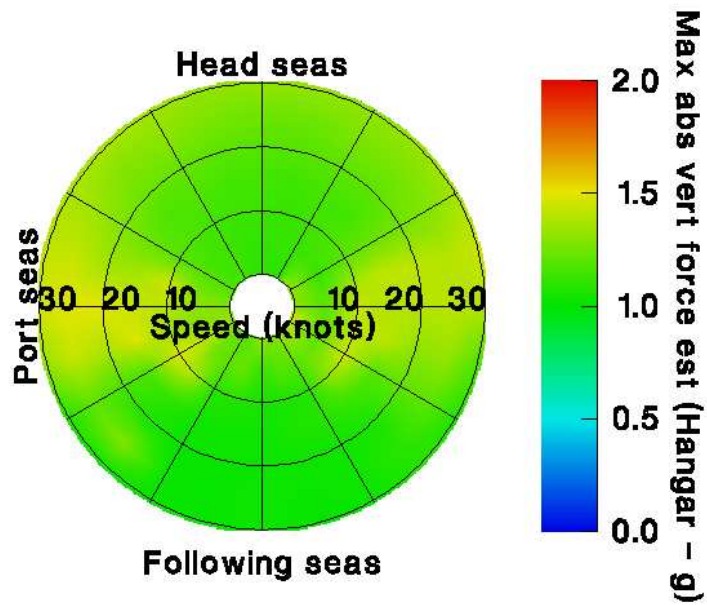
---



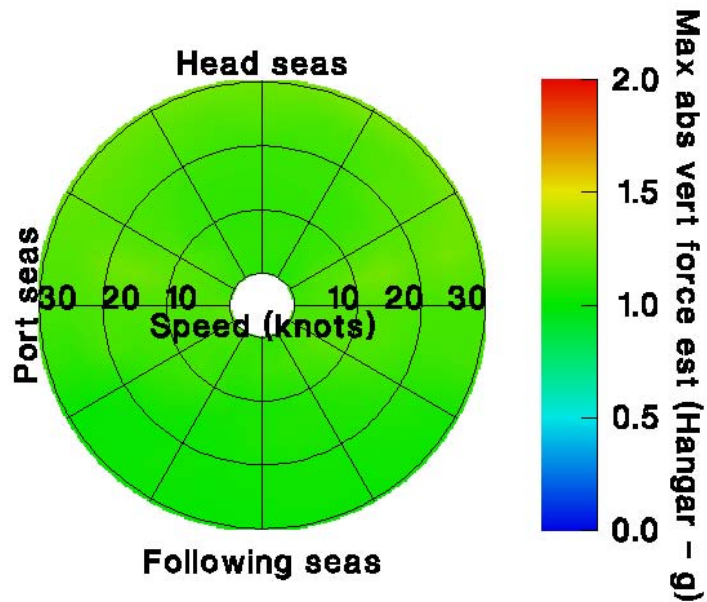
**Figure I.1:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 8.3$  s.



**Figure I.2:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 15.5$  s.

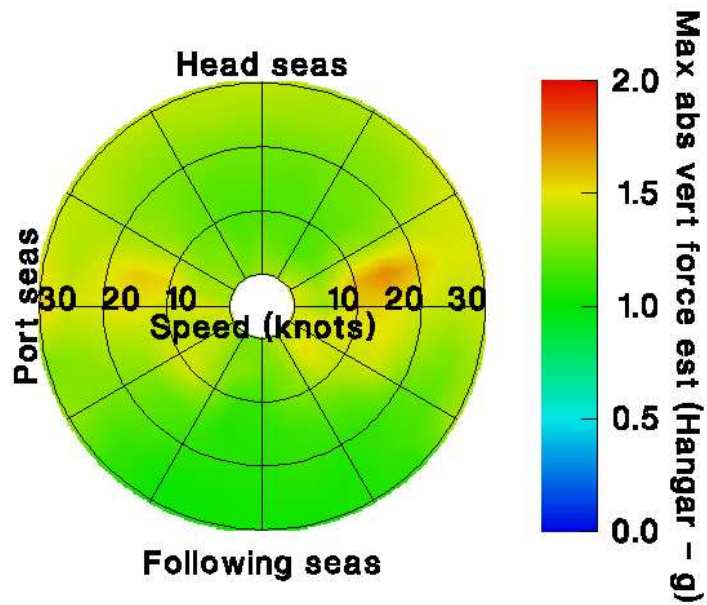


**Figure I.3:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 10.3$  s.

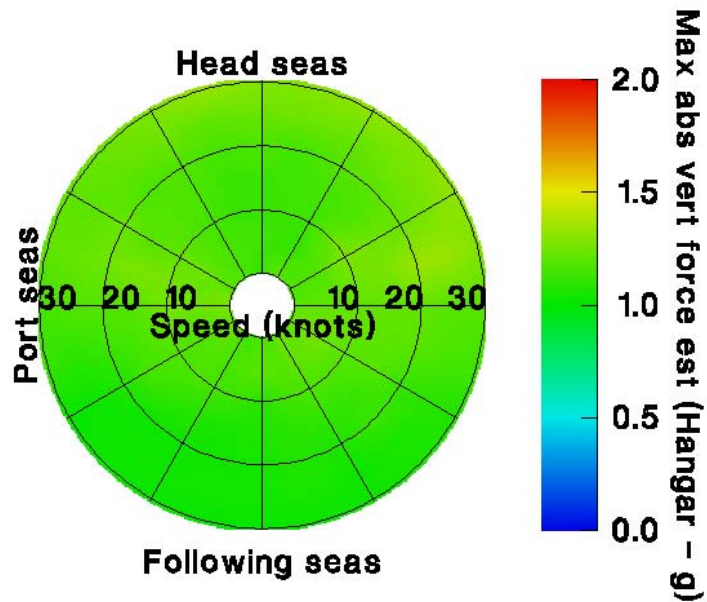


**Figure I.4:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 16.2$  s.



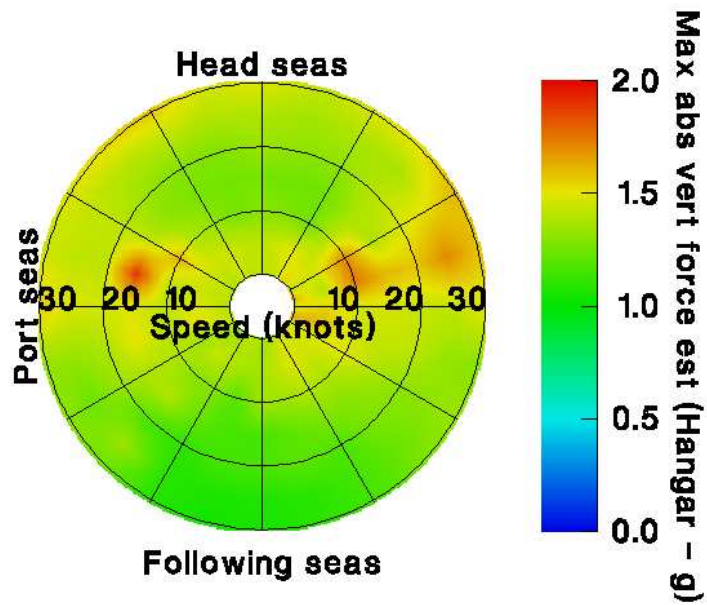


**Figure I.5:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 13.1$  s.

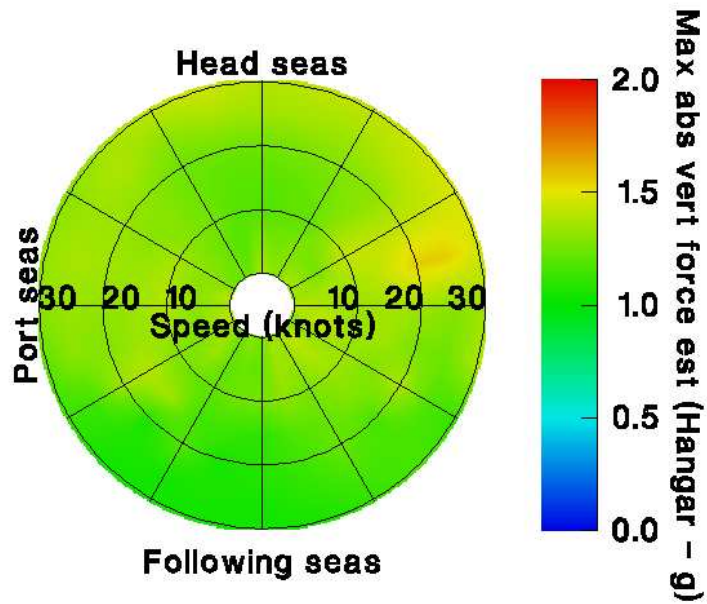


**Figure I.6:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 18.5$  s.

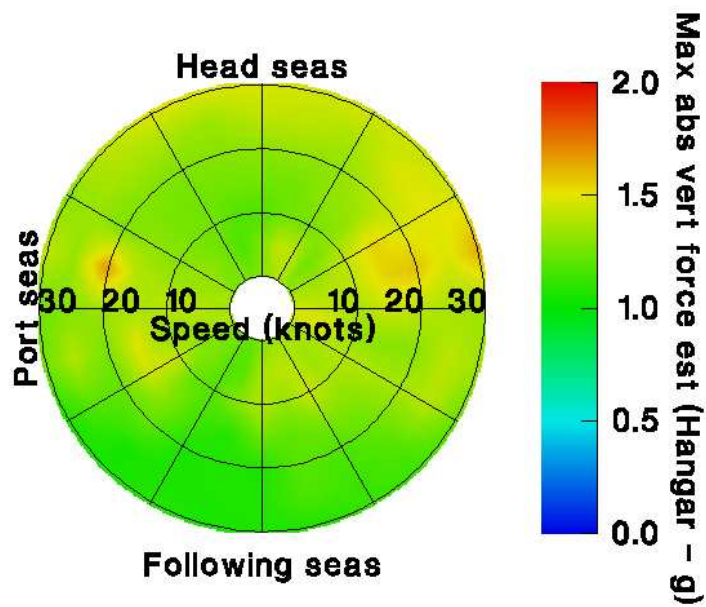




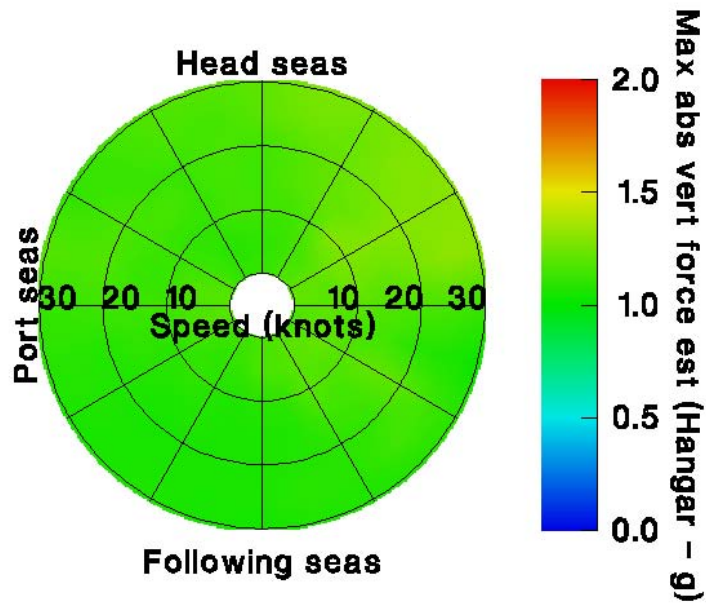
**Figure I.7:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 16.4$  s.



**Figure I.8:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 18.6$  s.



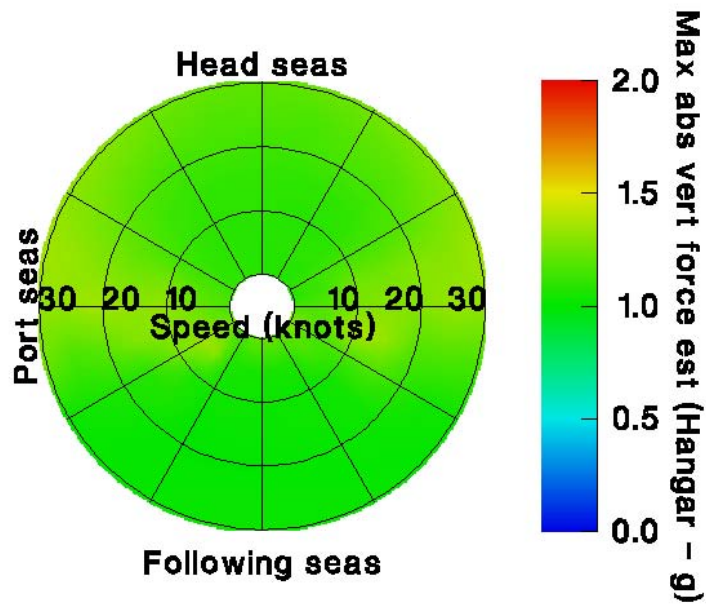
**Figure I.9:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 20.0$  s.



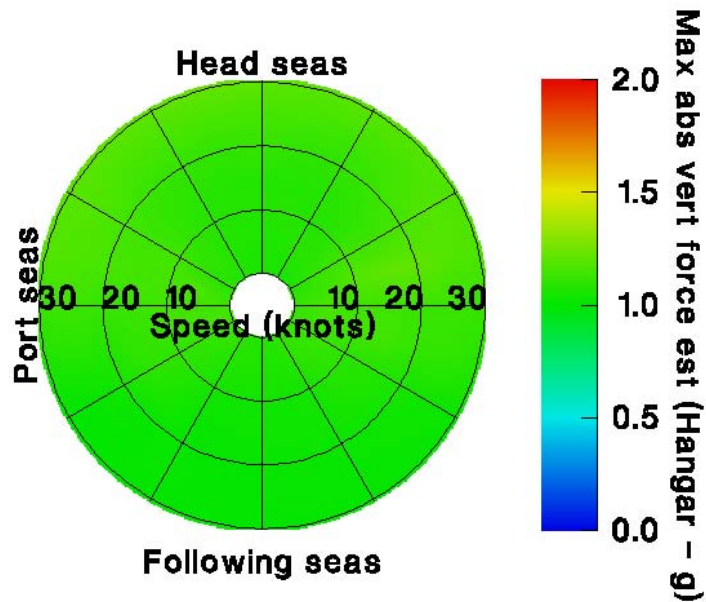
**Figure I.10:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 25.7$  s.

**Annex J**  
**Polar Plots of Maximum Absolute Vertical**  
**Force Estimator at Hangar Deck – JONSWAP**  
**Spectra (Coastal Waters)**

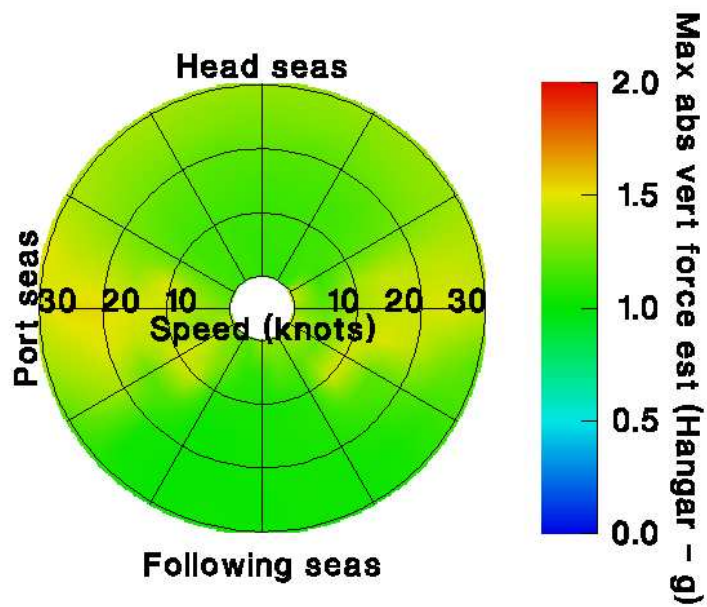
---



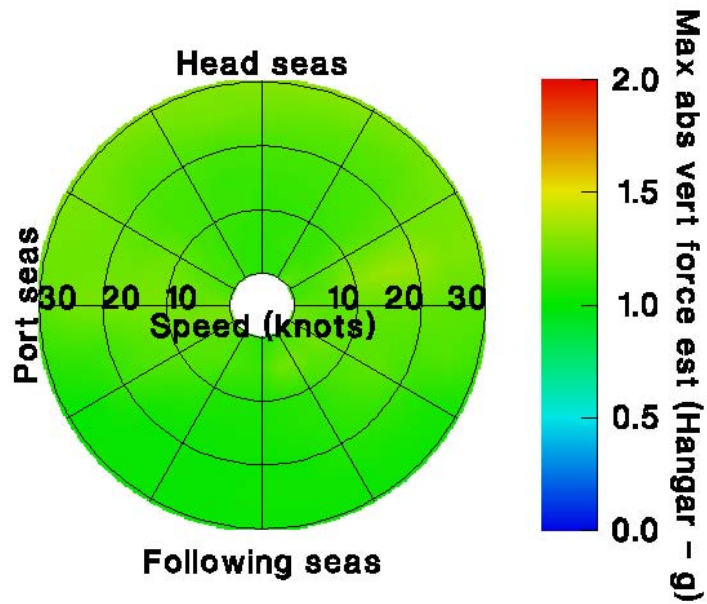
**Figure J.1:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 8.2$  s.



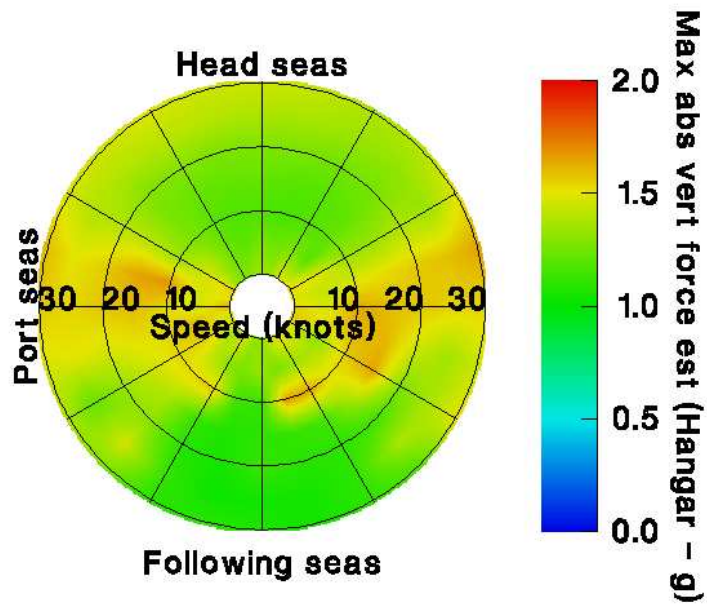
**Figure J.2:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 13.6$  s.



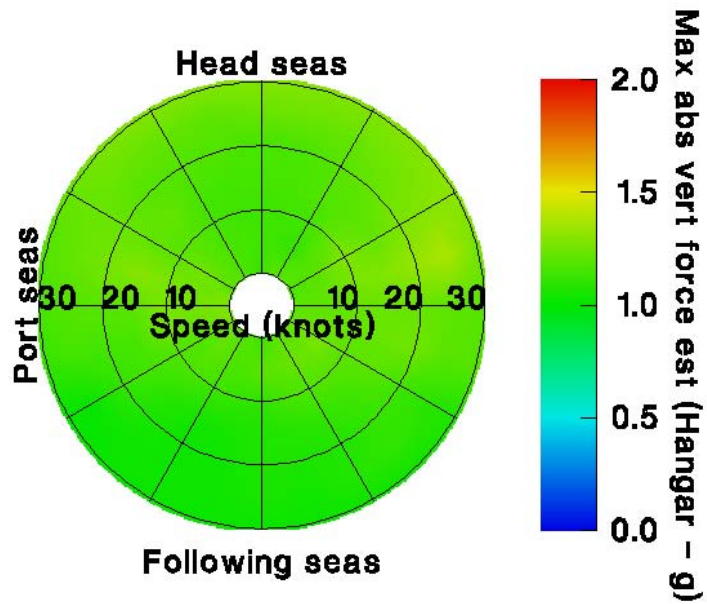
**Figure J.3:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 9.3$  s.



**Figure J.4:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 13.6$  s.



**Figure J.5:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 11.0$  s.

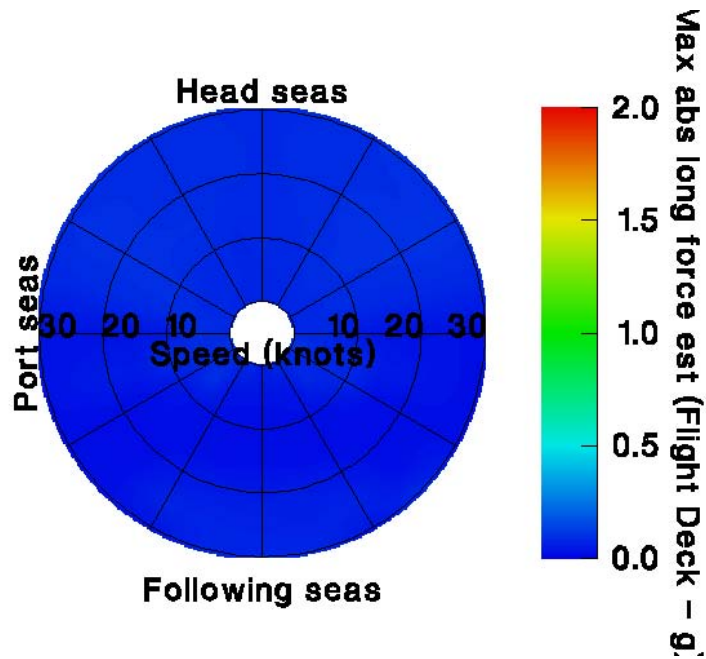


**Figure J.6:** Max. Abs. Vert. Force Est. at the Hangar Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 17.1$  s.

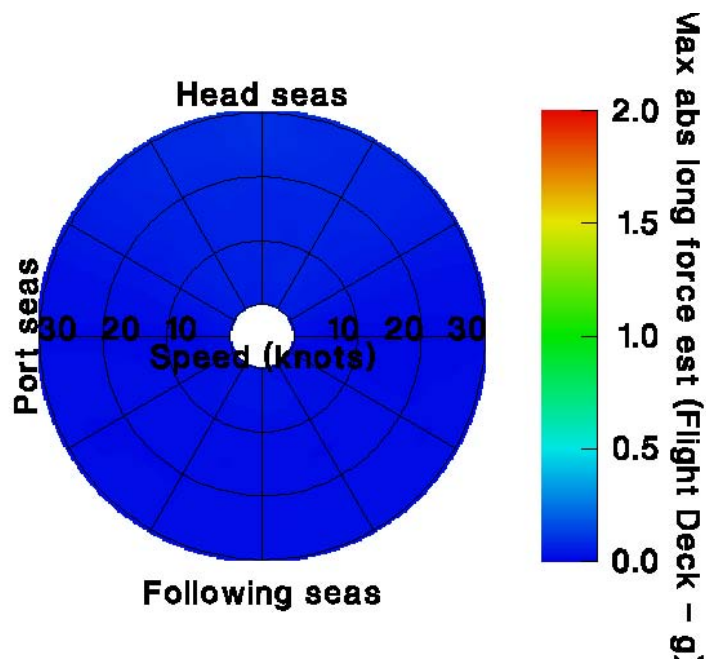
**Annex K**  
**Polar Plots of Maximum Absolute**  
**Longitudinal Force Estimator at Flight Deck**  
**– Bretschneider Spectra (Open Ocean)**

---



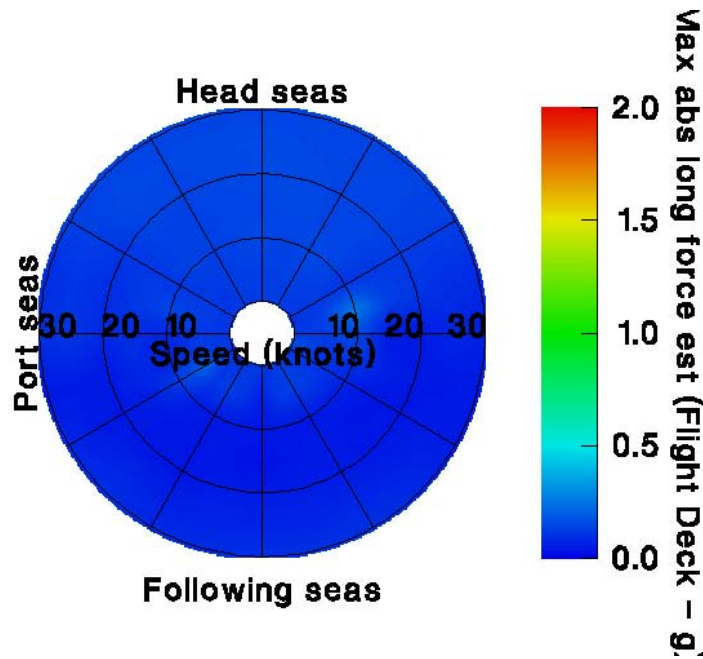


**Figure K.1:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 8.3$  s.

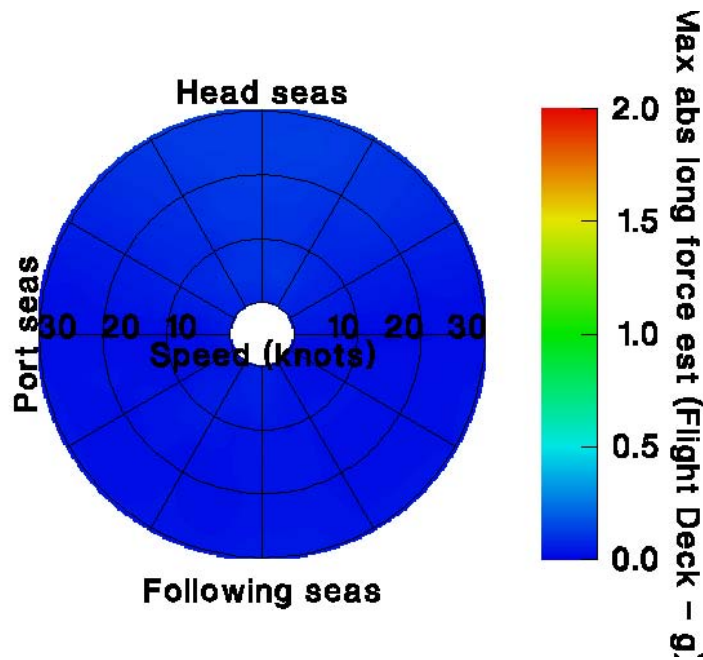


**Figure K.2:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 15.5$  s.

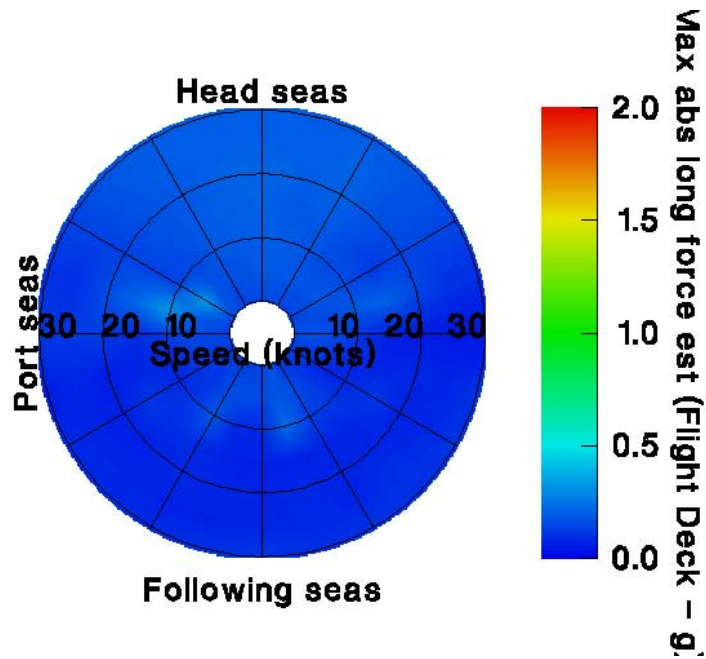




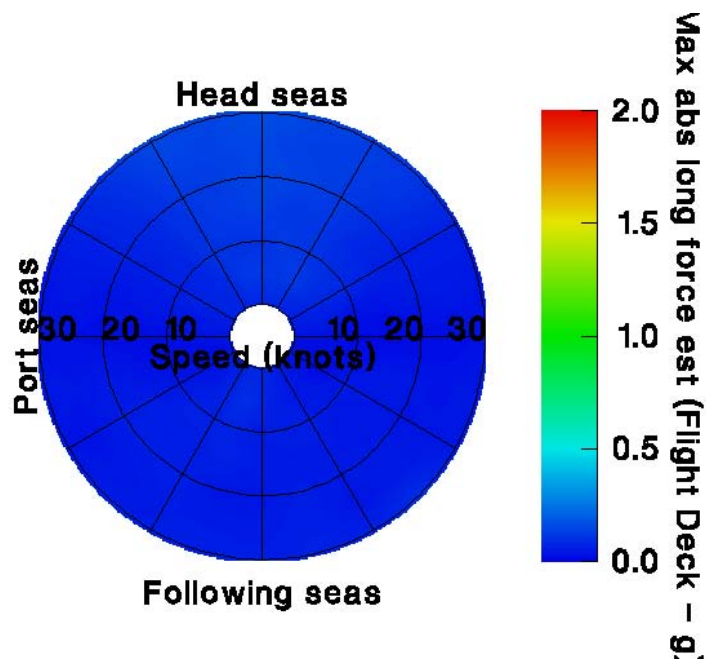
**Figure K.3:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 10.3$  s.



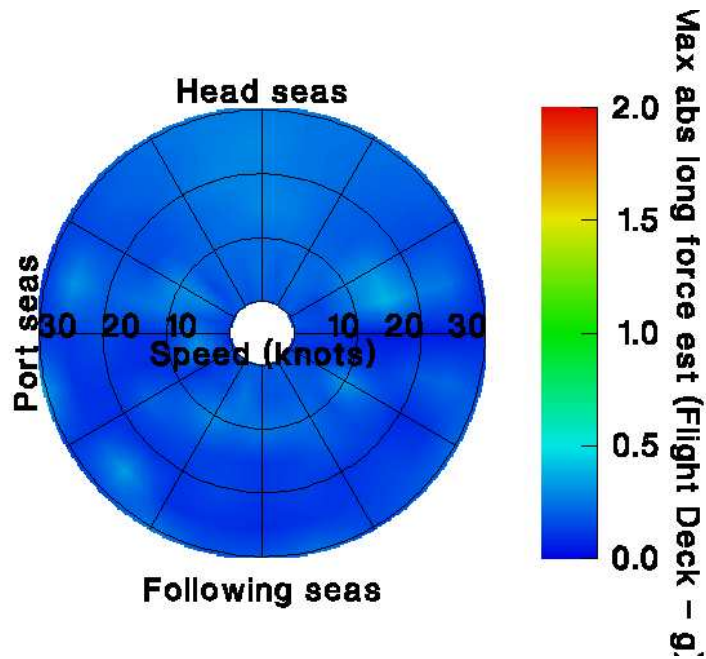
**Figure K.4:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 16.2$  s.



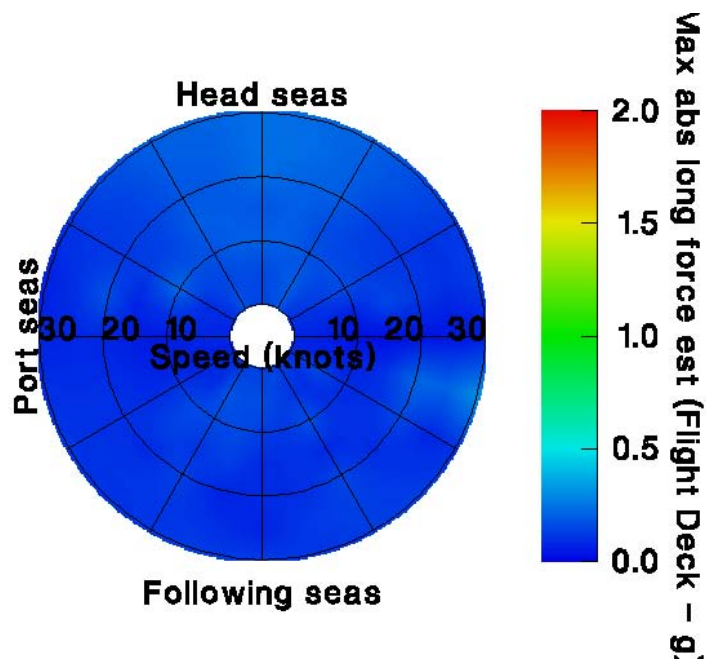
**Figure K.5:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 13.1$  s.



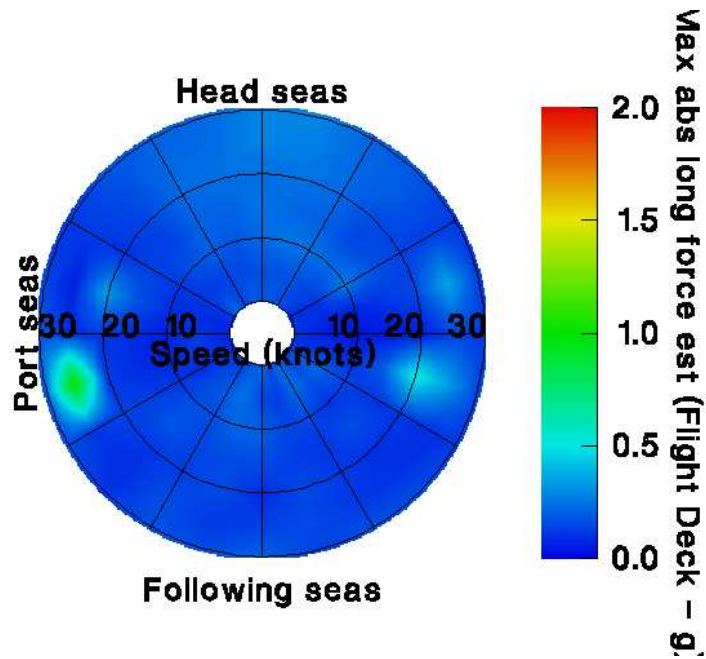
**Figure K.6:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 18.5$  s.



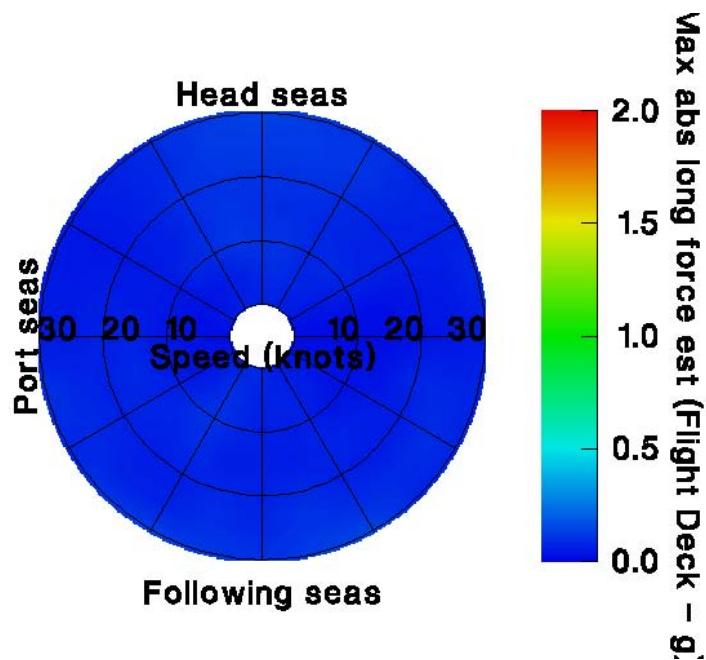
**Figure K.7:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 16.4$  s.



**Figure K.8:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 18.6$  s.



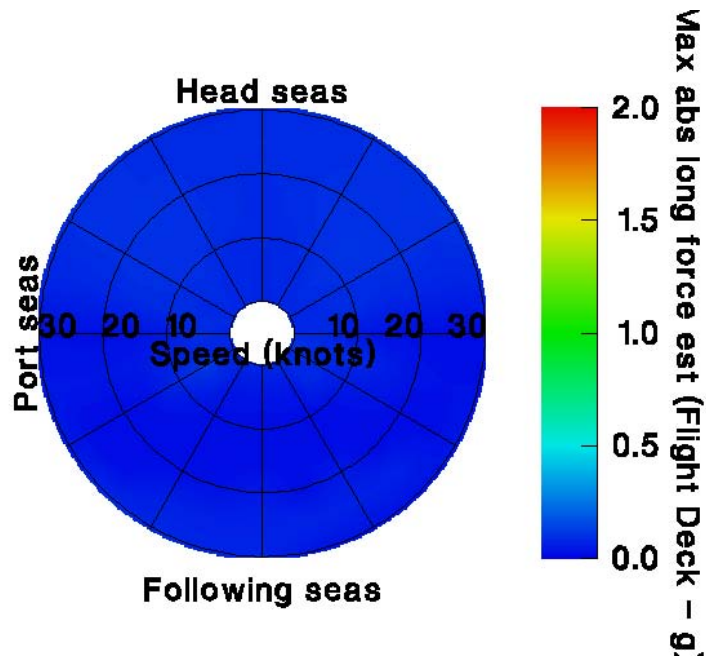
**Figure K.9:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 20.0$  s.



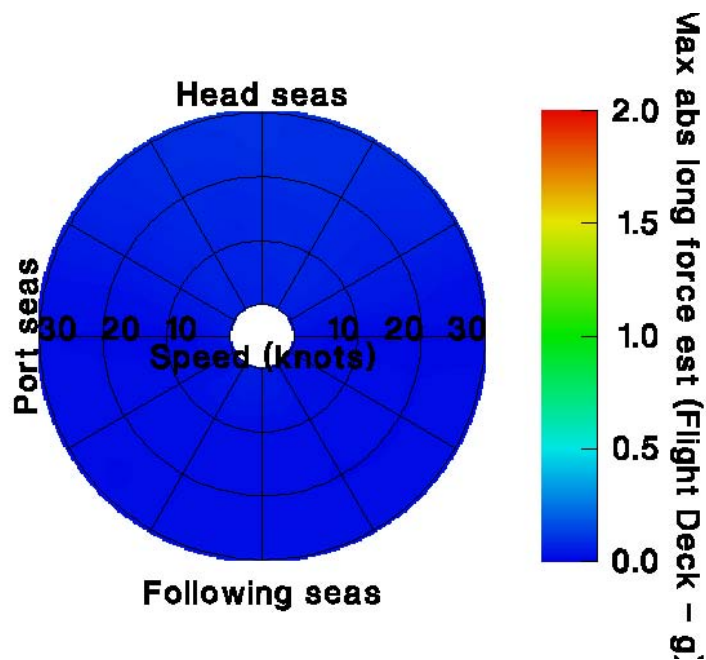
**Figure K.10:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 25.7$  s.

**Annex L**  
**Polar Plots of Maximum Absolute**  
**Longitudinal Force Estimator at Flight Deck**  
**– JONSWAP Spectra (Coastal Waters)**

---

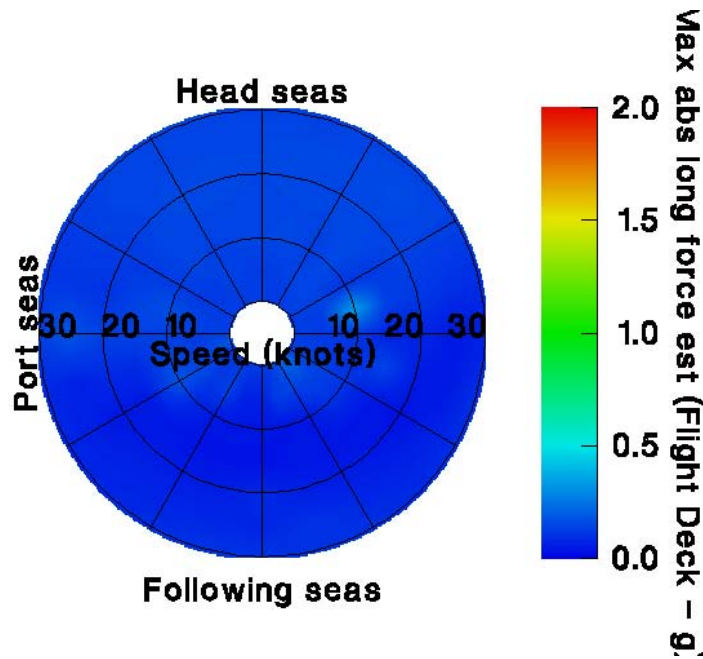


**Figure L.1:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 8.2$  s.

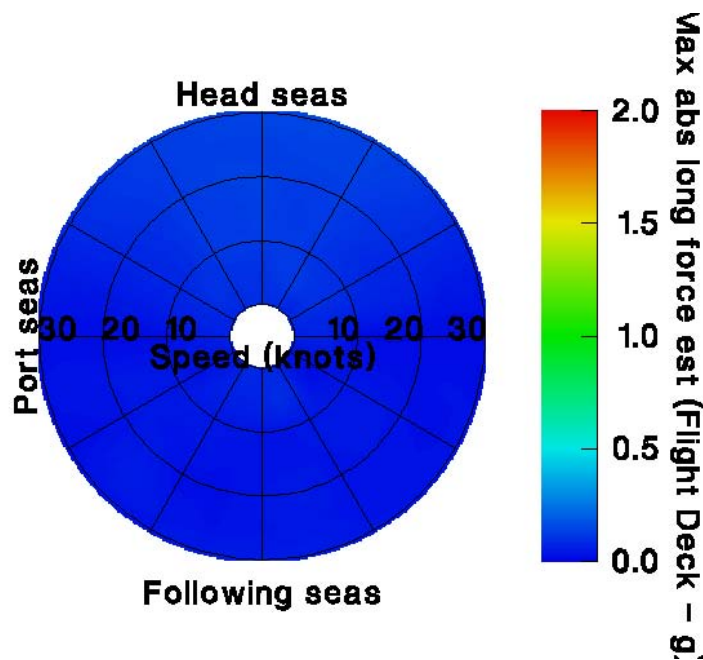


**Figure L.2:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 13.6$  s.

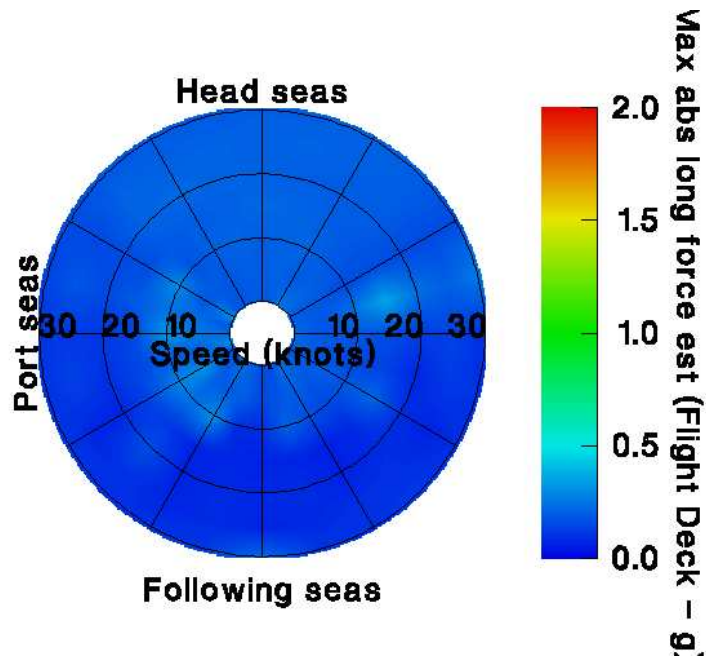




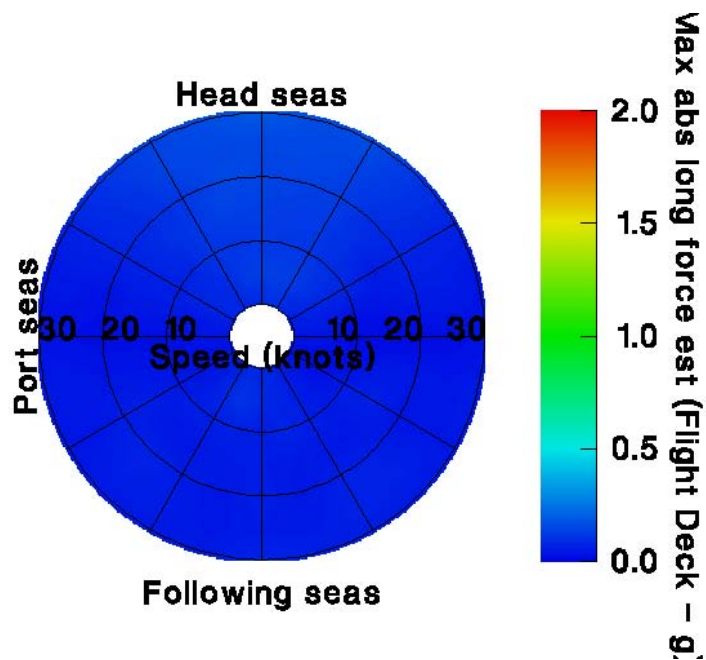
**Figure L.3:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 9.3$  s.



**Figure L.4:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 13.6$  s.



**Figure L.5:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 11.0$  s.

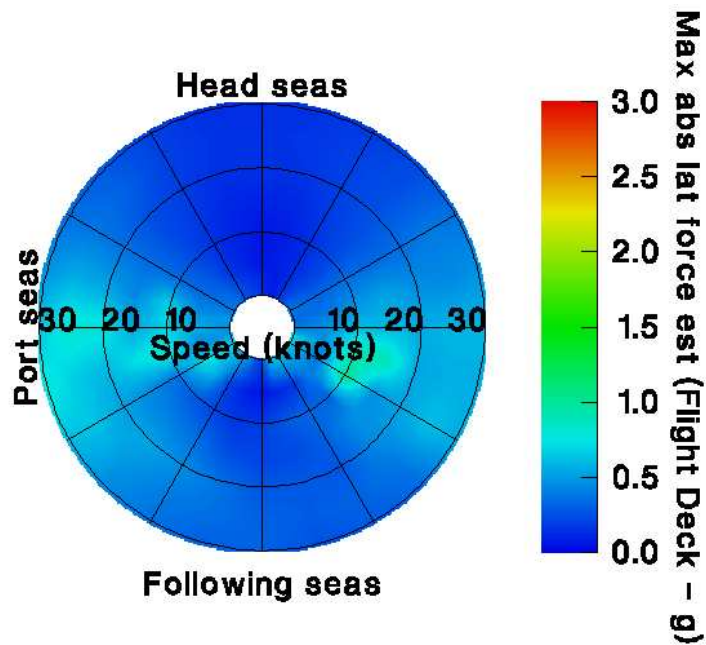


**Figure L.6:** Max. Abs. Long. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 17.1$  s.

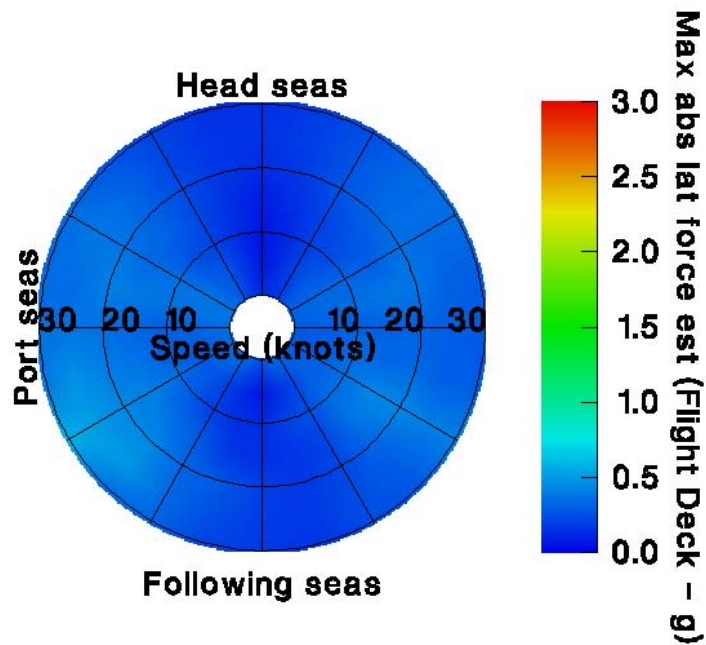


**Annex M**  
**Polar Plots of Maximum Absolute Lateral**  
**Force Estimator at Flight Deck –**  
**Bretschneider Spectra (Open Ocean)**

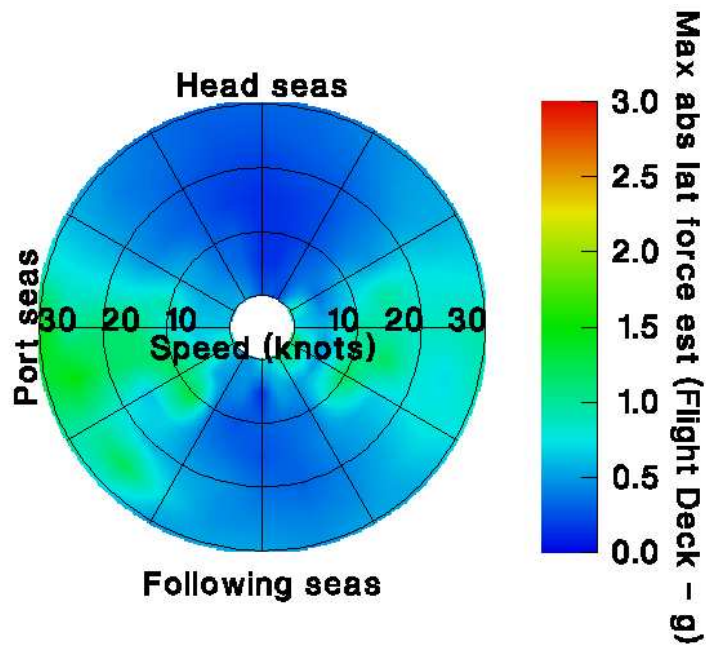
---



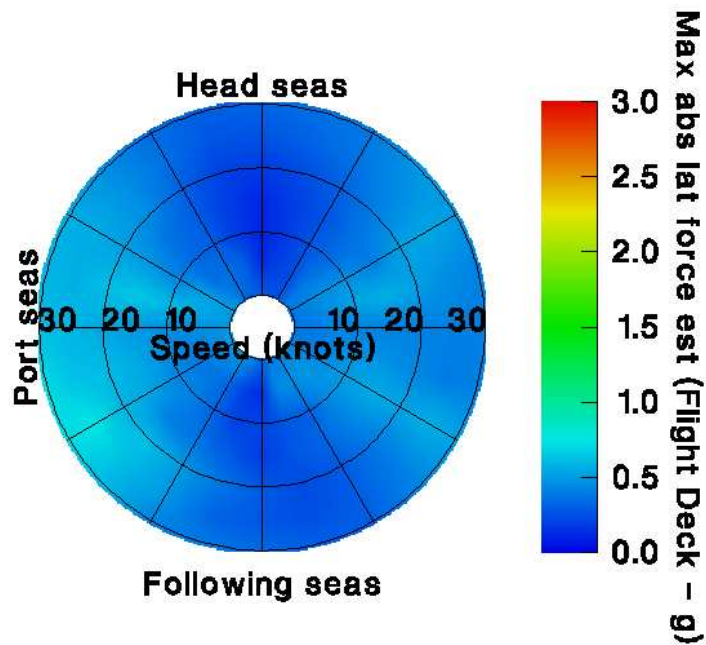
**Figure M.1:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 8.3$  s.



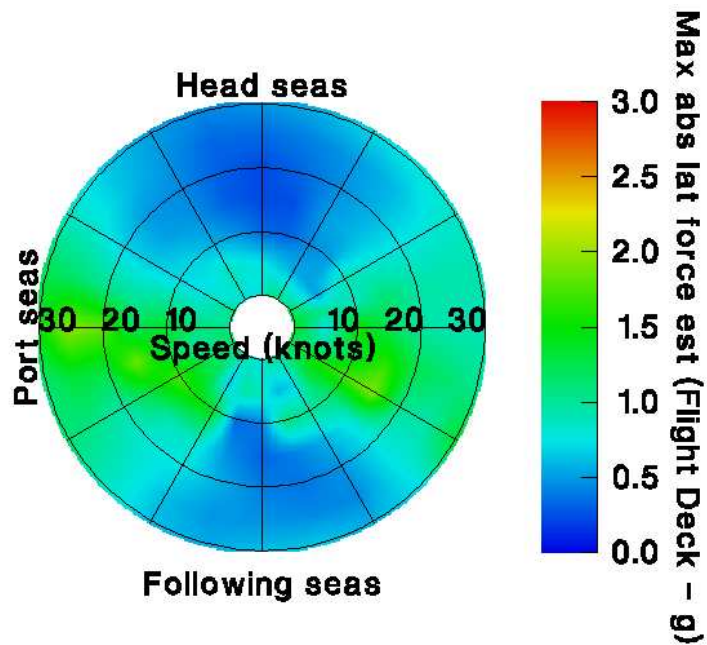
**Figure M.2:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 15.5$  s.



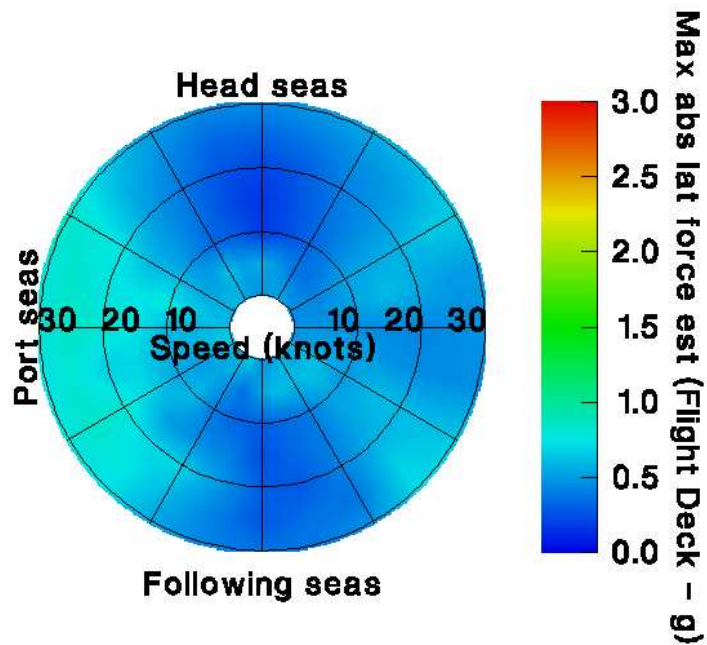
**Figure M.3:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 10.3$  s.



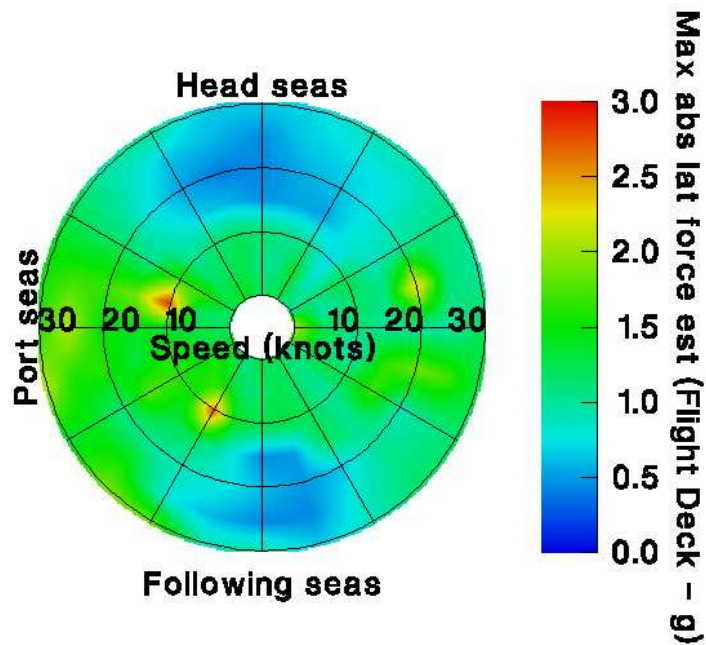
**Figure M.4:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 16.2$  s.



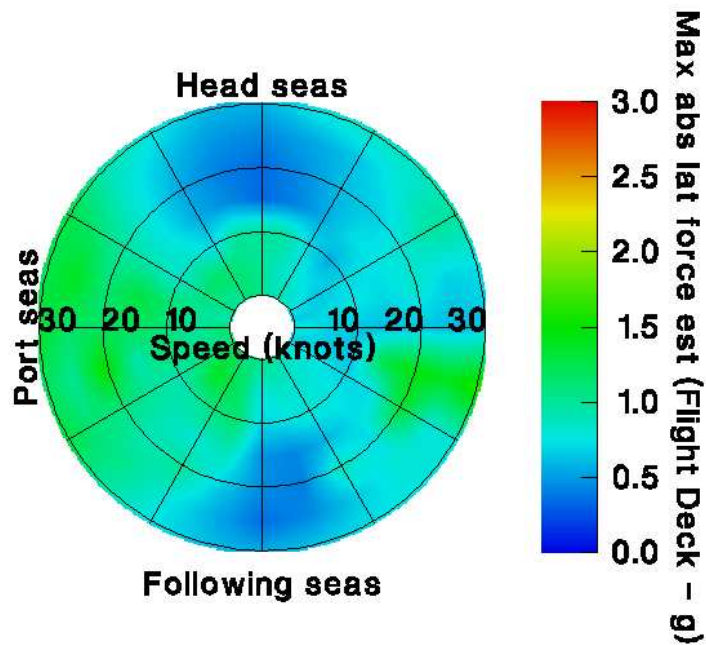
**Figure M.5:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 13.1$  s.



**Figure M.6:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 18.5$  s.

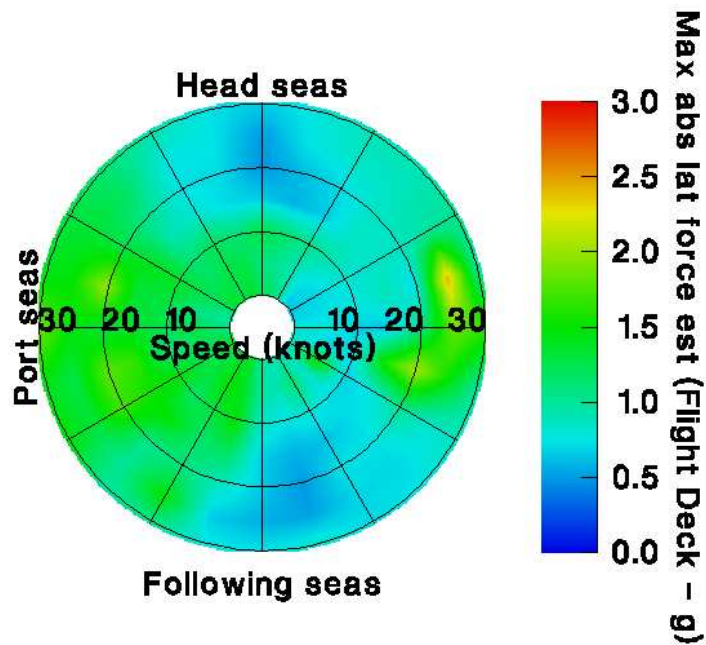


**Figure M.7:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 16.4$  s.

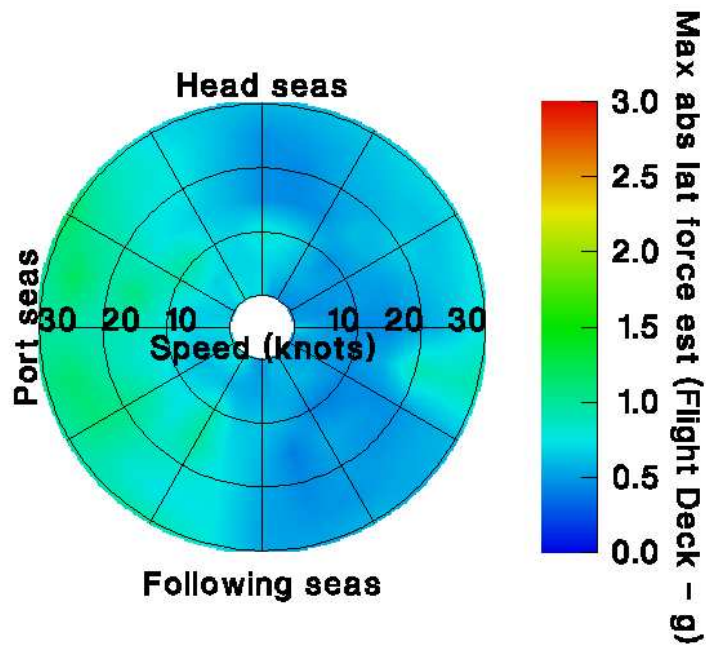


**Figure M.8:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 18.6$  s.





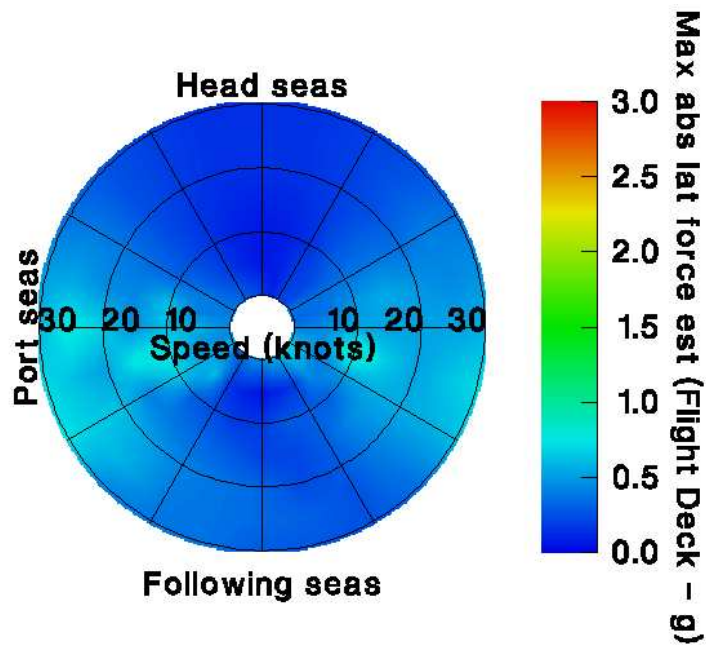
**Figure M.9:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 20.0$  s.



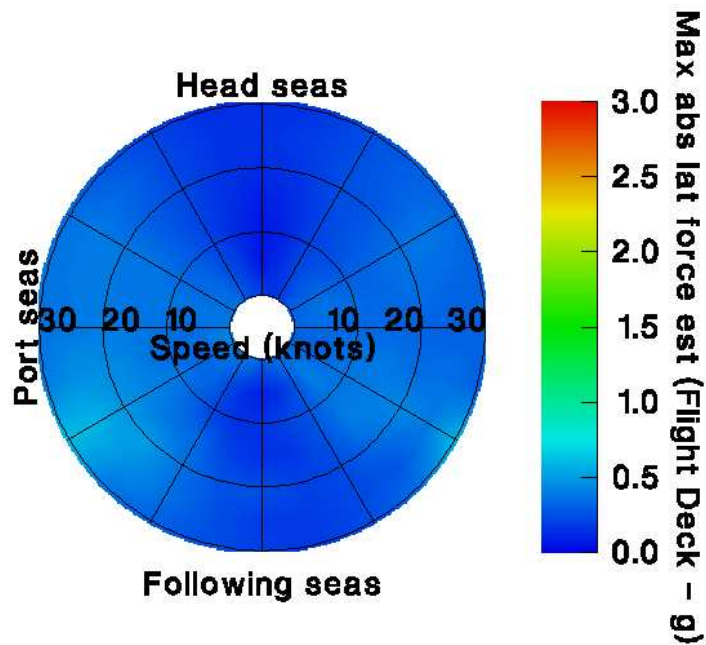
**Figure M.10:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 25.7$  s.

**Annex N**  
**Polar Plots of Maximum Absolute Lateral**  
**Force Estimator at Flight Deck – JONSWAP**  
**Spectra (Coastal Waters)**

---

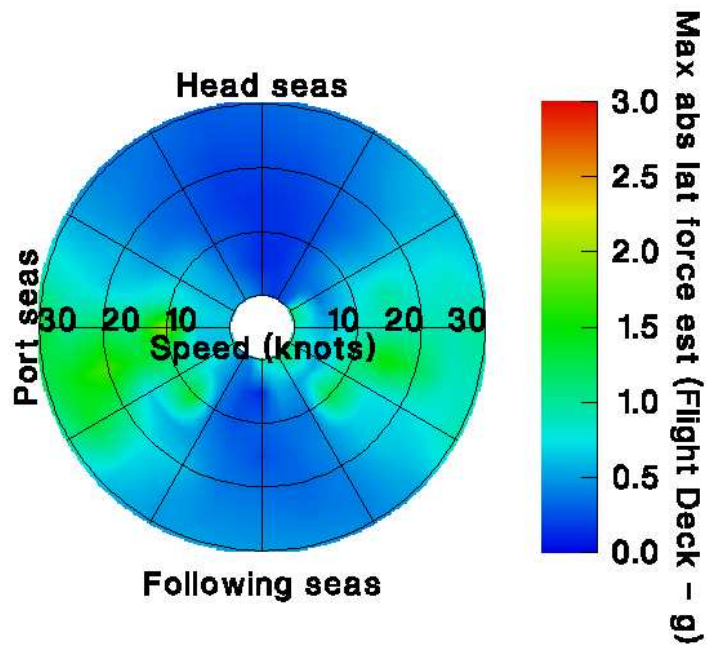


**Figure N.1:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 8.2$  s.

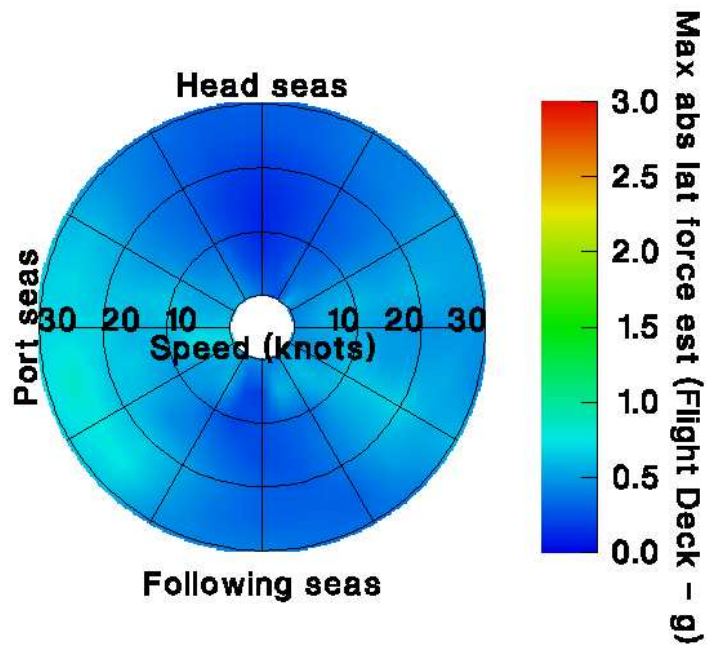


**Figure N.2:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 13.6$  s.

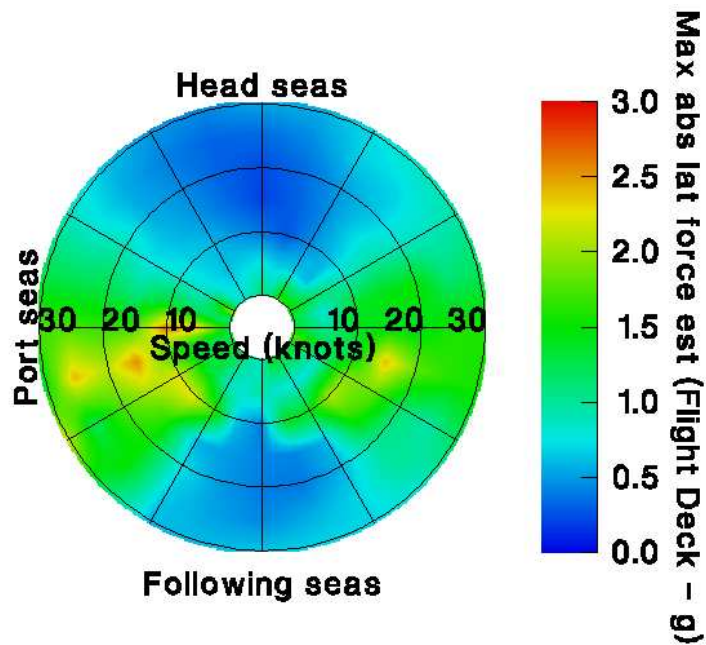




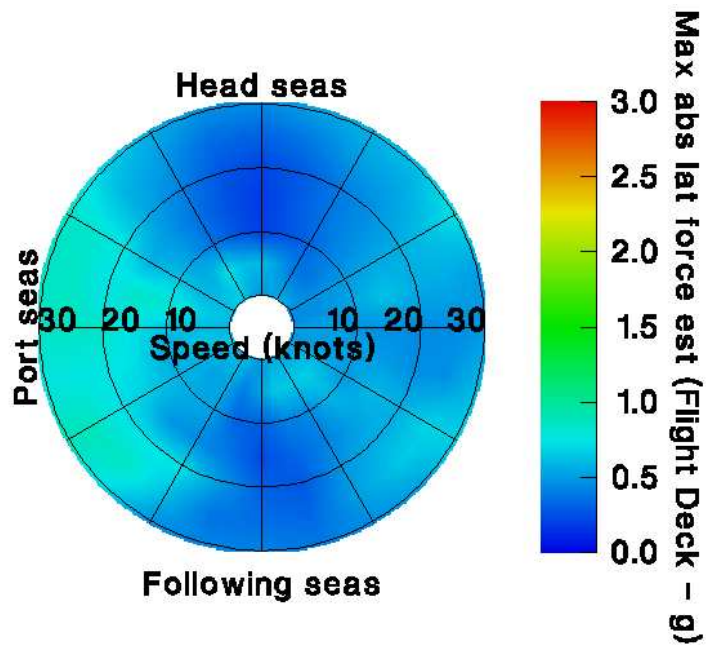
**Figure N.3:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 9.3$  s.



**Figure N.4:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 13.6$  s.



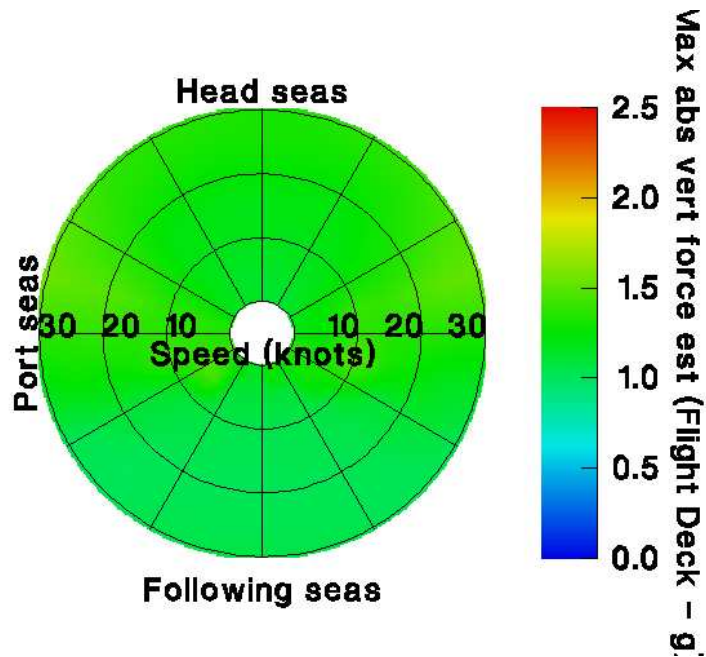
**Figure N.5:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 11.0$  s.



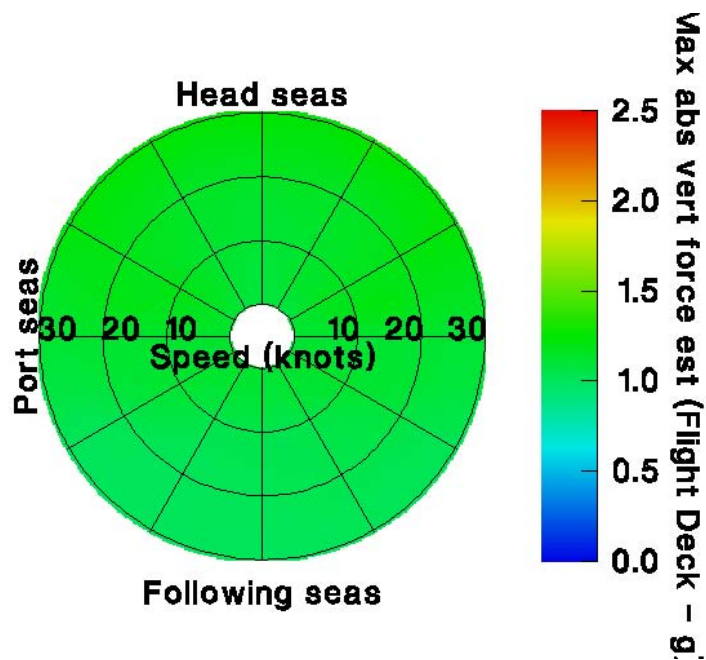
**Figure N.6:** Max. Abs. Lat. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 17.1$  s.

**Annex O**  
**Polar Plots of Maximum Absolute Vertical**  
**Force Estimator at Flight Deck –**  
**Bretschneider Spectra (Open Ocean)**

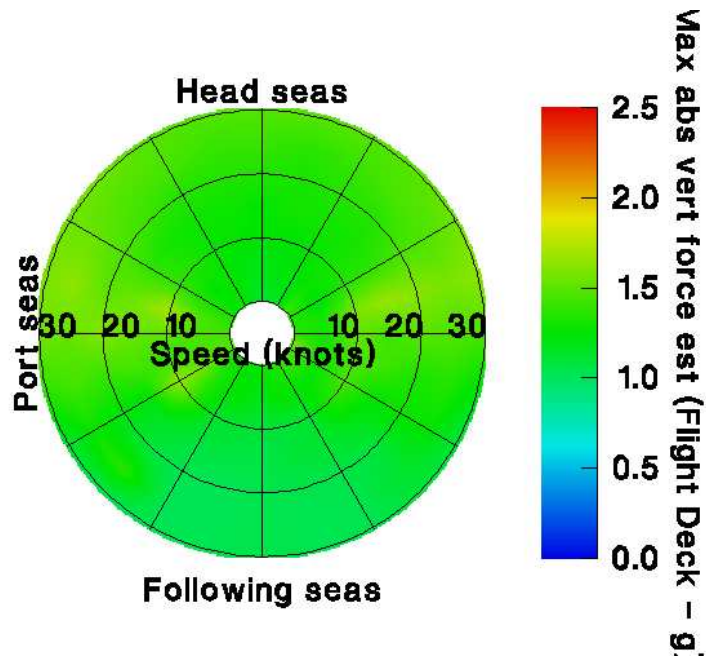
---



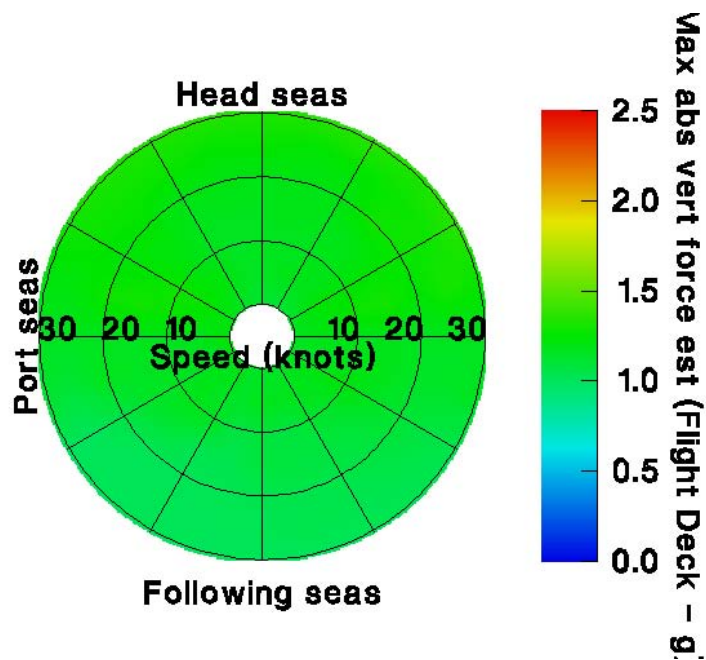
**Figure O.1:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 8.3$  s.



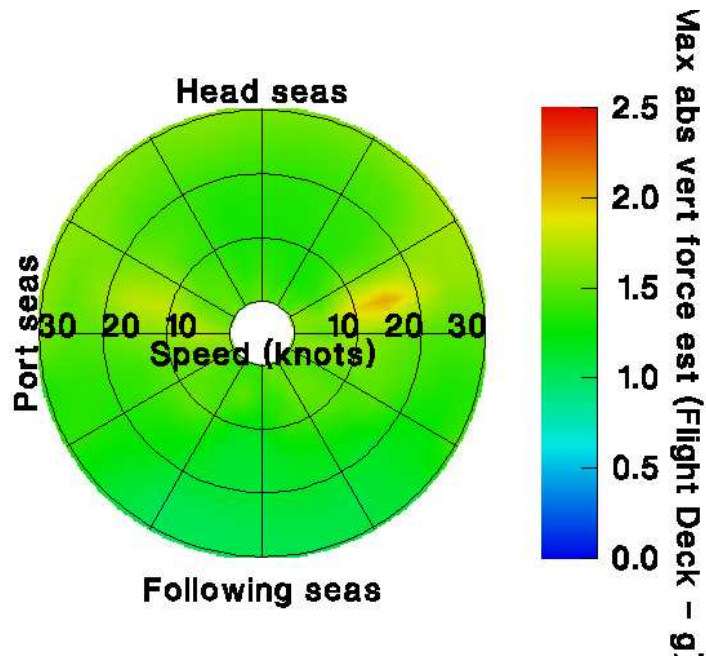
**Figure O.2:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 4.0$  m and  $T_P = 15.5$  s.



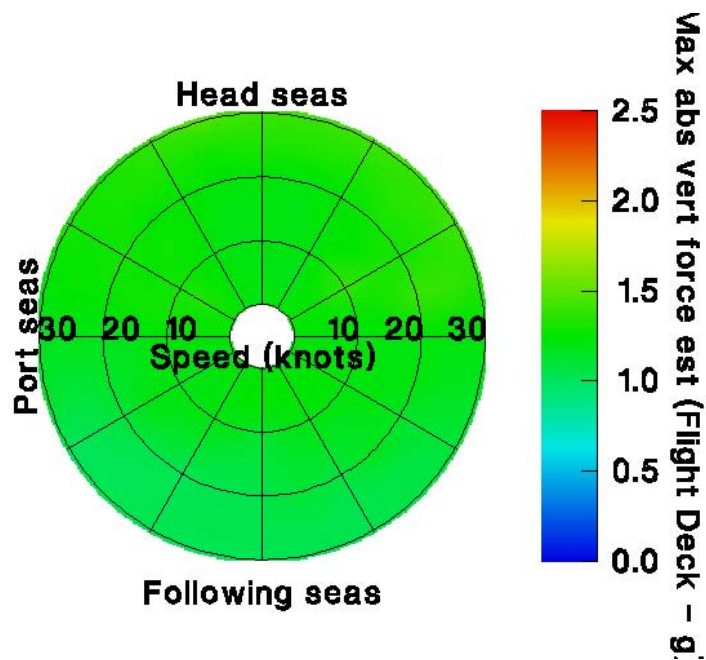
**Figure O.3:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 10.3$  s.



**Figure O.4:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 6.0$  m and  $T_P = 16.2$  s.

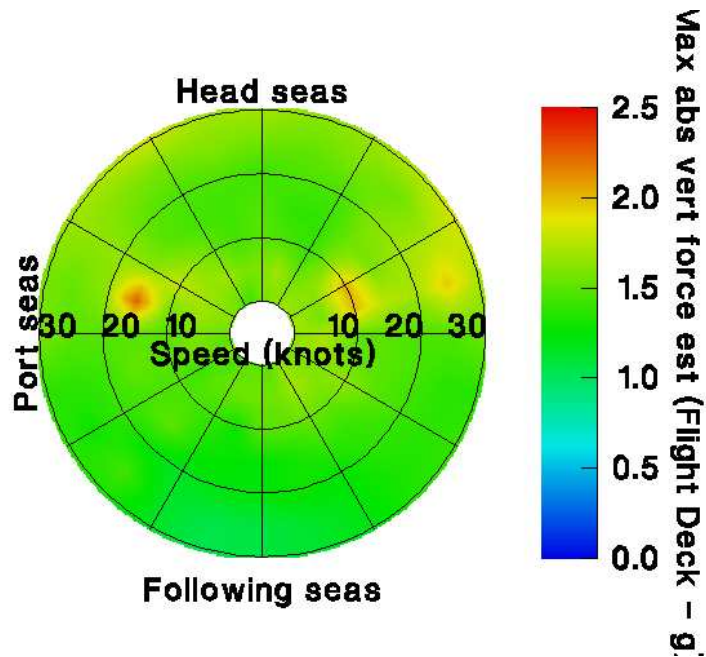


**Figure O.5:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 13.1$  s.

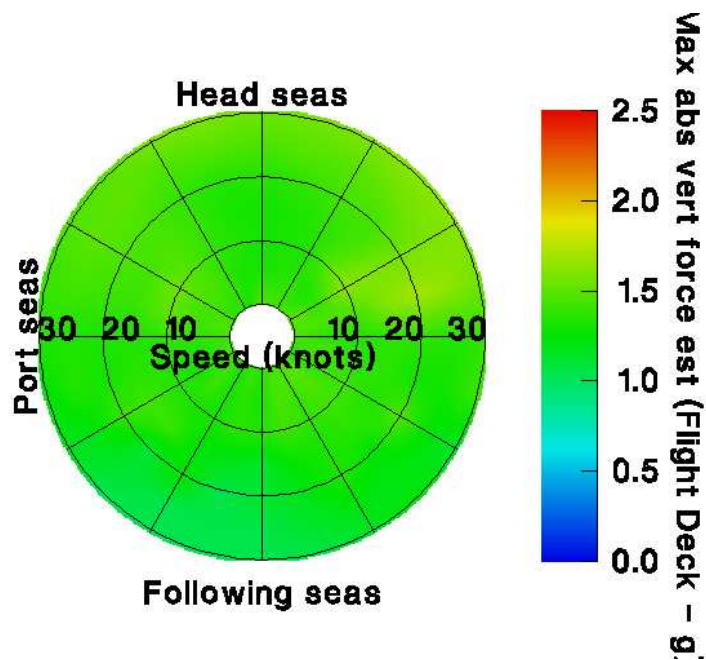


**Figure O.6:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 9.0$  m and  $T_P = 18.5$  s.

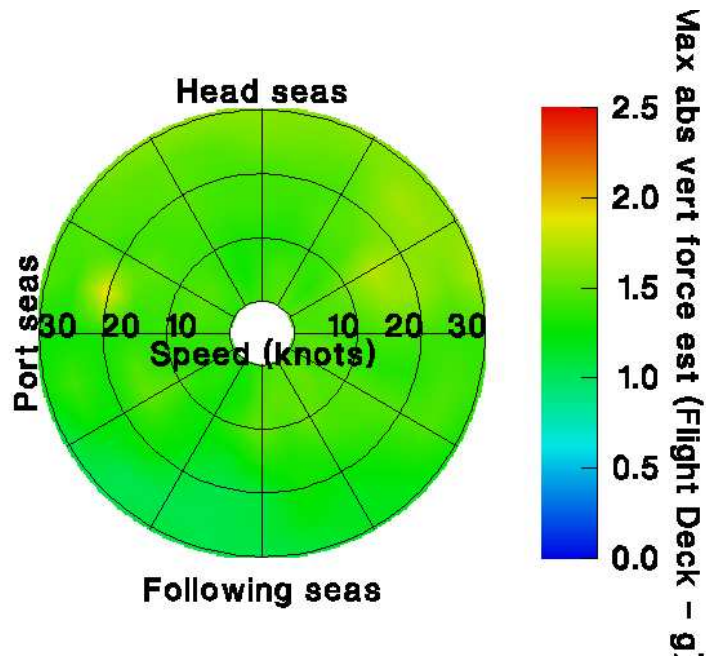




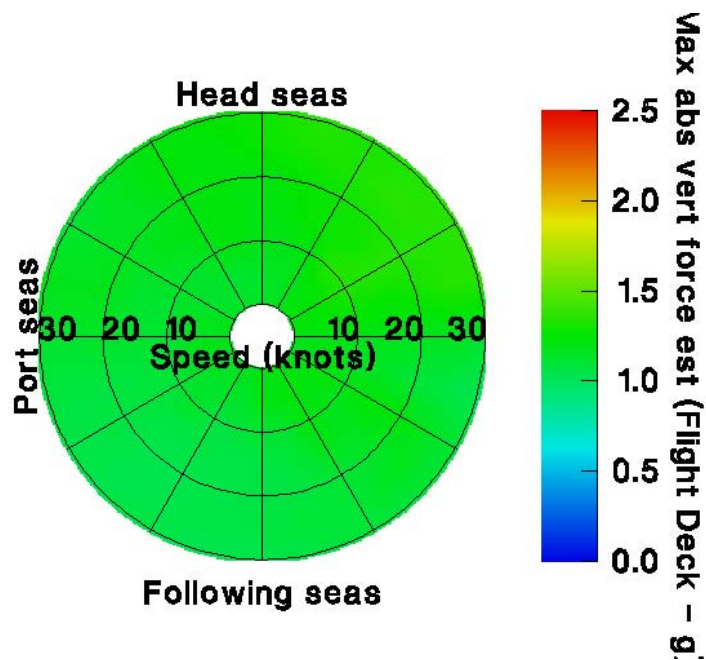
**Figure O.7:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 16.4$  s.



**Figure O.8:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 14.0$  m and  $T_P = 18.6$  s.



**Figure O.9:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 20.0$  s.

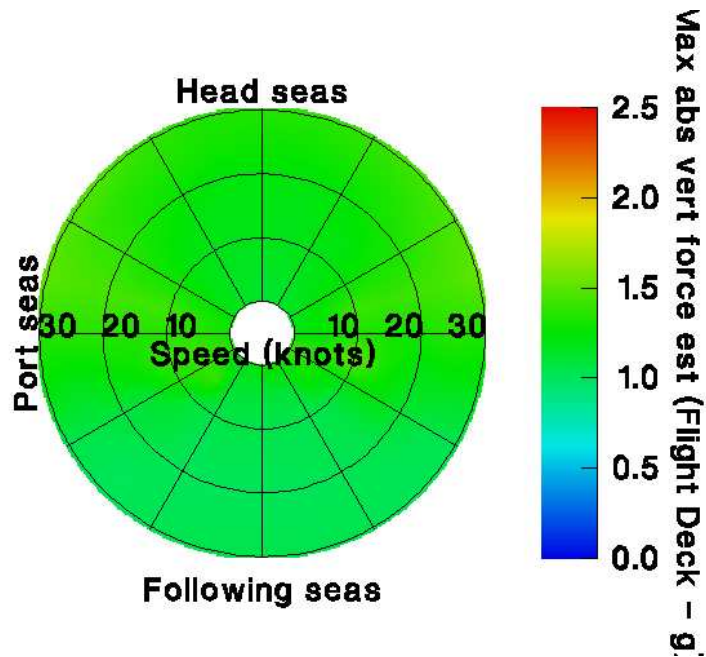


**Figure O.10:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: Bretschneider with  $H_S = 17.7$  m and  $T_P = 25.7$  s.

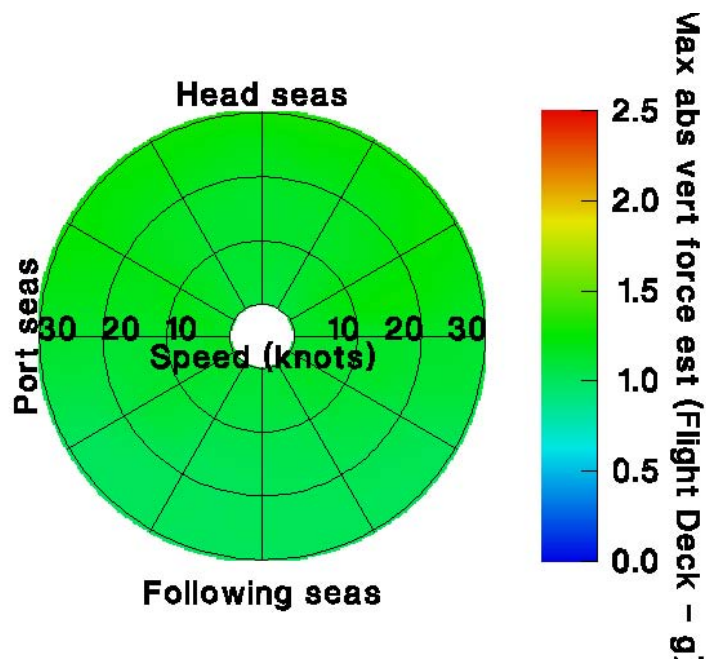


**Annex P**  
**Polar Plots of Maximum Absolute Vertical**  
**Force Estimator at Flight Deck – JONSWAP**  
**Spectra (Coastal Waters)**

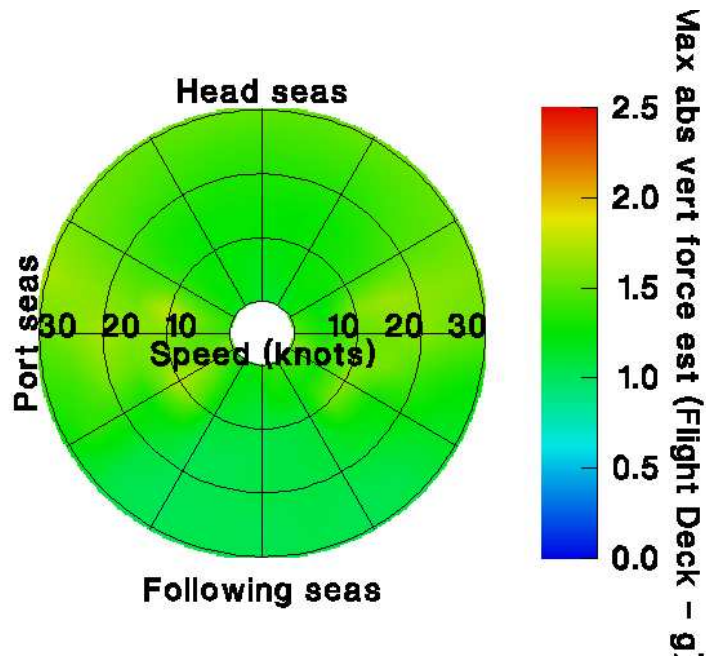
---



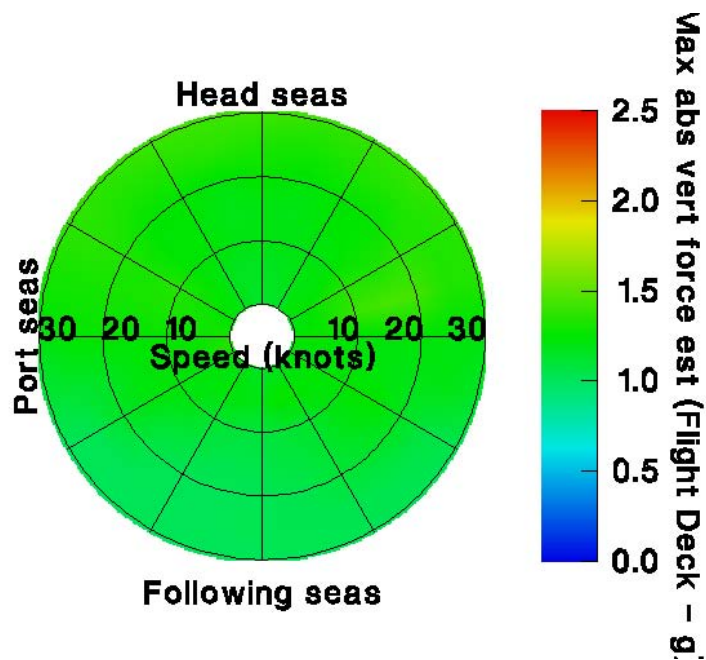
**Figure P.1:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 8.2$  s.



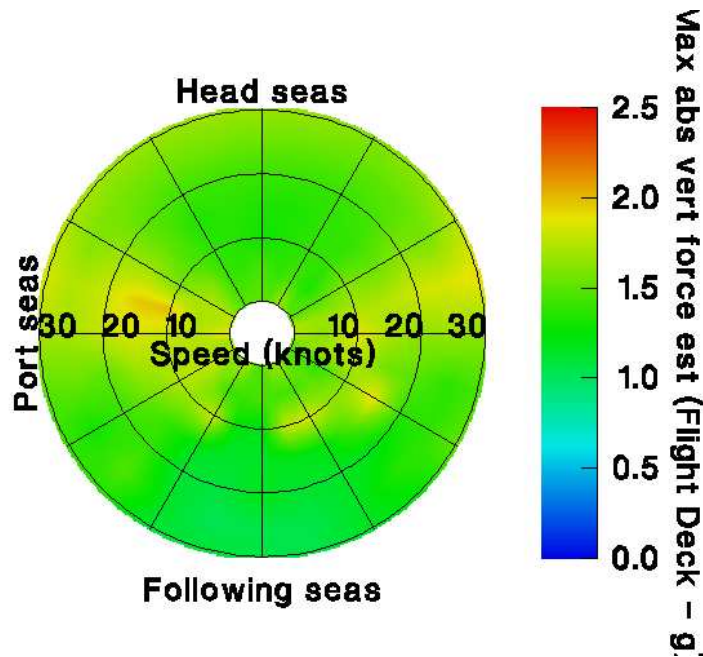
**Figure P.2:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 4.0$  m and  $T_P = 13.6$  s.



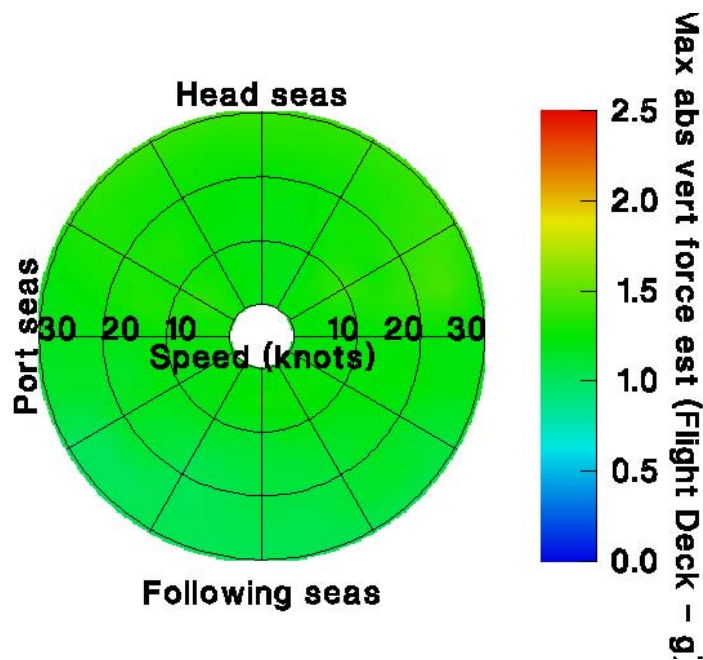
**Figure P.3:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 9.3$  s.



**Figure P.4:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 6.0$  m and  $T_P = 13.6$  s.



**Figure P.5:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 11.0$  s.



**Figure P.6:** Max. Abs. Vert. Force Est. at the Flight Deck with respect to Speed and Heading in a Seaway: JONSWAP with  $H_S = 9.0$  m and  $T_P = 17.1$  s.

**Annex Q**  
**Tables of Motion Maxima – Bretschneider**  
**Spectrum (Open Ocean)**

---

**Table Q.1:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	-0.3	-23.9	0.880	7.860	3.450	0.240	1.350	0.900
15.0	-0.2	-1.1	0.790	3.020	3.440	0.200	0.530	0.830
30.0	-0.1	26.5	0.990	7.830	3.660	0.250	1.760	0.900
45.0	-0.2	38.1	1.330	10.820	3.860	0.310	2.160	0.970
60.0	-0.3	44.6	1.670	12.930	3.720	0.350	2.460	1.010
75.0	-0.5	51.7	1.850	12.130	3.460	0.420	3.020	1.060
90.0	-1.0	58.4	1.950	12.610	3.590	0.510	3.250	1.080
105.0	-1.3	66.4	2.820	18.320	3.600	0.620	3.590	1.020
120.0	-0.7	-18.9	2.860	17.410	3.550	0.470	3.210	0.960
135.0	-2.5	102.8	2.850	15.820	2.870	0.740	3.180	0.830
150.0	-3.0	108.4	2.520	14.450	3.640	0.650	3.290	0.940
165.0	-1.3	19.3	3.330	20.960	3.320	0.470	2.830	0.830
180.0	-1.1	148.2	0.950	7.550	2.730	0.260	1.680	0.790
195.0	-0.3	371.7	1.850	10.880	3.940	0.340	2.260	0.970
210.0	-0.2	378.5	2.400	16.550	3.740	0.440	2.850	0.980
225.0	0.5	308.3	2.490	13.380	4.070	0.510	2.740	0.930
240.0	1.6	290.7	3.070	17.670	3.170	0.690	3.180	1.040
255.0	1.0	293.4	2.740	14.100	3.560	0.640	3.110	1.080
270.0	0.5	298.5	2.310	13.310	3.520	0.570	3.100	1.110
285.0	0.2	303.5	2.400	11.760	3.930	0.490	3.020	1.100
300.0	-0.0	308.0	1.910	11.940	3.830	0.440	2.910	1.080
315.0	-0.1	312.1	1.770	12.010	3.940	0.390	2.670	1.060
330.0	-0.2	316.1	1.600	10.310	3.870	0.350	2.510	1.030
345.0	-0.3	322.9	1.240	10.190	3.780	0.300	1.940	0.980

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.2:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	4.8	-1.1	0.870	3.360	2.790	0.240	0.550	0.840
15.0	4.7	13.7	0.890	4.360	3.130	0.250	0.650	0.860
30.0	4.7	28.4	1.000	6.100	3.460	0.280	1.210	0.930
45.0	4.6	42.9	1.410	8.470	3.430	0.360	1.700	1.030
60.0	4.4	55.4	1.760	11.680	3.690	0.480	2.420	1.110
75.0	4.0	58.1	2.130	14.570	3.820	0.510	2.840	1.100
90.0	3.7	59.3	1.960	14.900	3.710	0.530	2.650	1.090
105.0	3.6	61.5	2.040	14.390	3.440	0.560	2.840	1.080
120.0	3.8	62.7	2.300	14.820	3.760	0.570	2.850	1.090
135.0	3.9	62.8	2.300	12.340	3.530	0.550	2.820	1.100
150.0	4.5	146.7	0.910	6.720	2.420	0.260	1.780	0.690
165.0	4.8	163.9	0.720	5.880	2.110	0.200	1.140	0.600
180.0	4.8	179.2	0.660	2.870	1.930	0.190	0.520	0.580
195.0	4.8	194.6	0.740	4.620	2.010	0.200	1.120	0.600
210.0	4.7	210.8	0.900	8.370	2.550	0.250	1.820	0.680
225.0	4.7	285.0	3.010	12.140	3.070	0.750	2.730	0.970
240.0	4.6	285.7	3.270	18.900	3.090	0.770	2.860	0.960
255.0	4.4	290.0	2.660	11.760	3.220	0.710	2.720	1.030
270.0	4.4	293.0	2.760	12.750	3.560	0.660	2.690	1.080
285.0	4.4	294.5	2.420	9.880	3.470	0.640	2.640	1.100
300.0	4.7	302.3	1.830	11.210	3.640	0.520	2.510	1.130
315.0	4.7	315.3	1.410	8.250	3.430	0.380	1.870	1.060
330.0	4.7	329.6	1.120	6.180	3.530	0.290	1.270	0.950
345.0	4.8	344.3	0.890	4.160	2.990	0.250	0.740	0.870

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.3:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.7	-0.4	1.080	3.800	2.810	0.290	0.410	0.830
15.0	9.7	14.5	1.200	4.100	2.890	0.310	0.500	0.850
30.0	9.7	29.5	1.250	5.400	3.190	0.350	0.860	0.930
45.0	9.7	44.5	1.440	7.400	3.380	0.440	1.350	1.040
60.0	9.7	59.2	2.080	12.690	3.640	0.580	2.020	1.110
75.0	9.7	72.8	2.460	14.770	3.540	0.760	2.080	0.980
90.0	9.2	84.6	2.930	19.240	1.620	0.880	2.990	0.470
105.0	8.9	99.1	3.000	29.800	2.510	0.750	3.410	0.600
120.0	9.3	116.3	2.770	30.340	3.550	0.520	3.540	0.770
135.0	9.6	133.5	1.020	13.030	2.160	0.330	4.180	0.680
150.0	9.7	149.2	0.740	16.110	1.840	0.230	4.530	0.560
165.0	9.8	164.3	0.630	15.260	1.550	0.190	3.980	0.500
180.0	9.8	179.4	0.550	10.100	1.400	0.180	2.210	0.490
195.0	9.8	194.8	0.600	8.190	1.620	0.200	2.450	0.510
210.0	9.8	210.3	0.690	10.850	1.750	0.240	3.830	0.590
225.0	9.7	225.9	0.910	11.860	1.780	0.340	3.940	0.700
240.0	9.4	242.9	1.940	12.240	3.110	0.530	3.320	0.820
255.0	9.0	260.8	2.700	20.730	3.140	0.780	3.400	0.660
270.0	9.3	274.8	3.140	19.040	1.610	0.910	3.020	0.410
285.0	9.8	286.9	2.650	16.260	3.140	0.790	2.160	0.980
300.0	9.7	300.3	2.140	10.230	3.710	0.600	2.000	1.120
315.0	9.7	314.9	1.440	6.400	3.330	0.450	1.380	1.050
330.0	9.7	329.9	1.190	5.740	3.000	0.350	0.950	0.940
345.0	9.7	344.7	1.140	4.740	2.760	0.310	0.580	0.860

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table Q.4:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.7	-0.3	1.220	5.510	2.720	0.360	0.560	0.810
15.0	14.7	14.7	1.410	5.880	2.690	0.380	0.540	0.840
30.0	14.7	29.7	1.530	6.860	2.970	0.420	0.800	0.910
45.0	14.6	44.8	1.720	8.210	3.250	0.520	1.150	1.010
60.0	14.7	59.6	2.050	12.620	3.340	0.660	1.650	1.080
75.0	14.7	73.9	2.620	14.250	2.990	0.810	1.900	0.930
90.0	14.6	88.2	3.030	22.110	0.970	0.860	3.130	0.230
105.0	14.4	103.1	2.770	23.570	2.360	0.660	3.490	0.580
120.0	14.5	118.5	1.510	20.340	2.150	0.450	6.210	0.660
135.0	14.6	134.1	0.930	22.360	1.810	0.310	7.560	0.550
150.0	14.7	149.6	0.660	15.360	1.430	0.200	4.140	0.430
165.0	14.8	164.7	0.630	12.370	1.490	0.210	2.520	0.510
180.0	14.6	179.5	0.520	12.260	1.370	0.180	1.850	0.440
195.0	14.7	194.7	0.550	13.060	1.530	0.210	2.340	0.560
210.0	14.6	209.8	0.720	17.660	1.800	0.240	4.790	0.590
225.0	14.7	225.4	0.990	19.670	1.880	0.310	6.920	0.590
240.0	14.6	241.1	1.540	18.140	2.830	0.490	5.760	0.720
255.0	14.4	256.9	2.920	18.120	2.250	0.720	3.510	0.650
270.0	14.6	271.8	3.060	15.190	1.220	0.910	3.430	0.220
285.0	14.8	285.9	2.790	10.130	3.080	0.850	2.130	0.930
300.0	14.7	300.1	2.370	8.600	3.780	0.690	1.880	1.090
315.0	14.7	314.9	1.790	7.320	3.370	0.540	1.190	1.030
330.0	14.7	329.9	1.630	6.930	3.020	0.430	0.790	0.920
345.0	14.7	344.8	1.420	5.350	2.810	0.380	0.560	0.840

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.5: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.2	1.400	7.690	2.530	0.430	0.640	0.790
15.0	19.6	14.8	1.440	7.410	2.660	0.450	0.630	0.810
30.0	19.6	29.8	1.570	8.370	2.820	0.500	0.780	0.880
45.0	19.6	44.8	2.020	9.680	3.190	0.600	1.060	0.980
60.0	19.6	59.7	2.370	12.180	3.330	0.730	1.510	1.040
75.0	19.6	74.3	2.980	15.800	2.980	0.850	1.820	0.890
90.0	19.6	89.0	3.020	22.320	0.850	0.830	3.060	0.190
105.0	19.5	104.0	2.230	19.760	1.890	0.610	3.800	0.540
120.0	19.6	119.3	1.560	26.100	2.170	0.420	9.360	0.530
135.0	19.6	134.7	1.090	22.700	2.010	0.340	6.820	0.590
150.0	19.7	149.7	0.720	15.390	1.640	0.230	3.220	0.470
165.0	19.4	164.6	0.630	16.740	1.570	0.200	2.470	0.450
180.0	20.1	179.8	0.540	16.240	1.870	0.170	1.980	0.420
195.0	19.6	194.6	0.620	22.180	1.730	0.190	3.150	0.440
210.0	19.6	209.9	0.680	23.650	1.650	0.260	4.110	0.510
225.0	19.6	225.1	1.000	27.260	1.820	0.300	6.910	0.560
240.0	19.6	240.7	1.600	23.750	2.070	0.450	8.230	0.590
255.0	19.5	256.0	2.830	17.960	2.220	0.680	4.250	0.610
270.0	19.6	271.1	3.300	20.570	1.020	0.890	3.750	0.190
285.0	19.7	285.6	3.170	12.160	3.180	0.890	2.420	0.890
300.0	19.6	300.1	2.450	9.890	3.590	0.760	1.880	1.040
315.0	19.6	315.0	2.220	8.190	3.550	0.610	1.230	0.980
330.0	19.6	329.9	1.560	7.210	2.750	0.510	0.800	0.880
345.0	19.6	344.9	1.460	7.130	2.630	0.450	0.630	0.810

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.6:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.7	-0.1	1.490	8.150	2.230	0.490	0.600	0.750
15.0	24.7	14.9	1.540	7.700	2.650	0.510	0.600	0.770
30.0	24.7	29.9	1.900	8.490	2.870	0.570	0.770	0.840
45.0	24.7	44.9	2.170	9.810	3.030	0.660	1.070	0.930
60.0	24.7	59.8	2.570	14.170	3.400	0.790	1.560	1.000
75.0	24.7	74.6	3.020	14.660	2.750	0.890	1.810	0.860
90.0	24.6	89.3	2.690	20.720	0.820	0.810	2.990	0.180
105.0	24.6	104.4	2.120	20.040	2.130	0.580	4.650	0.480
120.0	24.6	119.8	1.520	30.710	2.010	0.410	10.630	0.550
135.0	24.7	134.8	0.770	20.510	1.690	0.280	5.490	0.470
150.0	24.5	149.9	0.640	17.960	2.070	0.210	3.180	0.460
165.0	24.8	164.8	0.570	16.660	1.420	0.180	1.960	0.400
180.0	24.4	179.8	0.460	17.940	1.580	0.160	2.750	0.400
195.0	24.7	194.9	0.540	20.310	1.790	0.170	3.000	0.400
210.0	24.8	210.1	0.720	23.540	1.850	0.210	3.890	0.430
225.0	24.7	225.1	0.930	27.880	1.820	0.290	6.510	0.490
240.0	24.6	240.2	1.250	32.650	1.900	0.420	11.160	0.580
255.0	24.6	255.6	2.870	20.270	2.160	0.660	5.070	0.560
270.0	24.6	270.7	3.000	17.580	1.040	0.870	3.880	0.200
285.0	24.7	285.4	3.050	12.390	2.950	0.920	2.740	0.850
300.0	24.7	300.1	2.670	9.590	3.470	0.810	2.050	0.990
315.0	24.7	315.1	2.300	8.120	3.230	0.670	1.300	0.930
330.0	24.7	330.0	1.800	7.160	2.590	0.570	0.820	0.840
345.0	24.7	344.9	1.630	7.190	2.610	0.510	0.610	0.770

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.7: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.7	-0.1	1.530	7.100	2.250	0.520	0.530	0.700
15.0	29.7	14.9	1.700	6.870	2.270	0.540	0.500	0.720
30.0	29.7	29.9	1.830	8.050	2.620	0.600	0.700	0.790
45.0	29.7	44.9	2.340	9.610	2.870	0.710	1.100	0.880
60.0	29.7	59.8	2.820	14.050	3.120	0.830	1.690	0.950
75.0	29.7	74.7	3.330	17.730	2.920	0.920	2.200	0.820
90.0	29.7	89.5	2.960	19.700	0.820	0.790	3.120	0.180
105.0	29.7	104.7	2.090	23.710	2.180	0.560	6.040	0.440
120.0	29.6	119.9	1.160	29.540	2.180	0.390	10.660	0.550
135.0	29.6	135.0	0.890	18.210	1.650	0.270	5.100	0.460
150.0	30.0	149.4	0.710	15.510	1.380	0.200	3.260	0.370
165.0	29.8	164.9	0.550	13.950	1.440	0.170	2.400	0.330
180.0	29.6	179.8	0.470	18.280	1.400	0.150	2.670	0.290
195.0	29.8	194.9	0.510	16.720	1.300	0.160	3.130	0.320
210.0	30.0	210.3	0.720	20.890	1.270	0.200	4.200	0.370
225.0	29.6	225.0	0.880	24.630	1.840	0.280	5.930	0.510
240.0	29.6	240.1	1.130	34.180	2.140	0.380	10.090	0.560
255.0	29.6	255.4	2.430	36.260	2.740	0.630	6.680	0.550
270.0	29.7	270.5	2.890	14.110	0.800	0.830	3.830	0.210
285.0	29.7	285.3	3.220	12.890	2.760	0.940	3.040	0.820
300.0	29.7	300.2	2.890	10.550	3.210	0.840	2.420	0.940
315.0	29.7	315.1	2.320	8.390	3.070	0.710	1.490	0.870
330.0	29.7	330.0	1.940	7.280	2.470	0.600	0.880	0.780
345.0	29.7	345.0	1.650	6.540	2.360	0.540	0.600	0.720

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.8:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	0.0	-7.8	2.580	6.860	3.810	0.730	1.520	1.040
15.0	-0.2	-2.3	2.360	6.360	3.350	0.730	1.080	1.050
30.0	-0.3	7.3	2.340	9.980	3.660	0.730	1.590	1.050
45.0	-0.3	23.2	2.330	13.450	3.210	0.750	2.950	1.000
60.0	-0.3	37.9	2.530	14.570	3.060	0.790	3.780	0.930
75.0	-0.3	52.1	2.650	13.820	2.670	0.840	4.250	0.810
90.0	-0.3	66.2	2.960	13.870	1.990	0.900	4.430	0.610
105.0	-0.3	82.5	3.260	13.470	0.930	0.950	4.520	0.250
120.0	-0.5	96.1	3.120	14.140	1.210	0.950	4.610	0.240
135.0	-0.9	106.3	2.750	14.800	1.790	0.920	4.620	0.470
150.0	-1.3	115.7	2.800	15.030	2.210	0.890	4.510	0.660
165.0	-1.5	119.2	3.100	15.980	2.480	0.870	4.380	0.720
180.0	-1.4	139.3	2.860	11.760	3.360	0.780	3.300	0.900
195.0	0.7	230.8	3.080	12.940	3.100	0.850	3.910	0.840
210.0	0.7	245.3	3.370	14.210	2.530	0.910	4.250	0.660
225.0	0.5	256.2	3.660	14.370	2.040	0.960	4.380	0.450
240.0	0.4	267.9	3.780	14.160	1.300	0.990	4.390	0.230
255.0	0.5	282.1	3.700	14.260	1.640	0.980	4.310	0.370
270.0	0.5	295.1	3.910	13.940	2.820	0.940	4.240	0.640
285.0	0.3	306.0	3.240	14.070	3.100	0.890	4.070	0.800
300.0	0.2	316.1	2.880	13.930	3.760	0.830	3.830	0.900
315.0	0.1	326.5	2.820	12.980	3.790	0.790	3.420	0.970
330.0	0.1	336.0	2.660	10.510	3.670	0.760	2.930	1.010
345.0	0.1	345.0	2.520	8.190	3.720	0.740	2.220	1.030

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.9: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	4.8	-1.3	2.460	3.010	4.120	0.730	0.460	1.070
15.0	4.8	13.5	2.540	6.970	4.290	0.740	1.600	1.060
30.0	4.8	28.2	2.590	9.830	4.430	0.760	2.720	1.020
45.0	4.8	42.8	2.890	13.070	4.000	0.810	3.360	0.940
60.0	4.7	57.0	3.300	13.120	3.200	0.870	3.820	0.790
75.0	4.7	71.4	3.400	13.780	1.710	0.920	3.910	0.520
90.0	4.7	86.0	2.940	13.250	0.550	0.960	4.100	0.130
105.0	4.6	99.9	3.050	13.330	1.130	0.940	4.210	0.290
120.0	4.3	111.6	3.800	13.630	2.310	0.900	4.130	0.550
135.0	4.1	120.0	2.610	13.540	2.850	0.860	3.980	0.670
150.0	4.4	144.5	2.820	10.980	3.170	0.770	2.870	0.850
165.0	4.7	162.4	2.690	6.740	3.780	0.730	1.660	0.890
180.0	4.8	178.9	2.670	3.940	3.750	0.710	0.870	0.900
195.0	4.8	195.1	2.790	6.040	3.640	0.730	1.910	0.900
210.0	4.7	211.6	2.760	9.420	3.360	0.770	2.920	0.870
225.0	4.6	228.6	2.590	10.480	2.790	0.830	3.650	0.790
240.0	4.6	244.2	3.560	11.030	2.510	0.900	4.010	0.620
255.0	4.8	258.1	3.030	11.280	1.390	0.950	4.110	0.340
270.0	4.8	272.3	3.680	12.520	0.510	0.970	4.000	0.090
285.0	4.9	286.9	3.580	13.120	1.600	0.950	3.840	0.480
300.0	4.9	301.2	3.220	12.820	2.920	0.890	3.620	0.770
315.0	4.9	315.4	3.020	10.810	3.930	0.830	3.370	0.940
330.0	4.8	329.7	2.740	11.170	4.350	0.780	2.740	1.010
345.0	4.8	344.2	2.480	7.810	4.070	0.750	1.810	1.060

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.10: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.8	-0.4	2.850	3.270	3.870	0.750	0.300	1.070
15.0	9.8	14.6	3.050	5.370	3.990	0.760	1.120	1.060
30.0	9.8	29.6	2.800	9.310	3.460	0.790	2.120	1.020
45.0	9.8	44.6	2.960	10.190	3.380	0.830	2.790	0.930
60.0	9.8	59.4	3.430	12.120	3.260	0.880	3.280	0.760
75.0	9.8	74.2	3.540	14.260	1.930	0.930	3.370	0.470
90.0	9.8	89.0	2.900	13.310	0.320	0.940	3.670	0.080
105.0	9.8	103.8	3.140	15.950	1.240	0.910	3.870	0.340
120.0	9.7	118.5	3.050	16.430	2.030	0.850	4.110	0.580
135.0	9.7	133.7	2.660	16.710	2.740	0.790	3.890	0.710
150.0	9.7	149.0	2.140	12.850	2.230	0.740	3.580	0.780
165.0	9.8	164.3	1.880	10.760	2.270	0.710	2.630	0.820
180.0	9.8	179.4	2.100	7.670	2.340	0.700	1.580	0.830
195.0	9.8	194.7	2.000	7.290	2.170	0.710	1.900	0.820
210.0	9.8	210.1	2.220	9.790	2.360	0.740	3.360	0.800
225.0	9.8	225.7	2.770	12.500	2.790	0.800	3.930	0.730
240.0	9.8	241.0	3.380	15.050	2.620	0.870	4.270	0.610
255.0	9.8	255.7	3.100	12.040	1.420	0.930	4.050	0.370
270.0	9.9	270.5	3.830	12.280	0.340	0.960	3.790	0.080
285.0	9.9	285.3	3.790	12.530	1.780	0.950	3.550	0.450
300.0	9.8	300.1	3.530	11.240	3.260	0.910	3.390	0.760
315.0	9.8	314.8	2.930	10.210	3.260	0.850	2.850	0.930
330.0	9.8	329.6	3.030	8.970	3.390	0.800	2.170	1.020
345.0	9.8	344.6	2.840	6.190	3.880	0.760	1.310	1.060

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.11: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.7	-0.3	2.720	5.000	3.590	0.790	0.440	1.060
15.0	14.7	14.8	3.020	6.820	3.610	0.800	1.090	1.050
30.0	14.7	29.8	2.770	9.630	3.600	0.820	1.890	1.010
45.0	14.7	44.8	3.210	11.120	3.220	0.860	2.560	0.920
60.0	14.7	59.8	2.980	12.520	2.650	0.890	3.130	0.760
75.0	14.8	74.6	3.770	15.340	2.090	0.910	2.980	0.460
90.0	14.8	89.5	2.790	13.600	0.370	0.910	3.300	0.110
105.0	14.8	104.4	3.300	17.180	1.040	0.870	3.650	0.320
120.0	14.7	119.3	3.320	21.550	2.000	0.820	4.900	0.530
135.0	14.7	134.5	2.290	19.290	2.200	0.760	5.120	0.640
150.0	14.7	149.6	1.970	12.080	2.220	0.720	3.110	0.710
165.0	14.8	164.7	2.000	9.410	2.060	0.710	1.940	0.760
180.0	14.7	179.7	1.920	8.380	2.230	0.680	1.260	0.750
195.0	14.7	194.7	2.170	9.380	2.130	0.710	1.720	0.770
210.0	14.7	209.8	1.950	15.010	2.150	0.730	3.420	0.740
225.0	14.7	225.2	2.480	17.740	2.120	0.790	5.370	0.700
240.0	14.7	240.4	3.260	17.080	2.190	0.850	5.250	0.580
255.0	14.8	255.3	3.730	15.130	1.290	0.910	4.320	0.360
270.0	14.8	270.2	3.540	13.900	0.450	0.950	3.840	0.110
285.0	14.8	285.0	3.680	13.490	1.830	0.960	3.460	0.450
300.0	14.7	299.9	3.110	13.440	2.590	0.920	3.260	0.750
315.0	14.7	314.7	3.310	11.050	3.390	0.880	2.610	0.920
330.0	14.7	329.7	2.920	10.140	3.710	0.830	1.820	1.010
345.0	14.7	344.7	3.040	7.440	3.760	0.800	1.040	1.050

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table Q.12: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.2	2.880	7.370	3.480	0.840	0.670	1.040
15.0	19.6	14.9	3.010	9.250	3.520	0.850	1.270	1.030
30.0	19.6	29.9	2.900	11.620	3.450	0.860	1.970	0.990
45.0	19.6	44.9	3.600	13.380	3.310	0.890	2.600	0.910
60.0	19.6	59.9	3.370	14.600	2.690	0.900	3.200	0.750
75.0	19.7	74.8	3.490	13.510	1.970	0.900	2.610	0.470
90.0	19.7	89.7	2.750	13.780	0.460	0.880	2.920	0.140
105.0	19.7	104.7	3.070	17.070	1.010	0.840	3.440	0.300
120.0	19.7	119.7	2.510	22.230	1.590	0.790	6.010	0.490
135.0	19.6	134.8	2.870	18.230	2.250	0.760	5.390	0.670
150.0	19.6	149.8	2.530	12.900	2.330	0.760	3.190	0.760
165.0	19.7	164.8	1.980	9.620	2.040	0.620	1.490	0.640
180.0	19.7	179.8	2.040	11.730	1.980	0.730	1.270	0.780
195.0	19.7	194.8	1.820	15.790	1.890	0.630	1.820	0.640
210.0	19.7	209.9	1.980	18.010	1.910	0.680	2.720	0.610
225.0	19.6	225.0	2.590	23.560	2.120	0.780	5.380	0.660
240.0	19.7	240.2	2.450	21.370	1.690	0.840	6.600	0.560
255.0	19.7	255.1	4.170	19.170	1.420	0.900	4.550	0.350
270.0	19.7	270.1	3.440	16.110	0.590	0.930	3.910	0.140
285.0	19.7	285.0	3.940	15.360	1.710	0.950	3.440	0.440
300.0	19.7	299.9	3.510	14.590	2.660	0.940	3.040	0.740
315.0	19.6	314.8	3.300	12.660	3.070	0.910	2.260	0.910
330.0	19.6	329.8	3.200	10.380	3.340	0.880	1.490	0.990
345.0	19.6	344.8	3.000	8.420	3.400	0.860	0.840	1.030

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.13: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.7	-0.1	3.460	7.790	3.830	0.900	0.730	1.010
15.0	24.7	15.0	3.530	9.280	3.900	0.900	1.280	1.000
30.0	24.7	30.0	3.260	11.680	3.310	0.910	1.960	0.970
45.0	24.7	45.0	3.300	13.660	2.970	0.920	2.630	0.890
60.0	24.7	60.0	3.360	14.470	2.740	0.930	3.320	0.740
75.0	24.7	74.9	3.320	12.530	1.770	0.900	2.450	0.470
90.0	24.7	89.8	2.600	13.090	0.570	0.860	2.790	0.160
105.0	24.7	104.8	3.160	16.500	0.940	0.810	3.370	0.280
120.0	24.7	119.9	2.390	21.670	1.390	0.770	6.570	0.460
135.0	24.7	134.9	2.110	16.650	1.640	0.690	4.040	0.510
150.0	24.7	149.9	2.480	13.360	2.120	0.810	3.190	0.700
165.0	24.8	164.8	2.170	9.800	2.290	0.640	1.420	0.650
180.0	24.8	179.9	1.420	10.860	1.640	0.570	0.820	0.610
195.0	24.8	195.0	1.860	14.750	1.870	0.620	1.630	0.630
210.0	24.6	209.8	1.380	19.800	1.720	0.540	2.700	0.490
225.0	24.7	225.0	2.430	26.780	2.080	0.790	5.400	0.660
240.0	24.7	240.0	2.230	25.820	1.590	0.800	6.720	0.500
255.0	24.7	255.0	3.480	22.860	1.240	0.870	4.420	0.340
270.0	24.7	270.0	3.630	16.640	0.630	0.910	3.760	0.160
285.0	24.7	285.0	3.370	15.010	1.580	0.950	3.250	0.450
300.0	24.7	299.9	3.350	14.980	2.440	0.960	2.800	0.730
315.0	24.7	314.9	3.220	13.370	2.960	0.940	1.950	0.880
330.0	24.7	329.9	3.230	10.190	3.280	0.930	1.240	0.960
345.0	24.7	344.9	3.760	8.120	3.770	0.910	0.680	1.000

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.14:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.7	-0.0	2.990	7.070	3.050	0.960	0.650	0.980
15.0	29.7	15.0	3.240	8.770	3.270	0.970	1.190	0.980
30.0	29.7	30.0	3.430	10.440	3.460	0.960	1.850	0.940
45.0	29.7	45.0	3.720	13.360	3.140	0.960	2.560	0.870
60.0	29.7	60.0	3.420	14.880	2.370	0.950	3.440	0.730
75.0	29.7	74.9	3.070	11.640	1.650	0.890	2.340	0.470
90.0	29.7	89.9	2.660	12.120	0.650	0.840	2.760	0.180
105.0	29.7	104.9	3.100	14.730	0.900	0.790	3.510	0.260
120.0	29.7	119.9	2.170	22.900	1.620	0.750	7.400	0.460
135.0	29.7	134.9	1.470	15.240	1.540	0.540	3.850	0.440
150.0	29.7	149.9	2.220	13.680	2.070	0.700	3.000	0.620
165.0	30.0	164.7	1.740	9.120	1.890	0.680	1.450	0.680
180.0	29.9	179.9	2.050	10.230	2.000	0.610	0.980	0.670
195.0	30.2	195.1	1.810	12.430	1.840	0.680	1.850	0.660
210.0	29.7	210.0	1.870	19.530	1.800	0.560	3.240	0.570
225.0	29.7	225.0	1.430	19.700	1.380	0.560	4.260	0.440
240.0	29.7	240.0	2.780	31.640	1.740	0.780	7.250	0.480
255.0	29.7	255.0	3.540	20.760	1.140	0.840	3.920	0.320
270.0	29.7	270.0	3.260	16.230	0.690	0.880	3.270	0.190
285.0	29.7	285.0	3.360	14.730	1.500	0.940	2.810	0.450
300.0	29.7	299.9	3.110	13.170	2.470	0.970	2.740	0.710
315.0	29.7	314.9	3.480	11.440	2.960	0.980	1.850	0.860
330.0	29.7	329.9	3.810	9.330	3.210	0.970	1.140	0.930
345.0	29.7	344.9	3.120	7.420	3.220	0.970	0.590	0.970

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table Q.15: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 0.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	-0.0	-11.0	2.220	12.920	6.210	0.600	2.190	1.630
15.0	-0.3	-5.0	2.180	11.860	5.630	0.590	1.950	1.640
30.0	-0.9	0.7	2.250	8.750	6.030	0.590	1.880	1.630
45.0	-1.5	8.1	3.410	17.490	6.130	0.670	4.050	1.600
60.0	-1.5	-38.2	4.580	34.770	5.930	1.060	6.690	1.170
75.0	-2.0	-19.2	4.300	21.960	6.750	0.980	6.610	1.410
90.0	-2.2	58.1	3.670	22.580	5.380	0.960	6.990	1.500
105.0	-2.0	-23.5	4.490	42.320	5.980	0.920	6.590	1.480
120.0	-1.3	32.1	5.000	46.490	5.020	1.030	6.920	1.230
135.0	-3.5	104.4	5.300	32.130	4.340	1.190	6.270	1.070
150.0	-4.5	110.9	4.470	21.900	5.390	1.110	5.890	1.280
165.0	-1.2	16.1	3.700	22.360	5.350	0.700	3.630	1.590
180.0	-0.3	354.5	4.220	21.250	6.340	0.680	3.110	1.610
195.0	-0.1	368.1	2.750	16.120	5.530	0.660	3.320	1.640
210.0	-0.1	374.0	3.320	14.110	5.660	0.740	3.850	1.620
225.0	-0.1	381.7	3.720	19.460	6.110	0.830	4.640	1.620
240.0	1.6	322.0	4.380	20.560	4.670	1.100	5.210	1.450
255.0	1.7	294.4	4.750	18.650	4.580	1.160	5.130	1.450
270.0	1.0	300.9	4.590	18.200	5.210	1.050	5.210	1.580
285.0	0.5	308.7	4.130	18.470	5.040	0.940	4.950	1.650
300.0	0.1	317.3	3.120	16.930	5.320	0.840	4.620	1.680
315.0	-0.0	324.9	2.990	15.900	5.540	0.760	4.040	1.670
330.0	0.0	333.9	2.630	17.620	6.480	0.690	3.470	1.650
345.0	0.1	342.6	2.440	12.980	6.540	0.630	3.010	1.640

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.16:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	4.5	-2.4	2.380	6.650	5.280	0.610	1.260	1.630
15.0	4.4	11.2	2.210	8.820	5.700	0.620	1.770	1.630
30.0	4.1	22.8	2.590	13.550	5.770	0.660	2.710	1.650
45.0	3.5	20.2	2.350	16.920	6.150	0.650	2.890	1.640
60.0	3.2	28.1	2.530	14.850	5.630	0.690	3.360	1.640
75.0	3.1	38.0	2.880	19.040	6.170	0.770	4.430	1.640
90.0	3.2	41.2	3.180	20.160	6.160	0.820	4.610	1.620
105.0	3.4	41.7	3.270	19.770	5.230	0.830	4.460	1.620
120.0	3.6	42.7	3.240	16.800	5.200	0.840	4.320	1.640
135.0	3.6	43.1	3.370	19.410	5.170	0.830	4.390	1.640
150.0	3.5	40.4	3.120	18.360	5.620	0.800	4.310	1.640
165.0	3.3	44.4	2.900	21.890	5.550	0.780	4.240	1.660
180.0	4.6	179.3	2.010	6.540	4.000	0.560	1.470	1.220
195.0	4.2	242.6	3.170	14.560	4.560	0.670	3.430	1.370
210.0	4.1	352.9	3.150	15.710	5.350	0.660	2.520	1.600
225.0	4.4	307.6	3.590	15.470	5.100	0.960	4.590	1.610
240.0	4.7	287.2	4.450	21.050	4.760	1.280	4.990	1.200
255.0	4.6	291.5	4.360	18.180	4.540	1.210	4.930	1.380
270.0	4.4	298.1	4.640	16.440	4.890	1.110	4.890	1.530
285.0	4.3	302.4	4.370	18.850	5.220	1.040	4.730	1.590
300.0	4.3	307.7	3.500	15.920	5.710	0.960	4.260	1.650
315.0	4.5	316.9	3.250	15.210	5.370	0.830	3.780	1.700
330.0	4.5	330.0	2.580	13.230	5.740	0.720	3.220	1.690
345.0	4.6	343.7	2.320	10.590	5.340	0.640	1.970	1.650

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.17: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.5	-0.8	2.280	6.400	5.310	0.690	1.030	1.600
15.0	9.5	14.1	2.570	8.000	5.100	0.710	1.230	1.610
30.0	9.5	29.1	2.850	10.030	5.490	0.770	2.060	1.640
45.0	9.5	44.0	3.290	13.880	5.520	0.900	2.870	1.660
60.0	9.5	58.4	3.590	18.690	4.840	1.060	3.720	1.580
75.0	9.3	71.0	4.100	18.820	4.640	1.230	4.220	1.270
90.0	8.5	78.5	5.470	26.900	3.590	1.290	5.070	0.900
105.0	8.1	81.7	4.570	27.760	2.890	1.280	5.290	0.740
120.0	7.9	94.1	5.860	30.160	3.040	1.230	6.350	0.520
135.0	8.2	116.3	4.260	24.210	4.350	0.980	6.000	1.100
150.0	9.2	146.6	1.730	16.860	3.140	0.650	5.790	1.140
165.0	9.5	162.9	1.820	18.260	3.350	0.570	5.170	1.080
180.0	9.7	178.8	1.510	15.180	3.200	0.540	3.650	1.070
195.0	9.7	195.1	1.860	10.790	3.280	0.570	3.490	1.080
210.0	9.4	212.0	1.720	16.150	3.220	0.660	4.990	1.160
225.0	8.8	235.2	4.930	26.550	4.560	0.920	5.620	1.220
240.0	8.3	268.6	4.920	34.660	3.960	1.330	5.900	0.600
255.0	8.5	273.6	4.500	27.200	2.400	1.360	5.280	0.530
270.0	8.8	279.0	4.930	20.280	2.690	1.370	4.840	0.770
285.0	9.6	287.9	4.580	25.210	4.690	1.280	4.400	1.260
300.0	9.6	300.8	3.820	15.080	5.340	1.110	3.750	1.600
315.0	9.5	314.9	3.220	12.930	5.770	0.930	3.000	1.690
330.0	9.5	329.6	2.800	11.870	5.270	0.790	2.270	1.670
345.0	9.5	344.5	2.300	12.840	5.370	0.710	1.570	1.620

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.18:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.6	-0.4	2.970	7.570	4.880	0.800	1.000	1.570
15.0	14.5	14.6	2.920	7.560	5.190	0.830	1.140	1.580
30.0	14.5	29.7	2.960	10.020	5.390	0.890	1.740	1.610
45.0	14.5	44.7	3.590	15.000	4.960	1.000	2.420	1.620
60.0	14.6	59.4	4.030	17.010	5.140	1.150	3.170	1.530
75.0	14.6	73.6	4.590	23.760	4.600	1.280	3.620	1.190
90.0	14.4	87.4	4.330	22.070	1.660	1.290	4.560	0.350
105.0	14.2	101.8	4.560	32.360	2.680	1.130	6.050	0.670
120.0	14.1	116.5	2.960	26.180	3.190	0.940	7.630	0.970
135.0	14.3	132.2	2.670	24.420	3.420	0.740	8.670	0.980
150.0	14.6	149.2	2.240	21.810	3.540	0.590	5.990	0.900
165.0	14.6	164.3	1.640	17.600	2.930	0.560	3.880	0.980
180.0	14.7	179.4	1.460	15.160	2.620	0.520	2.650	0.900
195.0	14.7	194.4	1.610	17.410	3.120	0.560	3.380	0.980
210.0	14.7	209.8	1.740	20.980	3.160	0.610	5.320	0.950
225.0	14.5	226.8	2.630	23.760	3.760	0.760	8.400	1.040
240.0	14.3	243.0	3.410	24.910	3.600	0.990	7.770	1.060
255.0	14.2	258.5	5.990	34.720	3.140	1.210	6.390	0.740
270.0	14.4	272.8	5.280	26.560	2.760	1.370	5.280	0.360
285.0	14.7	286.3	4.410	17.360	4.480	1.340	3.890	1.190
300.0	14.7	300.1	4.040	13.360	5.090	1.190	3.190	1.550
315.0	14.6	314.7	3.120	14.220	4.650	1.030	2.570	1.650
330.0	14.5	329.6	3.100	10.250	5.560	0.900	1.880	1.620
345.0	14.5	344.6	2.930	9.190	5.330	0.830	1.230	1.590

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.19: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.3	3.300	9.740	5.200	0.930	1.270	1.510
15.0	19.6	14.8	3.570	10.170	5.030	0.950	1.300	1.530
30.0	19.6	29.8	3.390	11.230	5.200	1.000	1.720	1.560
45.0	19.6	44.8	3.740	14.090	4.820	1.110	2.260	1.570
60.0	19.6	59.6	4.320	18.750	4.910	1.220	2.970	1.480
75.0	19.6	74.1	4.310	20.470	4.000	1.300	3.220	1.150
90.0	19.5	88.6	4.280	22.910	1.520	1.240	4.330	0.290
105.0	19.4	103.5	4.850	28.410	2.540	1.050	6.510	0.620
120.0	19.4	118.3	3.410	29.560	3.320	0.860	10.770	0.800
135.0	19.5	134.6	1.960	26.610	2.170	0.650	7.840	0.750
150.0	19.6	149.5	1.380	21.280	2.180	0.480	5.080	0.740
165.0	19.9	164.4	1.420	16.770	2.420	0.560	3.170	0.890
180.0	19.6	179.5	1.540	20.900	2.880	0.460	3.030	0.820
195.0	19.9	194.9	1.780	27.770	2.670	0.620	4.250	0.930
210.0	19.6	210.1	1.450	29.890	2.280	0.530	6.240	0.840
225.0	19.5	225.5	2.420	28.980	2.990	0.680	9.350	0.910
240.0	19.5	241.5	3.610	31.220	4.180	0.930	11.110	0.960
255.0	19.4	256.8	5.010	29.310	2.660	1.160	7.350	0.740
270.0	19.5	271.6	5.530	24.720	2.310	1.360	5.800	0.320
285.0	19.7	285.8	4.590	16.120	3.670	1.390	4.130	1.150
300.0	19.6	300.0	4.380	15.540	4.810	1.280	3.280	1.500
315.0	19.6	314.8	3.720	13.690	5.190	1.140	2.530	1.580
330.0	19.6	329.7	3.820	11.840	4.990	1.030	1.900	1.570
345.0	19.6	344.7	3.610	10.540	5.220	0.950	1.470	1.530

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table Q.20: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.6	-0.1	3.260	12.930	4.610	1.030	1.620	1.440
15.0	24.6	14.9	3.620	12.700	4.830	1.050	1.620	1.460
30.0	24.5	29.9	4.020	14.500	4.670	1.100	1.860	1.490
45.0	24.5	44.9	4.240	19.770	4.640	1.190	2.270	1.510
60.0	24.5	59.7	4.210	18.780	4.650	1.280	2.790	1.440
75.0	24.5	74.4	4.540	21.390	3.680	1.320	2.920	1.110
90.0	24.5	89.1	4.250	23.190	2.120	1.200	4.240	0.290
105.0	24.5	104.1	4.240	30.190	2.600	1.000	7.420	0.570
120.0	24.4	119.5	3.400	38.120	3.840	0.770	11.480	0.690
135.0	24.4	134.4	2.410	30.760	3.160	0.820	9.550	0.960
150.0	24.3	149.4	1.840	24.290	2.740	0.650	5.750	0.880
165.0	24.4	164.6	1.540	23.940	2.430	0.520	3.660	0.850
180.0	24.9	179.6	1.410	25.160	2.640	0.490	3.270	0.780
195.0	24.4	194.6	1.480	27.600	2.830	0.510	4.360	0.840
210.0	24.4	210.0	2.310	30.510	3.300	0.620	6.190	0.890
225.0	24.5	226.1	4.320	40.930	3.980	0.670	9.900	0.870
240.0	24.4	240.7	3.990	38.860	3.540	0.850	13.550	0.860
255.0	24.4	256.2	6.290	33.960	2.910	1.140	8.700	0.720
270.0	24.5	271.0	5.060	28.180	2.080	1.330	6.190	0.330
285.0	24.6	285.6	4.670	20.850	3.750	1.420	4.800	1.110
300.0	24.6	300.1	4.420	17.200	4.800	1.350	3.660	1.440
315.0	24.6	314.9	4.270	14.980	5.210	1.230	2.780	1.510
330.0	24.5	329.9	3.870	13.800	4.880	1.130	2.060	1.490
345.0	24.5	344.9	3.630	11.810	4.790	1.060	1.670	1.460

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.21: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.6	-0.1	3.920	13.580	4.550	1.110	1.740	1.370
15.0	29.6	14.9	3.660	14.350	4.590	1.130	1.700	1.390
30.0	29.6	29.9	3.760	15.960	4.550	1.180	1.940	1.430
45.0	29.6	44.9	4.160	18.360	4.510	1.270	2.300	1.450
60.0	29.6	59.8	4.600	19.670	4.230	1.340	2.700	1.390
75.0	29.5	74.5	4.580	20.920	3.660	1.350	2.740	1.090
90.0	29.5	89.3	4.220	21.600	1.840	1.170	4.360	0.300
105.0	29.5	104.6	3.350	40.570	3.820	0.970	10.020	0.590
120.0	29.3	119.5	2.480	34.880	2.570	0.800	13.290	0.800
135.0	29.3	134.6	2.190	28.900	3.140	0.680	8.240	0.840
150.0	29.6	149.6	1.710	27.090	3.280	0.560	4.860	0.810
165.0	29.4	164.5	1.560	27.330	2.610	0.520	4.480	0.810
180.0	30.2	179.5	1.330	28.660	2.860	0.420	4.430	0.670
195.0	29.6	194.6	1.680	31.390	2.780	0.500	5.340	0.820
210.0	29.7	209.9	1.750	28.290	2.770	0.570	6.160	0.860
225.0	29.3	224.9	2.390	37.730	3.040	0.690	8.370	0.930
240.0	29.3	240.6	3.020	43.530	3.950	0.880	14.410	0.960
255.0	29.5	255.6	4.900	38.800	2.870	1.090	9.490	0.690
270.0	29.5	270.7	5.810	30.190	2.570	1.300	6.350	0.360
285.0	29.6	285.4	5.240	20.830	3.580	1.440	4.860	1.080
300.0	29.6	300.1	4.600	18.280	4.600	1.400	3.840	1.380
315.0	29.6	315.0	4.630	15.050	4.580	1.300	2.970	1.440
330.0	29.6	330.0	3.960	13.400	4.660	1.200	2.270	1.420
345.0	29.6	345.0	3.990	13.620	4.590	1.130	1.900	1.380

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.22:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	-0.1	-12.1	4.100	12.930	5.470	1.150	2.840	1.510
15.0	-0.4	-6.9	3.690	10.760	4.750	1.140	2.040	1.520
30.0	-0.8	4.0	3.520	14.600	5.120	1.140	2.340	1.520
45.0	-0.6	21.9	3.620	18.020	4.710	1.160	3.850	1.450
60.0	-0.3	40.0	3.810	16.370	4.430	1.220	4.980	1.310
75.0	-0.3	55.3	4.050	17.750	3.630	1.290	5.480	1.100
90.0	-0.3	72.1	4.280	18.250	2.990	1.380	5.790	0.710
105.0	-0.4	87.5	4.770	17.650	1.240	1.420	5.900	0.270
120.0	-0.9	98.6	4.810	18.190	2.710	1.410	6.030	0.430
135.0	-1.5	108.2	4.620	19.170	2.500	1.380	6.000	0.710
150.0	-2.2	116.0	4.280	20.420	2.870	1.330	5.810	0.930
165.0	-0.8	18.7	3.630	16.130	5.360	1.160	3.000	1.490
180.0	-0.6	28.6	3.740	13.870	4.660	1.160	3.180	1.490
195.0	0.1	364.9	4.080	16.100	5.110	1.200	3.800	1.420
210.0	1.1	247.9	5.400	19.930	3.770	1.410	5.590	0.880
225.0	0.9	257.7	5.190	19.950	3.090	1.460	5.730	0.600
240.0	0.7	268.7	5.520	19.340	2.330	1.490	5.750	0.350
255.0	0.7	281.8	5.630	18.480	2.840	1.470	5.590	0.520
270.0	0.6	293.5	5.710	17.980	3.670	1.410	5.400	0.860
285.0	0.4	303.5	5.070	17.970	4.480	1.360	5.240	1.090
300.0	0.2	312.3	5.410	18.120	4.350	1.310	4.950	1.230
315.0	0.1	321.2	4.530	17.520	4.680	1.260	4.610	1.340
330.0	0.0	331.1	4.530	14.940	5.100	1.210	4.060	1.430
345.0	0.1	341.0	4.210	12.820	5.250	1.180	3.310	1.490

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.23: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	4.6	-2.9	3.930	6.340	6.460	1.130	1.280	1.540
15.0	4.5	10.7	3.900	10.740	6.720	1.130	2.290	1.530
30.0	4.4	24.5	3.990	13.250	5.830	1.170	3.630	1.480
45.0	4.4	38.4	4.290	17.900	5.060	1.220	4.580	1.370
60.0	4.3	51.0	5.070	19.400	4.460	1.280	4.990	1.210
75.0	4.2	60.0	4.790	18.770	3.580	1.320	5.190	1.020
90.0	4.1	70.8	5.440	19.280	2.590	1.380	5.410	0.730
105.0	4.0	84.0	4.310	19.110	1.540	1.400	5.640	0.310
120.0	3.8	96.5	5.560	20.510	1.870	1.390	5.750	0.320
135.0	3.6	107.1	5.250	20.610	2.570	1.350	5.710	0.620
150.0	3.3	116.8	4.570	21.500	3.240	1.300	5.710	0.850
165.0	3.3	124.6	4.760	21.550	3.960	1.270	5.790	0.990
180.0	4.5	177.7	4.270	7.000	5.600	1.110	1.540	1.320
195.0	4.6	195.8	4.090	9.510	4.990	1.130	2.640	1.300
210.0	4.4	216.9	4.070	13.620	4.790	1.210	3.960	1.240
225.0	4.3	241.4	5.240	15.480	3.960	1.350	5.070	0.950
240.0	4.3	252.8	4.750	15.440	3.000	1.410	5.360	0.690
255.0	4.5	264.0	4.740	15.780	1.780	1.450	5.480	0.340
270.0	4.6	276.6	5.630	16.790	1.300	1.470	5.370	0.290
285.0	4.7	289.7	5.390	17.980	2.910	1.430	5.210	0.750
300.0	4.8	302.6	4.800	16.140	3.860	1.350	4.870	1.110
315.0	4.8	315.7	4.810	17.250	5.530	1.270	4.470	1.330
330.0	4.7	329.4	4.110	12.570	6.190	1.200	3.740	1.460
345.0	4.7	343.2	4.030	12.410	6.530	1.150	2.690	1.520

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.24:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.7	-0.8	4.680	5.540	6.060	1.160	0.690	1.550
15.0	9.7	14.3	4.510	8.630	4.970	1.160	1.870	1.520
30.0	9.7	29.3	4.030	13.170	5.180	1.210	3.090	1.460
45.0	9.7	44.2	4.510	15.910	4.530	1.260	3.880	1.330
60.0	9.7	58.9	5.210	17.670	4.150	1.330	4.410	1.080
75.0	9.8	73.6	5.430	20.570	2.630	1.380	4.580	0.660
90.0	9.7	88.3	4.180	17.730	0.640	1.400	4.960	0.150
105.0	9.7	103.0	4.350	21.180	1.460	1.360	5.200	0.440
120.0	9.5	117.2	5.470	22.570	2.930	1.290	5.280	0.780
135.0	9.4	132.2	5.080	20.450	3.560	1.210	4.810	0.990
150.0	9.5	147.9	3.670	15.110	3.500	1.140	4.290	1.110
165.0	9.6	163.5	3.130	14.550	3.490	1.100	3.650	1.170
180.0	9.7	178.9	3.320	12.220	3.660	1.100	2.610	1.210
195.0	9.7	194.7	3.190	9.600	3.560	1.100	2.670	1.190
210.0	9.6	210.8	4.070	12.170	4.650	1.140	4.070	1.130
225.0	9.6	226.9	5.300	16.800	3.710	1.240	5.120	1.040
240.0	9.6	242.3	5.150	17.680	2.520	1.330	5.530	0.830
255.0	9.7	256.6	5.190	17.610	1.810	1.400	5.450	0.490
270.0	9.8	271.3	5.280	16.860	0.740	1.450	5.270	0.130
285.0	9.8	285.8	5.880	18.100	2.560	1.430	4.890	0.630
300.0	9.8	300.4	5.230	15.680	4.540	1.370	4.550	1.070
315.0	9.7	314.8	4.530	12.870	4.690	1.290	3.880	1.320
330.0	9.7	329.5	4.460	12.140	5.050	1.230	3.040	1.460
345.0	9.7	344.3	4.740	8.840	5.250	1.170	1.930	1.520

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.25: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.6	-0.4	4.800	6.490	5.170	1.210	0.700	1.520
15.0	14.6	14.7	4.850	9.050	5.560	1.220	1.650	1.500
30.0	14.6	29.8	4.280	11.410	5.150	1.250	2.740	1.440
45.0	14.7	44.8	5.190	14.750	4.420	1.300	3.590	1.310
60.0	14.7	59.6	4.670	16.620	3.800	1.340	4.250	1.060
75.0	14.8	74.4	5.630	20.190	2.850	1.370	4.160	0.650
90.0	14.8	89.2	4.340	18.010	0.580	1.360	4.570	0.170
105.0	14.7	104.1	5.620	22.690	1.490	1.320	4.980	0.430
120.0	14.6	118.6	4.430	26.570	2.680	1.250	6.340	0.720
135.0	14.6	134.0	3.690	21.760	2.690	1.170	6.390	0.920
150.0	14.7	149.3	3.230	17.560	3.080	1.110	4.050	1.000
165.0	14.8	164.4	3.440	14.570	3.890	1.080	2.740	1.070
180.0	14.7	179.5	3.750	10.610	4.200	1.080	2.150	1.170
195.0	14.7	194.6	3.480	15.360	3.370	1.090	2.610	1.100
210.0	14.7	209.9	3.170	18.690	2.930	1.140	4.540	1.060
225.0	14.7	225.6	3.640	18.680	3.060	1.210	6.850	0.990
240.0	14.6	241.1	5.240	20.690	2.640	1.300	6.960	0.800
255.0	14.8	255.7	5.450	19.890	1.710	1.380	5.960	0.490
270.0	14.8	270.5	5.180	18.490	0.790	1.430	5.470	0.170
285.0	14.8	285.3	5.640	18.520	2.400	1.430	4.920	0.620
300.0	14.7	299.9	4.510	16.590	3.490	1.390	4.530	1.050
315.0	14.7	314.6	5.060	15.320	4.570	1.330	3.650	1.300
330.0	14.6	329.5	4.620	11.860	4.850	1.270	2.640	1.440
345.0	14.6	344.5	5.020	9.440	5.450	1.230	1.580	1.500

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.26:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.3	5.100	9.660	5.000	1.280	1.040	1.490
15.0	19.6	14.8	4.460	11.100	4.900	1.280	1.820	1.470
30.0	19.6	29.9	4.130	14.010	4.210	1.300	2.840	1.410
45.0	19.6	44.9	4.780	16.610	4.720	1.320	3.610	1.290
60.0	19.6	59.8	5.120	19.780	4.030	1.340	4.390	1.050
75.0	19.7	74.6	5.190	16.320	2.580	1.340	3.790	0.660
90.0	19.7	89.5	4.090	18.150	0.700	1.320	4.160	0.210
105.0	19.7	104.5	4.860	21.000	1.330	1.270	4.780	0.400
120.0	19.6	119.4	3.870	27.090	2.060	1.210	7.720	0.670
135.0	19.6	134.6	3.750	21.770	2.620	1.130	6.140	0.830
150.0	19.6	149.6	3.100	16.180	2.680	1.110	4.170	0.950
165.0	19.6	164.6	3.530	13.420	3.350	1.070	2.680	0.990
180.0	19.7	179.7	2.910	17.040	3.160	0.980	2.190	0.940
195.0	19.7	194.8	2.990	20.980	2.840	1.060	3.210	1.000
210.0	19.6	209.9	3.450	25.490	3.030	1.120	4.990	1.010
225.0	19.6	225.0	3.570	29.300	3.180	1.160	6.630	0.870
240.0	19.6	240.5	4.210	27.370	2.320	1.260	8.770	0.770
255.0	19.7	255.3	5.820	27.680	1.740	1.360	6.440	0.490
270.0	19.7	270.2	4.950	21.620	0.970	1.410	5.720	0.210
285.0	19.7	285.1	6.090	21.520	2.410	1.430	5.280	0.610
300.0	19.6	299.8	5.370	20.120	3.650	1.420	4.600	1.030
315.0	19.6	314.7	4.970	18.360	4.620	1.370	3.420	1.280
330.0	19.6	329.6	4.210	14.760	4.380	1.330	2.380	1.410
345.0	19.6	344.6	4.560	11.040	5.080	1.290	1.350	1.470

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.27: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.5	-0.2	5.370	13.180	5.330	1.350	1.480	1.450
15.0	24.5	14.9	4.920	14.610	5.080	1.340	2.160	1.430
30.0	24.5	30.0	4.440	16.210	4.290	1.350	3.000	1.380
45.0	24.5	45.0	4.410	19.330	3.830	1.370	3.840	1.270
60.0	24.6	59.9	4.550	21.130	3.220	1.360	4.590	1.040
75.0	24.6	74.7	5.340	18.220	2.500	1.320	3.590	0.670
90.0	24.6	89.7	4.130	18.500	0.860	1.270	3.970	0.250
105.0	24.6	104.7	4.930	21.480	1.260	1.220	4.750	0.370
120.0	24.6	119.7	3.980	30.620	2.380	1.150	8.220	0.610
135.0	24.5	134.7	3.270	22.950	2.430	1.120	6.680	0.860
150.0	24.6	149.7	2.690	16.460	2.490	0.960	4.060	0.860
165.0	24.6	164.7	3.490	14.370	2.970	0.920	2.250	0.850
180.0	24.9	179.8	2.900	16.440	3.160	0.980	1.600	0.960
195.0	24.6	194.8	2.140	19.230	2.300	0.740	2.330	0.770
210.0	24.6	210.0	3.640	28.790	2.860	1.150	5.330	0.990
225.0	24.6	224.9	3.300	33.280	2.440	1.130	6.310	0.780
240.0	24.6	240.1	4.220	37.440	2.680	1.230	8.570	0.700
255.0	24.6	255.1	4.830	29.420	1.600	1.320	6.770	0.480
270.0	24.6	270.1	4.920	25.060	1.120	1.390	5.960	0.250
285.0	24.6	285.0	5.080	24.020	2.100	1.430	5.310	0.610
300.0	24.6	299.8	4.830	21.000	3.600	1.440	4.250	1.010
315.0	24.6	314.7	4.830	18.270	4.110	1.410	3.030	1.240
330.0	24.5	329.7	5.110	17.340	4.690	1.380	2.100	1.370
345.0	24.5	344.8	5.070	13.610	5.330	1.360	1.450	1.420

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table Q.28: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.6	-0.1	4.790	14.790	4.340	1.410	1.770	1.400
15.0	29.6	15.0	5.230	16.080	4.500	1.410	2.380	1.390
30.0	29.6	30.0	5.760	16.540	4.770	1.410	3.060	1.340
45.0	29.6	45.0	4.860	20.230	3.970	1.410	3.850	1.240
60.0	29.6	60.0	5.520	20.880	3.570	1.380	4.580	1.040
75.0	29.6	74.8	4.450	18.120	2.350	1.310	3.630	0.680
90.0	29.6	89.8	4.020	19.070	1.040	1.230	4.230	0.290
105.0	29.6	104.8	4.800	25.130	1.370	1.160	5.020	0.340
120.0	29.6	119.8	3.600	28.820	1.950	1.110	8.490	0.590
135.0	29.5	134.7	4.040	24.080	2.540	1.250	7.520	0.910
150.0	29.6	149.7	2.330	17.220	2.490	0.860	3.480	0.830
165.0	29.5	164.7	2.830	17.420	2.710	1.080	2.330	1.000
180.0	30.3	179.8	2.730	20.160	2.780	1.040	2.000	0.980
195.0	29.7	194.7	2.860	23.140	2.800	1.080	3.140	0.990
210.0	29.7	210.0	2.690	24.400	2.650	0.850	3.850	0.820
225.0	29.6	225.1	3.340	34.440	2.620	1.230	7.550	0.870
240.0	29.6	240.1	4.000	37.060	2.440	1.200	9.280	0.700
255.0	29.6	255.0	5.010	35.370	1.650	1.300	6.660	0.480
270.0	29.6	270.0	5.050	26.520	1.190	1.360	5.940	0.290
285.0	29.6	285.0	4.770	25.230	2.220	1.410	5.400	0.620
300.0	29.6	299.9	5.400	21.650	3.280	1.450	3.820	0.990
315.0	29.6	314.8	4.840	20.050	3.980	1.450	2.750	1.210
330.0	29.6	329.9	5.630	15.700	4.920	1.440	1.990	1.320
345.0	29.6	344.9	5.220	14.740	4.770	1.420	1.600	1.380

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table Q.29: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 0.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	-1.9	-33.1	5.440	26.190	8.460	1.600	7.240	2.390
15.0	-3.0	21.2	7.610	29.370	9.170	1.670	8.370	2.010
30.0	-3.6	5.1	6.940	31.960	9.190	1.660	8.850	2.120
45.0	-3.3	-81.5	6.850	29.680	7.050	1.850	9.350	1.650
60.0	-2.1	-71.2	8.500	37.240	6.980	1.940	9.940	1.250
75.0	-0.9	-54.0	7.440	33.730	6.280	1.940	9.670	1.140
90.0	-0.2	66.0	7.370	50.010	5.650	1.840	8.890	1.620
105.0	-0.3	80.6	7.380	35.540	4.800	1.970	9.030	0.950
120.0	-2.1	97.2	9.090	32.760	5.380	1.990	9.390	0.810
135.0	-4.3	105.3	7.950	30.810	5.430	1.930	9.240	1.260
150.0	-5.4	102.4	6.710	29.530	9.200	1.850	9.080	1.630
165.0	-2.3	32.1	5.730	25.450	8.970	1.590	7.140	2.310
180.0	-1.0	14.2	6.110	27.980	9.080	1.560	6.770	2.350
195.0	-0.9	24.9	6.570	28.390	7.570	1.590	6.780	2.330
210.0	-0.2	31.0	6.590	27.730	7.280	1.640	7.030	2.290
225.0	1.2	343.8	7.110	29.200	7.310	1.920	8.560	1.730
240.0	2.2	278.6	7.550	30.080	4.200	2.170	8.560	0.890
255.0	1.9	286.6	7.360	28.770	5.570	2.080	8.550	1.370
270.0	1.6	294.1	6.830	26.630	5.890	1.970	8.120	1.740
285.0	1.3	303.2	6.270	24.760	7.010	1.840	7.470	2.050
300.0	0.8	307.6	7.310	26.110	7.140	1.770	7.450	2.120
315.0	0.4	314.7	6.270	25.760	7.560	1.690	7.130	2.220
330.0	-0.5	322.3	6.630	29.540	7.640	1.640	7.170	2.330
345.0	-0.6	330.6	6.380	26.970	7.780	1.560	6.530	2.380

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.30: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	3.1	-30.3	5.680	25.610	8.800	1.530	6.460	2.470
15.0	2.7	-26.0	5.580	23.670	8.690	1.510	6.960	2.480
30.0	2.5	-18.4	5.330	22.790	8.380	1.460	6.700	2.470
45.0	2.6	-9.8	5.540	20.780	8.310	1.430	6.350	2.470
60.0	2.7	6.8	5.930	26.710	9.070	1.460	6.610	2.410
75.0	3.0	24.9	7.290	30.910	7.380	1.520	7.210	2.310
90.0	3.0	32.3	5.970	26.970	8.890	1.580	7.430	2.210
105.0	3.3	59.4	6.670	34.820	7.210	1.810	8.520	1.620
120.0	3.3	89.7	7.540	37.520	3.580	1.970	9.400	0.500
135.0	2.6	101.1	7.720	37.000	4.200	1.920	9.380	0.880
150.0	2.7	35.8	6.460	26.490	8.150	1.590	7.560	2.290
165.0	2.4	38.5	5.810	23.390	9.480	1.590	7.500	2.360
180.0	2.8	59.9	6.440	26.790	8.000	1.590	7.560	2.350
195.0	3.9	362.7	5.710	27.500	8.460	1.560	6.310	2.360
210.0	4.1	367.4	5.490	23.830	8.040	1.550	6.210	2.370
225.0	5.0	273.3	7.350	31.210	4.020	2.140	8.560	0.750
240.0	4.8	279.1	8.900	33.700	4.380	2.140	8.620	0.910
255.0	4.7	287.4	7.690	27.760	5.060	2.070	7.890	1.400
270.0	4.6	293.5	6.810	28.080	6.040	1.970	7.720	1.720
285.0	4.4	300.4	7.320	23.120	7.070	1.880	7.130	1.960
300.0	4.4	306.5	7.000	23.010	8.990	1.770	7.280	2.150
315.0	4.4	316.7	6.010	21.090	8.260	1.660	6.490	2.310
330.0	4.2	326.7	5.850	28.730	7.960	1.550	6.290	2.400
345.0	3.9	331.4	5.830	30.670	8.970	1.520	6.360	2.440

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.31: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.2	-2.0	5.090	15.610	8.620	1.450	2.580	2.470
15.0	9.1	12.6	4.960	16.390	8.650	1.460	3.340	2.470
30.0	9.0	27.5	5.880	19.480	8.130	1.530	4.510	2.420
45.0	9.1	42.8	6.280	20.440	7.630	1.650	5.530	2.280
60.0	9.3	57.1	6.810	26.920	7.280	1.810	6.340	2.020
75.0	9.1	70.1	7.460	29.550	5.800	1.950	7.020	1.520
90.0	8.4	77.5	8.980	36.590	3.940	1.990	7.750	1.060
105.0	8.2	89.0	8.450	35.300	3.550	1.980	8.760	0.530
120.0	7.9	100.1	9.150	41.380	4.260	1.900	8.940	0.800
135.0	7.6	111.3	7.380	33.760	5.830	1.780	8.440	1.230
150.0	7.5	124.6	6.480	32.310	7.600	1.630	8.060	1.530
165.0	8.1	150.8	5.050	29.150	6.290	1.400	7.000	1.830
180.0	9.2	177.8	3.670	19.980	5.260	1.290	5.090	1.840
195.0	9.3	195.8	3.780	14.420	5.240	1.320	4.530	1.840
210.0	8.5	234.4	7.300	33.330	6.880	1.740	7.490	1.630
225.0	8.3	257.0	8.070	38.740	5.780	2.000	8.660	1.100
240.0	8.4	268.4	8.560	38.020	3.900	2.090	8.930	0.740
255.0	8.5	274.6	8.950	31.530	3.310	2.110	8.640	0.720
270.0	8.7	280.8	7.520	32.720	5.040	2.100	8.080	0.970
285.0	9.3	289.3	7.980	26.470	7.240	2.050	7.450	1.510
300.0	9.5	301.1	6.860	23.050	6.680	1.900	6.260	2.000
315.0	9.4	314.5	6.310	24.000	7.280	1.730	5.700	2.290
330.0	9.3	328.9	5.640	22.140	8.030	1.580	4.710	2.430
345.0	9.3	343.4	5.230	19.310	8.510	1.490	3.750	2.470

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.32: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.4	-0.8	4.890	11.500	7.690	1.580	2.050	2.420
15.0	14.4	14.3	4.810	11.270	7.140	1.590	2.560	2.400
30.0	14.4	29.5	6.140	19.500	7.940	1.650	3.740	2.340
45.0	14.4	44.6	6.250	19.340	6.730	1.760	4.590	2.220
60.0	14.5	59.1	7.020	21.240	6.010	1.880	5.640	1.950
75.0	14.5	73.2	7.510	29.020	5.620	1.980	6.370	1.370
90.0	14.3	87.2	7.420	33.710	2.520	1.980	7.900	0.440
105.0	14.3	102.0	8.370	43.690	3.300	1.860	8.790	0.740
120.0	13.7	114.5	8.670	43.140	4.990	1.700	9.040	1.080
135.0	13.7	130.2	5.230	31.270	4.510	1.510	9.270	1.410
150.0	14.5	148.0	4.550	25.290	5.230	1.340	7.330	1.490
165.0	14.5	163.5	3.450	23.320	4.740	1.270	4.750	1.500
180.0	14.5	178.8	3.550	17.990	4.650	1.240	3.790	1.600
195.0	14.6	194.2	3.450	21.770	4.650	1.290	4.700	1.620
210.0	14.7	211.0	4.220	28.200	5.760	1.370	6.820	1.580
225.0	13.9	230.8	5.870	27.790	4.830	1.590	9.560	1.520
240.0	13.7	246.7	8.230	34.540	4.730	1.810	9.540	1.250
255.0	13.9	259.8	9.650	42.920	3.060	1.990	9.550	0.770
270.0	14.2	273.5	8.700	34.870	3.460	2.100	8.680	0.480
285.0	14.5	286.8	7.950	26.310	5.650	2.090	7.300	1.380
300.0	14.6	300.2	7.110	20.220	6.650	1.970	5.970	1.960
315.0	14.5	314.4	6.770	23.640	7.430	1.820	5.020	2.230
330.0	14.4	329.1	6.110	20.300	7.980	1.690	4.110	2.360
345.0	14.4	344.2	4.970	13.930	7.130	1.610	2.540	2.410

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.33: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.5	-0.4	6.300	11.630	7.960	1.720	2.130	2.330
15.0	19.5	14.7	6.420	13.680	7.430	1.730	2.690	2.320
30.0	19.5	29.9	6.200	17.620	7.030	1.780	3.430	2.270
45.0	19.5	44.9	5.630	21.050	6.240	1.850	4.310	2.160
60.0	19.5	59.6	6.860	25.070	6.670	1.940	5.280	1.890
75.0	19.5	74.0	8.080	31.380	5.120	1.980	6.100	1.330
90.0	19.5	88.5	6.540	30.380	1.990	1.920	7.630	0.410
105.0	19.5	103.6	7.750	36.600	4.210	1.770	9.190	0.740
120.0	19.2	117.8	5.290	39.060	4.870	1.610	11.290	1.080
135.0	19.4	134.5	4.600	29.510	4.450	1.410	10.880	1.310
150.0	19.4	149.3	3.840	24.470	4.610	1.340	7.580	1.440
165.0	19.5	164.1	3.350	19.630	4.330	1.190	4.310	1.360
180.0	19.6	179.6	4.250	24.310	5.330	1.370	3.560	1.670
195.0	19.6	194.7	3.520	29.140	4.240	1.240	5.970	1.470
210.0	19.3	210.6	3.980	34.620	4.180	1.220	8.500	1.400
225.0	19.5	225.5	5.720	36.820	4.520	1.460	11.130	1.380
240.0	19.2	242.8	5.990	37.630	4.150	1.700	12.580	1.240
255.0	19.3	257.3	8.180	33.580	2.780	1.910	10.550	0.830
270.0	19.4	271.9	8.570	39.820	3.810	2.070	9.370	0.450
285.0	19.6	286.1	7.240	27.550	4.690	2.120	7.780	1.320
300.0	19.6	300.0	6.840	21.530	5.910	2.030	5.810	1.900
315.0	19.5	314.5	6.040	19.380	6.230	1.920	4.400	2.170
330.0	19.5	329.4	6.280	16.850	7.160	1.810	3.440	2.280
345.0	19.5	344.5	6.430	13.140	7.260	1.750	2.610	2.320

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.34:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.5	-0.2	6.310	15.230	6.750	1.850	2.680	2.230
15.0	24.5	14.9	6.670	16.770	7.310	1.850	2.870	2.220
30.0	24.5	30.0	6.260	19.140	7.200	1.890	3.630	2.190
45.0	24.5	45.0	6.770	21.460	6.540	1.940	4.260	2.080
60.0	24.5	59.7	7.650	25.070	6.450	1.990	5.180	1.850
75.0	24.5	74.3	6.740	26.660	4.470	1.980	5.790	1.320
90.0	24.5	89.0	7.230	31.600	1.730	1.860	7.660	0.430
105.0	24.5	104.2	7.390	42.470	4.470	1.690	10.260	0.690
120.0	24.4	119.6	5.120	41.730	4.130	1.510	14.730	1.030
135.0	24.1	133.8	4.090	38.000	4.820	1.420	12.110	1.320
150.0	24.3	149.3	3.110	24.880	4.030	1.070	7.240	1.250
165.0	24.7	164.5	3.510	25.230	4.010	1.080	4.560	1.310
180.0	24.9	179.5	3.400	27.890	4.200	1.140	3.960	1.360
195.0	24.9	194.9	3.230	28.530	4.120	1.050	5.090	1.320
210.0	24.5	210.3	2.820	31.290	3.900	1.120	8.050	1.320
225.0	24.1	226.5	5.040	42.150	4.740	1.470	13.380	1.410
240.0	24.3	240.8	6.120	46.800	4.480	1.600	15.980	1.210
255.0	24.4	256.3	7.370	40.890	3.340	1.870	11.760	0.860
270.0	24.4	271.2	8.650	45.290	2.920	2.040	10.090	0.480
285.0	24.6	285.7	8.220	31.370	4.030	2.140	8.170	1.290
300.0	24.6	300.0	7.910	28.710	5.990	2.100	6.350	1.850
315.0	24.5	314.7	6.350	20.590	6.820	2.010	4.480	2.090
330.0	24.5	329.6	7.160	18.130	6.920	1.930	3.460	2.190
345.0	24.5	344.7	6.580	16.170	6.800	1.870	2.840	2.220

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.35: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.5	-0.0	6.450	19.440	6.690	1.950	3.210	2.130
15.0	29.5	15.0	6.380	20.390	6.500	1.950	3.400	2.120
30.0	29.5	30.1	6.420	21.790	6.190	1.980	3.870	2.100
45.0	29.5	45.0	7.640	27.280	7.060	2.020	4.410	2.020
60.0	29.5	59.8	6.750	28.140	5.770	2.030	5.190	1.800
75.0	29.4	74.4	7.420	31.510	3.990	1.970	5.980	1.310
90.0	29.4	89.3	6.140	32.580	1.930	1.800	8.380	0.470
105.0	29.4	104.5	6.050	37.240	3.010	1.610	11.270	0.610
120.0	29.0	119.1	8.160	41.680	3.990	1.460	15.600	1.050
135.0	29.0	134.3	3.850	36.720	4.130	1.170	11.060	1.140
150.0	29.7	148.9	3.870	31.690	4.490	1.180	7.700	1.320
165.0	30.1	163.9	3.330	35.440	4.140	1.190	5.870	1.400
180.0	30.0	178.8	3.360	34.270	4.110	1.190	5.550	1.480
195.0	30.5	194.9	3.230	32.610	4.430	1.140	5.890	1.420
210.0	30.3	210.5	4.240	35.150	4.180	1.200	7.520	1.380
225.0	29.3	225.8	3.610	39.900	4.100	1.300	11.490	1.320
240.0	29.0	241.2	6.970	46.870	4.330	1.560	17.020	1.220
255.0	29.4	255.7	6.620	45.740	3.250	1.830	12.940	0.880
270.0	29.4	270.8	8.230	44.710	2.810	2.000	10.540	0.520
285.0	29.5	285.6	7.210	38.050	4.270	2.150	9.170	1.270
300.0	29.5	300.1	6.830	30.240	5.820	2.150	6.490	1.780
315.0	29.5	314.9	7.550	24.840	6.660	2.100	5.130	2.010
330.0	29.5	329.9	6.740	23.390	6.770	2.040	4.140	2.100
345.0	29.5	344.9	7.170	19.900	7.210	1.980	3.600	2.120

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.



**Table Q.36:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	-0.8	-19.3	6.060	20.330	5.800	1.930	4.220	1.980
15.0	-2.3	-123.0	6.740	22.060	6.840	1.910	6.220	1.810
30.0	-2.2	-106.0	6.590	24.070	5.400	1.970	7.250	1.570
45.0	-1.7	-90.7	6.130	23.660	5.380	2.050	7.750	1.280
60.0	0.1	47.4	6.420	21.850	5.500	1.980	6.360	1.540
75.0	0.2	65.1	6.880	20.980	4.570	2.070	6.850	1.090
90.0	-0.1	83.0	7.160	21.610	2.840	2.140	7.110	0.480
105.0	-0.5	95.6	6.900	22.070	2.530	2.140	7.330	0.450
120.0	-1.3	104.6	7.510	25.120	3.290	2.100	7.370	0.740
135.0	-2.1	113.9	6.700	25.800	3.820	2.070	7.230	1.050
150.0	-3.0	123.2	7.210	25.210	4.910	2.010	6.730	1.330
165.0	-3.2	103.4	7.450	25.490	6.950	1.950	6.960	1.660
180.0	-2.9	154.2	6.480	23.750	6.620	1.880	4.210	1.840
195.0	1.1	225.9	7.040	25.880	6.060	2.010	6.040	1.600
210.0	1.1	241.1	8.210	26.450	5.690	2.120	6.750	1.270
225.0	0.8	252.4	9.210	28.440	4.970	2.190	6.980	0.910
240.0	0.5	263.1	9.730	24.780	4.010	2.230	7.020	0.550
255.0	0.3	274.5	9.820	22.840	2.870	2.240	6.860	0.440
270.0	0.3	285.8	9.650	21.820	4.400	2.210	6.560	0.780
285.0	0.1	295.9	9.460	22.320	5.390	2.150	6.260	1.130
300.0	-0.0	304.8	7.720	22.700	5.950	2.100	5.970	1.390
315.0	-0.1	313.8	8.140	23.350	6.360	2.050	5.580	1.590
330.0	-0.2	322.2	7.960	22.280	5.640	1.990	5.230	1.730
345.0	-0.4	331.1	6.380	21.480	5.860	1.950	4.720	1.870

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.37: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	3.4	-25.3	6.960	23.320	8.020	1.920	5.000	1.950
15.0	2.8	-19.1	6.780	22.490	8.220	1.910	5.030	2.000
30.0	2.7	-11.5	6.520	22.870	8.220	1.890	5.340	2.020
45.0	2.9	1.5	6.740	20.330	7.340	1.880	5.490	1.990
60.0	3.6	37.4	7.110	21.010	5.590	1.910	5.370	1.760
75.0	4.1	58.7	6.930	22.660	5.210	2.030	6.260	1.290
90.0	4.1	74.2	6.900	21.800	3.340	2.090	6.570	0.740
105.0	4.0	88.9	7.330	24.010	1.830	2.110	6.910	0.270
120.0	3.8	101.3	7.930	27.860	2.270	2.090	6.970	0.530
135.0	3.4	111.2	7.620	29.470	3.330	2.050	6.930	0.850
150.0	2.9	121.0	7.040	30.220	3.880	2.000	6.810	1.140
165.0	2.6	132.2	6.170	29.630	4.520	1.940	6.520	1.400
180.0	2.9	55.9	7.410	23.440	6.370	1.980	7.390	1.790
195.0	4.3	196.0	6.750	17.310	6.930	1.850	3.540	1.770
210.0	4.2	225.2	7.560	23.130	6.010	1.990	5.470	1.520
225.0	4.3	242.9	7.490	20.920	4.250	2.100	6.280	1.140
240.0	4.4	254.8	7.060	21.860	2.690	2.160	6.590	0.770
255.0	4.4	264.8	7.360	21.540	2.190	2.190	6.680	0.430
270.0	4.5	277.9	8.390	22.250	3.130	2.210	6.590	0.430
285.0	4.6	290.8	8.110	23.280	3.290	2.160	6.260	0.920
300.0	4.7	303.0	8.090	20.240	4.620	2.100	5.860	1.350
315.0	4.7	314.8	7.230	18.950	5.830	2.010	5.400	1.650
330.0	4.5	326.1	7.310	22.620	7.170	1.960	4.880	1.850
345.0	4.1	334.4	7.050	21.460	7.920	1.920	4.480	1.950

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.38: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.5	-1.6	6.320	9.430	6.960	1.860	1.440	2.050
15.0	9.5	13.5	6.330	13.130	6.720	1.870	2.690	2.020
30.0	9.5	28.6	6.600	16.020	6.610	1.910	4.050	1.910
45.0	9.6	43.6	7.680	18.430	6.310	1.960	4.870	1.680
60.0	9.6	58.1	8.090	23.470	5.420	2.030	5.530	1.330
75.0	9.7	73.0	7.830	21.040	3.140	2.090	5.780	0.810
90.0	9.7	87.8	6.720	21.250	1.090	2.100	6.170	0.220
105.0	9.6	102.7	7.070	26.180	1.540	2.070	6.320	0.490
120.0	9.2	116.1	7.790	26.400	3.690	2.000	6.210	0.920
135.0	9.0	130.4	7.270	23.620	3.990	1.910	5.610	1.230
150.0	9.0	145.7	7.010	19.740	5.160	1.860	4.710	1.460
165.0	9.1	161.3	6.410	17.880	6.130	1.770	4.330	1.550
180.0	9.3	178.0	5.600	15.400	5.100	1.800	3.770	1.660
195.0	9.5	194.7	6.260	13.380	6.280	1.800	3.560	1.620
210.0	9.4	211.7	7.290	16.190	5.340	1.890	5.030	1.540
225.0	9.3	228.7	7.160	20.600	4.340	1.970	6.290	1.320
240.0	9.3	243.7	7.770	21.950	3.410	2.060	6.820	0.990
255.0	9.6	257.3	8.730	19.620	1.910	2.140	6.900	0.570
270.0	9.7	271.8	9.060	23.210	1.690	2.190	6.770	0.200
285.0	9.7	286.2	8.310	23.290	2.790	2.160	6.380	0.750
300.0	9.7	300.7	8.040	20.240	4.940	2.100	5.840	1.290
315.0	9.7	314.7	7.260	18.080	6.130	2.030	4.940	1.660
330.0	9.6	329.0	6.560	16.390	6.170	1.950	3.870	1.890
345.0	9.5	343.6	6.370	15.030	6.750	1.890	2.660	2.010

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.39: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.5	-0.7	6.530	9.210	7.450	1.910	1.410	2.020
15.0	14.5	14.5	6.510	12.880	6.100	1.900	2.480	1.980
30.0	14.6	29.6	6.280	15.370	6.330	1.940	3.790	1.880
45.0	14.6	44.5	7.300	18.230	5.240	1.980	4.630	1.660
60.0	14.6	59.2	7.260	20.840	4.610	2.030	5.480	1.300
75.0	14.7	74.1	7.370	22.220	3.500	2.050	5.320	0.800
90.0	14.7	89.0	6.550	21.250	0.980	2.060	5.750	0.250
105.0	14.7	104.0	8.500	25.950	2.180	2.010	6.040	0.500
120.0	14.5	118.2	7.680	27.990	2.830	1.950	7.210	0.880
135.0	14.4	133.4	5.180	25.770	3.250	1.870	6.820	1.190
150.0	14.5	148.7	5.390	20.210	4.510	1.790	5.050	1.340
165.0	14.5	164.0	5.030	17.900	4.420	1.760	3.430	1.450
180.0	14.6	179.2	5.570	13.260	4.740	1.760	2.840	1.510
195.0	14.6	194.6	5.570	19.700	5.140	1.780	3.750	1.520
210.0	14.6	210.2	5.210	21.050	4.430	1.820	5.870	1.440
225.0	14.5	226.2	6.680	22.610	3.940	1.930	7.950	1.280
240.0	14.5	241.7	7.640	22.640	3.060	2.010	8.480	0.980
255.0	14.7	255.9	7.220	25.390	1.830	2.100	7.680	0.580
270.0	14.7	270.8	7.530	28.070	1.580	2.150	7.250	0.240
285.0	14.8	285.4	9.510	24.150	2.970	2.160	6.690	0.730
300.0	14.7	300.2	7.400	22.290	4.420	2.110	6.190	1.270
315.0	14.6	314.6	7.330	18.400	5.420	2.050	4.940	1.640
330.0	14.6	329.3	6.980	16.210	6.400	1.980	3.730	1.860
345.0	14.5	344.2	7.000	11.930	6.710	1.920	2.220	1.980

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.40:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.4	6.240	11.650	6.010	1.970	1.700	1.980
15.0	19.6	14.8	6.230	13.510	6.160	1.970	2.710	1.950
30.0	19.6	29.9	7.260	17.690	6.220	1.980	3.930	1.840
45.0	19.6	44.9	6.800	19.600	5.060	2.000	4.970	1.640
60.0	19.6	59.7	7.130	21.400	4.350	2.020	5.890	1.300
75.0	19.7	74.5	8.340	26.290	3.190	2.010	5.040	0.810
90.0	19.7	89.4	6.210	20.790	1.160	2.000	5.400	0.310
105.0	19.7	104.4	7.760	28.050	2.220	1.960	5.850	0.480
120.0	19.6	119.1	6.300	30.700	2.580	1.910	8.790	0.850
135.0	19.6	134.3	5.800	29.690	4.050	1.810	7.610	1.110
150.0	19.6	149.3	4.850	21.950	4.010	1.780	5.780	1.340
165.0	19.6	164.3	5.160	15.130	4.420	1.820	3.840	1.560
180.0	19.6	179.6	4.990	17.850	4.050	1.770	3.130	1.520
195.0	19.6	194.9	5.170	26.390	3.850	1.870	5.060	1.620
210.0	19.6	210.1	6.810	33.030	4.930	1.870	7.530	1.530
225.0	19.6	225.2	5.950	30.430	4.070	1.860	7.760	1.150
240.0	19.6	240.8	7.630	31.440	3.570	1.950	10.150	0.950
255.0	19.7	255.4	8.740	29.350	2.260	2.070	8.310	0.590
270.0	19.7	270.4	7.460	30.440	1.510	2.120	7.670	0.290
285.0	19.7	285.2	7.570	28.940	3.360	2.140	6.950	0.730
300.0	19.6	299.9	8.040	25.830	4.450	2.130	6.600	1.250
315.0	19.6	314.6	7.680	21.200	5.370	2.070	4.960	1.610
330.0	19.6	329.5	7.980	18.030	6.230	2.020	3.460	1.820
345.0	19.5	344.5	6.280	14.060	5.890	1.990	2.200	1.940

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.41: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.5	-0.2	7.600	15.740	6.610	2.030	2.210	1.920
15.0	24.5	14.9	7.110	17.480	5.790	2.030	3.190	1.900
30.0	24.5	30.0	6.870	19.520	5.850	2.030	4.270	1.810
45.0	24.5	45.0	7.440	21.440	5.450	2.020	5.190	1.620
60.0	24.5	59.9	7.450	23.570	4.500	2.010	6.240	1.300
75.0	24.6	74.6	8.030	20.740	3.670	1.980	4.960	0.840
90.0	24.6	89.5	6.220	21.690	1.340	1.930	5.170	0.380
105.0	24.6	104.6	6.520	25.660	1.540	1.880	5.660	0.450
120.0	24.5	119.5	5.860	32.840	2.420	1.820	10.010	0.800
135.0	24.5	134.5	6.030	31.040	3.650	1.860	9.130	1.180
150.0	24.6	149.5	4.190	20.550	3.120	1.660	5.860	1.150
165.0	24.7	164.5	5.010	20.280	4.390	1.800	4.140	1.460
180.0	25.0	179.7	4.230	15.970	4.210	1.470	1.940	1.170
195.0	24.8	195.0	5.010	24.820	4.280	1.860	4.060	1.500
210.0	24.6	210.0	5.300	33.750	4.020	1.730	6.570	1.210
225.0	24.6	225.2	5.100	42.760	3.660	1.830	9.060	1.170
240.0	24.6	240.3	6.150	38.350	3.070	1.910	11.200	0.940
255.0	24.6	255.2	7.490	36.280	1.780	2.020	8.740	0.600
270.0	24.6	270.2	7.560	32.790	1.610	2.090	8.020	0.350
285.0	24.6	285.1	8.830	31.780	2.550	2.120	7.530	0.740
300.0	24.6	299.9	7.750	28.610	4.110	2.130	6.720	1.220
315.0	24.6	314.7	6.900	24.230	5.230	2.120	4.900	1.570
330.0	24.5	329.6	7.370	21.650	5.590	2.080	3.370	1.780
345.0	24.5	344.7	6.870	16.920	5.700	2.050	2.300	1.890

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.42:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.5	-0.1	8.380	20.390	6.770	2.090	2.910	1.870
15.0	29.5	15.0	8.450	21.440	6.770	2.090	3.740	1.850
30.0	29.5	30.0	7.270	23.230	5.680	2.070	4.610	1.770
45.0	29.5	45.0	6.720	24.450	5.250	2.050	5.440	1.600
60.0	29.5	59.9	7.780	25.970	4.500	2.000	6.390	1.310
75.0	29.5	74.7	7.170	23.550	3.340	1.930	5.430	0.870
90.0	29.5	89.6	6.060	26.540	1.690	1.860	6.010	0.440
105.0	29.5	104.6	6.620	31.450	1.810	1.810	5.740	0.430
120.0	29.5	119.7	5.490	35.730	2.810	1.770	9.960	0.760
135.0	29.4	134.4	6.280	34.880	3.810	1.810	9.650	1.140
150.0	29.6	149.3	6.560	26.090	4.030	2.000	6.790	1.370
165.0	29.7	164.0	4.300	23.000	4.080	1.400	3.740	1.300
180.0	30.5	179.5	3.330	22.250	3.620	1.230	2.430	1.180
195.0	29.8	194.5	4.290	25.700	4.030	1.370	3.390	1.280
210.0	29.6	209.9	5.660	32.700	3.810	1.830	5.830	1.270
225.0	29.5	225.2	6.200	41.740	3.820	2.000	10.140	1.280
240.0	29.5	240.0	5.300	44.150	2.470	1.850	9.850	0.840
255.0	29.5	255.0	7.680	39.890	2.020	2.010	8.790	0.610
270.0	29.5	270.0	8.090	35.800	1.730	2.060	8.340	0.410
285.0	29.6	285.0	7.220	36.040	2.780	2.110	8.150	0.750
300.0	29.5	299.8	7.030	30.800	4.420	2.150	6.340	1.200
315.0	29.5	314.7	7.540	27.730	5.240	2.150	4.520	1.540
330.0	29.5	329.8	7.460	22.890	6.190	2.130	3.360	1.730
345.0	29.5	344.8	9.130	20.510	6.190	2.120	2.840	1.830

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table Q.43: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 0.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	-3.0	-643.3	10.340	43.230	10.050	3.050	12.810	2.490
15.0	-1.2	-768.4	10.710	38.330	11.250	2.900	12.800	2.830
30.0	-4.5	-140.3	10.030	43.750	9.440	2.830	9.930	2.870
45.0	-4.0	-99.0	11.020	38.280	9.310	3.010	12.010	2.360
60.0	1.5	54.9	9.810	36.270	9.620	2.940	9.600	2.420
75.0	1.3	72.6	11.550	42.480	7.290	3.110	10.280	1.640
90.0	0.5	87.6	13.620	49.390	6.930	3.190	10.930	0.990
105.0	-0.7	98.4	12.430	40.510	6.500	3.190	11.130	1.020
120.0	-3.5	106.6	10.330	35.360	7.860	3.150	11.270	1.590
135.0	-5.0	117.0	11.010	38.540	9.320	3.060	10.850	2.030
150.0	-6.3	129.9	10.410	37.000	9.620	2.930	9.660	2.510
165.0	-2.2	437.5	9.810	42.110	12.630	2.890	12.360	2.790
180.0	-2.4	1212.3	9.990	45.050	10.890	3.030	13.210	2.540
195.0	-2.5	344.7	10.470	50.720	9.690	3.150	12.800	2.490
210.0	0.7	344.3	11.620	38.980	8.430	3.290	13.710	2.100
225.0	2.3	262.1	11.080	43.050	5.190	3.480	12.320	1.120
240.0	-0.1	267.3	12.560	44.730	7.840	3.500	12.000	0.850
255.0	0.4	276.8	11.090	37.300	3.920	3.490	11.350	0.830
270.0	0.2	283.1	11.840	33.130	5.230	3.430	10.740	1.310
285.0	-0.9	286.8	11.490	33.220	6.430	3.370	10.550	1.610
300.0	-0.9	292.8	11.600	36.830	7.410	3.330	10.330	1.920
315.0	-1.7	252.4	12.020	46.080	9.930	3.330	13.360	2.070
330.0	-0.6	197.5	12.260	43.600	7.990	3.320	14.170	2.030
345.0	-2.4	-266.1	10.750	42.980	8.470	3.250	13.300	2.120

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.



**Table Q.44:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	1.0	-51.8	11.990	50.310	10.650	3.130	12.030	2.690
15.0	0.9	-97.9	13.120	40.110	11.230	2.930	13.570	2.480
30.0	1.3	-108.8	12.120	44.340	10.690	2.930	12.040	2.220
45.0	2.6	-92.0	9.460	43.670	11.610	2.990	12.380	1.930
60.0	3.4	-79.5	10.680	38.100	11.070	3.090	12.440	1.430
75.0	4.4	63.7	11.660	31.490	7.800	3.050	9.330	2.070
90.0	4.2	78.5	11.780	36.720	6.720	3.150	10.260	1.190
105.0	3.9	91.2	12.600	39.120	5.420	3.170	10.780	0.710
120.0	3.2	104.3	12.180	41.980	8.270	3.120	11.000	1.240
135.0	2.3	112.8	10.610	39.920	7.500	3.020	10.770	1.710
150.0	1.1	121.7	13.230	43.500	7.560	2.940	10.510	2.110
165.0	0.3	125.8	12.200	41.570	10.200	2.860	10.750	2.410
180.0	1.0	62.8	10.110	47.460	9.720	3.100	12.450	2.560
195.0	1.6	58.1	11.270	53.150	12.860	3.080	13.900	2.720
210.0	5.0	260.2	11.020	51.540	7.350	3.330	12.170	1.580
225.0	4.3	260.1	11.700	46.090	9.210	3.410	12.070	1.230
240.0	4.5	270.2	11.650	42.470	4.860	3.450	11.650	0.710
255.0	3.8	277.2	13.590	42.620	14.770	3.440	11.100	1.030
270.0	4.0	285.9	14.010	47.190	16.450	3.380	10.390	1.520
285.0	4.2	292.4	12.620	35.740	8.720	3.300	9.580	1.910
300.0	4.4	300.2	12.400	90.030	8.430	3.210	9.660	2.330
315.0	3.9	304.9	12.630	39.110	9.410	3.160	9.270	2.600
330.0	2.7	306.1	11.910	45.210	11.170	3.160	10.330	2.630
345.0	1.5	307.4	10.870	54.240	9.690	3.170	11.270	2.680

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.45: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	6.0	-43.9	10.440	47.400	9.930	3.050	11.860	2.980
15.0	6.2	-35.5	10.320	43.710	9.860	2.930	11.370	3.140
30.0	6.4	-26.2	10.140	46.660	10.800	2.830	11.130	3.230
45.0	6.9	-1.3	10.840	36.970	10.680	2.760	9.280	3.260
60.0	9.0	54.9	11.860	30.670	8.550	2.990	8.230	2.520
75.0	9.1	70.1	13.610	35.050	6.860	3.130	8.960	1.720
90.0	9.0	83.0	10.800	33.470	3.470	3.180	9.920	0.780
105.0	8.9	99.2	10.540	39.360	4.260	3.130	10.460	0.810
120.0	8.3	111.0	12.800	45.180	8.770	3.010	10.010	1.400
135.0	7.6	120.5	11.650	43.210	9.220	2.910	9.590	1.860
150.0	7.0	129.2	11.470	44.540	12.110	2.790	9.330	2.100
165.0	6.6	141.0	8.580	42.590	10.430	2.680	9.150	2.340
180.0	6.5	154.9	8.960	40.150	12.660	2.600	9.400	2.560
195.0	8.6	206.7	10.360	40.010	10.720	2.730	7.470	2.580
210.0	8.3	237.8	15.410	71.180	10.040	3.050	10.690	2.070
225.0	8.3	252.9	11.910	45.560	7.010	3.260	11.250	1.480
240.0	8.3	261.7	12.960	45.640	5.130	3.340	11.370	1.040
255.0	8.4	271.0	11.320	39.660	4.080	3.360	11.370	0.730
270.0	8.7	279.3	13.420	38.810	4.930	3.380	11.010	0.950
285.0	9.0	289.1	14.150	50.140	7.390	3.320	10.480	1.640
300.0	9.3	301.0	11.120	70.500	7.360	3.190	9.320	2.370
315.0	8.9	310.7	12.710	49.850	9.710	3.070	9.240	2.760
330.0	8.1	317.8	10.160	49.920	9.720	2.990	9.330	2.990
345.0	6.4	312.4	10.590	58.720	9.750	3.100	11.550	2.890

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.46:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	13.9	-2.3	9.260	25.470	11.140	2.800	4.880	3.320
15.0	14.0	13.2	9.410	24.490	10.990	2.810	5.040	3.280
30.0	14.1	28.8	10.140	22.790	9.520	2.860	5.900	3.160
45.0	14.2	44.2	11.720	29.880	9.630	2.940	7.070	2.850
60.0	14.2	58.2	11.120	27.520	8.720	3.040	7.530	2.390
75.0	14.3	73.0	12.630	32.500	8.660	3.120	8.640	1.560
90.0	14.4	87.5	10.190	32.160	2.390	3.130	9.830	0.530
105.0	14.5	103.4	12.040	46.850	6.180	3.040	10.660	0.920
120.0	13.8	116.2	11.870	48.180	6.750	2.900	10.350	1.480
135.0	13.3	129.3	9.200	40.890	7.340	2.750	9.540	1.860
150.0	13.6	145.8	8.010	37.430	7.950	2.540	7.570	2.060
165.0	14.5	163.0	7.850	25.140	7.040	2.510	5.390	2.300
180.0	14.7	178.6	8.270	20.870	7.200	2.540	4.200	2.460
195.0	14.6	194.9	7.330	32.160	7.510	2.540	6.420	2.430
210.0	13.7	216.1	8.350	40.020	7.160	2.660	9.630	2.270
225.0	13.6	233.1	10.950	47.390	7.990	2.850	11.100	1.840
240.0	13.5	248.4	11.780	58.880	6.590	3.120	11.910	1.500
255.0	13.8	260.8	11.090	36.530	3.230	3.260	12.220	0.860
270.0	14.0	274.2	13.790	40.950	3.200	3.350	11.920	0.610
285.0	14.3	287.4	12.820	50.950	7.250	3.320	11.210	1.520
300.0	14.4	300.6	10.940	38.990	7.030	3.230	9.200	2.340
315.0	14.2	313.7	13.140	36.030	9.290	3.070	8.020	2.830
330.0	14.0	327.7	10.020	29.980	10.050	2.950	6.980	3.140
345.0	13.9	342.6	9.740	29.690	11.070	2.860	5.900	3.280

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.47: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.3	-0.8	10.930	20.400	10.570	2.930	4.140	3.200
15.0	19.3	14.4	10.600	20.990	9.480	2.930	4.790	3.160
30.0	19.3	29.7	9.180	23.760	9.030	2.960	5.780	3.050
45.0	19.3	44.7	11.040	26.900	8.780	3.030	6.490	2.790
60.0	19.4	59.2	11.220	30.410	7.540	3.080	7.290	2.330
75.0	19.4	73.7	11.930	67.530	9.460	3.090	8.930	1.540
90.0	19.5	88.6	10.620	35.030	2.510	3.060	9.760	0.560
105.0	19.5	104.2	10.390	60.330	7.010	2.930	11.090	0.880
120.0	19.0	117.8	9.360	37.540	4.490	2.780	12.700	1.370
135.0	19.1	133.8	7.600	42.650	6.670	2.610	12.660	1.780
150.0	19.1	148.8	6.690	31.860	5.500	2.400	7.310	1.780
165.0	19.1	164.1	8.060	26.930	8.230	2.400	5.200	2.100
180.0	19.4	179.9	8.110	26.040	8.160	2.720	4.860	2.610
195.0	19.3	194.8	8.040	34.390	8.140	2.390	7.710	2.170
210.0	19.2	210.4	6.890	40.480	5.960	2.410	10.160	1.920
225.0	19.2	226.8	8.470	42.460	6.070	2.660	12.620	1.850
240.0	18.9	243.8	10.060	37.850	4.840	2.950	14.050	1.520
255.0	19.2	257.7	12.340	41.830	3.890	3.150	13.600	0.960
270.0	19.3	272.3	13.610	43.380	3.790	3.290	13.020	0.590
285.0	19.4	286.6	15.120	45.610	5.940	3.330	12.590	1.460
300.0	19.4	300.4	13.740	36.200	7.700	3.240	9.580	2.280
315.0	19.3	314.3	11.300	32.790	8.500	3.150	7.960	2.770
330.0	19.3	328.9	9.210	26.350	9.290	3.050	6.140	3.060
345.0	19.3	343.9	9.590	20.740	10.400	2.970	5.060	3.170

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.48:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.4	-0.3	11.630	21.270	10.910	3.050	4.410	3.070
15.0	24.4	14.9	11.540	23.720	9.560	3.050	4.900	3.050
30.0	24.4	30.0	10.990	25.400	9.070	3.050	5.760	2.940
45.0	24.4	45.0	9.950	27.800	7.780	3.090	6.630	2.720
60.0	24.4	59.6	11.480	29.460	7.410	3.100	7.680	2.280
75.0	24.4	74.0	13.630	40.200	6.420	3.070	9.100	1.550
90.0	24.5	89.1	10.030	34.440	2.390	2.970	10.090	0.630
105.0	24.5	104.4	11.860	54.030	6.910	2.870	11.470	0.850
120.0	24.1	119.1	8.740	42.570	4.670	2.660	15.000	1.320
135.0	23.9	134.3	8.660	48.420	6.960	2.600	14.010	1.820
150.0	24.2	148.8	6.990	44.950	6.140	2.570	10.210	2.010
165.0	24.9	163.9	5.670	23.900	5.470	1.890	5.350	1.830
180.0	25.6	179.5	5.990	26.520	6.220	1.820	3.770	1.820
195.0	25.3	195.3	7.790	30.120	6.370	2.370	6.340	2.000
210.0	24.3	211.5	7.580	38.660	7.460	2.520	11.060	2.090
225.0	23.8	227.0	10.120	47.620	8.160	2.530	15.520	1.960
240.0	24.1	241.6	10.170	52.080	4.650	2.790	16.330	1.520
255.0	24.4	256.5	11.080	53.140	3.330	3.070	14.580	1.010
270.0	24.3	271.5	15.780	65.930	3.910	3.250	13.990	0.650
285.0	24.4	286.2	12.260	50.030	7.990	3.320	13.000	1.460
300.0	24.4	300.3	12.410	40.120	6.950	3.280	10.160	2.250
315.0	24.4	314.7	10.100	34.190	7.640	3.220	7.800	2.700
330.0	24.4	329.5	10.420	26.230	8.750	3.150	6.020	2.950
345.0	24.4	344.5	12.250	28.880	9.120	3.090	5.120	3.040

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.49: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.5	-0.1	11.330	23.500	9.030	3.160	4.780	2.960
15.0	29.5	15.1	10.160	24.330	8.990	3.140	5.230	2.920
30.0	29.4	30.2	11.150	32.750	9.390	3.140	6.230	2.840
45.0	29.4	45.1	10.180	31.230	8.300	3.130	6.750	2.640
60.0	29.4	59.7	13.340	33.830	7.280	3.110	7.760	2.240
75.0	29.4	74.3	10.690	39.980	5.180	3.020	9.480	1.550
90.0	29.4	89.3	10.770	39.680	2.720	2.870	11.070	0.710
105.0	29.3	104.4	11.450	46.290	5.070	2.770	12.320	0.810
120.0	29.0	119.6	9.080	47.290	5.760	2.630	17.370	1.330
135.0	28.4	132.9	9.840	53.070	6.680	2.580	15.630	1.800
150.0	28.9	146.6	8.400	50.030	6.200	2.650	11.690	2.140
165.0	29.9	162.3	11.160	40.440	16.190	2.580	8.220	2.440
180.0	30.7	178.3	11.370	91.350	13.210	2.130	6.400	2.260
195.0	30.8	194.8	14.700	90.580	15.570	2.940	8.190	2.490
210.0	29.5	212.5	10.290	65.750	8.190	2.810	12.550	2.420
225.0	28.9	226.8	12.050	49.630	6.350	2.610	15.400	1.920
240.0	29.2	240.2	9.160	53.600	5.610	2.670	16.900	1.450
255.0	29.2	255.8	13.260	65.420	7.130	2.950	15.290	1.090
270.0	29.4	271.0	12.860	50.940	3.280	3.190	14.240	0.710
285.0	29.4	285.9	12.730	52.530	5.560	3.290	13.690	1.440
300.0	29.5	300.3	11.660	48.010	7.280	3.310	10.720	2.200
315.0	29.5	314.9	10.300	34.690	8.090	3.290	8.290	2.630
330.0	29.5	329.8	13.830	37.790	9.270	3.230	6.840	2.820
345.0	29.5	344.8	10.630	27.040	8.650	3.180	5.610	2.910

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.50: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 0.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	0.5	132.0	9.710	39.640	8.380	3.050	10.730	2.620
15.0	-2.9	-158.5	10.800	37.310	9.830	2.940	8.850	2.830
30.0	-3.9	-112.9	10.750	37.890	11.260	2.990	10.730	2.570
45.0	-3.1	-96.3	11.200	35.540	8.000	3.120	11.180	2.110
60.0	1.3	58.0	10.340	30.200	7.590	3.120	9.020	1.960
75.0	1.1	74.8	10.760	34.360	7.520	3.210	9.370	1.220
90.0	0.3	92.3	12.470	34.840	4.620	3.270	9.830	0.770
105.0	-1.0	101.9	10.800	32.110	5.460	3.260	10.060	1.040
120.0	-2.5	109.9	11.110	32.710	6.230	3.200	10.130	1.470
135.0	-4.2	117.7	11.590	37.070	7.970	3.140	9.610	1.840
150.0	-4.8	112.6	11.480	38.240	9.570	3.060	10.350	2.320
165.0	-3.8	69.3	12.970	38.680	8.790	3.070	11.590	2.460
180.0	-0.6	408.4	10.820	43.660	8.960	3.130	12.390	2.510
195.0	-1.5	286.9	10.940	41.560	10.390	3.270	12.160	2.180
210.0	2.7	246.3	11.120	38.360	7.810	3.350	10.540	1.800
225.0	1.0	254.4	12.900	50.890	6.490	3.470	10.610	1.310
240.0	0.2	263.9	15.130	43.630	6.210	3.510	10.400	0.800
255.0	-0.4	272.3	13.350	36.620	4.920	3.520	9.950	0.660
270.0	-0.4	279.9	14.070	37.430	5.620	3.470	9.450	0.920
285.0	-0.1	288.6	12.860	33.920	5.530	3.430	9.010	1.340
300.0	-0.3	296.2	12.080	34.350	6.400	3.380	8.720	1.730
315.0	-2.1	301.5	11.330	35.760	8.480	3.340	9.030	1.960
330.0	-3.2	306.6	11.130	38.070	9.020	3.310	9.620	2.220
345.0	2.4	136.5	11.870	40.770	9.010	3.220	11.130	2.200

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.51: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	1.3	-45.3	11.460	53.750	9.280	3.180	10.760	2.560
15.0	1.1	-117.6	11.070	44.110	10.890	2.980	12.160	2.350
30.0	1.8	-107.0	10.540	39.430	11.630	3.050	11.920	2.070
45.0	2.6	-93.5	10.370	38.830	10.220	3.110	12.360	1.770
60.0	3.7	40.0	9.870	30.720	9.210	2.970	7.720	2.620
75.0	4.4	64.2	13.350	29.630	6.000	3.150	8.450	1.710
90.0	4.3	80.9	10.510	31.710	4.280	3.230	9.170	0.820
105.0	4.0	95.5	12.740	31.270	4.240	3.240	9.460	0.630
120.0	3.5	107.4	12.650	37.580	6.240	3.200	9.470	1.150
135.0	2.7	115.7	14.170	40.540	6.040	3.130	9.600	1.500
150.0	1.9	125.2	12.620	44.280	7.340	3.060	9.270	1.900
165.0	1.1	135.8	11.160	42.010	8.900	2.970	8.730	2.270
180.0	0.9	141.9	10.550	36.960	10.960	2.920	9.270	2.530
195.0	2.0	68.7	11.560	50.830	9.450	3.210	10.990	2.520
210.0	4.7	241.1	11.960	39.150	6.920	3.290	9.780	1.880
225.0	4.4	251.9	12.480	40.130	5.690	3.370	10.070	1.350
240.0	4.4	262.8	11.640	36.490	4.280	3.450	9.950	0.860
255.0	4.1	272.2	14.060	38.070	3.970	3.460	9.680	0.630
270.0	4.3	283.4	12.890	33.090	5.470	3.450	9.240	0.990
285.0	4.3	292.2	12.480	33.630	5.890	3.370	8.710	1.520
300.0	4.5	302.2	13.390	38.130	6.580	3.300	8.120	2.020
315.0	4.2	308.6	12.470	42.290	7.960	3.240	8.000	2.320
330.0	3.3	312.0	12.040	44.300	8.950	3.230	8.530	2.440
345.0	2.1	315.8	11.480	43.780	9.550	3.220	9.040	2.580

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.



**Table Q.52: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	6.1	-36.8	10.260	51.430	9.450	3.120	10.400	2.790
15.0	6.1	-30.3	10.120	50.050	9.960	3.050	10.700	2.880
30.0	6.3	-19.0	9.920	42.490	11.060	2.980	10.240	2.980
45.0	9.1	41.0	11.900	25.500	9.400	3.010	6.870	2.620
60.0	9.2	56.0	12.840	27.210	8.410	3.120	7.470	2.110
75.0	9.4	71.4	12.300	29.300	4.580	3.190	8.010	1.340
90.0	9.4	86.3	10.590	28.840	2.270	3.220	8.620	0.460
105.0	9.3	102.1	10.820	34.940	3.700	3.180	8.950	0.740
120.0	8.5	113.5	10.010	36.550	6.730	3.110	8.460	1.290
135.0	7.9	124.4	11.420	34.510	6.850	3.020	8.000	1.700
150.0	7.5	134.3	11.830	38.900	9.430	2.910	7.360	1.950
165.0	6.9	141.6	9.640	39.860	7.440	2.870	7.500	2.150
180.0	6.7	155.3	10.120	40.460	8.350	2.820	7.820	2.400
195.0	8.9	198.3	10.010	41.910	8.740	2.820	6.330	2.460
210.0	8.5	223.9	11.500	38.010	7.500	3.040	8.150	2.150
225.0	8.5	240.6	12.610	35.250	7.750	3.200	9.150	1.670
240.0	8.6	251.4	12.910	32.090	4.290	3.310	9.640	1.240
255.0	8.9	262.7	12.280	31.900	2.810	3.360	10.080	0.670
270.0	9.1	275.7	13.630	34.220	2.840	3.430	9.990	0.550
285.0	9.3	288.1	12.940	32.220	5.190	3.390	9.580	1.250
300.0	9.4	301.0	11.770	29.130	9.370	3.290	8.170	1.990
315.0	9.2	313.1	13.210	40.540	9.240	3.190	7.470	2.460
330.0	8.7	324.0	10.680	32.800	10.190	3.080	6.970	2.780
345.0	7.3	323.5	10.230	40.440	9.720	3.110	8.800	2.780

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.53: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.1	-1.8	10.240	18.390	9.410	2.950	3.660	3.050
15.0	14.2	13.5	10.200	21.540	9.330	2.960	4.400	3.020
30.0	14.3	28.9	10.380	24.040	9.290	2.990	5.530	2.840
45.0	14.4	43.9	11.560	26.640	8.550	3.050	6.100	2.530
60.0	14.4	58.3	12.160	27.440	7.130	3.120	6.880	2.020
75.0	14.5	73.3	12.880	30.330	6.240	3.160	7.530	1.280
90.0	14.6	88.4	10.110	29.260	1.830	3.160	8.210	0.430
105.0	14.6	103.8	11.970	41.890	5.070	3.120	8.710	0.750
120.0	14.0	117.1	9.730	33.520	5.060	3.010	8.970	1.280
135.0	13.8	131.8	9.490	32.530	5.380	2.890	8.120	1.700
150.0	13.8	147.2	8.380	27.320	6.440	2.750	6.200	1.960
165.0	14.1	163.0	8.710	22.890	7.690	2.730	4.400	2.140
180.0	14.3	178.7	7.930	21.420	6.640	2.710	4.320	2.210
195.0	14.3	195.1	8.140	31.780	8.350	2.760	6.240	2.250
210.0	14.0	212.8	8.650	29.870	6.060	2.880	8.750	2.150
225.0	13.9	229.9	12.520	32.840	6.680	2.950	10.540	1.740
240.0	13.9	244.7	12.570	34.070	4.450	3.170	11.190	1.390
255.0	14.3	258.2	11.410	31.600	3.220	3.290	11.240	0.820
270.0	14.4	272.5	13.780	37.000	2.530	3.380	11.080	0.440
285.0	14.5	286.5	15.380	41.410	4.360	3.370	10.340	1.170
300.0	14.4	300.7	11.570	34.930	7.350	3.290	8.760	1.960
315.0	14.4	314.3	12.340	31.030	8.070	3.190	7.090	2.480
330.0	14.2	328.3	10.940	31.280	9.170	3.080	5.940	2.810
345.0	14.1	342.9	10.170	26.950	9.050	3.010	4.860	3.000

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.54:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.3	-0.8	9.640	19.130	8.600	3.040	3.660	2.970
15.0	19.4	14.5	9.600	20.110	8.840	3.050	4.500	2.930
30.0	19.4	29.7	11.040	23.960	9.010	3.060	5.490	2.770
45.0	19.4	44.7	10.100	23.440	7.410	3.100	6.440	2.480
60.0	19.4	59.1	11.410	28.260	6.660	3.120	7.140	1.990
75.0	19.6	74.0	13.530	33.740	5.600	3.120	7.420	1.280
90.0	19.6	89.2	10.050	28.810	1.800	3.080	8.290	0.510
105.0	19.6	104.4	13.540	43.940	6.040	3.010	8.910	0.750
120.0	19.2	118.5	11.810	44.850	7.050	2.920	11.210	1.230
135.0	19.2	133.7	8.090	35.260	4.770	2.780	9.480	1.580
150.0	19.3	148.8	10.320	36.930	7.470	2.700	8.180	1.940
165.0	19.3	163.9	7.740	22.320	6.110	2.630	4.560	1.990
180.0	19.6	179.3	7.940	23.560	6.320	2.660	4.540	2.020
195.0	19.5	194.8	7.790	35.650	6.200	2.600	6.760	1.940
210.0	19.3	210.7	11.490	40.840	7.040	2.780	10.390	2.090
225.0	19.2	226.4	8.900	38.870	6.020	2.870	11.980	1.760
240.0	19.2	242.2	12.760	39.650	4.990	3.000	13.170	1.360
255.0	19.5	256.6	13.880	47.710	2.990	3.220	12.470	0.850
270.0	19.5	271.3	15.250	39.630	2.630	3.320	11.830	0.480
285.0	19.6	285.9	12.240	39.840	6.040	3.340	11.060	1.150
300.0	19.5	300.4	12.770	34.840	6.400	3.290	9.260	1.910
315.0	19.4	314.5	10.830	33.280	7.190	3.220	7.180	2.430
330.0	19.3	329.0	12.280	27.190	8.990	3.150	5.410	2.760
345.0	19.3	344.0	9.450	22.120	8.900	3.090	4.270	2.910

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.55: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.4	-0.3	10.230	21.450	9.080	3.130	4.000	2.870
15.0	24.4	14.9	10.740	22.760	9.350	3.120	4.670	2.830
30.0	24.4	30.0	10.800	24.710	8.510	3.110	5.800	2.690
45.0	24.4	44.9	11.820	25.790	7.520	3.130	6.620	2.430
60.0	24.4	59.6	12.320	31.880	6.450	3.110	7.530	1.980
75.0	24.5	74.3	12.310	30.130	5.650	3.070	7.720	1.300
90.0	24.6	89.3	9.710	32.900	1.970	2.990	8.380	0.590
105.0	24.6	104.5	12.900	41.120	5.260	2.950	8.700	0.710
120.0	24.3	119.2	9.780	39.990	4.050	2.830	12.950	1.180
135.0	24.1	134.4	7.570	34.720	6.340	2.810	12.780	1.710
150.0	24.2	148.9	9.280	31.490	7.380	2.760	9.500	1.990
165.0	24.8	164.2	7.830	24.400	6.730	2.970	5.600	2.280
180.0	25.4	179.5	5.450	20.200	4.810	2.040	2.410	1.580
195.0	25.0	195.4	7.710	30.290	6.740	2.780	6.370	2.240
210.0	24.3	210.6	8.540	39.490	7.240	2.770	10.960	2.070
225.0	24.3	225.5	8.990	48.310	6.030	2.790	13.590	1.780
240.0	24.3	241.0	10.210	47.770	4.290	2.970	15.080	1.380
255.0	24.5	255.8	12.010	48.450	2.680	3.140	13.110	0.890
270.0	24.5	270.9	12.500	47.430	2.720	3.270	12.570	0.560
285.0	24.5	285.7	14.230	41.400	3.970	3.310	12.060	1.160
300.0	24.5	300.2	12.070	37.040	5.940	3.310	10.020	1.880
315.0	24.5	314.7	10.820	35.050	7.570	3.260	7.280	2.380
330.0	24.4	329.4	10.770	31.240	8.000	3.210	5.530	2.670
345.0	24.4	344.5	10.590	24.520	8.920	3.160	4.450	2.820

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.56: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.5	-0.1	11.530	23.630	10.110	3.210	4.580	2.770
15.0	29.5	15.1	12.330	27.560	9.410	3.190	5.090	2.730
30.0	29.5	30.2	11.760	29.320	8.480	3.180	6.070	2.620
45.0	29.5	45.1	10.240	29.170	7.260	3.160	7.080	2.390
60.0	29.4	59.8	11.730	31.870	6.750	3.090	7.890	1.960
75.0	29.5	74.4	11.640	36.390	4.900	3.010	8.550	1.340
90.0	29.5	89.4	9.040	38.840	2.390	2.900	9.260	0.680
105.0	29.4	104.4	11.940	51.600	6.140	2.830	9.550	0.710
120.0	29.3	119.5	9.150	42.060	3.920	2.700	13.010	1.080
135.0	29.0	133.9	8.380	40.210	5.320	2.780	13.820	1.640
150.0	29.4	147.9	7.160	43.280	6.350	2.420	9.200	1.770
165.0	30.1	162.9	6.190	41.240	6.230	2.110	6.170	1.910
180.0	30.7	178.6	5.530	34.080	6.830	1.940	4.810	1.960
195.0	30.2	194.7	7.050	34.900	7.090	2.200	5.900	2.070
210.0	29.8	210.4	6.940	40.670	6.090	2.410	8.500	1.750
225.0	29.2	225.7	7.990	46.210	5.040	2.770	14.060	1.780
240.0	29.3	240.4	9.410	51.310	4.640	2.820	15.010	1.320
255.0	29.5	255.5	13.060	51.070	3.040	3.120	13.370	0.920
270.0	29.5	270.5	11.980	49.810	2.910	3.210	12.830	0.640
285.0	29.5	285.5	11.570	49.640	4.360	3.280	12.810	1.170
300.0	29.5	300.1	11.670	51.660	6.650	3.310	10.450	1.850
315.0	29.5	314.8	11.230	35.900	7.660	3.310	8.100	2.320
330.0	29.5	329.7	11.320	34.980	8.140	3.270	6.070	2.590
345.0	29.5	344.8	13.290	26.030	9.250	3.250	4.910	2.730

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table Q.57: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 0.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	-0.6	-136.9	13.330	54.580	11.150	3.900	13.110	3.280
15.0	-2.8	-134.4	13.880	46.070	10.840	3.810	13.480	3.310
30.0	-4.0	-116.3	14.060	44.350	10.860	3.860	13.020	3.070
45.0	2.1	38.6	12.660	38.570	10.600	3.860	9.140	2.940
60.0	2.6	64.0	13.490	36.130	7.440	4.040	10.050	1.890
75.0	2.2	83.3	13.450	43.280	4.770	4.110	10.550	1.010
90.0	0.9	100.0	15.480	45.440	7.170	4.120	11.130	1.140
105.0	-1.4	109.9	15.400	43.170	6.930	4.070	11.330	1.560
120.0	-3.3	116.2	12.800	41.700	8.860	4.030	11.030	2.010
135.0	-5.3	125.7	14.870	41.500	9.780	3.950	10.490	2.450
150.0	-5.5	143.3	14.450	44.630	12.660	3.850	8.940	2.980
165.0	-4.9	154.4	12.900	39.400	12.410	3.990	7.320	3.380
180.0	-0.4	239.9	12.560	44.490	12.000	3.810	8.450	3.380
195.0	3.0	226.1	13.200	48.400	10.300	4.040	11.230	2.840
210.0	3.1	241.6	13.890	51.910	8.030	4.260	12.370	2.210
225.0	1.4	252.5	14.880	64.120	7.010	4.440	12.580	1.640
240.0	-0.4	261.6	19.470	68.030	6.800	4.490	12.420	1.040
255.0	-1.2	269.3	18.060	46.510	5.870	4.500	11.510	0.740
270.0	-1.7	276.9	15.910	35.680	5.050	4.500	11.030	0.870
285.0	-1.8	284.4	14.480	34.600	5.150	4.430	10.690	1.200
300.0	-3.5	288.1	14.630	39.440	6.330	4.430	11.040	1.550
315.0	-5.4	290.7	15.440	48.150	10.060	4.460	12.320	1.950
330.0	-6.9	273.9	16.310	54.120	7.260	4.360	14.440	2.200
345.0	1.7	-171.5	13.470	58.450	10.880	4.110	14.690	2.760

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.58:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	0.1	-131.1	16.530	75.540	12.160	3.840	15.060	3.150
15.0	0.4	-118.9	16.970	52.300	11.460	3.850	14.700	2.840
30.0	1.4	-107.9	16.280	48.520	11.580	3.890	14.640	2.550
45.0	2.4	20.1	13.730	43.050	11.730	3.770	9.090	3.410
60.0	4.5	49.4	14.560	36.570	8.530	3.920	8.860	2.620
75.0	5.0	71.3	13.420	31.250	6.500	4.070	9.500	1.490
90.0	4.6	89.6	15.260	35.640	4.690	4.100	10.120	0.710
105.0	4.0	104.5	18.500	40.580	7.500	4.070	10.420	1.190
120.0	3.4	113.6	15.450	44.430	9.950	4.020	10.470	1.660
135.0	2.4	122.2	15.710	43.780	10.140	3.950	10.110	2.040
150.0	1.4	130.1	17.560	48.040	10.110	3.870	9.850	2.390
165.0	0.5	139.8	15.280	51.890	8.350	3.820	9.000	2.760
180.0	0.2	152.6	11.860	49.150	9.730	3.740	8.120	3.110
195.0	4.6	217.9	13.370	51.510	11.520	3.950	10.050	2.940
210.0	4.9	238.0	17.020	55.750	8.360	4.210	11.590	2.290
225.0	4.6	250.4	15.220	50.120	6.330	4.310	11.910	1.650
240.0	4.5	260.9	13.870	48.120	5.330	4.400	11.390	1.090
255.0	3.9	270.8	17.330	49.560	4.100	4.480	11.320	0.630
270.0	3.6	279.9	18.720	40.200	6.670	4.450	11.020	0.940
285.0	4.0	290.0	16.210	37.730	5.270	4.410	10.560	1.480
300.0	3.9	297.4	16.330	41.100	6.350	4.300	9.850	2.000
315.0	3.1	302.6	16.200	54.170	7.250	4.290	10.140	2.280
330.0	1.9	307.2	15.340	80.740	7.750	4.310	11.080	2.500
345.0	0.3	312.8	15.950	77.520	9.130	4.240	12.150	2.770

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.59: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	6.1	-28.6	14.220	90.020	10.400	4.300	14.360	3.350
15.0	5.0	-32.0	14.140	70.370	11.820	3.990	14.010	3.280
30.0	6.2	-104.3	17.200	59.470	12.750	3.920	16.120	2.190
45.0	6.1	-9.8	13.710	57.640	13.010	3.840	12.310	3.390
60.0	9.0	54.1	15.150	33.980	10.510	3.920	8.070	2.460
75.0	9.6	72.2	14.130	31.920	5.130	4.060	8.720	1.460
90.0	9.5	88.5	13.000	32.860	2.790	4.080	9.470	0.480
105.0	9.2	104.8	11.800	34.690	7.140	4.050	9.760	1.030
120.0	8.5	115.5	15.580	40.400	6.450	3.930	9.160	1.520
135.0	7.8	126.8	14.100	41.260	9.280	3.850	8.490	2.010
150.0	7.1	135.2	17.960	43.960	9.030	3.810	8.120	2.330
165.0	6.3	141.0	17.390	47.590	10.880	3.790	7.870	2.550
180.0	5.6	151.2	13.590	47.100	11.080	3.740	7.790	2.840
195.0	8.6	202.2	15.300	61.530	12.940	3.740	8.310	2.850
210.0	8.6	229.6	15.850	53.920	8.180	4.040	10.720	2.330
225.0	8.6	243.3	14.810	43.210	7.830	4.190	10.980	1.840
240.0	8.6	252.4	20.500	42.270	5.200	4.250	11.200	1.370
255.0	8.8	265.2	13.260	40.590	3.220	4.340	11.550	0.730
270.0	9.0	275.9	17.520	41.570	3.070	4.350	11.600	0.620
285.0	9.2	288.1	17.400	42.480	5.520	4.350	11.290	1.350
300.0	9.2	300.9	18.010	60.130	7.340	4.260	9.830	2.200
315.0	8.8	311.9	16.170	49.690	8.870	4.150	8.840	2.750
330.0	7.5	315.3	14.920	52.250	10.050	4.120	9.960	2.890
345.0	6.7	322.0	15.430	90.430	9.680	4.370	12.320	3.120

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.



**Table Q.60: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	13.3	-4.8	13.910	37.930	11.780	3.820	6.460	3.560
15.0	13.7	11.7	13.080	35.890	11.170	3.800	6.010	3.500
30.0	14.0	27.8	14.900	30.000	11.670	3.820	6.380	3.290
45.0	14.2	43.1	13.530	28.760	9.100	3.880	6.710	2.910
60.0	14.3	57.7	16.580	31.940	8.990	3.940	7.470	2.310
75.0	14.5	73.4	16.130	32.980	5.760	4.010	8.380	1.440
90.0	14.5	89.1	14.290	34.130	2.200	4.010	9.370	0.510
105.0	14.5	104.6	16.210	38.600	6.650	3.960	9.520	0.920
120.0	13.9	117.6	13.810	35.280	6.930	3.820	9.650	1.470
135.0	13.7	132.5	14.750	32.430	9.430	3.690	8.080	2.000
150.0	13.6	146.9	10.910	31.750	7.920	3.590	6.120	2.300
165.0	13.6	162.1	10.220	25.430	7.800	3.590	5.250	2.560
180.0	13.9	178.6	10.860	29.520	10.410	3.540	5.400	2.650
195.0	13.9	196.8	9.890	42.160	9.270	3.660	8.200	2.700
210.0	13.6	216.6	11.020	37.250	7.400	3.790	10.520	2.460
225.0	13.5	232.8	15.880	41.570	6.590	3.930	11.910	2.000
240.0	13.8	245.6	17.410	65.390	7.490	4.110	12.730	1.580
255.0	14.2	258.9	16.370	59.120	4.010	4.220	13.080	0.930
270.0	14.2	273.2	18.540	40.580	3.520	4.300	12.970	0.570
285.0	14.3	286.8	18.180	46.300	5.740	4.290	12.570	1.290
300.0	14.2	301.0	16.630	51.880	8.780	4.220	10.450	2.200
315.0	14.1	314.0	13.980	44.010	8.570	4.120	8.630	2.810
330.0	13.8	327.1	14.950	42.370	10.470	3.990	7.850	3.210
345.0	13.4	340.6	14.910	46.650	10.600	3.890	7.280	3.450

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.61: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.1	-1.3	12.830	27.680	10.420	3.900	5.430	3.460
15.0	19.2	14.0	14.910	28.150	10.920	3.870	5.520	3.400
30.0	19.2	29.3	13.320	28.810	10.580	3.870	6.190	3.210
45.0	19.3	44.2	14.300	28.860	8.690	3.910	6.920	2.850
60.0	19.3	58.6	13.110	33.390	7.350	3.930	7.370	2.290
75.0	19.5	73.9	16.060	35.260	6.630	3.940	8.540	1.470
90.0	19.6	89.2	11.910	36.380	2.380	3.920	9.350	0.620
105.0	19.5	104.4	15.730	54.460	10.830	3.880	9.230	0.890
120.0	19.2	118.6	15.470	43.080	6.730	3.770	10.950	1.420
135.0	19.0	133.5	10.800	36.610	6.720	3.610	9.280	1.810
150.0	18.9	148.2	10.520	37.790	7.650	3.510	8.250	2.170
165.0	19.1	164.0	10.890	28.330	8.650	3.570	5.640	2.600
180.0	19.3	179.4	10.320	34.040	7.100	3.510	5.700	2.560
195.0	19.4	194.9	10.970	40.260	10.420	3.570	8.960	2.650
210.0	19.2	211.3	9.920	42.290	8.180	3.530	10.540	2.160
225.0	19.0	227.7	11.590	42.760	5.980	3.720	13.320	2.000
240.0	19.0	242.8	14.590	57.050	6.870	3.940	14.610	1.570
255.0	19.4	257.1	17.500	52.970	3.220	4.090	14.470	0.980
270.0	19.4	271.8	18.380	48.200	3.050	4.220	14.230	0.590
285.0	19.4	286.3	16.640	52.280	9.520	4.230	13.760	1.300
300.0	19.4	300.7	14.880	53.610	7.420	4.200	11.130	2.160
315.0	19.3	314.6	14.600	47.600	8.800	4.100	9.370	2.760
330.0	19.1	328.8	13.460	38.710	11.670	4.010	7.320	3.160
345.0	19.1	343.5	15.300	36.000	10.540	3.940	6.120	3.380

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.62:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.3	-0.5	15.360	28.290	11.150	3.970	5.390	3.340
15.0	24.3	14.7	13.860	27.230	10.290	3.940	5.750	3.310
30.0	24.3	29.9	12.550	30.840	9.300	3.940	6.570	3.140
45.0	24.3	44.7	14.670	32.070	9.800	3.940	7.250	2.800
60.0	24.3	59.2	16.740	32.380	8.740	3.910	8.250	2.270
75.0	24.4	74.2	17.050	74.510	10.970	3.870	9.330	1.530
90.0	24.5	89.2	12.960	52.470	4.250	3.820	9.910	0.740
105.0	24.4	104.3	14.020	50.720	7.310	3.740	9.330	0.810
120.0	24.2	119.1	13.570	43.130	4.360	3.620	13.060	1.340
135.0	24.2	134.2	9.980	38.520	6.150	3.470	10.810	1.660
150.0	24.2	149.0	10.370	38.770	6.550	3.380	9.440	2.030
165.0	24.6	164.1	10.790	30.140	8.550	3.570	5.430	2.510
180.0	25.4	179.8	11.190	28.590	7.740	3.770	3.970	2.660
195.0	24.9	195.3	11.070	34.380	7.230	3.610	7.260	2.400
210.0	24.1	211.5	12.200	52.220	8.940	3.450	12.320	2.380
225.0	24.4	225.2	9.160	49.040	6.380	3.550	12.760	1.740
240.0	24.1	241.3	12.540	52.930	5.060	3.800	16.180	1.580
255.0	24.4	256.1	16.730	47.500	20.180	3.950	14.990	1.240
270.0	24.4	271.2	14.980	64.410	3.510	4.160	14.960	0.680
285.0	24.4	285.9	19.010	57.160	5.150	4.190	14.840	1.290
300.0	24.4	300.6	16.150	49.150	7.910	4.170	12.100	2.120
315.0	24.3	314.8	14.470	50.250	8.550	4.140	9.740	2.720
330.0	24.3	329.4	12.730	36.670	9.530	4.080	7.550	3.100
345.0	24.3	344.3	14.950	35.980	10.870	4.010	6.200	3.270

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.63: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.4	-0.1	14.410	28.850	11.710	4.040	5.770	3.230
15.0	29.4	15.1	13.630	28.320	10.290	4.020	6.180	3.200
30.0	29.4	30.1	15.100	31.750	9.500	3.990	7.020	3.050
45.0	29.4	45.0	12.590	30.030	7.960	3.960	7.520	2.750
60.0	29.3	59.6	12.990	36.400	7.310	3.910	8.580	2.270
75.0	29.4	74.2	17.510	47.890	5.390	3.820	10.040	1.560
90.0	29.4	89.2	14.400	48.110	4.040	3.720	10.740	0.850
105.0	29.3	104.1	14.780	52.730	3.640	3.670	10.000	0.790
120.0	29.1	119.3	10.630	44.190	4.780	3.520	14.200	1.290
135.0	28.9	134.1	9.630	41.360	6.900	3.380	12.920	1.700
150.0	29.1	147.9	10.210	43.390	6.850	3.170	9.120	2.060
165.0	29.9	162.3	10.240	50.630	6.990	3.340	7.330	2.450
180.0	30.4	178.3	10.370	44.180	9.990	3.430	5.720	2.700
195.0	30.9	194.9	8.950	40.050	8.240	3.250	7.040	2.510
210.0	29.7	211.0	11.750	48.800	9.440	3.570	10.860	2.390
225.0	29.2	225.2	9.520	58.640	6.560	3.370	13.460	1.780
240.0	29.3	240.4	12.210	51.860	6.730	3.610	15.110	1.440
255.0	29.4	255.7	13.670	63.920	4.180	3.940	15.440	1.050
270.0	29.4	270.8	15.740	90.360	5.510	4.160	15.720	0.800
285.0	29.4	285.8	15.590	63.270	5.500	4.150	15.700	1.320
300.0	29.4	300.4	15.880	53.370	7.490	4.150	12.430	2.090
315.0	29.4	315.0	13.030	46.030	8.410	4.160	10.070	2.660
330.0	29.4	329.8	13.000	42.290	9.080	4.120	8.230	3.000
345.0	29.4	344.8	15.290	33.950	9.860	4.090	6.770	3.180

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.64:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	-2.0	-9.4	13.280	42.840	8.290	4.170	6.480	2.510
15.0	-0.2	8.4	13.170	33.810	7.140	4.060	6.320	2.460
30.0	1.3	26.3	13.510	29.920	7.070	4.090	6.680	2.290
45.0	2.1	46.8	13.460	25.740	5.960	4.120	7.340	1.810
60.0	2.1	65.7	12.930	25.720	4.860	4.160	7.500	1.150
75.0	1.5	83.5	14.670	30.230	2.600	4.200	7.540	0.510
90.0	0.9	100.8	14.450	40.540	4.080	4.240	7.880	0.630
105.0	-0.3	112.8	13.900	32.810	4.160	4.200	8.110	1.060
120.0	-1.6	123.2	13.440	29.770	5.400	4.160	8.090	1.440
135.0	-2.8	133.7	14.500	30.370	6.020	4.160	7.480	1.770
150.0	-3.5	146.7	15.150	33.010	7.170	4.130	6.090	2.100
165.0	-3.5	159.6	15.190	32.310	7.830	4.100	4.300	2.360
180.0	-2.7	176.8	15.170	22.480	8.790	4.080	3.040	2.520
195.0	-1.3	196.2	14.930	33.000	8.370	4.130	4.560	2.470
210.0	-0.2	218.4	15.690	38.290	7.800	4.230	7.010	2.130
225.0	-0.1	234.8	15.030	42.900	7.250	4.320	7.920	1.670
240.0	-0.4	248.9	16.130	42.960	5.610	4.390	8.140	1.150
255.0	-1.1	261.8	16.590	36.790	3.900	4.460	8.230	0.600
270.0	-1.7	272.9	16.020	32.040	2.130	4.470	8.190	0.380
285.0	-2.3	283.0	19.020	32.350	3.450	4.450	8.060	0.750
300.0	-2.7	291.8	16.670	31.400	4.370	4.450	7.890	1.120
315.0	-3.9	303.0	14.160	36.340	5.940	4.350	7.910	1.530
330.0	-4.3	318.6	14.190	48.250	7.510	4.340	7.940	1.980
345.0	-3.6	333.4	14.410	40.430	7.780	4.250	7.120	2.320

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.65: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	2.0	-23.0	15.050	41.080	8.680	4.190	7.490	2.360
15.0	2.3	-7.0	15.130	41.180	9.160	4.120	7.180	2.510
30.0	3.0	10.2	14.970	36.380	8.820	4.070	6.660	2.490
45.0	4.0	31.8	14.550	31.470	7.850	4.090	6.320	2.220
60.0	4.7	54.7	15.660	27.790	5.780	4.140	6.870	1.600
75.0	4.9	72.7	13.280	26.970	3.730	4.180	7.140	0.890
90.0	4.6	89.6	13.500	28.810	2.080	4.210	7.140	0.320
105.0	4.4	104.9	15.620	29.640	3.890	4.220	7.190	0.700
120.0	3.8	115.6	18.070	33.350	4.940	4.190	7.090	1.090
135.0	3.3	126.1	18.420	37.680	6.230	4.140	6.740	1.450
150.0	2.7	134.6	17.760	36.300	6.740	4.120	6.250	1.730
165.0	2.1	143.8	17.200	34.440	8.250	4.110	5.630	2.000
180.0	1.6	155.2	15.340	34.500	8.040	4.090	4.920	2.270
195.0	1.6	169.6	13.010	33.360	8.890	4.070	4.370	2.460
210.0	2.6	191.1	13.790	27.250	9.240	4.120	5.080	2.470
225.0	4.2	227.0	13.810	31.420	6.410	4.230	7.240	1.810
240.0	4.3	243.6	13.800	30.280	4.340	4.310	7.910	1.260
255.0	4.3	255.4	14.200	28.440	3.360	4.370	8.050	0.840
270.0	4.2	270.1	18.530	30.860	2.430	4.420	8.120	0.330
285.0	4.1	283.9	16.180	29.920	2.640	4.430	8.070	0.660
300.0	3.9	296.4	16.410	33.710	4.380	4.370	7.800	1.190
315.0	3.3	304.7	15.510	35.360	5.550	4.350	7.530	1.530
330.0	2.7	312.4	15.490	38.620	6.780	4.330	7.540	1.800
345.0	2.1	323.2	15.100	39.920	7.960	4.270	7.510	2.090

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.66:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	7.0	-21.3	15.820	46.240	9.650	4.160	7.690	2.410
15.0	6.7	-9.4	15.660	46.230	10.200	4.100	7.720	2.540
30.0	8.3	19.8	15.620	40.120	9.290	4.040	6.190	2.430
45.0	9.2	40.8	16.680	25.190	8.700	4.080	5.660	2.050
60.0	9.3	56.4	15.010	27.570	6.620	4.100	5.950	1.570
75.0	9.6	72.8	14.900	28.020	3.280	4.160	6.280	0.920
90.0	9.6	88.5	12.920	26.980	1.190	4.140	6.520	0.320
105.0	9.5	103.7	14.680	27.940	2.550	4.180	6.110	0.580
120.0	9.0	116.6	13.790	30.490	4.330	4.040	5.400	1.020
135.0	8.7	130.7	16.250	26.800	5.550	4.040	4.030	1.490
150.0	8.2	142.9	17.210	25.470	7.780	4.040	2.950	1.830
165.0	7.2	144.8	17.210	30.810	6.940	4.050	3.100	1.910
180.0	6.8	155.9	16.440	33.260	9.280	4.020	3.440	2.130
195.0	8.9	192.7	14.570	28.940	7.670	4.090	5.070	2.250
210.0	9.1	210.5	17.070	37.590	8.350	4.100	6.660	2.020
225.0	9.2	227.5	16.710	28.470	5.970	4.160	8.000	1.650
240.0	9.3	242.6	14.720	29.240	4.500	4.300	8.920	1.200
255.0	9.6	256.1	14.790	30.240	3.240	4.330	9.140	0.730
270.0	9.5	270.6	17.190	33.070	1.630	4.370	9.090	0.310
285.0	9.5	285.1	16.030	33.330	3.200	4.340	8.860	0.710
300.0	9.4	299.8	16.690	35.620	5.350	4.310	8.040	1.330
315.0	9.3	313.5	16.470	40.690	8.390	4.260	7.040	1.830
330.0	9.0	326.5	16.030	35.770	8.500	4.200	6.050	2.190
345.0	7.9	334.7	15.970	36.390	9.400	4.160	6.480	2.350

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.67: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.2	-2.2	14.740	27.290	8.540	4.060	3.860	2.580
15.0	14.2	12.9	13.800	26.720	8.660	4.000	4.050	2.530
30.0	14.3	28.1	13.160	24.330	7.660	4.010	4.570	2.340
45.0	14.3	43.0	14.240	25.230	7.940	4.010	5.030	2.010
60.0	14.4	57.9	15.090	31.390	7.640	4.050	5.290	1.570
75.0	14.6	73.6	14.540	29.220	3.720	4.070	5.770	0.970
90.0	14.6	88.8	13.040	27.550	1.400	4.070	5.940	0.430
105.0	14.5	103.8	13.620	32.060	1.960	4.060	5.150	0.570
120.0	14.3	118.1	17.140	27.370	4.330	4.020	4.770	1.000
135.0	14.1	133.0	15.220	26.490	5.830	3.940	4.150	1.430
150.0	14.0	147.7	14.080	27.130	6.810	3.980	3.470	1.760
165.0	13.9	162.5	10.990	21.530	5.310	3.920	3.470	1.970
180.0	14.1	178.2	12.210	28.950	6.680	3.960	4.610	2.090
195.0	14.3	194.2	11.640	34.170	6.110	3.980	6.350	2.090
210.0	14.2	210.5	14.080	41.630	7.580	4.040	7.960	1.880
225.0	14.3	226.1	14.120	34.460	5.530	4.080	9.260	1.580
240.0	14.4	241.3	16.920	37.470	4.790	4.170	10.310	1.180
255.0	14.5	255.6	17.430	36.990	3.380	4.280	10.610	0.720
270.0	14.5	270.4	16.510	41.130	2.000	4.300	10.490	0.370
285.0	14.6	285.1	15.620	45.990	3.560	4.300	10.140	0.750
300.0	14.5	300.1	15.660	36.090	6.220	4.280	8.520	1.370
315.0	14.4	314.4	14.590	35.270	6.590	4.210	7.390	1.860
330.0	14.3	328.6	15.210	33.490	7.670	4.130	5.950	2.220
345.0	14.2	343.1	13.980	32.100	8.050	4.080	4.630	2.470

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.



**Table Q.68:** Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.4	-1.1	13.330	27.340	7.770	4.020	3.660	2.550
15.0	19.4	14.0	13.500	25.110	7.830	4.000	4.040	2.510
30.0	19.4	29.1	15.050	25.320	7.920	3.990	4.850	2.340
45.0	19.4	44.0	13.750	24.990	6.450	3.970	5.430	2.030
60.0	19.4	58.7	15.580	28.570	6.700	3.990	5.690	1.610
75.0	19.6	74.0	15.020	34.440	4.100	4.010	5.940	1.050
90.0	19.6	89.0	12.770	32.260	1.860	3.990	5.890	0.550
105.0	19.6	103.9	15.350	49.760	2.470	3.980	4.990	0.570
120.0	19.4	118.8	14.580	27.840	3.600	3.960	6.310	0.980
135.0	19.3	133.6	11.430	26.460	3.860	3.900	5.190	1.370
150.0	19.2	148.5	12.160	27.520	5.260	3.890	4.660	1.680
165.0	19.3	163.6	13.520	23.270	6.380	3.860	4.010	1.770
180.0	19.4	179.0	11.180	29.430	6.350	3.950	5.040	2.080
195.0	19.4	194.3	13.040	40.690	7.110	3.900	6.370	1.840
210.0	19.5	209.9	12.330	43.820	5.830	3.950	8.860	1.820
225.0	19.5	225.2	11.260	43.330	4.840	3.970	10.170	1.530
240.0	19.5	240.6	13.010	43.510	4.310	4.090	11.190	1.140
255.0	19.5	255.2	13.890	44.830	3.280	4.170	11.720	0.720
270.0	19.5	270.3	16.020	43.340	2.170	4.240	11.580	0.450
285.0	19.5	285.1	16.840	46.570	4.450	4.240	11.130	0.810
300.0	19.5	300.1	14.340	37.550	6.230	4.200	9.280	1.370
315.0	19.5	314.6	15.360	37.300	6.250	4.200	7.630	1.860
330.0	19.4	329.2	14.960	35.350	7.040	4.120	5.970	2.220
345.0	19.4	344.0	13.740	33.340	7.940	4.070	4.490	2.450

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.69: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.4	-0.6	12.530	28.180	7.780	4.020	3.780	2.520
15.0	24.4	14.5	13.870	26.190	8.040	3.990	4.330	2.490
30.0	24.4	29.5	13.350	27.660	7.830	3.960	5.280	2.330
45.0	24.4	44.4	14.940	27.310	6.680	3.950	6.300	2.040
60.0	24.4	59.3	13.280	26.830	5.440	3.940	6.540	1.650
75.0	24.5	74.3	16.170	40.750	5.000	3.930	6.870	1.120
90.0	24.5	89.2	12.480	39.650	2.220	3.900	6.580	0.670
105.0	24.5	104.0	16.690	52.650	2.720	3.930	5.670	0.620
120.0	24.4	119.1	14.080	31.230	3.380	3.920	7.750	0.990
135.0	24.4	134.0	11.640	28.380	4.310	3.790	6.390	1.320
150.0	24.3	148.8	11.730	27.430	5.430	3.830	5.490	1.740
165.0	24.4	164.1	11.090	27.400	6.440	3.790	4.100	1.850
180.0	24.6	179.4	11.070	29.150	6.120	4.060	4.120	2.150
195.0	24.6	194.6	10.900	39.280	6.750	3.880	6.060	1.930
210.0	24.5	210.1	10.730	42.540	5.900	3.930	9.890	1.930
225.0	24.5	225.1	10.740	47.680	4.680	3.930	10.810	1.490
240.0	24.5	240.2	13.690	50.330	4.740	4.010	11.490	1.120
255.0	24.4	255.0	16.440	53.340	2.620	4.130	12.000	0.740
270.0	24.4	270.2	14.840	51.210	2.060	4.190	12.250	0.540
285.0	24.5	285.1	17.150	48.550	3.620	4.190	11.730	0.880
300.0	24.5	300.0	14.550	40.400	5.100	4.160	8.990	1.380
315.0	24.5	314.8	14.880	41.040	5.950	4.150	7.970	1.850
330.0	24.4	329.5	15.530	38.900	7.470	4.090	6.010	2.190
345.0	24.4	344.4	14.490	34.470	7.800	4.060	4.330	2.420

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table Q.70: Course-Keeping Ability and Motion Parameters: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.4	-0.4	13.420	28.280	7.780	4.010	4.100	2.480
15.0	29.4	14.7	13.080	27.430	7.600	3.980	4.900	2.440
30.0	29.4	29.7	12.070	27.980	7.390	3.950	6.000	2.310
45.0	29.5	44.6	14.910	29.350	6.380	3.920	6.700	2.050
60.0	29.5	59.5	13.880	29.670	6.100	3.910	7.510	1.690
75.0	29.5	74.3	15.270	46.540	4.500	3.870	8.070	1.200
90.0	29.5	89.2	12.200	48.500	2.600	3.830	7.900	0.770
105.0	29.4	104.0	13.220	59.990	3.190	3.880	7.040	0.690
120.0	29.4	119.2	11.130	33.350	3.000	3.820	9.020	1.000
135.0	29.3	134.2	10.360	30.680	3.710	3.740	8.130	1.350
150.0	29.3	149.1	14.110	35.720	6.310	3.810	6.920	1.740
165.0	29.5	164.1	11.710	30.590	5.540	3.920	4.060	2.020
180.0	29.8	179.3	10.700	33.210	6.390	3.960	3.280	2.040
195.0	29.8	194.8	13.960	43.750	7.010	4.220	6.120	2.200
210.0	29.5	210.0	13.300	47.670	7.700	3.890	8.710	1.870
225.0	29.5	225.0	10.960	49.680	5.570	3.840	10.710	1.480
240.0	29.5	240.1	11.990	52.650	3.510	3.930	11.710	1.100
255.0	29.4	255.0	17.220	62.160	2.920	4.110	11.330	0.780
270.0	29.4	270.1	14.660	56.730	2.240	4.150	12.390	0.640
285.0	29.5	285.1	15.510	60.690	4.100	4.170	12.090	0.940
300.0	29.5	299.9	16.940	49.170	5.180	4.130	9.010	1.400
315.0	29.5	314.8	13.850	41.430	6.060	4.110	7.220	1.830
330.0	29.5	329.6	12.870	36.540	6.590	4.090	5.590	2.170
345.0	29.4	344.6	12.080	33.940	7.780	4.060	4.430	2.390

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

This page intentionally left blank.

**Annex R**  
**Tables of Motion Maxima – JONSWAP**  
**Spectrum (Coastal Waters)**

---

**Table R.1:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	-0.4	-27.7	0.960	6.910	3.910	0.240	1.640	0.980
15.0	-0.0	12.7	0.800	3.830	3.340	0.200	0.820	0.880
30.0	-0.1	30.9	1.170	7.930	3.570	0.250	1.650	0.980
45.0	-0.2	39.3	1.200	10.350	3.810	0.310	2.100	1.060
60.0	-0.3	44.1	1.680	12.270	3.850	0.350	2.340	1.080
75.0	-0.6	50.4	1.620	11.960	3.870	0.420	2.890	1.130
90.0	-1.1	57.2	2.090	13.460	3.690	0.520	3.220	1.120
105.0	-1.1	-36.3	2.940	15.290	4.140	0.480	3.140	1.100
120.0	-0.8	-19.3	2.980	20.750	4.050	0.480	3.210	1.030
135.0	-2.3	102.3	2.660	15.250	2.970	0.770	3.200	0.810
150.0	-3.1	107.6	2.700	14.920	3.600	0.680	3.350	0.950
165.0	-2.8	101.7	2.990	16.330	2.990	0.800	3.240	0.730
180.0	-1.0	66.4	2.890	12.470	3.790	0.450	2.380	0.830
195.0	-0.4	18.6	2.690	15.100	3.910	0.370	2.510	1.040
210.0	-0.2	387.7	2.310	8.220	3.950	0.380	2.310	1.080
225.0	0.5	314.2	2.030	8.390	3.580	0.390	2.220	1.080
240.0	1.5	291.9	2.940	15.410	3.150	0.710	2.950	1.050
255.0	1.0	293.6	2.580	12.360	3.200	0.670	3.050	1.100
270.0	0.5	299.3	2.240	12.790	3.440	0.580	3.100	1.150
285.0	0.2	304.9	2.440	12.840	3.980	0.500	2.930	1.160
300.0	0.0	309.2	1.890	12.130	3.860	0.440	2.650	1.150
315.0	-0.1	312.9	1.590	10.810	3.890	0.390	2.550	1.130
330.0	-0.2	315.9	1.390	12.470	3.770	0.360	2.410	1.110
345.0	-0.3	321.4	1.300	8.580	3.710	0.300	2.080	1.070

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.2: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	4.7	-1.1	0.820	3.610	2.910	0.220	0.560	0.870
15.0	4.7	13.8	0.780	4.650	3.440	0.230	0.930	0.890
30.0	4.7	28.6	1.040	6.770	3.350	0.280	1.290	0.990
45.0	4.6	43.0	1.350	7.240	3.470	0.370	1.790	1.110
60.0	4.4	55.1	1.750	11.690	3.840	0.500	2.340	1.170
75.0	4.0	56.2	2.030	11.700	3.890	0.510	2.590	1.150
90.0	3.6	57.8	2.050	14.070	3.700	0.530	2.710	1.130
105.0	3.6	60.6	2.400	14.400	3.890	0.570	2.790	1.120
120.0	3.8	61.1	2.120	12.050	3.530	0.570	2.760	1.130
135.0	3.9	61.5	2.100	15.150	3.720	0.570	2.710	1.140
150.0	4.4	145.5	0.920	6.570	2.440	0.250	1.700	0.740
165.0	4.8	163.8	0.720	5.030	2.230	0.190	1.080	0.620
180.0	4.8	179.2	0.640	2.600	2.000	0.170	0.500	0.580
195.0	4.8	194.7	0.640	4.580	2.130	0.190	1.030	0.620
210.0	4.7	211.2	0.890	6.250	2.570	0.250	1.680	0.720
225.0	4.7	284.5	3.110	14.320	2.890	0.800	2.540	0.930
240.0	4.5	286.4	3.050	13.150	3.570	0.790	2.740	0.940
255.0	4.4	289.9	2.740	13.340	3.060	0.740	2.660	1.030
270.0	4.3	293.3	2.900	11.910	3.400	0.700	2.640	1.090
285.0	4.4	295.0	2.620	9.230	3.570	0.660	2.500	1.120
300.0	4.7	302.5	1.950	9.930	3.820	0.540	2.470	1.190
315.0	4.7	315.1	1.370	8.690	3.650	0.390	1.850	1.140
330.0	4.7	329.4	1.050	6.420	3.370	0.290	1.280	1.020
345.0	4.7	344.1	0.810	4.320	3.350	0.240	0.880	0.910

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.3: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.7	-0.4	0.990	3.910	2.680	0.290	0.420	0.860
15.0	9.7	14.5	1.090	4.100	2.760	0.310	0.480	0.890
30.0	9.7	29.5	1.310	6.090	3.160	0.350	0.900	0.990
45.0	9.7	44.5	1.520	8.450	3.490	0.460	1.410	1.110
60.0	9.7	59.2	2.150	12.830	3.810	0.610	1.980	1.160
75.0	9.7	72.9	2.670	14.870	3.640	0.790	2.040	0.980
90.0	9.3	85.2	2.820	16.880	1.600	0.900	2.630	0.410
105.0	9.0	99.8	3.130	25.380	2.730	0.760	3.230	0.600
120.0	9.2	115.7	2.240	16.290	3.190	0.550	3.340	0.810
135.0	9.6	133.2	0.830	12.400	1.890	0.330	4.200	0.740
150.0	9.7	148.9	0.650	14.390	1.550	0.230	4.840	0.610
165.0	9.8	164.3	0.610	14.960	1.590	0.180	4.190	0.520
180.0	9.8	179.4	0.540	9.800	1.450	0.170	2.530	0.480
195.0	9.8	194.9	0.510	8.840	1.610	0.180	2.620	0.520
210.0	9.8	210.4	0.670	11.450	1.580	0.240	3.970	0.610
225.0	9.7	226.1	0.860	12.840	1.920	0.350	3.870	0.750
240.0	9.3	243.5	2.760	15.090	2.970	0.560	3.290	0.840
255.0	9.1	260.3	2.940	21.730	2.320	0.800	3.250	0.640
270.0	9.4	274.3	2.970	16.060	1.590	0.930	2.640	0.360
285.0	9.8	286.8	2.690	13.480	3.180	0.820	2.070	0.980
300.0	9.7	300.3	2.150	9.230	3.920	0.640	2.070	1.170
315.0	9.7	314.8	1.480	7.440	3.580	0.470	1.460	1.130
330.0	9.7	329.8	1.200	5.890	3.330	0.360	0.940	1.010
345.0	9.7	344.7	1.080	4.060	2.680	0.310	0.520	0.900

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table R.4: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.7	-0.3	1.330	5.390	2.650	0.360	0.520	0.850
15.0	14.7	14.7	1.260	5.900	2.690	0.380	0.530	0.880
30.0	14.6	29.8	1.590	6.840	2.990	0.440	0.770	0.980
45.0	14.6	44.8	1.710	8.770	3.200	0.550	1.200	1.090
60.0	14.7	59.6	2.220	12.560	3.520	0.700	1.720	1.130
75.0	14.7	74.0	2.760	15.000	3.130	0.830	1.780	0.930
90.0	14.6	88.3	2.800	18.390	1.060	0.870	2.670	0.210
105.0	14.4	103.1	2.990	23.610	2.320	0.680	3.350	0.580
120.0	14.5	118.1	2.290	20.190	2.590	0.470	5.800	0.680
135.0	14.6	133.9	0.980	23.880	1.810	0.310	7.760	0.580
150.0	14.7	149.6	0.680	15.570	1.530	0.230	4.640	0.500
165.0	14.7	164.6	0.450	11.490	1.220	0.150	2.460	0.400
180.0	14.7	179.6	0.470	11.690	1.360	0.180	1.790	0.520
195.0	14.8	194.7	0.540	15.150	1.660	0.160	2.250	0.460
210.0	14.7	209.9	0.590	16.910	1.560	0.220	4.580	0.560
225.0	14.7	225.6	1.020	19.360	2.080	0.330	6.850	0.630
240.0	14.6	241.2	1.350	18.370	2.190	0.510	5.880	0.760
255.0	14.5	256.8	3.260	19.310	2.420	0.740	3.510	0.640
270.0	14.6	271.6	3.100	15.270	1.130	0.920	2.990	0.200
285.0	14.8	285.9	2.920	9.790	3.130	0.880	2.020	0.930
300.0	14.7	300.1	2.360	9.390	3.590	0.720	1.830	1.140
315.0	14.6	314.8	1.850	7.170	3.450	0.570	1.220	1.110
330.0	14.6	329.8	1.440	6.090	3.000	0.450	0.820	0.980
345.0	14.7	344.8	1.290	5.490	2.770	0.380	0.580	0.890

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.5: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.2	1.360	7.270	2.640	0.430	0.620	0.810
15.0	19.6	14.8	1.410	7.690	2.800	0.450	0.590	0.850
30.0	19.6	29.8	1.790	8.330	3.160	0.530	0.750	0.940
45.0	19.6	44.8	2.130	10.710	3.450	0.640	1.080	1.050
60.0	19.6	59.8	2.250	13.060	3.360	0.770	1.510	1.090
75.0	19.6	74.4	2.810	14.390	2.960	0.870	1.620	0.890
90.0	19.6	89.0	2.720	17.520	0.760	0.840	2.570	0.180
105.0	19.6	104.0	2.310	19.540	2.070	0.630	3.720	0.530
120.0	19.6	119.1	1.350	27.020	1.980	0.440	9.550	0.580
135.0	19.6	134.8	0.730	22.260	1.540	0.280	6.460	0.510
150.0	19.8	149.7	0.770	14.860	1.440	0.220	3.310	0.460
165.0	19.9	164.7	0.530	14.030	1.290	0.180	1.750	0.420
180.0	19.6	179.6	0.520	20.080	1.430	0.160	2.490	0.400
195.0	19.7	194.8	0.500	22.410	1.450	0.170	3.080	0.430
210.0	19.7	209.9	0.580	23.240	1.420	0.180	4.280	0.440
225.0	19.6	225.1	0.960	26.430	1.760	0.320	7.590	0.610
240.0	19.6	240.7	1.610	27.840	2.840	0.480	8.940	0.660
255.0	19.6	255.9	2.700	16.550	2.090	0.710	4.160	0.610
270.0	19.6	270.9	3.240	19.350	0.920	0.900	3.360	0.190
285.0	19.7	285.5	3.120	9.780	3.030	0.920	2.290	0.890
300.0	19.6	300.1	2.520	9.120	3.600	0.810	1.880	1.100
315.0	19.6	314.9	2.180	7.940	3.420	0.660	1.290	1.060
330.0	19.6	329.9	1.660	6.880	3.040	0.530	0.860	0.940
345.0	19.6	344.9	1.400	6.920	2.730	0.460	0.650	0.850

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.6: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.7	-0.1	1.480	7.280	2.570	0.480	0.600	0.760
15.0	24.7	14.9	1.610	7.490	2.430	0.500	0.590	0.800
30.0	24.7	29.9	1.790	8.670	2.980	0.580	0.730	0.890
45.0	24.7	44.9	2.200	11.330	3.220	0.710	1.050	1.000
60.0	24.7	59.8	2.550	13.210	3.130	0.840	1.510	1.050
75.0	24.7	74.6	3.010	13.760	2.830	0.910	1.730	0.860
90.0	24.6	89.4	2.850	20.020	0.780	0.820	2.510	0.170
105.0	24.6	104.4	2.150	23.370	2.140	0.600	4.740	0.480
120.0	24.6	119.9	1.280	28.410	1.760	0.400	10.150	0.520
135.0	24.6	134.8	1.000	21.640	1.850	0.310	5.990	0.520
150.0	24.6	149.8	0.620	14.890	1.350	0.210	2.710	0.420
165.0	24.6	164.8	0.570	17.690	1.680	0.160	2.580	0.410
180.0	24.7	179.9	0.510	19.460	1.630	0.150	2.440	0.360
195.0	24.7	194.7	0.540	20.760	1.510	0.160	3.480	0.390
210.0	24.4	209.7	0.640	22.660	1.630	0.200	4.320	0.420
225.0	24.6	225.1	1.080	30.900	1.910	0.280	6.890	0.520
240.0	24.6	240.3	1.640	33.050	2.570	0.470	12.050	0.650
255.0	24.6	255.6	2.260	23.670	2.230	0.670	5.080	0.560
270.0	24.6	270.6	3.140	17.140	0.980	0.870	3.510	0.200
285.0	24.7	285.4	3.340	12.180	2.770	0.950	2.530	0.860
300.0	24.7	300.1	2.670	9.970	3.330	0.870	2.120	1.050
315.0	24.7	315.1	2.310	8.090	3.140	0.720	1.440	1.000
330.0	24.7	330.0	1.890	7.130	2.800	0.580	0.930	0.890
345.0	24.7	345.0	1.560	7.000	2.490	0.500	0.650	0.790

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.7: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.7	-0.1	1.530	6.760	2.130	0.490	0.550	0.700
15.0	29.8	14.9	1.640	6.930	2.340	0.520	0.510	0.740
30.0	29.8	29.9	1.750	8.130	2.530	0.600	0.700	0.830
45.0	29.7	44.9	2.140	10.320	2.850	0.750	1.160	0.950
60.0	29.7	59.8	2.980	14.140	3.300	0.890	1.660	1.010
75.0	29.7	74.7	2.960	15.670	2.810	0.940	1.940	0.830
90.0	29.7	89.5	2.750	18.240	0.760	0.800	2.680	0.180
105.0	29.7	104.6	2.300	28.110	2.820	0.580	6.130	0.440
120.0	29.6	119.9	1.330	32.060	2.000	0.420	11.010	0.580
135.0	29.7	134.6	0.840	19.350	1.560	0.280	5.190	0.460
150.0	29.6	150.0	0.670	13.810	1.300	0.190	3.110	0.360
165.0	29.8	164.8	0.500	15.720	1.090	0.150	2.430	0.290
180.0	29.7	179.9	0.460	16.100	1.220	0.140	2.640	0.250
195.0	29.9	195.0	0.510	20.770	1.290	0.140	3.470	0.280
210.0	29.4	209.5	0.640	21.500	1.510	0.190	4.910	0.390
225.0	29.5	224.8	0.810	25.310	1.720	0.260	5.790	0.470
240.0	29.6	240.2	1.640	38.090	2.590	0.460	11.460	0.630
255.0	29.7	255.3	2.680	29.200	2.550	0.640	6.140	0.520
270.0	29.7	270.4	2.900	14.500	0.780	0.840	3.420	0.210
285.0	29.7	285.3	3.370	13.690	2.930	0.970	2.940	0.820
300.0	29.7	300.2	2.850	10.360	3.510	0.910	2.500	1.000
315.0	29.7	315.1	2.290	8.560	3.120	0.750	1.690	0.940
330.0	29.7	330.1	1.910	7.320	2.580	0.600	1.030	0.820
345.0	29.7	345.0	1.620	6.350	2.440	0.520	0.650	0.730

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.8:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	0.0	-7.5	2.400	9.440	4.010	0.680	1.720	1.120
15.0	-0.1	-2.3	2.120	6.800	3.800	0.670	1.130	1.110
30.0	-0.4	4.2	2.040	8.890	3.680	0.670	1.540	1.120
45.0	-0.4	19.7	2.280	12.600	3.660	0.690	3.120	1.090
60.0	-0.4	35.8	2.450	15.470	3.160	0.740	4.180	1.020
75.0	-0.4	50.0	2.680	15.670	2.810	0.800	4.720	0.910
90.0	-0.4	63.9	2.760	15.680	2.390	0.870	4.900	0.720
105.0	-0.4	78.6	2.920	14.860	1.560	0.930	4.960	0.390
120.0	-0.6	93.4	2.900	15.200	1.310	0.950	5.090	0.210
135.0	-1.1	103.6	3.050	15.830	1.980	0.920	5.150	0.480
150.0	-1.6	110.3	2.670	16.020	2.420	0.880	5.080	0.650
165.0	-0.3	14.7	2.480	16.710	3.400	0.700	1.920	1.080
180.0	0.3	269.3	2.420	12.900	3.670	0.720	3.160	1.030
195.0	0.2	357.0	2.690	14.650	3.980	0.720	2.850	1.080
210.0	0.3	363.7	2.870	14.430	3.820	0.750	3.420	1.040
225.0	0.8	262.8	3.840	14.860	1.900	0.980	4.930	0.390
240.0	0.8	273.9	3.620	14.940	1.610	0.990	4.890	0.280
255.0	0.8	286.8	4.130	14.750	2.170	0.960	4.770	0.550
270.0	0.6	298.1	3.730	15.200	3.250	0.900	4.690	0.770
285.0	0.3	307.8	3.790	14.210	3.550	0.850	4.430	0.890
300.0	0.2	317.8	3.160	14.410	4.130	0.800	4.250	0.980
315.0	0.1	328.1	2.980	15.000	3.840	0.760	3.780	1.040
330.0	0.1	338.9	2.640	13.600	3.780	0.720	3.110	1.090
345.0	0.1	347.1	2.370	9.960	3.870	0.690	2.320	1.110

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.9: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	4.8	-1.2	2.230	2.890	4.330	0.680	0.510	1.140
15.0	4.8	13.1	2.280	7.000	4.190	0.690	1.740	1.130
30.0	4.7	27.5	2.480	10.300	4.510	0.720	2.960	1.100
45.0	4.7	42.0	2.730	11.910	4.210	0.770	3.670	1.020
60.0	4.6	55.9	2.990	14.350	3.350	0.840	4.170	0.890
75.0	4.6	69.8	3.180	14.170	2.140	0.910	4.390	0.630
90.0	4.5	83.1	3.330	14.700	0.970	0.960	4.590	0.240
105.0	4.3	93.7	3.380	14.700	1.130	0.950	4.750	0.200
120.0	4.0	99.6	3.100	15.420	2.010	0.920	4.750	0.340
135.0	3.9	108.3	3.010	16.580	2.700	0.880	4.670	0.540
150.0	4.3	141.5	2.560	11.760	3.350	0.730	3.220	0.900
165.0	4.6	161.8	2.300	7.510	3.650	0.670	1.800	0.940
180.0	4.8	178.8	2.120	4.810	3.430	0.660	0.940	0.960
195.0	4.8	195.3	2.310	6.490	3.680	0.670	2.080	0.950
210.0	4.7	212.6	2.590	9.780	3.450	0.730	3.200	0.920
225.0	4.5	231.0	2.630	11.340	3.040	0.810	4.070	0.840
240.0	4.5	247.6	2.960	12.100	2.720	0.900	4.490	0.640
255.0	4.6	260.4	3.390	12.550	1.430	0.960	4.610	0.340
270.0	4.7	274.3	3.400	13.620	0.850	0.980	4.500	0.170
285.0	4.8	288.1	3.880	13.290	2.360	0.940	4.280	0.590
300.0	4.8	302.1	3.260	13.270	3.460	0.870	4.210	0.870
315.0	4.8	316.0	2.740	11.390	4.180	0.790	3.580	1.010
330.0	4.8	330.2	2.480	9.980	4.200	0.740	2.840	1.090
345.0	4.8	344.5	2.320	6.900	4.310	0.690	1.840	1.130

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.10: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.7	-0.4	2.570	3.040	3.940	0.710	0.310	1.140
15.0	9.7	14.6	2.580	5.290	3.850	0.720	1.150	1.130
30.0	9.7	29.6	2.890	8.910	3.600	0.750	2.080	1.090
45.0	9.8	44.5	2.860	10.950	3.530	0.810	2.790	1.010
60.0	9.8	59.3	3.290	12.370	3.660	0.870	3.360	0.850
75.0	9.8	74.0	3.340	12.940	2.130	0.920	3.610	0.540
90.0	9.8	88.8	2.820	14.540	0.420	0.930	4.000	0.100
105.0	9.8	103.6	3.310	16.450	1.380	0.900	4.270	0.380
120.0	9.7	118.2	2.900	17.280	2.230	0.830	4.420	0.630
135.0	9.7	133.4	2.780	17.250	3.020	0.760	4.000	0.750
150.0	9.7	148.9	2.080	13.730	2.490	0.690	3.820	0.830
165.0	9.7	164.2	1.730	11.150	2.330	0.650	2.870	0.860
180.0	9.8	179.4	1.910	8.330	2.690	0.650	1.720	0.870
195.0	9.8	194.7	1.910	7.540	2.510	0.660	2.090	0.870
210.0	9.8	210.3	2.040	10.160	2.690	0.700	3.580	0.840
225.0	9.7	225.9	2.720	12.800	2.840	0.770	4.110	0.790
240.0	9.7	241.3	3.180	15.550	2.680	0.850	4.540	0.660
255.0	9.8	256.1	3.110	12.920	1.560	0.930	4.410	0.410
270.0	9.8	270.9	3.650	12.860	0.460	0.970	4.170	0.090
285.0	9.9	285.5	3.640	12.010	2.110	0.960	3.780	0.520
300.0	9.8	300.1	3.380	11.730	3.130	0.890	3.420	0.850
315.0	9.8	314.9	2.820	11.060	3.540	0.820	2.840	1.010
330.0	9.8	329.7	2.960	8.440	3.890	0.760	2.030	1.100
345.0	9.8	344.6	2.480	5.510	3.980	0.730	1.150	1.130

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.11: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.7	-0.3	2.330	4.950	3.650	0.760	0.400	1.140
15.0	14.7	14.8	2.350	6.390	3.650	0.770	1.010	1.120
30.0	14.7	29.8	3.010	8.950	3.940	0.800	1.760	1.080
45.0	14.7	44.8	2.890	10.060	3.430	0.840	2.400	1.000
60.0	14.7	59.7	2.920	13.060	3.000	0.890	3.050	0.840
75.0	14.8	74.6	3.750	14.500	2.290	0.910	3.120	0.530
90.0	14.8	89.4	2.920	14.760	0.380	0.910	3.590	0.110
105.0	14.7	104.3	3.800	18.920	1.240	0.860	4.030	0.360
120.0	14.7	119.1	2.830	19.780	1.860	0.780	5.310	0.570
135.0	14.7	134.4	2.250	20.530	2.350	0.730	5.390	0.690
150.0	14.7	149.6	1.960	13.680	2.090	0.670	3.660	0.750
165.0	14.7	164.7	2.040	9.250	2.510	0.640	1.890	0.760
180.0	14.7	179.7	1.820	8.130	2.250	0.640	1.240	0.790
195.0	14.7	194.7	1.840	10.930	2.440	0.650	1.940	0.800
210.0	14.7	209.8	2.080	16.920	2.530	0.690	3.600	0.790
225.0	14.7	225.3	2.410	17.110	2.650	0.750	5.630	0.730
240.0	14.7	240.6	3.510	18.210	2.340	0.840	5.530	0.620
255.0	14.8	255.4	3.600	15.740	1.470	0.910	4.660	0.400
270.0	14.8	270.3	3.450	14.420	0.500	0.960	4.180	0.120
285.0	14.8	285.1	3.940	13.190	1.940	0.960	3.570	0.510
300.0	14.7	299.9	3.070	12.940	2.860	0.920	3.110	0.840
315.0	14.7	314.7	2.830	11.400	3.350	0.860	2.360	1.000
330.0	14.7	329.7	3.070	8.830	3.810	0.810	1.600	1.080
345.0	14.7	344.7	2.370	6.510	3.670	0.770	0.830	1.120

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table R.12: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.2	2.900	7.130	3.680	0.830	0.590	1.110
15.0	19.6	14.9	2.850	8.790	3.730	0.830	1.090	1.100
30.0	19.6	29.9	3.030	10.320	3.560	0.850	1.720	1.060
45.0	19.6	44.9	3.020	12.340	3.480	0.880	2.350	0.980
60.0	19.6	59.9	3.260	14.740	2.860	0.910	3.000	0.830
75.0	19.7	74.8	3.710	14.440	2.330	0.910	2.670	0.530
90.0	19.7	89.7	2.870	14.620	0.460	0.880	3.190	0.140
105.0	19.7	104.7	3.340	18.280	1.170	0.830	3.810	0.330
120.0	19.6	119.6	2.520	22.640	1.590	0.760	6.570	0.520
135.0	19.7	134.8	2.160	18.110	1.890	0.690	4.220	0.580
150.0	19.7	149.8	1.750	12.880	1.810	0.680	2.900	0.700
165.0	19.7	164.8	1.620	11.140	1.770	0.520	1.460	0.590
180.0	19.6	179.8	1.520	14.700	1.710	0.550	1.370	0.620
195.0	19.7	194.9	1.450	15.130	1.820	0.540	1.950	0.650
210.0	19.7	209.9	1.900	19.590	1.980	0.640	3.140	0.660
225.0	19.6	225.0	2.110	25.860	2.270	0.740	6.200	0.720
240.0	19.7	240.3	2.610	21.800	2.130	0.810	7.190	0.600
255.0	19.7	255.2	3.310	18.570	1.280	0.890	4.970	0.390
270.0	19.7	270.1	3.380	16.580	0.650	0.940	4.220	0.150
285.0	19.7	285.0	3.420	14.860	1.910	0.970	3.390	0.510
300.0	19.7	299.9	3.300	14.140	2.760	0.940	2.750	0.820
315.0	19.6	314.8	2.770	12.380	3.050	0.900	1.940	0.980
330.0	19.6	329.8	3.220	9.840	3.640	0.860	1.230	1.060
345.0	19.6	344.8	2.850	7.700	3.980	0.840	0.660	1.100

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.13: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.7	-0.1	3.110	7.390	3.750	0.900	0.610	1.080
15.0	24.7	15.0	3.080	8.410	3.690	0.900	1.050	1.060
30.0	24.7	30.0	3.370	10.160	3.660	0.910	1.620	1.030
45.0	24.7	45.0	3.480	11.560	3.280	0.930	2.220	0.960
60.0	24.7	60.0	3.410	14.200	2.870	0.930	2.950	0.810
75.0	24.7	74.9	3.410	12.490	1.930	0.910	2.410	0.530
90.0	24.7	89.8	2.750	13.790	0.570	0.850	2.980	0.160
105.0	24.7	104.8	3.170	18.470	1.180	0.800	3.760	0.310
120.0	24.7	119.9	2.410	21.710	1.460	0.740	6.170	0.450
135.0	24.7	134.9	2.060	15.750	1.600	0.650	4.360	0.540
150.0	24.7	149.9	1.920	12.580	2.070	0.730	3.340	0.710
165.0	24.7	164.9	1.850	10.330	2.150	0.660	1.510	0.700
180.0	24.8	179.9	1.820	10.590	2.220	0.610	0.990	0.700
195.0	24.7	194.9	1.650	15.100	2.000	0.520	1.830	0.620
210.0	24.7	210.0	1.950	21.070	2.030	0.640	3.640	0.650
225.0	24.7	225.0	2.170	25.780	1.700	0.770	5.700	0.670
240.0	24.7	240.1	2.590	29.580	2.060	0.780	7.720	0.550
255.0	24.7	255.1	3.450	22.130	1.210	0.860	4.810	0.370
270.0	24.7	270.1	3.490	16.870	0.710	0.920	4.040	0.170
285.0	24.7	285.0	3.270	14.650	1.730	0.960	3.110	0.510
300.0	24.7	299.9	3.620	13.210	2.940	0.960	2.470	0.800
315.0	24.7	314.9	3.280	12.070	3.180	0.950	1.700	0.950
330.0	24.7	329.9	3.620	9.680	3.520	0.920	1.050	1.030
345.0	24.7	344.9	3.230	7.760	3.550	0.910	0.570	1.060

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.14:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.7	-0.0	3.440	6.920	3.510	0.970	0.560	1.040
15.0	29.7	15.0	3.380	7.440	3.380	0.970	0.940	1.030
30.0	29.7	30.0	3.440	9.310	3.530	0.970	1.470	1.000
45.0	29.7	45.0	3.600	11.510	3.170	0.980	2.100	0.930
60.0	29.7	60.0	3.070	13.890	2.380	0.970	2.940	0.790
75.0	29.7	74.9	3.260	10.750	1.720	0.920	2.260	0.530
90.0	29.7	89.9	2.610	12.680	0.650	0.830	2.940	0.180
105.0	29.7	104.9	2.600	15.270	0.880	0.780	3.950	0.290
120.0	29.7	119.9	2.960	30.860	2.340	0.730	8.010	0.500
135.0	29.7	134.9	1.950	19.990	1.780	0.610	5.070	0.540
150.0	29.8	149.9	2.030	13.570	2.070	0.650	3.150	0.670
165.0	29.6	164.9	1.970	9.920	2.160	0.610	1.750	0.710
180.0	30.1	179.9	1.580	11.120	2.140	0.580	1.160	0.690
195.0	29.7	194.9	2.020	14.810	2.320	0.610	2.290	0.700
210.0	29.8	210.0	1.840	18.100	1.920	0.640	3.620	0.640
225.0	29.8	225.2	1.420	21.610	1.410	0.520	4.590	0.500
240.0	29.7	240.1	2.400	33.670	1.950	0.750	7.900	0.510
255.0	29.7	255.1	3.180	21.040	1.110	0.820	4.320	0.350
270.0	29.7	270.0	3.380	15.620	0.760	0.880	3.540	0.200
285.0	29.7	285.0	3.400	14.000	1.750	0.950	2.700	0.510
300.0	29.7	299.9	3.160	12.530	2.460	0.980	2.380	0.780
315.0	29.7	314.9	3.560	11.350	3.320	0.990	1.580	0.920
330.0	29.7	329.9	3.360	9.380	3.140	0.980	1.000	0.990
345.0	29.7	344.9	3.290	6.960	3.490	0.970	0.580	1.030

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table R.15: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 0.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	-0.1	-14.8	1.870	10.290	6.140	0.490	2.120	1.640
15.0	-0.3	-8.0	1.720	7.890	5.720	0.460	1.460	1.630
30.0	-0.8	2.9	1.630	7.570	5.810	0.460	1.530	1.610
45.0	-1.2	14.5	2.010	15.930	5.970	0.500	2.860	1.640
60.0	-2.4	-38.4	4.420	43.020	6.280	0.950	6.070	1.390
75.0	-2.0	-24.4	5.010	38.990	4.770	0.940	6.760	1.460
90.0	-2.7	-27.4	3.840	28.270	6.680	0.910	6.660	1.530
105.0	-2.5	-4.7	3.710	26.250	5.210	0.880	6.530	1.530
120.0	-1.5	23.5	4.840	31.530	5.600	0.960	6.450	1.320
135.0	-3.6	104.8	4.580	39.430	4.650	1.150	5.880	1.150
150.0	-4.6	112.2	4.010	20.170	5.380	1.060	5.500	1.370
165.0	-2.6	39.5	3.600	18.140	5.340	0.830	4.940	1.460
180.0	-0.3	358.6	4.490	22.360	5.610	0.540	2.880	1.610
195.0	-0.1	372.2	2.760	14.720	5.610	0.570	2.980	1.650
210.0	-0.3	378.0	3.130	15.580	6.160	0.650	3.460	1.660
225.0	-0.3	382.0	3.270	15.190	6.400	0.760	4.020	1.660
240.0	0.1	385.1	3.880	17.100	5.710	0.820	4.490	1.680
255.0	0.7	332.4	3.900	20.870	6.540	1.030	5.240	1.620
270.0	0.8	335.1	3.670	20.450	5.030	0.960	5.120	1.680
285.0	0.3	309.4	3.370	19.550	5.610	0.860	4.630	1.730
300.0	0.1	316.4	2.730	18.210	5.550	0.760	4.160	1.730
315.0	-0.2	324.7	2.470	17.860	5.850	0.670	3.820	1.720
330.0	-0.1	331.9	2.470	17.630	5.730	0.590	3.170	1.690
345.0	-0.0	338.4	2.240	11.790	6.210	0.530	2.500	1.660

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.16:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	4.5	-2.4	1.750	5.970	5.090	0.480	1.000	1.600
15.0	4.4	11.9	1.700	6.570	5.420	0.500	1.370	1.620
30.0	4.2	24.6	2.100	9.280	5.780	0.560	2.230	1.660
45.0	3.8	29.7	2.080	13.270	6.090	0.600	2.840	1.680
60.0	3.3	30.9	2.230	14.270	5.760	0.610	3.010	1.680
75.0	3.0	37.8	2.590	19.140	5.710	0.680	3.670	1.680
90.0	3.1	40.6	2.870	19.470	5.900	0.730	4.000	1.680
105.0	3.4	42.5	3.340	17.730	5.060	0.760	3.860	1.680
120.0	3.6	43.3	3.180	15.460	5.570	0.760	3.870	1.690
135.0	3.6	43.1	3.100	17.570	5.490	0.740	3.770	1.690
150.0	3.5	41.8	2.750	18.210	5.730	0.720	3.650	1.700
165.0	3.3	51.9	3.470	16.580	5.580	0.690	3.940	1.680
180.0	4.6	179.4	1.560	5.440	3.750	0.430	1.250	1.150
195.0	4.3	199.3	1.780	10.030	3.850	0.490	2.300	1.230
210.0	4.1	353.6	2.830	11.890	5.560	0.550	1.920	1.590
225.0	4.3	308.0	3.870	15.000	5.440	0.890	3.980	1.660
240.0	4.2	360.6	4.810	21.120	5.250	0.800	3.740	1.590
255.0	4.5	292.7	3.960	19.790	4.660	1.160	4.550	1.470
270.0	4.3	298.9	4.520	17.300	4.910	1.050	4.480	1.600
285.0	4.2	303.3	3.940	22.710	5.250	0.980	4.580	1.670
300.0	4.3	306.9	3.570	16.070	5.750	0.910	4.130	1.720
315.0	4.4	316.9	3.120	15.510	5.370	0.750	3.450	1.760
330.0	4.5	329.6	2.270	12.190	5.680	0.610	2.710	1.720
345.0	4.5	343.5	2.060	7.760	5.200	0.520	1.630	1.640

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.17: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.5	-0.7	1.950	6.780	4.930	0.590	1.050	1.580
15.0	9.5	14.2	2.040	6.520	4.970	0.610	1.140	1.600
30.0	9.4	29.1	2.280	9.240	5.070	0.680	1.840	1.670
45.0	9.4	44.0	2.870	15.660	5.610	0.830	2.840	1.710
60.0	9.4	58.3	3.440	19.740	4.890	1.020	3.470	1.640
75.0	9.2	70.1	4.080	22.360	4.840	1.190	3.930	1.350
90.0	8.3	76.0	4.230	21.580	3.710	1.250	4.370	1.100
105.0	8.0	77.5	4.400	33.960	3.960	1.230	4.530	1.030
120.0	8.0	82.5	5.060	31.450	3.670	1.250	5.330	0.800
135.0	8.1	83.6	5.310	31.370	3.260	1.250	5.230	0.930
150.0	9.2	146.2	1.420	17.140	3.110	0.550	6.080	1.120
165.0	9.5	162.8	1.280	19.300	2.770	0.440	5.650	1.020
180.0	9.7	178.8	1.070	15.570	2.710	0.420	3.880	0.980
195.0	9.7	195.2	1.370	12.160	2.870	0.450	3.610	1.040
210.0	9.4	212.2	1.430	15.910	3.030	0.560	5.280	1.140
225.0	8.4	264.4	4.890	32.280	4.770	1.270	5.570	0.760
240.0	8.5	275.7	4.350	30.490	4.830	1.340	4.970	0.750
255.0	8.5	278.2	4.750	30.930	3.900	1.340	4.860	0.800
270.0	8.7	281.1	6.140	47.450	3.400	1.340	4.660	0.950
285.0	9.5	288.1	4.290	26.800	5.000	1.260	4.000	1.340
300.0	9.6	300.8	3.430	15.640	5.480	1.060	3.570	1.670
315.0	9.5	314.8	2.980	17.640	5.410	0.860	2.980	1.730
330.0	9.5	329.6	2.380	10.590	4.950	0.700	2.130	1.690
345.0	9.5	344.4	2.160	9.130	5.170	0.620	1.440	1.610

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.18: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.5	-0.4	2.380	7.910	4.580	0.720	1.120	1.530
15.0	14.5	14.6	2.560	7.530	4.550	0.740	1.060	1.560
30.0	14.5	29.7	2.770	10.070	5.090	0.820	1.590	1.630
45.0	14.5	44.7	2.960	13.850	5.470	0.950	2.210	1.670
60.0	14.6	59.4	3.620	19.010	5.280	1.120	3.020	1.590
75.0	14.6	73.5	4.510	23.970	4.740	1.260	3.300	1.240
90.0	14.3	87.1	4.560	23.730	1.990	1.280	4.230	0.400
105.0	14.0	100.9	5.230	42.580	3.390	1.110	6.210	0.680
120.0	14.1	116.3	3.090	28.050	4.130	0.880	7.910	1.000
135.0	14.4	132.7	2.590	24.160	3.530	0.640	8.570	0.960
150.0	14.5	148.8	1.530	22.630	2.580	0.500	6.790	0.890
165.0	14.6	164.3	1.150	18.720	2.360	0.420	3.860	0.860
180.0	14.7	179.4	1.580	14.170	3.140	0.470	2.600	0.970
195.0	14.7	194.5	1.120	17.140	2.320	0.420	3.500	0.870
210.0	14.6	209.8	1.500	21.170	2.700	0.520	6.190	0.970
225.0	14.4	227.3	2.690	23.730	3.490	0.700	8.560	1.060
240.0	14.2	243.7	3.050	22.890	3.640	0.950	7.630	1.090
255.0	14.0	259.3	5.200	33.560	3.010	1.200	6.430	0.760
270.0	14.2	273.5	5.190	27.420	3.120	1.360	4.850	0.440
285.0	14.7	286.4	4.220	17.820	5.220	1.320	3.640	1.260
300.0	14.6	300.1	3.780	14.310	4.980	1.160	3.170	1.610
315.0	14.5	314.7	2.960	12.740	4.880	0.980	2.600	1.690
330.0	14.5	329.6	2.680	10.840	4.920	0.840	1.870	1.640
345.0	14.5	344.6	2.730	8.510	4.700	0.750	1.230	1.570

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.19: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.3	2.840	10.130	4.390	0.850	1.330	1.480
15.0	19.6	14.8	2.780	10.050	4.720	0.870	1.250	1.500
30.0	19.6	29.8	3.240	13.430	5.290	0.950	1.600	1.570
45.0	19.5	44.9	3.330	15.840	4.750	1.070	2.070	1.610
60.0	19.6	59.6	4.350	21.730	5.350	1.200	2.740	1.540
75.0	19.6	74.1	4.220	21.080	4.130	1.290	2.910	1.200
90.0	19.4	88.4	4.530	26.610	2.730	1.240	4.080	0.330
105.0	19.4	103.2	5.080	34.210	2.680	1.030	6.730	0.650
120.0	19.5	118.4	2.830	30.240	3.180	0.800	10.690	0.840
135.0	19.3	134.2	1.910	30.240	3.220	0.630	10.150	0.950
150.0	19.6	149.3	1.660	22.040	3.320	0.550	6.080	0.950
165.0	19.8	164.5	1.390	19.400	2.740	0.420	3.170	0.790
180.0	19.6	179.3	1.420	20.460	2.920	0.400	3.240	0.770
195.0	19.8	194.9	1.190	23.400	2.460	0.370	3.820	0.750
210.0	19.6	210.1	1.330	32.720	2.930	0.540	7.010	0.960
225.0	19.4	225.5	1.950	32.300	3.490	0.660	10.760	1.050
240.0	19.5	241.9	4.310	30.690	3.670	0.880	11.210	0.960
255.0	19.3	257.1	5.600	37.170	3.500	1.140	7.390	0.760
270.0	19.4	271.8	4.970	31.900	3.230	1.340	5.420	0.350
285.0	19.6	285.9	4.540	13.410	4.020	1.380	3.930	1.200
300.0	19.6	300.0	3.950	16.530	5.300	1.260	3.300	1.560
315.0	19.6	314.8	3.480	11.490	4.790	1.100	2.460	1.620
330.0	19.6	329.8	3.110	10.420	4.980	0.970	1.840	1.580
345.0	19.6	344.8	2.770	8.740	4.660	0.880	1.260	1.510

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table R.20: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.6	-0.1	2.960	11.900	4.180	0.950	1.480	1.410
15.0	24.6	14.8	2.790	12.140	4.300	0.970	1.500	1.430
30.0	24.6	29.9	3.240	14.900	4.750	1.050	1.810	1.500
45.0	24.5	44.9	3.630	18.180	5.060	1.170	2.140	1.550
60.0	24.5	59.7	4.180	18.730	4.620	1.280	2.540	1.490
75.0	24.5	74.3	4.570	24.880	3.970	1.320	2.670	1.160
90.0	24.4	88.9	4.780	25.270	1.610	1.190	4.030	0.310
105.0	24.5	104.1	3.620	32.610	2.680	0.970	8.030	0.600
120.0	24.4	119.5	2.820	34.590	3.140	0.720	12.670	0.730
135.0	24.3	134.5	1.550	29.870	2.550	0.620	9.240	0.880
150.0	24.2	149.6	1.360	22.860	3.030	0.480	5.450	0.820
165.0	24.5	164.4	1.270	22.670	2.750	0.400	3.740	0.730
180.0	24.8	179.7	1.250	25.470	2.470	0.370	3.180	0.710
195.0	24.6	194.6	1.240	27.180	2.240	0.380	4.710	0.710
210.0	24.2	209.4	1.280	28.320	2.630	0.450	6.490	0.780
225.0	24.4	225.6	2.320	36.790	3.370	0.660	10.470	0.970
240.0	24.3	241.1	4.160	41.650	3.860	0.800	14.510	0.930
255.0	24.4	256.3	5.370	37.450	2.970	1.110	8.840	0.740
270.0	24.4	271.2	4.910	25.900	2.610	1.320	5.900	0.350
285.0	24.6	285.6	4.640	18.470	4.070	1.420	4.410	1.160
300.0	24.6	300.1	4.190	16.560	4.610	1.340	3.700	1.500
315.0	24.6	314.9	3.870	14.220	5.120	1.210	2.890	1.560
330.0	24.6	329.9	3.480	12.210	5.020	1.080	2.080	1.500
345.0	24.6	344.9	3.140	11.510	4.490	0.980	1.680	1.430

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.21: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.6	-0.1	2.990	13.780	4.150	1.010	1.670	1.320
15.0	29.6	14.9	3.200	13.350	4.240	1.040	1.550	1.350
30.0	29.6	29.9	3.460	16.700	4.380	1.130	1.850	1.420
45.0	29.6	44.9	3.970	19.140	4.740	1.250	2.190	1.480
60.0	29.5	59.8	4.170	22.360	4.450	1.350	2.610	1.440
75.0	29.5	74.5	4.340	21.350	3.520	1.350	2.630	1.130
90.0	29.5	89.2	4.040	23.010	1.770	1.170	3.980	0.310
105.0	29.5	104.5	3.420	37.230	3.660	0.940	10.790	0.610
120.0	29.2	119.5	2.890	42.650	3.600	0.770	14.020	0.870
135.0	29.3	134.5	1.570	28.870	2.420	0.580	8.140	0.860
150.0	29.4	149.7	1.460	23.930	2.410	0.450	5.140	0.750
165.0	29.7	164.1	1.150	27.630	2.450	0.350	4.400	0.640
180.0	29.2	179.5	1.250	27.130	2.280	0.370	4.710	0.680
195.0	29.8	194.6	1.250	31.570	2.600	0.340	5.580	0.630
210.0	29.5	209.8	1.450	29.330	2.430	0.460	6.460	0.750
225.0	29.3	224.9	1.740	32.340	2.570	0.590	8.670	0.910
240.0	29.3	240.8	2.860	41.120	2.960	0.730	14.080	0.890
255.0	29.4	255.7	4.330	46.180	3.440	1.070	10.770	0.770
270.0	29.5	270.8	4.880	36.640	3.240	1.290	6.050	0.370
285.0	29.6	285.5	4.720	24.050	3.640	1.440	5.280	1.120
300.0	29.6	300.2	4.380	18.000	4.760	1.400	3.990	1.430
315.0	29.6	315.1	3.830	14.940	4.620	1.290	3.130	1.480
330.0	29.6	330.1	3.750	13.440	4.480	1.150	2.290	1.410
345.0	29.6	345.0	3.440	13.080	4.530	1.040	1.830	1.350

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.22:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	0.0	-11.0	3.450	14.170	6.110	1.040	2.980	1.680
15.0	-0.4	-7.0	3.320	13.220	5.530	1.030	2.640	1.670
30.0	-1.1	-0.7	3.160	12.550	5.430	1.010	2.740	1.670
45.0	-1.6	-77.7	4.650	20.550	4.510	1.300	6.950	1.000
60.0	-0.6	35.0	3.590	19.660	5.770	1.100	5.420	1.510
75.0	-0.5	50.5	3.890	20.250	4.850	1.190	5.990	1.340
90.0	-0.4	65.8	4.890	19.910	3.840	1.300	6.390	1.010
105.0	-0.4	80.4	5.200	19.510	2.090	1.380	6.550	0.530
120.0	-1.0	95.1	4.980	20.310	2.490	1.400	6.750	0.380
135.0	-2.0	104.1	4.660	21.070	3.190	1.360	6.830	0.730
150.0	-1.2	15.5	3.840	21.030	5.520	1.100	4.610	1.520
165.0	-0.6	9.6	3.070	23.060	6.120	1.040	3.140	1.650
180.0	-0.2	354.8	3.360	17.050	5.650	1.050	3.710	1.640
195.0	0.1	367.9	3.800	19.530	6.110	1.080	4.120	1.620
210.0	0.0	382.4	4.150	18.600	5.510	1.140	4.920	1.560
225.0	1.6	270.7	5.420	21.040	3.160	1.480	6.500	0.530
240.0	1.4	276.8	5.740	20.870	2.490	1.480	6.350	0.490
255.0	1.3	287.6	6.060	23.540	3.340	1.420	6.180	0.860
270.0	1.0	297.2	6.410	19.950	4.240	1.350	5.940	1.130
285.0	0.7	305.8	5.060	18.740	5.100	1.280	5.830	1.310
300.0	0.4	314.7	4.680	18.050	5.870	1.210	5.470	1.430
315.0	0.1	322.5	4.720	18.030	5.590	1.170	5.200	1.510
330.0	-0.1	331.8	4.120	18.310	5.670	1.120	4.690	1.570
345.0	0.0	343.1	3.700	17.610	6.070	1.070	3.880	1.640

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.23: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	4.6	-2.9	3.390	8.060	6.250	1.020	1.530	1.690
15.0	4.2	5.5	3.560	10.920	6.590	1.020	2.450	1.690
30.0	3.5	0.1	3.520	14.940	6.690	1.030	3.050	1.690
45.0	3.4	10.1	4.000	16.780	6.210	1.040	3.960	1.660
60.0	3.5	24.4	4.350	18.290	5.150	1.080	4.800	1.590
75.0	3.8	50.0	4.530	21.000	4.570	1.200	5.720	1.370
90.0	3.7	61.7	5.190	20.020	4.640	1.270	5.920	1.150
105.0	3.7	75.0	4.160	20.980	2.590	1.340	6.190	0.740
120.0	3.6	89.8	5.310	21.430	1.720	1.370	6.450	0.250
135.0	3.4	101.4	4.840	24.130	2.770	1.340	6.590	0.560
150.0	3.6	48.6	4.920	20.960	5.550	1.190	5.650	1.410
165.0	3.4	49.4	4.670	20.710	5.720	1.170	5.540	1.480
180.0	4.5	177.6	3.310	8.820	5.290	0.980	1.730	1.420
195.0	4.5	197.9	3.630	10.210	5.410	1.020	3.010	1.420
210.0	4.4	244.0	5.330	17.030	4.840	1.320	5.710	1.040
225.0	4.4	257.1	4.620	18.390	4.200	1.410	6.170	0.710
240.0	4.4	267.8	4.760	17.540	2.830	1.450	6.140	0.410
255.0	4.4	278.7	6.000	23.020	2.420	1.450	6.090	0.540
270.0	4.4	287.7	4.820	18.990	3.120	1.420	6.040	0.830
285.0	4.5	295.5	5.640	18.010	3.970	1.360	5.770	1.100
300.0	4.6	305.1	4.600	19.210	5.250	1.280	5.410	1.330
315.0	4.6	317.5	4.120	16.220	5.990	1.180	4.710	1.510
330.0	4.7	330.5	3.830	16.560	6.140	1.100	4.040	1.620
345.0	4.7	343.9	3.520	12.010	6.250	1.040	2.850	1.680

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.24:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.6	-0.8	3.850	5.460	5.810	1.070	0.780	1.690
15.0	9.6	14.1	3.800	8.770	5.900	1.070	1.810	1.670
30.0	9.6	29.1	4.200	11.630	5.300	1.120	3.070	1.610
45.0	9.6	44.0	4.390	13.880	5.190	1.200	3.980	1.500
60.0	9.7	58.7	4.820	16.990	5.310	1.290	4.650	1.260
75.0	9.7	73.1	4.860	19.260	3.270	1.370	5.030	0.830
90.0	9.6	87.5	4.810	19.810	1.100	1.390	5.600	0.200
105.0	9.5	102.1	4.580	24.090	2.140	1.340	5.930	0.510
120.0	9.2	115.8	5.050	23.850	3.670	1.250	5.770	0.880
135.0	9.2	130.7	4.260	23.600	4.170	1.140	5.260	1.070
150.0	9.4	147.3	3.340	16.770	4.050	1.050	5.140	1.230
165.0	9.5	163.2	2.850	16.260	3.740	0.980	4.190	1.280
180.0	9.6	178.9	2.650	13.080	3.730	0.960	2.930	1.280
195.0	9.7	194.8	2.830	9.830	3.660	0.990	3.020	1.290
210.0	9.6	211.2	3.300	12.650	4.150	1.060	4.890	1.270
225.0	9.4	228.3	4.390	18.260	4.290	1.170	5.460	1.140
240.0	9.3	243.9	5.760	19.130	3.390	1.290	6.010	0.930
255.0	9.5	258.0	5.910	19.540	2.210	1.390	6.130	0.550
270.0	9.7	272.3	6.210	20.830	1.330	1.450	5.810	0.200
285.0	9.8	286.5	5.380	18.220	3.430	1.420	5.290	0.810
300.0	9.7	300.6	5.060	15.290	4.610	1.340	4.690	1.260
315.0	9.7	314.9	4.350	13.350	5.190	1.230	3.810	1.500
330.0	9.7	329.6	4.240	11.750	5.670	1.140	2.920	1.620
345.0	9.6	344.4	3.890	9.220	5.650	1.080	1.700	1.670

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.25: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.6	-0.4	3.490	6.250	5.320	1.140	0.740	1.670
15.0	14.6	14.7	3.500	7.920	5.300	1.150	1.550	1.650
30.0	14.6	29.8	4.220	10.820	5.330	1.190	2.560	1.590
45.0	14.6	44.8	4.370	12.680	5.190	1.250	3.360	1.470
60.0	14.7	59.5	4.350	17.050	4.420	1.320	4.170	1.240
75.0	14.7	74.2	5.650	22.500	3.320	1.360	4.500	0.800
90.0	14.7	88.9	4.260	19.540	0.780	1.350	5.130	0.190
105.0	14.7	103.8	5.720	23.940	1.720	1.290	5.620	0.500
120.0	14.5	118.1	5.250	26.120	3.410	1.180	6.700	0.800
135.0	14.5	133.7	3.710	24.340	3.350	1.090	7.020	1.000
150.0	14.6	149.1	3.110	20.190	3.450	1.000	5.320	1.080
165.0	14.7	164.4	3.100	15.730	3.760	0.950	2.790	1.100
180.0	14.7	179.5	2.580	13.020	3.440	0.940	2.110	1.150
195.0	14.7	194.6	2.790	16.060	3.530	0.960	3.040	1.180
210.0	14.7	209.9	3.190	20.350	3.530	1.030	5.260	1.150
225.0	14.6	226.0	3.580	19.730	3.130	1.120	7.610	1.070
240.0	14.5	241.7	4.890	21.990	3.550	1.250	7.350	0.890
255.0	14.7	256.2	5.370	23.570	2.100	1.360	6.590	0.570
270.0	14.7	270.9	5.790	19.530	1.260	1.430	5.900	0.200
285.0	14.8	285.5	5.480	18.600	3.010	1.430	5.160	0.770
300.0	14.7	300.0	4.610	16.290	4.270	1.370	4.310	1.230
315.0	14.6	314.6	4.290	14.450	4.880	1.280	3.270	1.470
330.0	14.6	329.5	4.460	12.410	5.400	1.210	2.220	1.590
345.0	14.6	344.5	3.530	8.080	5.340	1.160	1.260	1.650

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.26: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.6	-0.3	4.230	9.010	5.170	1.230	1.050	1.620
15.0	19.6	14.8	4.040	10.390	5.390	1.240	1.630	1.600
30.0	19.6	29.9	4.420	12.720	5.420	1.260	2.480	1.550
45.0	19.6	44.9	4.640	15.620	4.800	1.310	3.330	1.430
60.0	19.6	59.8	4.640	17.850	4.270	1.340	4.070	1.220
75.0	19.6	74.6	5.540	21.420	3.440	1.350	3.960	0.790
90.0	19.7	89.4	4.350	19.760	0.800	1.300	4.680	0.220
105.0	19.7	104.4	5.070	26.430	1.690	1.240	5.650	0.470
120.0	19.6	119.1	3.960	30.810	2.920	1.140	8.740	0.740
135.0	19.6	134.6	2.950	27.140	2.890	1.030	7.490	0.910
150.0	19.6	149.5	3.170	19.930	3.130	1.020	5.060	1.080
165.0	19.7	164.6	2.420	15.400	2.620	0.780	2.620	0.860
180.0	19.5	179.5	1.840	16.810	2.620	0.710	2.550	0.810
195.0	19.7	194.8	2.170	22.920	2.760	0.810	3.390	0.960
210.0	19.6	210.0	2.730	27.820	2.960	0.950	5.420	1.010
225.0	19.5	225.3	3.270	31.650	3.130	1.080	8.610	1.010
240.0	19.6	240.8	3.670	28.210	2.910	1.220	9.800	0.870
255.0	19.7	255.6	5.360	23.810	2.050	1.330	7.150	0.570
270.0	19.7	270.5	6.170	21.140	1.120	1.410	6.210	0.230
285.0	19.7	285.2	5.080	20.290	2.570	1.450	5.180	0.760
300.0	19.6	299.9	4.890	17.940	3.970	1.410	4.080	1.200
315.0	19.6	314.6	4.150	16.250	4.450	1.350	2.910	1.440
330.0	19.6	329.6	4.840	12.930	5.540	1.290	1.950	1.550
345.0	19.6	344.6	4.390	10.430	5.220	1.250	1.150	1.610

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.27: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.5	-0.2	4.690	11.990	5.350	1.320	1.440	1.570
15.0	24.5	14.9	4.840	13.110	5.360	1.320	1.860	1.560
30.0	24.5	30.0	4.650	14.830	5.100	1.340	2.550	1.510
45.0	24.5	45.0	5.300	16.930	4.720	1.360	3.270	1.400
60.0	24.5	59.9	4.990	19.330	4.140	1.370	4.070	1.190
75.0	24.6	74.7	4.910	18.620	2.730	1.340	3.620	0.800
90.0	24.6	89.6	4.310	19.750	0.880	1.260	4.440	0.260
105.0	24.6	104.6	5.190	27.700	1.720	1.180	5.740	0.430
120.0	24.6	119.8	3.300	28.940	2.270	1.090	9.440	0.670
135.0	24.5	134.7	3.350	26.790	2.860	1.040	7.020	0.860
150.0	24.5	149.7	2.550	17.330	3.170	0.960	4.760	0.970
165.0	24.6	164.7	2.860	18.310	3.330	0.930	2.880	1.000
180.0	24.9	179.8	2.700	18.270	3.300	0.900	2.060	1.050
195.0	24.6	194.6	2.190	22.350	2.790	0.750	3.190	0.900
210.0	24.6	209.9	2.690	29.400	3.030	0.830	5.100	0.870
225.0	24.5	225.1	3.830	37.920	3.740	1.070	8.250	0.960
240.0	24.5	240.3	3.170	37.250	2.710	1.170	11.610	0.850
255.0	24.6	255.3	4.940	35.420	1.850	1.300	7.570	0.560
270.0	24.6	270.3	6.100	25.760	1.330	1.390	6.440	0.270
285.0	24.6	285.1	4.910	22.950	2.640	1.450	5.250	0.750
300.0	24.6	299.9	5.240	19.100	4.320	1.440	3.820	1.170
315.0	24.5	314.7	4.630	17.870	4.640	1.410	2.660	1.390
330.0	24.5	329.7	5.290	14.590	5.030	1.370	1.890	1.500
345.0	24.5	344.8	4.530	12.860	5.160	1.330	1.350	1.550

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table R.28:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.6	-0.1	4.770	14.420	4.810	1.410	1.650	1.510
15.0	29.6	15.0	4.530	14.360	4.890	1.410	1.990	1.510
30.0	29.6	30.0	5.160	15.550	4.770	1.420	2.550	1.460
45.0	29.6	45.0	5.000	17.820	4.750	1.430	3.220	1.370
60.0	29.6	60.0	4.440	19.490	3.690	1.410	4.100	1.170
75.0	29.6	74.8	4.880	17.940	2.670	1.340	3.550	0.800
90.0	29.6	89.7	4.200	19.670	1.060	1.220	4.630	0.290
105.0	29.6	104.8	4.030	22.740	1.260	1.140	6.160	0.390
120.0	29.5	119.8	3.260	32.470	2.450	1.050	10.300	0.680
135.0	29.5	134.7	2.530	22.490	2.320	0.780	6.610	0.730
150.0	29.6	149.7	2.980	19.810	3.210	0.970	4.440	0.970
165.0	29.6	164.5	3.050	20.550	3.530	0.920	3.350	1.070
180.0	30.4	179.8	2.640	23.910	3.260	0.840	2.700	1.000
195.0	29.7	194.8	3.040	24.350	3.540	0.900	3.860	1.060
210.0	29.7	210.0	2.640	25.630	2.580	0.930	4.960	0.950
225.0	29.5	225.0	2.870	35.260	2.580	1.010	7.460	0.850
240.0	29.6	240.1	3.120	37.600	2.210	1.100	9.670	0.700
255.0	29.6	255.1	4.690	33.710	1.670	1.260	7.530	0.540
270.0	29.6	270.1	4.830	29.060	1.360	1.350	6.480	0.310
285.0	29.6	285.1	5.090	25.200	2.560	1.440	5.190	0.750
300.0	29.6	299.9	4.750	20.420	3.570	1.470	3.450	1.140
315.0	29.6	314.9	5.320	17.260	4.860	1.460	2.440	1.340
330.0	29.6	329.9	4.850	14.840	4.680	1.440	1.900	1.450
345.0	29.6	344.9	4.890	14.660	4.790	1.420	1.760	1.500

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table R.29: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 0.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	-1.0	-23.1	5.060	26.210	9.450	1.290	6.700	2.560
15.0	-1.9	-121.3	5.430	27.840	9.400	1.310	8.010	2.430
30.0	-2.9	-77.1	7.990	90.780	9.270	1.590	9.830	2.130
45.0	-4.3	97.6	6.960	90.080	6.440	1.690	10.120	1.860
60.0	-2.8	-80.0	7.070	90.820	7.510	1.770	10.690	1.610
75.0	-0.7	-40.2	6.840	55.750	7.520	1.740	10.820	1.590
90.0	-0.7	-18.6	7.090	52.800	6.420	1.650	10.840	1.920
105.0	-1.4	-40.0	8.700	41.160	8.530	1.540	9.560	2.130
120.0	-1.2	95.7	7.710	52.080	5.300	1.920	10.530	0.770
135.0	-4.2	105.0	7.320	52.560	6.200	1.810	9.990	1.430
150.0	-5.4	58.8	6.530	50.000	9.140	1.600	9.890	2.040
165.0	-8.0	-10.4	4.810	45.400	7.620	1.670	10.900	2.150
180.0	-0.7	10.3	4.700	29.270	8.800	1.260	6.160	2.590
195.0	-1.0	20.6	5.210	26.400	8.790	1.350	6.860	2.510
210.0	-0.3	382.9	5.300	43.130	8.870	1.420	7.000	2.430
225.0	0.2	395.2	6.440	30.490	7.750	1.490	7.480	2.390
240.0	2.7	283.8	7.720	34.790	5.620	2.040	8.990	1.410
255.0	1.1	287.6	7.420	31.980	7.930	1.960	8.670	1.750
270.0	1.5	295.8	7.430	38.360	5.990	1.820	8.810	2.010
285.0	1.3	304.0	7.310	28.050	7.400	1.660	7.990	2.250
300.0	0.9	312.0	8.440	36.500	7.170	1.530	7.360	2.410
315.0	0.3	320.4	5.490	24.960	8.390	1.420	6.640	2.500
330.0	-0.1	327.4	4.610	28.730	9.290	1.340	6.350	2.540
345.0	-0.5	332.8	4.620	26.270	9.600	1.290	6.290	2.570

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.30: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	3.6	-17.0	5.300	25.760	8.660	1.200	4.750	2.620
15.0	2.6	-23.9	4.310	23.560	9.160	1.230	6.230	2.630
30.0	2.4	-17.3	5.060	20.940	8.360	1.210	6.210	2.600
45.0	2.2	-6.9	4.160	21.480	8.680	1.180	6.100	2.600
60.0	2.3	-9.1	7.300	35.260	8.470	1.270	7.680	2.470
75.0	2.4	-1.8	5.490	25.630	8.510	1.270	7.550	2.480
90.0	2.5	21.5	6.770	27.560	8.550	1.350	7.790	2.420
105.0	2.7	26.4	6.260	56.500	8.650	1.380	8.040	2.340
120.0	2.6	17.6	5.130	26.260	8.770	1.250	6.350	2.520
135.0	2.3	22.0	5.920	30.560	8.860	1.280	7.110	2.460
150.0	2.4	27.5	4.740	26.830	9.220	1.290	6.430	2.540
165.0	2.4	32.1	4.890	23.370	8.200	1.330	6.640	2.560
180.0	2.8	71.0	4.920	29.070	8.150	1.320	7.790	2.440
195.0	3.7	365.9	4.270	23.800	8.880	1.210	4.690	2.560
210.0	3.8	372.1	4.670	23.500	8.810	1.260	5.310	2.550
225.0	4.2	351.2	6.370	29.110	8.240	1.500	6.650	2.320
240.0	4.5	295.7	7.890	37.160	6.830	1.980	9.070	1.560
255.0	4.7	289.5	8.050	60.930	6.580	1.930	8.580	1.730
270.0	4.5	296.2	8.340	47.650	7.030	1.820	7.990	2.050
285.0	4.3	303.0	7.170	30.120	7.880	1.710	6.880	2.240
300.0	4.3	309.2	5.870	30.530	7.500	1.580	7.140	2.350
315.0	4.2	316.8	5.640	22.300	8.190	1.460	6.340	2.490
330.0	4.1	329.9	4.510	20.450	8.370	1.300	5.020	2.590
345.0	4.0	340.0	4.090	23.690	8.490	1.200	4.580	2.610

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.31: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 10.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.2	-1.8	4.210	14.210	8.090	1.220	2.320	2.540
15.0	9.0	12.4	4.280	13.600	7.780	1.230	2.750	2.540
30.0	8.8	26.9	4.720	18.050	8.220	1.320	4.020	2.530
45.0	8.8	41.8	5.340	22.900	8.010	1.470	5.130	2.440
60.0	8.8	55.5	6.060	27.000	8.000	1.660	6.080	2.240
75.0	8.4	64.2	5.970	61.450	6.620	1.760	7.070	1.950
90.0	7.9	68.6	7.900	57.290	5.870	1.780	7.660	1.760
105.0	7.8	77.0	6.950	40.990	5.570	1.850	8.370	1.300
120.0	7.7	90.7	7.820	45.650	3.710	1.870	10.160	0.590
135.0	7.5	91.3	8.860	50.180	6.330	1.810	9.940	1.210
150.0	7.8	72.5	8.100	46.100	5.970	1.820	8.080	1.810
165.0	7.7	71.5	7.630	62.550	6.100	1.770	7.960	1.960
180.0	9.2	177.7	2.580	21.090	5.030	1.000	5.290	1.780
195.0	9.2	197.6	3.190	20.610	5.470	1.060	4.900	1.800
210.0	8.4	299.8	8.940	38.250	8.110	1.760	7.880	1.810
225.0	8.3	271.4	8.210	56.400	5.590	2.050	10.420	0.870
240.0	8.3	280.0	10.940	45.680	6.400	2.030	9.020	1.180
255.0	8.4	283.0	7.540	36.400	5.100	2.030	8.400	1.320
270.0	8.5	285.7	9.540	91.130	5.610	2.000	8.410	1.500
285.0	9.1	290.5	8.100	50.660	5.600	1.950	7.440	1.780
300.0	9.3	301.6	5.670	25.540	9.000	1.760	6.440	2.220
315.0	9.2	314.7	5.530	25.860	7.830	1.560	5.730	2.450
330.0	9.2	329.1	4.640	20.680	7.950	1.380	4.390	2.550
345.0	9.2	343.7	4.790	19.360	8.720	1.270	3.300	2.560

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.32: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.4	-0.8	4.670	10.790	7.310	1.380	2.040	2.460
15.0	14.3	14.3	4.600	11.610	7.120	1.410	2.360	2.460
30.0	14.3	29.4	4.520	17.430	7.120	1.490	3.220	2.460
45.0	14.3	44.5	5.110	22.670	7.400	1.620	4.300	2.360
60.0	14.4	59.1	6.460	26.810	6.900	1.790	5.460	2.120
75.0	14.3	72.3	6.670	66.830	5.720	1.910	6.690	1.610
90.0	13.7	85.3	7.850	43.210	4.270	1.930	8.590	0.680
105.0	13.5	99.1	8.760	68.190	3.600	1.810	10.320	0.740
120.0	13.2	110.4	8.360	48.890	5.640	1.620	10.190	1.120
135.0	13.5	127.8	6.600	40.580	5.600	1.350	9.830	1.430
150.0	14.4	148.3	3.120	24.910	4.690	1.070	7.250	1.450
165.0	14.3	163.2	3.310	25.430	5.130	1.020	5.360	1.560
180.0	14.4	178.6	3.190	26.100	5.080	0.920	3.880	1.390
195.0	14.3	193.9	3.400	23.970	5.320	1.040	5.180	1.640
210.0	14.6	209.8	2.960	24.960	4.800	1.100	7.320	1.610
225.0	13.6	236.2	6.600	40.520	5.010	1.520	10.750	1.580
240.0	13.1	253.2	8.740	52.340	5.500	1.790	10.700	1.250
255.0	13.1	265.1	8.570	50.190	3.640	1.960	10.360	0.740
270.0	13.6	275.9	8.740	34.510	3.760	2.060	8.880	0.780
285.0	14.4	287.3	7.740	30.730	5.590	2.020	7.040	1.610
300.0	14.5	300.2	6.890	27.280	7.010	1.880	5.820	2.140
315.0	14.4	314.4	5.570	25.000	7.660	1.690	4.650	2.390
330.0	14.4	329.2	4.890	20.100	7.060	1.530	3.750	2.480
345.0	14.3	344.2	4.810	14.660	7.930	1.420	2.870	2.470

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.33: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.5	-0.4	5.600	11.100	7.600	1.560	2.160	2.350
15.0	19.5	14.7	4.980	12.180	7.320	1.570	2.350	2.350
30.0	19.4	29.8	5.500	17.630	6.930	1.650	3.150	2.350
45.0	19.4	44.9	5.570	23.530	7.020	1.750	3.890	2.280
60.0	19.5	59.5	6.800	26.420	6.760	1.870	4.980	2.060
75.0	19.4	73.7	6.720	57.320	5.290	1.930	6.110	1.530
90.0	19.2	87.7	7.360	35.510	3.410	1.880	8.370	0.530
105.0	19.2	102.7	7.900	47.940	4.100	1.690	10.600	0.810
120.0	19.1	117.2	5.410	37.400	5.230	1.450	12.500	1.120
135.0	19.2	134.2	4.100	42.830	5.000	1.200	11.320	1.310
150.0	19.1	149.0	2.810	27.690	4.440	1.080	8.830	1.500
165.0	19.5	164.0	2.360	19.700	4.020	0.940	4.810	1.400
180.0	19.6	179.5	3.360	23.560	5.520	1.170	3.780	1.640
195.0	19.6	194.8	2.100	27.810	3.910	0.900	5.770	1.410
210.0	19.2	210.4	2.830	34.220	4.520	1.100	9.550	1.550
225.0	19.1	227.3	6.510	46.520	6.340	1.220	12.450	1.360
240.0	18.9	244.4	6.230	40.980	5.230	1.590	13.260	1.310
255.0	18.8	259.5	8.840	42.240	3.370	1.850	11.410	0.870
270.0	19.0	273.1	8.650	34.460	3.410	2.030	9.350	0.590
285.0	19.5	286.3	6.900	25.630	5.320	2.070	7.080	1.530
300.0	19.6	300.0	6.390	25.870	6.840	1.970	5.550	2.080
315.0	19.5	314.5	5.780	19.620	7.300	1.820	4.440	2.310
330.0	19.5	329.4	5.460	17.890	7.040	1.680	3.460	2.370
345.0	19.5	344.5	4.900	12.610	7.350	1.600	2.670	2.360

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.34: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.5	-0.2	5.350	14.430	6.640	1.710	2.530	2.230
15.0	24.5	14.9	6.040	15.870	6.510	1.720	2.720	2.240
30.0	24.5	29.9	6.100	22.470	6.920	1.780	3.290	2.250
45.0	24.4	44.9	6.210	23.790	6.680	1.860	3.880	2.190
60.0	24.4	59.7	5.880	24.640	5.830	1.940	4.600	2.000
75.0	24.4	74.0	6.690	28.530	5.170	1.950	5.620	1.490
90.0	24.3	88.5	7.350	37.320	3.320	1.820	8.650	0.520
105.0	24.3	104.1	7.230	48.420	5.020	1.610	12.740	0.820
120.0	24.1	119.0	5.080	46.060	3.990	1.420	16.360	1.110
135.0	23.7	132.6	5.810	44.070	5.080	1.280	13.750	1.420
150.0	24.2	148.8	3.860	35.340	4.870	1.070	8.900	1.450
165.0	24.8	164.3	2.820	31.370	4.640	0.950	5.270	1.360
180.0	25.3	179.6	3.840	26.590	4.410	0.890	3.990	1.310
195.0	25.2	195.3	2.850	28.360	4.710	0.920	5.010	1.340
210.0	24.2	210.8	3.500	31.660	4.460	1.130	9.340	1.510
225.0	23.7	228.7	7.400	40.480	4.890	1.200	14.270	1.370
240.0	24.1	241.3	5.820	46.300	4.590	1.420	16.590	1.240
255.0	24.0	257.4	8.480	63.410	4.450	1.770	12.970	0.900
270.0	24.2	271.9	8.570	37.580	3.290	2.000	10.060	0.560
285.0	24.5	286.0	7.280	29.610	4.940	2.100	7.870	1.490
300.0	24.5	300.1	6.180	20.960	5.910	2.060	5.740	2.010
315.0	24.5	314.7	6.200	18.990	6.910	1.930	4.770	2.210
330.0	24.5	329.7	6.170	16.040	6.570	1.830	3.670	2.260
345.0	24.5	344.7	5.810	14.460	6.630	1.750	2.970	2.250

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.35: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.6	-0.0	5.830	19.660	6.480	1.830	3.080	2.130
15.0	29.5	15.0	5.490	19.130	6.250	1.840	3.100	2.140
30.0	29.5	30.1	5.790	22.330	6.460	1.890	3.640	2.150
45.0	29.5	45.0	6.500	27.200	6.740	1.960	4.040	2.110
60.0	29.4	59.7	6.590	27.290	5.900	1.990	4.410	1.930
75.0	29.4	74.2	7.030	33.440	4.910	1.960	5.710	1.470
90.0	29.3	88.9	7.610	41.120	2.890	1.770	9.380	0.530
105.0	29.3	104.4	6.920	41.330	3.480	1.520	13.400	0.720
120.0	28.7	118.1	6.790	44.500	4.140	1.290	16.440	1.040
135.0	28.8	133.9	4.960	40.410	5.000	1.300	13.530	1.400
150.0	29.6	148.2	4.090	39.840	4.780	1.050	8.590	1.370
165.0	29.7	163.3	4.200	35.440	6.290	0.960	6.350	1.490
180.0	30.2	178.7	10.820	35.820	15.820	1.060	5.840	1.680
195.0	30.7	194.8	3.300	34.600	4.810	0.870	6.420	1.330
210.0	30.0	210.9	3.590	36.250	5.360	1.020	8.810	1.410
225.0	28.8	227.5	6.550	46.550	5.560	1.450	14.640	1.670
240.0	28.9	241.6	9.250	57.240	4.230	1.320	16.920	1.140
255.0	29.2	256.1	6.590	52.270	3.520	1.710	14.500	0.940
270.0	29.2	271.3	8.450	40.650	3.310	1.980	10.810	0.590
285.0	29.5	285.8	7.340	32.670	4.460	2.140	8.380	1.460
300.0	29.5	300.1	6.860	26.280	6.250	2.120	6.370	1.940
315.0	29.5	314.9	6.600	23.940	6.300	2.040	5.270	2.110
330.0	29.5	329.9	5.960	20.020	6.580	1.940	4.250	2.150
345.0	29.5	345.0	5.750	19.410	6.400	1.860	3.530	2.140

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.



**Table R.36:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg
0.0	-1.0	-20.7	5.780	20.350	6.050	1.910	4.550	2.030
15.0	-2.2	-124.4	6.800	24.500	7.550	1.890	6.320	1.860
30.0	-2.3	-110.4	7.500	25.020	6.170	1.950	7.090	1.660
45.0	-1.8	-91.3	6.620	26.430	5.810	2.040	7.770	1.320
60.0	0.1	49.7	6.290	22.580	6.000	1.980	6.490	1.540
75.0	0.2	66.2	6.900	20.820	4.850	2.070	6.920	1.100
90.0	-0.1	84.2	6.650	21.090	3.070	2.130	7.170	0.520
105.0	-0.6	96.0	7.320	22.510	3.240	2.130	7.350	0.520
120.0	-1.4	105.3	7.350	24.800	3.820	2.110	7.490	0.810
135.0	-2.2	114.0	6.640	26.150	4.450	2.070	7.340	1.100
150.0	-3.1	123.7	6.800	26.570	5.190	2.020	6.860	1.390
165.0	-2.9	87.6	6.400	22.780	6.610	1.930	7.250	1.740
180.0	-1.0	25.0	5.820	23.380	5.990	1.900	4.690	2.010
195.0	1.0	225.4	6.640	23.120	6.420	2.010	6.160	1.660
210.0	1.1	242.1	8.280	26.940	5.890	2.120	6.920	1.300
225.0	0.8	253.0	9.070	28.210	5.040	2.190	7.130	0.930
240.0	0.4	263.2	9.510	26.120	4.240	2.230	7.140	0.580
255.0	0.3	274.2	9.590	24.240	3.270	2.240	6.990	0.480
270.0	0.2	284.7	9.410	23.060	4.580	2.210	6.750	0.790
285.0	0.0	294.0	8.700	23.650	5.370	2.160	6.460	1.120
300.0	-0.2	302.6	7.660	23.160	6.410	2.110	6.210	1.390
315.0	-0.2	311.4	7.840	25.120	6.310	2.060	5.880	1.610
330.0	-0.3	319.8	7.910	25.360	6.070	2.010	5.530	1.760
345.0	-0.5	329.1	6.560	22.270	6.230	1.950	4.970	1.920

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.37: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	3.2	-27.7	7.090	25.410	8.050	1.940	5.510	2.000
15.0	2.8	-20.8	6.910	23.760	8.340	1.910	5.380	2.060
30.0	2.7	-13.3	6.320	22.900	8.310	1.860	5.500	2.050
45.0	2.9	3.4	6.570	21.470	7.710	1.840	5.640	2.030
60.0	3.9	41.9	7.280	21.300	5.560	1.930	5.770	1.750
75.0	4.1	60.1	7.110	22.890	5.400	2.020	6.350	1.290
90.0	4.2	76.0	6.640	22.580	3.430	2.100	6.700	0.720
105.0	4.0	89.6	7.050	23.590	2.030	2.110	6.960	0.320
120.0	3.7	101.3	7.570	27.120	2.770	2.090	7.100	0.570
135.0	3.4	111.1	7.620	30.520	3.500	2.040	7.060	0.890
150.0	2.9	120.9	7.010	30.720	4.400	1.990	6.890	1.190
165.0	2.6	131.7	6.440	29.990	4.910	1.930	6.630	1.450
180.0	2.8	56.5	7.260	24.230	6.450	1.980	7.560	1.850
195.0	4.2	194.8	6.470	18.530	7.590	1.840	3.650	1.840
210.0	4.2	227.1	7.600	23.020	6.100	1.990	5.630	1.540
225.0	4.3	244.3	7.670	22.380	4.190	2.110	6.400	1.140
240.0	4.3	255.9	6.920	23.320	3.020	2.170	6.760	0.770
255.0	4.4	265.5	7.620	23.070	2.210	2.200	6.770	0.440
270.0	4.5	278.2	8.420	22.360	3.040	2.200	6.700	0.460
285.0	4.6	290.8	7.940	24.190	3.340	2.170	6.460	0.970
300.0	4.7	302.8	8.190	21.440	4.720	2.100	6.060	1.410
315.0	4.6	313.9	7.340	20.730	5.870	2.020	5.760	1.700
330.0	4.4	324.5	7.560	25.860	7.100	1.950	5.340	1.880
345.0	4.0	331.6	7.230	24.880	7.890	1.920	4.980	1.980

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.38:** Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	9.5	-1.7	6.220	10.360	7.160	1.850	1.710	2.120
15.0	9.5	13.5	6.200	13.930	7.360	1.860	2.860	2.090
30.0	9.5	28.7	6.400	15.890	6.770	1.890	4.250	1.970
45.0	9.6	43.7	7.460	20.440	6.640	1.950	5.120	1.740
60.0	9.6	58.1	8.030	23.150	5.330	2.030	5.750	1.390
75.0	9.7	73.0	8.200	21.410	3.150	2.080	5.930	0.850
90.0	9.7	87.7	6.490	21.440	1.090	2.110	6.290	0.230
105.0	9.6	102.6	6.580	26.060	1.720	2.060	6.470	0.510
120.0	9.1	115.8	7.790	26.340	3.750	1.990	6.260	0.940
135.0	9.0	130.1	7.180	26.310	4.410	1.910	5.700	1.280
150.0	9.0	145.5	7.150	23.320	5.280	1.840	4.920	1.510
165.0	9.0	160.9	6.500	21.660	6.870	1.760	4.650	1.610
180.0	9.3	177.8	5.970	16.060	5.850	1.770	3.910	1.710
195.0	9.5	194.7	6.180	13.630	6.160	1.780	3.570	1.670
210.0	9.4	211.9	6.870	20.220	5.770	1.880	5.170	1.590
225.0	9.2	229.1	7.760	21.520	4.200	1.990	6.340	1.370
240.0	9.3	244.0	7.790	22.790	3.690	2.080	6.950	1.030
255.0	9.6	257.5	8.420	20.110	1.970	2.150	7.050	0.590
270.0	9.7	271.9	9.030	23.430	1.630	2.190	6.970	0.210
285.0	9.7	286.3	8.220	24.670	3.110	2.190	6.660	0.790
300.0	9.7	300.8	7.820	22.180	5.150	2.110	6.120	1.350
315.0	9.6	314.6	7.110	19.070	6.040	2.030	5.260	1.720
330.0	9.6	328.9	6.390	17.330	6.150	1.940	4.160	1.950
345.0	9.5	343.5	6.370	13.660	6.930	1.890	2.940	2.080

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.39: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	14.5	-0.7	6.750	9.790	7.000	1.900	1.500	2.080
15.0	14.5	14.5	6.550	13.290	7.220	1.900	2.680	2.050
30.0	14.6	29.6	6.560	16.390	6.590	1.920	4.070	1.930
45.0	14.6	44.5	6.850	19.490	5.600	1.980	4.890	1.720
60.0	14.6	59.2	7.320	21.600	4.580	2.030	5.720	1.360
75.0	14.7	74.1	7.880	22.290	3.680	2.060	5.590	0.830
90.0	14.7	89.0	6.510	22.140	0.950	2.060	5.910	0.260
105.0	14.7	103.9	8.470	27.220	2.180	2.010	6.250	0.520
120.0	14.4	118.1	8.850	29.080	3.520	1.930	7.400	0.910
135.0	14.4	133.3	5.640	25.510	3.820	1.880	7.080	1.230
150.0	14.4	148.6	5.370	21.970	4.230	1.760	5.280	1.370
165.0	14.6	163.9	4.750	17.660	4.450	1.720	3.490	1.460
180.0	14.6	179.2	4.770	13.020	4.680	1.750	3.040	1.590
195.0	14.6	194.6	4.610	19.590	4.630	1.740	3.800	1.530
210.0	14.6	210.2	5.430	21.630	4.330	1.810	6.120	1.480
225.0	14.5	226.3	5.700	21.710	3.450	1.930	8.230	1.330
240.0	14.5	241.9	7.550	23.580	3.730	2.000	8.600	1.010
255.0	14.7	256.1	7.860	25.580	2.000	2.120	7.880	0.610
270.0	14.7	270.9	7.450	28.270	1.660	2.160	7.520	0.250
285.0	14.8	285.5	9.830	25.700	3.050	2.150	6.970	0.770
300.0	14.7	300.2	6.980	23.050	4.740	2.110	6.460	1.320
315.0	14.6	314.6	8.410	18.990	6.440	2.040	5.280	1.700
330.0	14.5	329.3	6.970	17.140	6.090	1.970	3.910	1.920
345.0	14.5	344.2	6.410	13.640	7.160	1.920	2.470	2.040

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.40: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 20.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	19.5	-0.4	6.310	12.030	6.230	1.960	1.830	2.040
15.0	19.6	14.8	6.370	13.530	6.170	1.960	2.910	2.010
30.0	19.6	29.9	7.160	16.890	6.590	1.980	4.170	1.900
45.0	19.6	44.9	6.530	19.250	5.470	2.010	5.250	1.700
60.0	19.6	59.7	7.050	22.560	4.820	2.020	6.070	1.350
75.0	19.7	74.5	8.240	27.450	3.450	2.030	5.360	0.850
90.0	19.7	89.4	6.310	21.470	1.190	2.000	5.570	0.320
105.0	19.7	104.4	9.080	27.520	1.980	1.950	6.090	0.500
120.0	19.6	119.0	6.060	29.490	2.750	1.900	9.120	0.880
135.0	19.6	134.3	5.930	29.640	3.900	1.800	7.420	1.110
150.0	19.5	149.3	5.510	22.180	4.420	1.790	6.060	1.430
165.0	19.6	164.4	4.800	15.580	3.910	1.740	3.550	1.430
180.0	19.6	179.5	5.500	18.290	4.900	1.760	3.100	1.500
195.0	19.7	194.7	4.710	27.170	3.990	1.680	4.450	1.370
210.0	19.6	210.0	5.480	36.160	4.820	1.830	7.400	1.490
225.0	19.6	225.3	5.810	33.920	4.310	1.850	9.100	1.250
240.0	19.6	240.9	7.460	31.570	3.370	1.950	10.310	0.980
255.0	19.7	255.5	8.030	31.700	1.960	2.070	8.580	0.610
270.0	19.7	270.4	7.310	31.700	1.580	2.130	7.990	0.300
285.0	19.7	285.3	8.310	30.280	3.470	2.150	7.530	0.760
300.0	19.6	300.0	7.880	25.790	4.510	2.120	6.820	1.300
315.0	19.6	314.6	7.040	23.360	5.950	2.080	5.280	1.660
330.0	19.6	329.4	6.470	18.690	5.810	2.030	3.730	1.880
345.0	19.5	344.5	6.320	14.190	6.190	1.990	2.240	2.000

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.41: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	24.5	-0.2	6.550	16.490	6.880	2.030	2.370	1.980
15.0	24.5	14.9	6.810	17.020	6.130	2.030	3.280	1.950
30.0	24.5	30.0	7.000	19.220	5.850	2.030	4.440	1.860
45.0	24.5	45.0	7.200	22.140	5.180	2.040	5.480	1.670
60.0	24.5	59.9	7.430	23.970	4.590	2.020	6.460	1.350
75.0	24.6	74.6	8.480	22.120	3.730	1.980	5.290	0.870
90.0	24.6	89.5	6.410	22.160	1.280	1.930	5.350	0.380
105.0	24.6	104.6	7.450	25.950	1.570	1.870	5.970	0.460
120.0	24.5	119.5	6.230	36.020	3.120	1.810	10.230	0.820
135.0	24.5	134.5	5.520	33.860	3.840	1.800	9.560	1.200
150.0	24.5	149.4	5.640	26.830	4.340	1.780	6.960	1.330
165.0	24.8	164.5	3.930	18.130	3.570	1.280	3.070	1.070
180.0	24.8	179.7	5.620	21.400	4.440	1.870	2.590	1.440
195.0	24.8	194.9	3.740	21.840	3.590	1.270	2.960	1.100
210.0	24.6	210.1	4.720	34.160	3.920	1.740	7.170	1.310
225.0	24.5	225.2	6.010	43.630	4.500	1.850	9.740	1.240
240.0	24.6	240.3	5.930	40.430	2.960	1.910	11.390	0.960
255.0	24.6	255.2	7.810	37.120	1.990	2.030	9.030	0.620
270.0	24.6	270.2	7.270	33.870	1.660	2.100	8.370	0.350
285.0	24.6	285.1	8.350	32.550	2.840	2.150	8.070	0.770
300.0	24.6	299.9	7.690	29.610	4.050	2.130	6.940	1.270
315.0	24.6	314.7	6.640	24.180	5.150	2.120	5.000	1.620
330.0	24.5	329.6	7.450	23.480	6.520	2.080	3.440	1.830
345.0	24.5	344.7	7.040	18.620	6.910	2.060	2.410	1.940

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table R.42: Course-Keeping Ability and Motion Parameters: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Heave m	Roll deg	Pitch deg	Heave m	Roll deg	Pitch deg
0.0	29.5	-0.1	7.810	21.160	6.690	2.100	3.120	1.920
15.0	29.5	15.0	7.760	21.020	6.760	2.090	3.780	1.900
30.0	29.5	30.1	7.300	23.570	5.870	2.080	4.770	1.810
45.0	29.5	45.0	6.640	24.420	5.050	2.060	5.610	1.650
60.0	29.5	59.9	7.360	27.310	4.540	2.020	6.640	1.350
75.0	29.5	74.7	6.930	24.610	3.400	1.940	5.760	0.900
90.0	29.5	89.6	6.230	27.530	1.680	1.860	6.260	0.450
105.0	29.5	104.6	6.810	37.440	2.020	1.820	6.090	0.450
120.0	29.4	119.7	5.050	36.680	2.830	1.780	11.650	0.860
135.0	29.4	134.5	4.930	28.160	3.060	1.620	8.690	1.020
150.0	29.6	149.4	4.510	25.890	3.590	1.640	5.980	1.280
165.0	29.8	164.5	3.960	23.160	3.930	1.520	3.530	1.340
180.0	29.7	179.3	4.040	25.160	4.650	1.360	2.900	1.370
195.0	30.1	194.8	4.180	25.490	3.740	1.460	3.490	1.310
210.0	29.8	210.1	4.770	26.770	4.030	1.630	5.310	1.260
225.0	29.5	225.0	4.680	38.530	3.080	1.730	8.400	1.040
240.0	29.5	240.1	6.260	46.600	3.270	1.850	11.470	0.940
255.0	29.5	255.1	8.430	39.650	2.000	2.010	9.100	0.630
270.0	29.5	270.1	7.990	36.340	1.810	2.070	8.700	0.410
285.0	29.6	285.1	7.320	38.600	2.910	2.120	8.680	0.780
300.0	29.5	299.9	8.120	32.600	4.550	2.150	6.920	1.250
315.0	29.5	314.8	7.540	27.360	5.510	2.160	4.890	1.580
330.0	29.5	329.8	7.960	26.070	6.070	2.130	3.650	1.780
345.0	29.5	344.8	7.840	20.830	6.750	2.120	2.940	1.880

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

This page intentionally left blank.



**Annex S**  
**Tables of Hangar Deck Accelerations –**  
**Bretschneider Spectrum (Open Ocean)**

---

**Table S.1:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.3	-23.9	0.702	1.634	10.545	0.166	0.315	0.246
15.0	-0.2	-1.1	0.671	0.597	10.439	0.155	0.111	0.217
30.0	-0.1	26.5	0.673	1.530	10.421	0.166	0.389	0.233
45.0	-0.2	38.1	0.771	2.565	10.577	0.179	0.522	0.262
60.0	-0.3	44.6	0.755	3.519	10.864	0.184	0.618	0.284
75.0	-0.5	51.7	0.762	2.795	10.727	0.193	0.766	0.315
90.0	-1.0	58.4	0.722	3.400	11.409	0.196	0.884	0.348
105.0	-1.3	66.4	1.020	6.293	12.679	0.194	1.032	0.410
120.0	-0.7	-18.9	0.801	6.408	12.649	0.177	0.794	0.351
135.0	-2.5	102.8	0.873	4.992	12.074	0.174	1.037	0.506
150.0	-3.0	108.4	0.810	5.508	11.654	0.183	0.981	0.452
165.0	-1.3	19.3	0.738	6.112	12.616	0.161	0.718	0.357
180.0	-1.1	148.2	0.501	1.629	10.677	0.138	0.386	0.215
195.0	-0.3	371.7	0.804	3.085	11.222	0.175	0.545	0.293
210.0	-0.2	378.5	0.896	5.402	11.776	0.180	0.712	0.356
225.0	0.5	308.3	0.850	5.649	12.282	0.175	0.733	0.403
240.0	1.6	290.7	0.925	6.238	12.935	0.207	0.964	0.523
255.0	1.0	293.4	0.928	4.621	12.147	0.210	0.936	0.491
270.0	0.5	298.5	0.765	3.682	11.573	0.209	0.879	0.436
285.0	0.2	303.5	0.826	4.078	11.661	0.204	0.806	0.385
300.0	-0.0	308.0	0.816	2.987	10.934	0.199	0.745	0.357
315.0	-0.1	312.1	0.770	3.295	10.866	0.193	0.672	0.330
330.0	-0.2	316.1	0.714	2.584	10.820	0.188	0.612	0.310
345.0	-0.3	322.9	0.689	2.130	10.792	0.180	0.478	0.283

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.2:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	4.8	-1.1	0.749	0.620	10.575	0.179	0.104	0.269
15.0	4.7	13.7	0.785	0.880	10.663	0.182	0.149	0.269
30.0	4.7	28.4	0.828	1.241	10.750	0.195	0.305	0.290
45.0	4.6	42.9	0.869	2.029	10.752	0.211	0.479	0.320
60.0	4.4	55.4	0.848	2.895	11.055	0.224	0.705	0.369
75.0	4.0	58.1	0.851	3.488	11.251	0.222	0.784	0.384
90.0	3.7	59.3	0.783	4.077	11.688	0.218	0.781	0.382
105.0	3.6	61.5	0.754	4.104	11.347	0.217	0.830	0.400
120.0	3.8	62.7	0.764	3.412	11.676	0.219	0.832	0.415
135.0	3.9	62.8	0.817	3.643	11.470	0.221	0.821	0.416
150.0	4.5	146.7	0.374	1.503	10.378	0.100	0.413	0.132
165.0	4.8	163.9	0.346	1.104	10.276	0.088	0.240	0.101
180.0	4.8	179.2	0.331	0.555	10.352	0.084	0.101	0.096
195.0	4.8	194.6	0.336	0.948	10.373	0.087	0.240	0.104
210.0	4.7	210.8	0.375	1.852	10.401	0.096	0.417	0.131
225.0	4.7	285.0	0.957	4.942	12.866	0.206	0.940	0.588
240.0	4.6	285.7	0.760	6.530	13.398	0.204	0.977	0.618
255.0	4.4	290.0	0.819	3.816	12.025	0.216	0.916	0.548
270.0	4.4	293.0	0.905	5.015	12.211	0.223	0.885	0.504
285.0	4.4	294.5	0.856	3.607	11.717	0.227	0.860	0.478
300.0	4.7	302.3	0.809	2.967	11.079	0.230	0.743	0.403
315.0	4.7	315.3	0.806	2.259	10.866	0.217	0.519	0.336
330.0	4.7	329.6	0.825	1.390	10.731	0.198	0.325	0.303
345.0	4.8	344.3	0.756	0.925	10.578	0.185	0.173	0.277

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.3:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.7	-0.4	0.819	0.647	10.779	0.200	0.078	0.324
15.0	9.7	14.5	0.812	0.801	10.747	0.203	0.132	0.320
30.0	9.7	29.5	0.870	1.269	10.895	0.218	0.263	0.324
45.0	9.7	44.5	0.939	1.986	10.856	0.237	0.447	0.329
60.0	9.7	59.2	0.920	3.373	11.012	0.249	0.690	0.418
75.0	9.7	72.8	0.831	4.276	11.971	0.223	0.853	0.635
90.0	9.2	84.6	0.475	5.989	12.965	0.118	1.006	0.839
105.0	8.9	99.1	0.884	8.010	13.375	0.119	1.062	0.541
120.0	9.3	116.3	0.799	9.554	12.153	0.105	0.958	0.280
135.0	9.6	133.5	0.307	2.897	10.376	0.081	0.915	0.137
150.0	9.7	149.2	0.271	3.206	10.176	0.069	0.903	0.099
165.0	9.8	164.3	0.234	2.852	10.057	0.064	0.764	0.084
180.0	9.8	179.4	0.227	1.865	10.020	0.062	0.413	0.059
195.0	9.8	194.8	0.214	1.612	10.079	0.064	0.478	0.061
210.0	9.8	210.3	0.270	2.172	10.204	0.071	0.783	0.085
225.0	9.7	225.9	0.269	2.605	10.343	0.081	0.878	0.134
240.0	9.4	242.9	0.514	3.259	11.110	0.104	0.913	0.261
255.0	9.0	260.8	0.918	8.004	12.271	0.128	1.067	0.544
270.0	9.3	274.8	0.443	6.215	13.110	0.102	1.042	0.869
285.0	9.8	286.9	0.872	5.910	12.053	0.224	0.886	0.694
300.0	9.7	300.3	0.958	3.220	11.206	0.252	0.696	0.456
315.0	9.7	314.9	0.854	2.009	10.831	0.240	0.452	0.342
330.0	9.7	329.9	0.853	1.213	10.784	0.221	0.277	0.331
345.0	9.7	344.7	0.751	0.933	10.830	0.205	0.145	0.322

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.4:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.7	-0.3	0.793	1.023	10.773	0.219	0.112	0.320
15.0	14.7	14.7	0.844	1.175	10.812	0.223	0.147	0.315
30.0	14.7	29.7	0.908	1.523	10.945	0.238	0.261	0.324
45.0	14.6	44.8	0.960	2.150	11.008	0.256	0.424	0.362
60.0	14.7	59.6	0.931	3.246	11.396	0.265	0.643	0.510
75.0	14.7	73.9	0.766	4.742	12.234	0.225	0.822	0.750
90.0	14.6	88.2	0.331	5.531	12.889	0.058	0.979	0.829
105.0	14.4	103.1	0.535	8.855	12.904	0.095	1.030	0.433
120.0	14.5	118.5	0.272	4.347	10.685	0.071	1.372	0.236
135.0	14.6	134.1	0.199	4.380	10.182	0.055	1.487	0.207
150.0	14.7	149.6	0.195	2.882	10.009	0.055	0.790	0.102
165.0	14.8	164.7	0.236	2.235	10.061	0.065	0.472	0.073
180.0	14.6	179.5	0.270	2.153	9.918	0.063	0.325	0.054
195.0	14.7	194.7	0.224	2.371	9.961	0.066	0.416	0.048
210.0	14.6	209.8	0.229	3.416	10.045	0.068	0.920	0.063
225.0	14.7	225.4	0.264	3.949	10.186	0.059	1.387	0.118
240.0	14.6	241.1	0.278	4.124	10.653	0.073	1.317	0.196
255.0	14.4	256.9	0.483	6.971	12.866	0.104	1.065	0.429
270.0	14.6	271.8	0.356	4.938	13.026	0.052	1.102	0.889
285.0	14.8	285.9	0.868	3.971	12.366	0.225	0.902	0.837
300.0	14.7	300.1	0.989	3.108	11.440	0.267	0.680	0.577
315.0	14.7	314.9	0.940	1.913	11.097	0.259	0.420	0.398
330.0	14.7	329.9	0.942	1.405	10.914	0.240	0.248	0.339
345.0	14.7	344.8	0.811	1.038	10.774	0.225	0.139	0.321

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.5:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.6	-0.2	0.838	1.484	11.069	0.236	0.142	0.375
15.0	19.6	14.8	0.870	1.530	11.212	0.240	0.173	0.379
30.0	19.6	29.8	0.921	1.872	11.090	0.255	0.263	0.415
45.0	19.6	44.8	1.053	2.274	11.325	0.272	0.405	0.496
60.0	19.6	59.7	0.978	3.171	11.661	0.277	0.611	0.660
75.0	19.6	74.3	0.808	4.094	12.636	0.228	0.784	0.861
90.0	19.6	89.0	0.284	5.474	12.963	0.047	0.944	0.823
105.0	19.5	104.0	0.433	4.883	11.754	0.076	1.044	0.381
120.0	19.6	119.3	0.218	5.094	10.638	0.046	1.859	0.320
135.0	19.6	134.7	0.194	4.347	10.184	0.057	1.280	0.177
150.0	19.7	149.7	0.407	2.673	9.952	0.067	0.582	0.078
165.0	19.4	164.6	0.551	2.852	9.906	0.079	0.432	0.076
180.0	20.1	179.8	0.513	2.721	9.893	0.072	0.340	0.061
195.0	19.6	194.6	0.529	3.699	9.891	0.071	0.541	0.088
210.0	19.6	209.9	0.446	4.395	9.894	0.065	0.725	0.100
225.0	19.6	225.1	0.179	5.083	9.914	0.049	1.279	0.140
240.0	19.6	240.7	0.219	4.974	10.707	0.046	1.686	0.161
255.0	19.5	256.0	0.532	5.607	12.105	0.087	1.169	0.360
270.0	19.6	271.1	0.341	7.451	13.632	0.043	1.158	0.887
285.0	19.7	285.6	0.836	4.523	12.918	0.223	0.953	0.954
300.0	19.6	300.1	0.982	2.878	11.921	0.275	0.673	0.736
315.0	19.6	315.0	0.928	2.012	11.501	0.271	0.416	0.544
330.0	19.6	329.9	0.865	1.615	11.239	0.256	0.247	0.440
345.0	19.6	344.9	0.883	1.377	11.245	0.241	0.158	0.390

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.6:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.7	-0.1	0.835	1.502	11.519	0.245	0.150	0.517
15.0	24.7	14.9	0.879	1.602	11.534	0.251	0.171	0.530
30.0	24.7	29.9	0.872	1.983	11.636	0.266	0.252	0.585
45.0	24.7	44.9	0.923	2.279	11.841	0.283	0.388	0.680
60.0	24.7	59.8	1.084	3.567	12.208	0.285	0.594	0.833
75.0	24.7	74.6	0.822	3.878	13.206	0.230	0.762	0.978
90.0	24.6	89.3	0.341	5.644	13.002	0.043	0.930	0.823
105.0	24.6	104.4	0.342	5.233	11.268	0.061	1.160	0.350
120.0	24.6	119.8	0.291	5.962	10.589	0.055	2.014	0.294
135.0	24.7	134.8	0.267	3.680	9.916	0.063	0.982	0.111
150.0	24.5	149.9	0.711	3.092	9.948	0.095	0.561	0.088
165.0	24.8	164.8	0.610	2.883	9.972	0.085	0.349	0.072
180.0	24.4	179.8	0.670	3.101	9.970	0.097	0.482	0.104
195.0	24.7	194.9	0.708	3.513	9.996	0.088	0.524	0.096
210.0	24.8	210.1	0.727	3.888	9.996	0.081	0.680	0.098
225.0	24.7	225.1	0.251	4.690	9.901	0.061	1.144	0.162
240.0	24.6	240.2	0.208	6.125	10.062	0.051	2.107	0.241
255.0	24.6	255.6	0.415	6.127	12.199	0.070	1.301	0.303
270.0	24.6	270.7	0.324	7.302	13.313	0.046	1.171	0.871
285.0	24.7	285.4	0.794	4.522	13.192	0.220	0.984	1.049
300.0	24.7	300.1	1.015	2.842	12.469	0.278	0.689	0.890
315.0	24.7	315.1	0.935	2.399	11.902	0.278	0.426	0.719
330.0	24.7	330.0	0.914	1.679	11.936	0.264	0.258	0.606
345.0	24.7	344.9	0.901	1.452	11.615	0.250	0.170	0.539

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.7:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.7	-0.1	0.794	1.308	11.855	0.249	0.142	0.667
15.0	29.7	14.9	0.880	1.533	11.839	0.255	0.152	0.687
30.0	29.7	29.9	0.931	1.732	11.944	0.270	0.227	0.753
45.0	29.7	44.9	1.029	2.191	12.412	0.287	0.367	0.861
60.0	29.7	59.8	0.985	3.443	12.632	0.288	0.581	0.998
75.0	29.7	74.7	0.802	4.418	13.338	0.228	0.797	1.081
90.0	29.7	89.5	0.237	5.503	12.772	0.043	0.956	0.814
105.0	29.7	104.7	0.271	5.412	11.067	0.054	1.396	0.324
120.0	29.6	119.9	0.303	5.447	10.002	0.071	1.924	0.244
135.0	29.6	135.0	0.848	3.234	9.934	0.083	0.898	0.088
150.0	30.0	149.4	0.374	2.775	10.034	0.084	0.602	0.099
165.0	29.8	164.9	0.797	2.509	10.072	0.091	0.445	0.104
180.0	29.6	179.8	0.809	3.167	10.183	0.090	0.486	0.117
195.0	29.8	194.9	0.735	2.942	10.117	0.090	0.571	0.112
210.0	30.0	210.3	0.324	3.622	10.084	0.084	0.768	0.107
225.0	29.6	225.0	0.297	4.340	9.932	0.079	1.037	0.132
240.0	29.6	240.1	0.272	5.971	9.932	0.065	1.800	0.236
255.0	29.6	255.4	0.324	7.709	11.440	0.067	1.596	0.259
270.0	29.7	270.5	0.360	5.589	13.124	0.049	1.152	0.851
285.0	29.7	285.3	0.788	4.198	13.626	0.219	1.003	1.138
300.0	29.7	300.2	0.908	2.829	12.852	0.279	0.727	1.034
315.0	29.7	315.1	0.877	2.165	12.440	0.280	0.445	0.881
330.0	29.7	330.0	0.887	1.668	12.084	0.267	0.269	0.764
345.0	29.7	345.0	0.868	1.344	11.936	0.254	0.176	0.691

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table S.8:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	0.0	-7.8	0.463	1.391	10.352	0.123	0.297	0.189
15.0	-0.2	-2.3	0.468	1.338	10.372	0.123	0.207	0.185
30.0	-0.3	7.3	0.489	1.938	10.339	0.123	0.311	0.184
45.0	-0.3	23.2	0.497	2.660	10.342	0.117	0.590	0.192
60.0	-0.3	37.9	0.440	3.016	10.439	0.109	0.768	0.208
75.0	-0.3	52.1	0.320	2.888	10.563	0.094	0.878	0.230
90.0	-0.3	66.2	0.271	2.862	10.734	0.067	0.922	0.255
105.0	-0.3	82.5	0.109	2.836	10.833	0.023	0.927	0.279
120.0	-0.5	96.1	0.157	2.844	10.801	0.022	0.926	0.281
135.0	-0.9	106.3	0.228	2.946	10.813	0.047	0.918	0.270
150.0	-1.3	115.7	0.269	3.124	10.619	0.069	0.889	0.257
165.0	-1.5	119.2	0.281	3.358	10.754	0.077	0.857	0.252
180.0	-1.4	139.3	0.365	2.408	10.740	0.101	0.641	0.213
195.0	0.7	230.8	0.358	2.859	10.746	0.084	0.775	0.231
210.0	0.7	245.3	0.282	3.249	10.882	0.064	0.858	0.270
225.0	0.5	256.2	0.227	3.410	10.970	0.042	0.891	0.298
240.0	0.4	267.9	0.163	3.466	11.045	0.020	0.902	0.315
255.0	0.5	282.1	0.187	3.489	10.957	0.039	0.903	0.310
270.0	0.5	295.1	0.292	3.488	10.852	0.072	0.897	0.284
285.0	0.3	306.0	0.325	3.501	10.645	0.093	0.854	0.257
300.0	0.2	316.1	0.435	3.430	10.609	0.105	0.793	0.234
315.0	0.1	326.5	0.479	3.148	10.541	0.113	0.702	0.216
330.0	0.1	336.0	0.489	2.488	10.417	0.118	0.591	0.203
345.0	0.1	345.0	0.475	1.627	10.470	0.121	0.442	0.194

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.9:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	4.8	-1.3	0.559	0.576	10.459	0.143	0.086	0.202
15.0	4.8	13.5	0.644	1.341	10.547	0.142	0.323	0.205
30.0	4.8	28.2	0.710	2.133	10.625	0.136	0.566	0.214
45.0	4.8	42.8	0.477	2.923	10.666	0.125	0.722	0.232
60.0	4.7	57.0	0.430	2.995	10.984	0.101	0.836	0.261
75.0	4.7	71.4	0.215	3.192	10.974	0.058	0.858	0.293
90.0	4.7	86.0	0.064	3.064	10.895	0.012	0.869	0.304
105.0	4.6	99.9	0.111	2.721	10.830	0.023	0.864	0.285
120.0	4.3	111.6	0.228	2.858	10.924	0.046	0.842	0.254
135.0	4.1	120.0	0.266	2.842	10.676	0.057	0.799	0.231
150.0	4.4	144.5	0.316	2.011	10.624	0.075	0.560	0.174
165.0	4.7	162.4	0.364	1.299	10.462	0.078	0.325	0.150
180.0	4.8	178.9	0.362	0.709	10.552	0.080	0.166	0.141
195.0	4.8	195.1	0.329	1.180	10.511	0.078	0.358	0.145
210.0	4.7	211.6	0.328	1.852	10.544	0.075	0.563	0.161
225.0	4.6	228.6	0.260	2.386	10.595	0.067	0.726	0.193
240.0	4.6	244.2	0.223	2.544	10.808	0.051	0.823	0.239
255.0	4.8	258.1	0.143	2.818	10.896	0.028	0.853	0.282
270.0	4.8	272.3	0.063	3.202	11.125	0.009	0.855	0.314
285.0	4.9	286.9	0.240	3.448	11.021	0.052	0.849	0.310
300.0	4.9	301.2	0.389	3.399	10.949	0.098	0.812	0.277
315.0	4.9	315.4	0.549	2.709	10.834	0.124	0.730	0.241
330.0	4.8	329.7	0.646	2.514	10.629	0.135	0.574	0.219
345.0	4.8	344.2	0.571	1.631	10.492	0.141	0.366	0.208

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.10:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	9.8	-0.4	0.685	0.590	10.511	0.162	0.057	0.213
15.0	9.8	14.6	0.593	1.129	10.476	0.159	0.249	0.213
30.0	9.8	29.6	0.653	2.006	10.560	0.153	0.479	0.222
45.0	9.8	44.6	0.533	2.363	10.663	0.138	0.648	0.243
60.0	9.8	59.4	0.412	3.172	10.962	0.105	0.775	0.283
75.0	9.8	74.2	0.253	3.291	11.400	0.052	0.777	0.315
90.0	9.8	89.0	0.045	3.024	10.979	0.013	0.799	0.308
105.0	9.8	103.8	0.122	3.455	10.840	0.026	0.804	0.267
120.0	9.7	118.5	0.187	3.433	10.848	0.042	0.854	0.222
135.0	9.7	133.7	0.219	3.343	10.520	0.051	0.787	0.182
150.0	9.7	149.0	0.187	2.456	10.251	0.055	0.699	0.149
165.0	9.8	164.3	0.195	2.021	10.118	0.057	0.506	0.129
180.0	9.8	179.4	0.190	1.378	10.149	0.058	0.292	0.116
195.0	9.8	194.7	0.210	1.397	10.147	0.057	0.346	0.111
210.0	9.8	210.1	0.178	1.885	10.206	0.055	0.641	0.119
225.0	9.8	225.7	0.221	2.568	10.450	0.051	0.786	0.152
240.0	9.8	241.0	0.224	3.419	10.744	0.044	0.887	0.199
255.0	9.8	255.7	0.159	2.854	10.880	0.028	0.846	0.253
270.0	9.9	270.5	0.067	2.998	11.098	0.014	0.833	0.310
285.0	9.9	285.3	0.251	3.335	11.187	0.050	0.817	0.328
300.0	9.8	300.1	0.447	3.248	11.218	0.105	0.800	0.301
315.0	9.8	314.8	0.548	2.316	10.693	0.138	0.662	0.254
330.0	9.8	329.6	0.568	2.025	10.566	0.153	0.490	0.227
345.0	9.8	344.6	0.692	1.321	10.550	0.159	0.283	0.216

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.11: Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	14.7	-0.3	0.633	0.892	10.470	0.180	0.086	0.227
15.0	14.7	14.8	0.629	1.404	10.631	0.177	0.252	0.225
30.0	14.7	29.8	0.650	2.122	10.653	0.169	0.451	0.235
45.0	14.7	44.8	0.570	2.565	10.764	0.151	0.624	0.267
60.0	14.7	59.8	0.418	2.913	11.015	0.115	0.768	0.312
75.0	14.8	74.6	0.263	3.709	11.608	0.055	0.718	0.331
90.0	14.8	89.5	0.067	3.092	10.869	0.019	0.736	0.308
105.0	14.8	104.4	0.127	3.187	10.970	0.027	0.752	0.259
120.0	14.7	119.3	0.170	4.280	10.678	0.036	0.999	0.232
135.0	14.7	134.5	0.185	3.599	10.250	0.039	0.983	0.188
150.0	14.7	149.6	0.138	2.146	10.169	0.040	0.572	0.133
165.0	14.8	164.7	0.164	1.655	10.106	0.046	0.359	0.112
180.0	14.7	179.7	0.190	1.430	10.084	0.048	0.222	0.097
195.0	14.7	194.7	0.148	1.664	10.046	0.045	0.290	0.091
210.0	14.7	209.8	0.175	2.857	9.997	0.044	0.614	0.088
225.0	14.7	225.2	0.193	3.459	10.096	0.041	1.025	0.108
240.0	14.7	240.4	0.196	3.843	10.523	0.038	1.068	0.159
255.0	14.8	255.3	0.182	3.434	10.852	0.030	0.884	0.222
270.0	14.8	270.2	0.081	3.218	11.066	0.021	0.843	0.303
285.0	14.8	285.0	0.254	3.574	11.356	0.052	0.807	0.349
300.0	14.7	299.9	0.370	3.113	11.016	0.113	0.787	0.341
315.0	14.7	314.7	0.538	2.753	10.823	0.151	0.629	0.291
330.0	14.7	329.7	0.625	2.117	10.709	0.168	0.434	0.251
345.0	14.7	344.7	0.702	1.411	10.548	0.177	0.236	0.232

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.12:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.6	-0.2	0.723	1.383	10.690	0.197	0.140	0.284
15.0	19.6	14.9	0.765	1.856	10.796	0.194	0.294	0.283
30.0	19.6	29.9	0.706	2.642	10.707	0.184	0.474	0.297
45.0	19.6	44.9	0.685	3.178	10.867	0.165	0.638	0.331
60.0	19.6	59.9	0.439	3.565	11.133	0.124	0.788	0.360
75.0	19.7	74.8	0.223	3.664	11.406	0.058	0.657	0.346
90.0	19.7	89.7	0.088	3.111	10.883	0.025	0.656	0.306
105.0	19.7	104.7	0.144	3.282	10.874	0.031	0.683	0.249
120.0	19.7	119.7	0.157	4.252	10.377	0.037	1.162	0.241
135.0	19.6	134.8	0.202	3.224	10.137	0.043	0.977	0.176
150.0	19.6	149.8	0.202	2.216	10.137	0.048	0.571	0.128
165.0	19.7	164.8	0.182	1.675	10.039	0.047	0.271	0.085
180.0	19.7	179.8	0.176	2.018	10.016	0.053	0.224	0.087
195.0	19.7	194.8	0.164	2.757	9.976	0.044	0.310	0.069
210.0	19.7	209.9	0.149	3.204	9.957	0.038	0.465	0.071
225.0	19.6	225.0	0.141	4.293	9.971	0.038	0.952	0.097
240.0	19.7	240.2	0.150	4.259	10.050	0.037	1.275	0.107
255.0	19.7	255.1	0.227	3.909	10.816	0.034	0.897	0.189
270.0	19.7	270.1	0.115	3.536	10.957	0.028	0.835	0.291
285.0	19.7	285.0	0.245	3.900	11.443	0.054	0.785	0.368
300.0	19.7	299.9	0.420	3.410	11.181	0.121	0.750	0.403
315.0	19.6	314.8	0.626	2.958	11.006	0.163	0.563	0.366
330.0	19.6	329.8	0.680	2.190	10.808	0.183	0.370	0.322
345.0	19.6	344.8	0.746	1.634	10.745	0.194	0.196	0.297

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.13:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.7	-0.1	0.961	1.562	11.268	0.212	0.163	0.406
15.0	24.7	15.0	0.814	1.977	11.178	0.208	0.302	0.404
30.0	24.7	30.0	0.726	2.648	11.121	0.197	0.475	0.414
45.0	24.7	45.0	0.643	3.283	11.193	0.176	0.644	0.435
60.0	24.7	60.0	0.451	3.349	11.420	0.133	0.811	0.442
75.0	24.7	74.9	0.208	3.009	11.304	0.062	0.626	0.369
90.0	24.7	89.8	0.111	2.991	10.846	0.031	0.624	0.297
105.0	24.7	104.8	0.166	2.901	10.676	0.038	0.650	0.227
120.0	24.7	119.9	0.153	3.965	10.087	0.045	1.209	0.209
135.0	24.7	134.9	0.158	2.876	10.022	0.047	0.714	0.118
150.0	24.7	149.9	0.235	2.419	10.030	0.065	0.561	0.103
165.0	24.8	164.8	0.251	1.742	10.015	0.063	0.253	0.066
180.0	24.8	179.9	0.166	1.837	9.910	0.059	0.141	0.049
195.0	24.8	195.0	0.174	2.467	9.950	0.058	0.271	0.056
210.0	24.6	209.8	0.165	3.342	9.920	0.041	0.456	0.067
225.0	24.7	225.0	0.174	4.810	9.944	0.049	0.936	0.110
240.0	24.7	240.0	0.133	4.919	9.899	0.040	1.224	0.096
255.0	24.7	255.0	0.193	4.522	10.497	0.040	0.842	0.166
270.0	24.7	270.0	0.136	3.690	10.952	0.034	0.788	0.279
285.0	24.7	285.0	0.200	3.298	11.263	0.057	0.736	0.390
300.0	24.7	299.9	0.477	3.597	11.311	0.128	0.710	0.482
315.0	24.7	314.9	0.633	3.012	11.284	0.173	0.512	0.468
330.0	24.7	329.9	0.842	2.041	11.279	0.195	0.328	0.439
345.0	24.7	344.9	0.798	1.607	11.082	0.207	0.173	0.417

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.14:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.7	-0.0	0.980	1.446	11.709	0.225	0.156	0.561
15.0	29.7	15.0	0.767	1.856	11.410	0.220	0.288	0.559
30.0	29.7	30.0	0.821	2.450	11.827	0.208	0.455	0.556
45.0	29.7	45.0	0.667	3.201	11.488	0.185	0.631	0.557
60.0	29.7	60.0	0.485	3.369	11.696	0.139	0.833	0.533
75.0	29.7	74.9	0.232	2.919	11.214	0.065	0.611	0.398
90.0	29.7	89.9	0.130	2.821	10.873	0.036	0.629	0.285
105.0	29.7	104.9	0.219	2.878	10.502	0.046	0.692	0.207
120.0	29.7	119.9	0.218	4.059	9.990	0.058	1.332	0.186
135.0	29.7	134.9	0.188	2.687	9.927	0.051	0.669	0.085
150.0	29.7	149.9	0.276	2.403	9.948	0.078	0.520	0.072
165.0	30.0	164.7	0.279	1.593	9.906	0.090	0.257	0.050
180.0	29.9	179.9	0.273	1.756	9.902	0.087	0.176	0.035
195.0	30.2	195.1	0.286	2.111	9.888	0.085	0.319	0.045
210.0	29.7	210.0	0.246	3.226	9.905	0.066	0.548	0.071
225.0	29.7	225.0	0.164	3.358	9.905	0.045	0.729	0.083
240.0	29.7	240.0	0.210	5.601	9.912	0.050	1.283	0.133
255.0	29.7	255.0	0.196	3.817	10.436	0.048	0.755	0.149
270.0	29.7	270.0	0.148	3.509	10.837	0.040	0.698	0.270
285.0	29.7	285.0	0.191	3.250	11.115	0.061	0.658	0.417
300.0	29.7	299.9	0.451	3.091	11.622	0.135	0.702	0.566
315.0	29.7	314.9	0.623	2.616	11.688	0.181	0.496	0.583
330.0	29.7	329.9	0.775	1.991	11.785	0.206	0.312	0.575
345.0	29.7	344.9	0.865	1.447	11.611	0.220	0.166	0.567

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table S.15:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.0	-11.0	1.258	2.602	10.804	0.262	0.465	0.363
15.0	-0.3	-5.0	1.225	2.709	10.722	0.262	0.395	0.356
30.0	-0.9	0.7	1.235	1.875	10.787	0.258	0.372	0.338
45.0	-1.5	8.1	1.198	6.008	12.582	0.252	0.872	0.358
60.0	-1.5	-38.2	1.150	9.519	13.249	0.186	1.592	0.619
75.0	-2.0	-19.2	1.080	6.577	12.946	0.228	1.528	0.512
90.0	-2.2	58.1	1.455	6.632	12.760	0.246	1.589	0.494
105.0	-2.0	-23.5	2.012	11.072	14.282	0.244	1.501	0.507
120.0	-1.3	32.1	1.076	11.272	13.982	0.203	1.610	0.593
135.0	-3.5	104.4	1.141	10.274	13.556	0.196	1.692	0.684
150.0	-4.5	110.9	1.364	8.739	12.881	0.221	1.574	0.633
165.0	-1.2	16.1	1.100	5.626	12.310	0.250	0.818	0.396
180.0	-0.3	354.5	1.251	7.298	13.050	0.254	0.715	0.394
195.0	-0.1	368.1	1.198	4.742	11.827	0.259	0.731	0.388
210.0	-0.1	374.0	1.187	4.569	11.702	0.257	0.886	0.421
225.0	-0.1	381.7	1.101	5.523	12.173	0.255	1.088	0.462
240.0	1.6	322.0	0.888	7.346	12.848	0.248	1.377	0.617
255.0	1.7	294.4	1.100	6.726	12.869	0.254	1.430	0.646
270.0	1.0	300.9	1.051	5.760	12.693	0.262	1.353	0.578
285.0	0.5	308.7	1.017	5.127	12.083	0.268	1.242	0.516
300.0	0.1	317.3	1.065	5.084	11.717	0.265	1.113	0.466
315.0	-0.0	324.9	1.086	4.502	11.271	0.265	0.952	0.429
330.0	0.0	333.9	1.248	4.756	11.333	0.262	0.788	0.396
345.0	0.1	342.6	1.194	3.768	10.926	0.262	0.649	0.375

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table S.16:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.5	-2.4	1.278	1.296	10.896	0.296	0.240	0.391
15.0	4.4	11.2	1.315	1.728	11.016	0.296	0.371	0.388
30.0	4.1	22.8	1.358	2.590	10.948	0.296	0.615	0.401
45.0	3.5	20.2	1.272	3.303	11.268	0.292	0.630	0.384
60.0	3.2	28.1	1.238	3.270	10.956	0.289	0.772	0.386
75.0	3.1	38.0	1.355	4.480	11.495	0.285	1.039	0.418
90.0	3.2	41.2	1.266	5.512	11.718	0.281	1.098	0.446
105.0	3.4	41.7	1.095	4.799	11.742	0.285	1.080	0.463
120.0	3.6	42.7	1.150	4.677	11.787	0.287	1.051	0.470
135.0	3.6	43.1	1.261	5.570	12.058	0.286	1.058	0.475
150.0	3.5	40.4	1.261	4.483	11.755	0.286	1.009	0.464
165.0	3.3	44.4	1.229	5.165	11.714	0.284	0.965	0.457
180.0	4.6	179.3	0.581	1.350	10.826	0.147	0.286	0.200
195.0	4.2	242.6	1.119	4.134	12.090	0.198	0.741	0.312
210.0	4.1	352.9	1.313	3.848	11.914	0.290	0.567	0.409
225.0	4.4	307.6	1.156	4.853	12.150	0.285	1.190	0.532
240.0	4.7	287.2	2.329	7.871	13.850	0.235	1.510	0.779
255.0	4.6	291.5	1.086	6.089	12.644	0.257	1.442	0.695
270.0	4.4	298.1	1.071	5.670	12.888	0.275	1.356	0.621
285.0	4.3	302.4	1.199	5.512	12.325	0.284	1.281	0.575
300.0	4.3	307.7	1.280	4.353	11.659	0.290	1.155	0.533
315.0	4.5	316.9	1.146	3.999	11.225	0.299	0.957	0.480
330.0	4.5	330.0	1.281	3.272	11.178	0.301	0.744	0.437
345.0	4.6	343.7	1.313	2.763	10.972	0.298	0.434	0.405

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.17:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.5	-0.8	1.554	1.194	11.133	0.328	0.194	0.435
15.0	9.5	14.1	1.357	1.679	11.037	0.328	0.304	0.436
30.0	9.5	29.1	1.559	2.236	11.140	0.331	0.560	0.446
45.0	9.5	44.0	1.465	3.464	11.456	0.326	0.842	0.476
60.0	9.5	58.4	1.077	5.884	11.830	0.305	1.137	0.568
75.0	9.3	71.0	2.878	6.280	13.324	0.261	1.369	0.752
90.0	8.5	78.5	1.701	8.804	14.238	0.192	1.541	0.865
105.0	8.1	81.7	1.243	9.541	13.824	0.153	1.566	0.857
120.0	7.9	94.1	0.684	11.939	14.344	0.088	1.688	0.796
135.0	8.2	116.3	0.694	8.226	12.972	0.124	1.467	0.508
150.0	9.2	146.6	0.432	3.490	10.626	0.115	1.205	0.225
165.0	9.5	162.9	0.430	3.422	10.414	0.110	1.009	0.183
180.0	9.7	178.8	0.413	2.902	10.321	0.107	0.681	0.144
195.0	9.7	195.1	0.441	2.313	10.561	0.108	0.684	0.140
210.0	9.4	212.0	0.414	3.322	10.650	0.114	1.056	0.187
225.0	8.8	235.2	0.562	12.533	13.529	0.132	1.380	0.379
240.0	8.3	268.6	1.162	10.891	14.564	0.113	1.698	0.844
255.0	8.5	273.6	0.752	10.946	13.204	0.108	1.604	0.899
270.0	8.8	279.0	0.713	7.086	13.888	0.157	1.552	0.941
285.0	9.6	287.9	1.389	8.350	14.226	0.254	1.428	0.827
300.0	9.6	300.8	1.095	4.965	11.721	0.308	1.152	0.625
315.0	9.5	314.9	1.418	4.106	11.504	0.328	0.859	0.507
330.0	9.5	329.6	1.319	2.653	11.213	0.333	0.590	0.465
345.0	9.5	344.5	1.410	2.666	11.133	0.329	0.352	0.442

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.18:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.6	-0.4	1.417	1.338	11.270	0.359	0.196	0.457
15.0	14.5	14.6	1.504	1.708	11.192	0.360	0.302	0.457
30.0	14.5	29.7	1.457	2.359	11.297	0.360	0.526	0.478
45.0	14.5	44.7	1.408	4.010	11.325	0.352	0.786	0.533
60.0	14.6	59.4	1.206	4.750	12.135	0.323	1.071	0.671
75.0	14.6	73.6	1.285	8.758	14.079	0.252	1.289	0.893
90.0	14.4	87.4	0.485	8.066	13.552	0.075	1.440	0.928
105.0	14.2	101.8	0.684	11.177	13.904	0.103	1.588	0.658
120.0	14.1	116.5	0.421	6.179	11.611	0.097	1.759	0.451
135.0	14.3	132.2	0.366	4.997	11.089	0.081	1.752	0.341
150.0	14.6	149.2	0.507	4.325	10.631	0.085	1.153	0.209
165.0	14.6	164.3	0.426	3.203	10.386	0.103	0.730	0.156
180.0	14.7	179.4	0.288	2.488	10.092	0.090	0.472	0.116
195.0	14.7	194.4	0.401	3.242	10.159	0.092	0.603	0.101
210.0	14.7	209.8	0.404	4.057	10.190	0.079	1.004	0.113
225.0	14.5	226.8	0.390	6.013	10.829	0.086	1.728	0.224
240.0	14.3	243.0	0.569	5.622	11.499	0.105	1.819	0.360
255.0	14.2	258.5	0.876	11.232	14.565	0.117	1.721	0.632
270.0	14.4	272.8	1.050	10.115	14.174	0.081	1.638	0.985
285.0	14.7	286.3	1.096	6.859	13.342	0.249	1.373	0.970
300.0	14.7	300.1	1.227	3.946	12.148	0.324	1.072	0.756
315.0	14.6	314.7	1.349	3.136	11.485	0.354	0.774	0.590
330.0	14.5	329.6	1.369	2.395	11.598	0.362	0.512	0.507
345.0	14.5	344.6	1.433	1.739	11.280	0.361	0.289	0.469

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.19:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.3	1.567	1.845	11.715	0.385	0.270	0.577
15.0	19.6	14.8	1.554	2.506	11.681	0.386	0.351	0.576
30.0	19.6	29.8	1.450	2.768	11.830	0.386	0.536	0.616
45.0	19.6	44.8	1.456	3.783	11.827	0.376	0.768	0.686
60.0	19.6	59.6	1.262	5.752	12.252	0.340	1.042	0.821
75.0	19.6	74.1	1.061	7.208	13.915	0.254	1.202	0.997
90.0	19.5	88.6	0.518	7.854	13.849	0.064	1.364	0.917
105.0	19.4	103.5	0.461	7.425	12.899	0.088	1.587	0.601
120.0	19.4	118.3	0.441	6.575	11.855	0.077	2.182	0.495
135.0	19.5	134.6	0.448	5.213	10.380	0.071	1.475	0.254
150.0	19.6	149.5	0.517	3.993	10.120	0.091	0.925	0.148
165.0	19.9	164.4	0.571	3.044	10.113	0.102	0.573	0.124
180.0	19.6	179.5	0.540	3.535	10.019	0.104	0.521	0.112
195.0	19.9	194.9	0.549	4.757	10.008	0.094	0.736	0.134
210.0	19.6	210.1	0.405	5.264	9.978	0.083	1.107	0.170
225.0	19.5	225.5	0.445	5.684	10.374	0.071	1.757	0.212
240.0	19.5	241.5	0.453	6.877	11.318	0.083	2.334	0.321
255.0	19.4	256.8	0.506	10.955	13.588	0.103	1.848	0.536
270.0	19.5	271.6	0.897	9.825	14.859	0.071	1.731	0.985
285.0	19.7	285.8	0.888	6.679	13.320	0.247	1.426	1.106
300.0	19.6	300.0	1.138	4.770	12.636	0.336	1.073	0.938
315.0	19.6	314.8	1.463	3.332	12.115	0.374	0.749	0.770
330.0	19.6	329.7	1.412	2.536	12.013	0.385	0.494	0.668
345.0	19.6	344.7	1.508	2.012	11.808	0.386	0.327	0.597

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.20:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.6	-0.1	1.564	2.570	12.189	0.404	0.378	0.798
15.0	24.6	14.9	1.481	2.981	12.139	0.407	0.434	0.799
30.0	24.5	29.9	1.423	3.407	12.432	0.405	0.572	0.834
45.0	24.5	44.9	1.417	4.895	12.403	0.393	0.768	0.897
60.0	24.5	59.7	1.309	5.368	12.654	0.355	1.001	0.993
75.0	24.5	74.4	0.891	6.821	13.687	0.258	1.125	1.095
90.0	24.5	89.1	0.831	8.193	13.833	0.066	1.303	0.912
105.0	24.5	104.1	0.432	6.724	13.085	0.078	1.652	0.559
120.0	24.4	119.5	0.626	7.468	11.802	0.079	2.194	0.446
135.0	24.4	134.4	0.707	5.839	10.694	0.119	1.728	0.280
150.0	24.3	149.4	0.801	4.460	10.185	0.139	1.022	0.182
165.0	24.4	164.6	0.729	4.067	10.001	0.143	0.642	0.145
180.0	24.9	179.6	0.737	4.250	10.138	0.126	0.565	0.132
195.0	24.4	194.6	0.733	4.633	9.934	0.131	0.743	0.171
210.0	24.4	210.0	0.652	6.245	10.019	0.122	1.067	0.196
225.0	24.5	226.1	0.819	11.876	12.648	0.094	1.795	0.343
240.0	24.4	240.7	0.573	8.165	11.843	0.074	2.587	0.388
255.0	24.4	256.2	0.550	13.414	14.150	0.098	2.075	0.481
270.0	24.5	271.0	1.263	9.036	14.700	0.071	1.785	0.961
285.0	24.6	285.6	1.044	6.943	14.082	0.244	1.537	1.213
300.0	24.6	300.1	1.320	4.644	13.259	0.344	1.126	1.129
315.0	24.6	314.9	1.537	3.421	12.609	0.387	0.786	0.997
330.0	24.5	329.9	1.487	2.892	12.852	0.399	0.537	0.897
345.0	24.5	344.9	1.563	2.454	12.452	0.404	0.397	0.828

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.21:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.1	1.405	3.158	13.067	0.415	0.441	1.050
15.0	29.6	14.9	1.439	3.157	13.078	0.419	0.476	1.053
30.0	29.6	29.9	1.507	4.050	12.979	0.419	0.593	1.082
45.0	29.6	44.9	1.457	4.795	13.111	0.406	0.759	1.130
60.0	29.6	59.8	1.329	5.198	13.369	0.367	0.959	1.185
75.0	29.5	74.5	0.904	6.232	14.234	0.263	1.070	1.215
90.0	29.5	89.3	0.591	8.575	13.648	0.067	1.297	0.908
105.0	29.5	104.6	0.566	8.675	11.447	0.087	2.084	0.527
120.0	29.3	119.5	0.527	6.769	10.502	0.110	2.419	0.426
135.0	29.3	134.6	0.879	5.376	10.649	0.136	1.450	0.214
150.0	29.6	149.6	1.006	4.892	10.002	0.144	0.868	0.167
165.0	29.4	164.5	1.008	4.632	9.937	0.157	0.801	0.183
180.0	30.2	179.5	1.039	4.980	10.035	0.149	0.788	0.189
195.0	29.6	194.6	0.910	5.390	10.007	0.155	0.943	0.216
210.0	29.7	209.9	0.899	4.782	9.993	0.135	1.075	0.215
225.0	29.3	224.9	0.928	6.498	10.032	0.131	1.443	0.275
240.0	29.3	240.6	0.885	8.453	10.460	0.119	2.611	0.465
255.0	29.5	255.6	0.480	11.426	12.976	0.089	2.120	0.357
270.0	29.5	270.7	0.990	13.882	14.388	0.082	1.801	0.939
285.0	29.6	285.4	0.886	7.227	14.021	0.242	1.549	1.307
300.0	29.6	300.1	1.363	4.824	13.581	0.349	1.166	1.306
315.0	29.6	315.0	1.446	3.950	13.485	0.394	0.838	1.220
330.0	29.6	330.0	1.442	3.041	13.343	0.411	0.601	1.138
345.0	29.6	345.0	1.418	3.034	13.015	0.415	0.481	1.077

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.22:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.1	-12.1	0.789	2.977	10.648	0.173	0.555	0.278
15.0	-0.4	-6.9	0.660	2.401	10.607	0.174	0.391	0.268
30.0	-0.8	4.0	0.813	2.765	10.549	0.172	0.449	0.263
45.0	-0.6	21.9	0.630	3.615	10.670	0.165	0.774	0.278
60.0	-0.3	40.0	0.546	3.553	10.806	0.149	1.024	0.307
75.0	-0.3	55.3	0.431	3.749	11.123	0.121	1.143	0.338
90.0	-0.3	72.1	0.352	3.755	11.183	0.072	1.204	0.373
105.0	-0.4	87.5	0.167	3.980	11.463	0.026	1.201	0.394
120.0	-0.9	98.6	0.298	3.942	11.419	0.040	1.203	0.393
135.0	-1.5	108.2	0.334	4.357	11.486	0.068	1.187	0.388
150.0	-2.2	116.0	0.347	3.990	10.975	0.095	1.144	0.376
165.0	-0.8	18.7	0.626	3.663	10.847	0.168	0.567	0.280
180.0	-0.6	28.6	0.587	2.897	10.916	0.168	0.610	0.280
195.0	0.1	364.9	0.709	4.135	11.118	0.162	0.756	0.297
210.0	1.1	247.9	0.434	4.512	11.500	0.081	1.136	0.375
225.0	0.9	257.7	0.319	4.638	11.468	0.055	1.174	0.409
240.0	0.7	268.7	0.267	4.745	11.886	0.031	1.188	0.427
255.0	0.7	281.8	0.342	4.763	11.857	0.052	1.179	0.422
270.0	0.6	293.5	0.507	4.756	11.753	0.091	1.147	0.396
285.0	0.4	303.5	0.547	4.774	11.289	0.120	1.104	0.366
300.0	0.2	312.3	0.604	4.791	11.080	0.138	1.036	0.342
315.0	0.1	321.2	0.617	4.546	11.023	0.151	0.955	0.321
330.0	0.0	331.1	0.703	3.317	10.932	0.162	0.830	0.303
345.0	0.1	341.0	0.714	2.780	10.751	0.170	0.667	0.289

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.23:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.6	-2.9	1.023	1.249	10.888	0.202	0.240	0.287
15.0	4.5	10.7	1.125	2.044	10.953	0.200	0.455	0.292
30.0	4.4	24.5	1.009	2.631	10.932	0.193	0.746	0.305
45.0	4.4	38.4	0.726	4.099	10.974	0.177	0.971	0.332
60.0	4.3	51.0	0.592	4.627	11.499	0.150	1.084	0.357
75.0	4.2	60.0	0.449	4.391	11.483	0.121	1.133	0.377
90.0	4.1	70.8	0.310	4.107	11.609	0.077	1.168	0.403
105.0	4.0	84.0	0.169	4.070	11.390	0.028	1.186	0.419
120.0	3.8	96.5	0.184	4.462	11.830	0.026	1.177	0.414
135.0	3.6	107.1	0.256	4.534	11.396	0.050	1.141	0.392
150.0	3.3	116.8	0.295	4.321	11.335	0.071	1.116	0.367
165.0	3.3	124.6	0.400	4.139	11.149	0.086	1.098	0.341
180.0	4.5	177.7	0.641	1.272	11.059	0.115	0.295	0.209
195.0	4.6	195.8	0.513	1.850	10.807	0.111	0.496	0.212
210.0	4.4	216.9	0.493	2.863	10.886	0.104	0.773	0.247
225.0	4.3	241.4	0.451	3.452	11.112	0.076	1.033	0.329
240.0	4.3	252.8	0.328	3.565	11.303	0.054	1.109	0.372
255.0	4.5	264.0	0.188	3.997	11.232	0.028	1.153	0.410
270.0	4.6	276.6	0.164	4.457	11.545	0.028	1.165	0.436
285.0	4.7	289.7	0.347	5.015	11.581	0.080	1.156	0.421
300.0	4.8	302.6	0.611	4.737	11.576	0.133	1.088	0.384
315.0	4.8	315.7	0.724	3.571	11.316	0.169	0.966	0.344
330.0	4.7	329.4	0.985	3.088	11.066	0.188	0.785	0.315
345.0	4.7	343.2	1.028	2.905	10.880	0.198	0.539	0.296

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table S.24:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	9.7	-0.8	1.105	1.037	10.829	0.227	0.130	0.303
15.0	9.7	14.3	0.944	1.780	10.746	0.223	0.400	0.305
30.0	9.7	29.3	0.867	2.837	10.937	0.212	0.692	0.322
45.0	9.7	44.2	0.687	3.376	11.029	0.188	0.902	0.354
60.0	9.7	58.9	0.515	4.635	11.398	0.141	1.049	0.402
75.0	9.8	73.6	0.346	5.144	12.085	0.071	1.054	0.439
90.0	9.7	88.3	0.101	4.213	11.520	0.021	1.074	0.432
105.0	9.7	103.0	0.198	4.619	11.578	0.035	1.065	0.387
120.0	9.5	117.2	0.312	4.781	11.591	0.056	1.101	0.340
135.0	9.4	132.2	0.320	4.188	11.063	0.070	0.984	0.280
150.0	9.5	147.9	0.313	2.981	10.662	0.077	0.856	0.228
165.0	9.6	163.5	0.291	2.699	10.422	0.081	0.708	0.197
180.0	9.7	178.9	0.388	2.159	10.414	0.084	0.484	0.173
195.0	9.7	194.7	0.300	1.870	10.291	0.082	0.488	0.161
210.0	9.6	210.8	0.477	2.776	10.907	0.078	0.796	0.180
225.0	9.6	226.9	0.442	3.550	11.171	0.072	1.039	0.230
240.0	9.6	242.3	0.256	3.877	11.185	0.059	1.165	0.296
255.0	9.7	256.6	0.222	4.247	11.445	0.040	1.141	0.360
270.0	9.8	271.3	0.112	4.398	11.581	0.022	1.153	0.429
285.0	9.8	285.8	0.406	5.457	11.866	0.066	1.123	0.448
300.0	9.8	300.4	0.650	3.925	11.782	0.137	1.080	0.417
315.0	9.7	314.8	0.770	3.073	11.034	0.187	0.906	0.364
330.0	9.7	329.5	0.755	2.837	10.947	0.212	0.687	0.327
345.0	9.7	344.3	0.963	1.807	10.726	0.223	0.412	0.307

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.25:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.6	-0.4	1.090	1.191	10.928	0.252	0.137	0.324
15.0	14.6	14.7	1.072	1.905	10.983	0.247	0.378	0.326
30.0	14.6	29.8	0.842	2.571	11.019	0.234	0.654	0.346
45.0	14.7	44.8	0.824	3.572	11.055	0.205	0.881	0.388
60.0	14.7	59.6	0.563	3.952	11.553	0.151	1.056	0.442
75.0	14.8	74.4	0.362	5.532	12.351	0.072	0.991	0.461
90.0	14.8	89.2	0.099	4.115	11.584	0.029	1.001	0.434
105.0	14.7	104.1	0.270	4.587	11.508	0.040	1.007	0.378
120.0	14.6	118.6	0.274	5.389	11.143	0.053	1.299	0.349
135.0	14.6	134.0	0.263	4.195	10.586	0.059	1.238	0.283
150.0	14.7	149.3	0.274	3.197	10.410	0.058	0.756	0.202
165.0	14.8	164.4	0.374	2.637	10.434	0.068	0.510	0.168
180.0	14.7	179.5	0.377	1.840	10.407	0.076	0.383	0.154
195.0	14.7	194.6	0.287	2.767	10.191	0.066	0.446	0.132
210.0	14.7	209.9	0.268	3.542	10.105	0.059	0.813	0.124
225.0	14.7	225.6	0.334	3.733	10.509	0.060	1.316	0.165
240.0	14.6	241.1	0.337	4.909	10.929	0.057	1.421	0.248
255.0	14.8	255.7	0.249	5.084	11.210	0.044	1.211	0.320
270.0	14.8	270.5	0.150	4.737	11.498	0.031	1.185	0.417
285.0	14.8	285.3	0.413	5.881	12.228	0.067	1.134	0.469
300.0	14.7	299.9	0.547	4.327	11.481	0.147	1.102	0.470
315.0	14.7	314.6	0.789	3.397	11.225	0.203	0.882	0.412
330.0	14.6	329.5	0.934	2.609	10.922	0.233	0.627	0.361
345.0	14.6	344.5	1.170	1.779	10.917	0.246	0.354	0.333

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.26:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.3	1.236	1.925	11.038	0.273	0.215	0.403
15.0	19.6	14.8	1.160	2.435	11.093	0.270	0.424	0.402
30.0	19.6	29.9	1.051	3.112	11.072	0.254	0.686	0.423
45.0	19.6	44.9	0.965	3.964	11.678	0.224	0.896	0.467
60.0	19.6	59.8	0.617	5.046	11.721	0.161	1.098	0.495
75.0	19.7	74.6	0.302	4.910	11.814	0.077	0.928	0.482
90.0	19.7	89.5	0.136	4.127	11.383	0.038	0.915	0.433
105.0	19.7	104.5	0.219	4.262	11.177	0.048	0.937	0.366
120.0	19.6	119.4	0.242	5.137	10.718	0.059	1.502	0.368
135.0	19.6	134.6	0.262	3.862	10.387	0.062	1.123	0.248
150.0	19.6	149.6	0.266	2.806	10.222	0.066	0.749	0.182
165.0	19.6	164.6	0.343	2.354	10.219	0.075	0.487	0.154
180.0	19.7	179.7	0.320	2.827	10.126	0.070	0.383	0.124
195.0	19.7	194.8	0.276	3.685	10.072	0.068	0.548	0.125
210.0	19.6	209.9	0.288	4.776	10.061	0.063	0.862	0.136
225.0	19.6	225.0	0.300	5.811	9.974	0.055	1.177	0.143
240.0	19.6	240.5	0.236	5.617	10.197	0.057	1.700	0.170
255.0	19.7	255.3	0.331	5.787	11.430	0.050	1.263	0.269
270.0	19.7	270.2	0.190	5.199	11.488	0.041	1.211	0.398
285.0	19.7	285.1	0.360	5.843	12.166	0.069	1.183	0.490
300.0	19.6	299.8	0.555	4.678	11.563	0.155	1.116	0.541
315.0	19.6	314.7	0.859	4.248	11.423	0.219	0.841	0.508
330.0	19.6	329.6	0.977	2.854	11.243	0.252	0.574	0.456
345.0	19.6	344.6	1.162	2.007	11.125	0.268	0.308	0.419

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.27:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	24.5	-0.2	1.247	2.634	11.733	0.293	0.326	0.549
15.0	24.5	14.9	1.313	3.273	11.396	0.289	0.508	0.544
30.0	24.5	30.0	1.112	3.659	11.480	0.273	0.730	0.557
45.0	24.5	45.0	0.941	4.387	11.601	0.240	0.951	0.586
60.0	24.6	59.9	0.639	5.217	11.799	0.175	1.136	0.578
75.0	24.6	74.7	0.358	4.385	12.310	0.083	0.874	0.504
90.0	24.6	89.7	0.169	4.096	11.308	0.047	0.850	0.431
105.0	24.6	104.7	0.272	3.831	11.168	0.060	0.881	0.346
120.0	24.6	119.7	0.278	5.647	10.368	0.072	1.525	0.343
135.0	24.5	134.7	0.263	3.992	10.184	0.087	1.196	0.241
150.0	24.6	149.7	0.281	2.921	10.102	0.088	0.721	0.166
165.0	24.6	164.7	0.379	2.442	10.171	0.085	0.399	0.117
180.0	24.9	179.8	0.375	2.707	10.044	0.093	0.276	0.104
195.0	24.6	194.8	0.251	3.155	9.963	0.072	0.379	0.099
210.0	24.6	210.0	0.325	4.784	10.100	0.081	0.901	0.197
225.0	24.6	224.9	0.211	5.812	9.976	0.060	1.071	0.204
240.0	24.6	240.1	0.286	7.165	9.935	0.060	1.548	0.173
255.0	24.6	255.1	0.266	5.975	10.773	0.059	1.269	0.231
270.0	24.6	270.1	0.232	5.745	11.378	0.050	1.213	0.379
285.0	24.6	285.0	0.297	5.391	11.647	0.072	1.153	0.514
300.0	24.6	299.8	0.578	5.033	11.802	0.165	1.052	0.633
315.0	24.6	314.7	0.881	4.238	11.732	0.233	0.773	0.633
330.0	24.5	329.7	1.079	3.408	11.680	0.269	0.521	0.595
345.0	24.5	344.8	1.260	2.536	11.485	0.286	0.332	0.564

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.28:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	29.6	-0.1	1.182	3.225	12.145	0.311	0.413	0.737
15.0	29.6	15.0	1.223	3.629	12.281	0.305	0.568	0.727
30.0	29.6	30.0	1.176	3.937	12.460	0.288	0.754	0.728
45.0	29.6	45.0	0.908	4.743	12.204	0.253	0.959	0.732
60.0	29.6	60.0	0.751	4.909	12.389	0.188	1.132	0.699
75.0	29.6	74.8	0.312	3.935	12.010	0.089	0.870	0.530
90.0	29.6	89.8	0.207	4.069	11.256	0.055	0.863	0.421
105.0	29.6	104.8	0.363	4.017	11.275	0.072	0.889	0.315
120.0	29.6	119.8	0.310	5.150	10.175	0.088	1.525	0.307
135.0	29.5	134.7	0.393	4.116	10.061	0.124	1.317	0.218
150.0	29.6	149.7	0.348	2.984	9.945	0.105	0.606	0.125
165.0	29.5	164.7	0.413	2.982	9.946	0.133	0.414	0.106
180.0	30.3	179.8	0.473	3.447	9.895	0.131	0.355	0.090
195.0	29.7	194.7	0.375	3.887	9.891	0.127	0.530	0.125
210.0	29.7	210.0	0.334	4.045	9.934	0.091	0.638	0.131
225.0	29.6	225.1	0.323	5.806	10.015	0.095	1.282	0.273
240.0	29.6	240.1	0.328	6.827	9.932	0.075	1.620	0.257
255.0	29.6	255.0	0.327	6.833	10.956	0.071	1.212	0.220
270.0	29.6	270.0	0.262	6.038	11.334	0.059	1.168	0.368
285.0	29.6	285.0	0.324	5.802	11.657	0.077	1.130	0.540
300.0	29.6	299.9	0.617	5.207	12.103	0.174	0.982	0.734
315.0	29.6	314.8	0.922	4.301	12.196	0.243	0.728	0.771
330.0	29.6	329.9	1.188	3.282	12.167	0.282	0.514	0.762
345.0	29.6	344.9	1.235	3.040	12.312	0.302	0.387	0.746

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table S.29:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-1.9	-33.1	1.349	6.996	13.261	0.319	1.489	0.573
15.0	-3.0	21.2	1.614	10.346	13.517	0.265	1.761	0.687
30.0	-3.6	5.1	1.539	9.045	13.415	0.282	1.839	0.696
45.0	-3.3	-81.5	1.196	8.935	14.158	0.234	2.060	0.814
60.0	-2.1	-71.2	1.335	10.977	14.619	0.190	2.203	0.861
75.0	-0.9	-54.0	1.653	11.338	14.501	0.180	2.184	0.833
90.0	-0.2	66.0	1.531	14.265	14.658	0.242	2.057	0.770
105.0	-0.3	80.6	1.263	11.251	14.621	0.158	2.112	0.847
120.0	-2.1	97.2	1.315	9.001	14.554	0.129	2.158	0.880
135.0	-4.3	105.3	1.199	8.776	14.279	0.190	2.112	0.863
150.0	-5.4	102.4	1.246	8.824	13.871	0.230	2.030	0.828
165.0	-2.3	32.1	1.603	8.900	13.515	0.305	1.485	0.588
180.0	-1.0	14.2	1.329	6.728	12.432	0.313	1.407	0.565
195.0	-0.9	24.9	1.376	7.625	12.213	0.313	1.420	0.560
210.0	-0.2	31.0	1.320	7.571	12.409	0.313	1.507	0.599
225.0	1.2	343.8	1.416	9.379	13.131	0.246	1.937	0.745
240.0	2.2	278.6	1.073	10.400	13.676	0.143	2.105	0.905
255.0	1.9	286.6	1.171	10.741	14.393	0.216	2.062	0.847
270.0	1.6	294.1	1.268	9.559	14.134	0.264	1.927	0.770
285.0	1.3	303.2	1.238	8.232	13.080	0.296	1.752	0.694
300.0	0.8	307.6	1.259	9.560	13.528	0.302	1.697	0.669
315.0	0.4	314.7	1.406	7.576	13.256	0.315	1.581	0.630
330.0	-0.5	322.3	1.295	7.843	12.467	0.317	1.537	0.591
345.0	-0.6	330.6	1.474	6.657	12.752	0.323	1.366	0.570

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.30:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	3.1	-30.3	1.913	6.645	12.183	0.369	1.318	0.569
15.0	2.7	-26.0	1.907	5.567	11.951	0.366	1.377	0.552
30.0	2.5	-18.4	1.845	5.214	11.506	0.364	1.314	0.536
45.0	2.6	-9.8	1.782	5.013	11.845	0.369	1.237	0.530
60.0	2.7	6.8	1.877	5.482	12.259	0.358	1.343	0.556
75.0	3.0	24.9	1.507	9.781	13.464	0.347	1.521	0.612
90.0	3.0	32.3	1.768	6.888	12.983	0.333	1.604	0.642
105.0	3.3	59.4	1.289	9.953	14.856	0.252	1.933	0.804
120.0	3.3	89.7	0.806	14.729	14.297	0.082	2.143	0.940
135.0	2.6	101.1	1.080	11.896	15.103	0.122	2.057	0.894
150.0	2.7	35.8	1.657	6.930	13.502	0.333	1.563	0.613
165.0	2.4	38.5	1.813	5.477	12.405	0.342	1.539	0.589
180.0	2.8	59.9	1.559	7.811	12.213	0.331	1.544	0.571
195.0	3.9	362.7	1.655	8.439	12.827	0.354	1.341	0.591
210.0	4.1	367.4	1.637	5.865	12.622	0.360	1.345	0.597
225.0	5.0	273.3	1.174	11.030	13.667	0.120	2.134	0.902
240.0	4.8	279.1	1.135	11.223	14.113	0.146	2.163	0.936
255.0	4.7	287.4	1.214	8.246	13.765	0.224	2.006	0.877
270.0	4.6	293.5	1.410	9.876	14.793	0.276	1.906	0.809
285.0	4.4	300.4	1.810	8.211	13.725	0.306	1.782	0.737
300.0	4.4	306.5	3.657	6.861	12.866	0.338	1.717	0.692
315.0	4.4	316.7	1.834	5.974	12.587	0.351	1.492	0.624
330.0	4.2	326.7	1.674	7.769	12.519	0.364	1.357	0.591
345.0	3.9	331.4	1.745	7.858	11.735	0.369	1.316	0.579

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.31:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.2	-2.0	2.001	2.986	11.427	0.430	0.486	0.569
15.0	9.1	12.6	1.987	3.249	11.630	0.427	0.707	0.573
30.0	9.0	27.5	1.804	4.515	11.461	0.411	1.058	0.591
45.0	9.1	42.8	1.604	5.066	11.879	0.380	1.388	0.631
60.0	9.3	57.1	1.464	8.489	13.581	0.337	1.676	0.731
75.0	9.1	70.1	1.671	7.815	15.773	0.255	1.870	0.885
90.0	8.4	77.5	1.312	14.161	15.383	0.175	1.972	0.955
105.0	8.2	89.0	0.789	11.878	14.687	0.085	2.068	0.963
120.0	7.9	100.1	0.735	15.242	14.083	0.102	1.997	0.880
135.0	7.6	111.3	1.069	10.220	13.591	0.133	1.834	0.769
150.0	7.5	124.6	1.213	8.572	12.621	0.155	1.707	0.649
165.0	8.1	150.8	2.168	8.237	12.197	0.168	1.429	0.423
180.0	9.2	177.8	0.783	3.788	10.935	0.156	0.960	0.264
195.0	9.3	195.8	0.766	3.018	10.972	0.155	0.884	0.243
210.0	8.5	234.4	1.733	11.771	12.838	0.162	1.772	0.554
225.0	8.3	257.0	1.036	14.264	14.183	0.132	2.099	0.779
240.0	8.4	268.4	0.866	15.567	14.486	0.107	2.203	0.918
255.0	8.5	274.6	0.832	12.105	14.056	0.115	2.183	0.963
270.0	8.7	280.8	1.346	12.788	14.310	0.165	2.110	0.988
285.0	9.3	289.3	3.546	8.936	15.226	0.263	1.972	0.932
300.0	9.5	301.1	1.313	6.811	13.751	0.336	1.678	0.775
315.0	9.4	314.5	1.519	6.001	12.284	0.381	1.400	0.662
330.0	9.3	328.9	1.870	4.710	11.898	0.410	1.079	0.615
345.0	9.3	343.4	1.932	4.261	11.348	0.425	0.770	0.585

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.



**Table S.32:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.4	-0.8	2.116	2.179	11.845	0.468	0.396	0.630
15.0	14.4	14.3	1.777	2.581	11.694	0.464	0.607	0.624
30.0	14.4	29.5	1.928	5.224	12.097	0.445	0.976	0.647
45.0	14.4	44.6	1.587	5.793	12.084	0.409	1.293	0.697
60.0	14.5	59.1	1.193	7.187	12.990	0.353	1.631	0.838
75.0	14.5	73.2	2.150	10.421	16.911	0.238	1.782	0.994
90.0	14.3	87.2	0.632	11.285	14.989	0.079	1.953	1.001
105.0	14.3	102.0	0.700	14.263	14.624	0.098	1.937	0.810
120.0	13.7	114.5	1.039	17.519	14.141	0.122	2.021	0.722
135.0	13.7	130.2	0.655	7.254	11.865	0.118	1.926	0.546
150.0	14.5	148.0	0.696	5.277	11.438	0.120	1.423	0.352
165.0	14.5	163.5	0.631	4.101	10.980	0.122	0.889	0.276
180.0	14.5	178.8	0.668	3.046	10.697	0.130	0.676	0.230
195.0	14.6	194.2	0.629	4.114	10.479	0.125	0.838	0.191
210.0	14.7	211.0	0.855	7.091	11.356	0.120	1.328	0.234
225.0	13.9	230.8	0.850	7.472	11.812	0.127	2.039	0.400
240.0	13.7	246.7	1.029	10.568	12.744	0.130	2.180	0.587
255.0	13.9	259.8	0.679	16.760	13.550	0.107	2.240	0.779
270.0	14.2	273.5	0.862	11.455	15.185	0.084	2.205	1.008
285.0	14.5	286.8	2.466	8.765	15.379	0.238	2.005	1.038
300.0	14.6	300.2	1.404	6.111	13.289	0.351	1.674	0.900
315.0	14.5	314.4	1.688	4.907	12.611	0.407	1.296	0.752
330.0	14.4	329.1	1.889	4.291	11.912	0.439	0.953	0.681
345.0	14.4	344.2	2.020	2.623	11.788	0.462	0.549	0.645

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.33:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.5	-0.4	2.231	2.368	12.249	0.499	0.439	0.787
15.0	19.5	14.7	2.009	3.250	12.243	0.493	0.656	0.784
30.0	19.5	29.9	2.106	4.450	12.400	0.475	0.949	0.797
45.0	19.5	44.9	1.704	5.830	12.510	0.436	1.260	0.846
60.0	19.5	59.6	1.377	7.330	13.456	0.369	1.585	0.979
75.0	19.5	74.0	1.400	8.593	15.599	0.235	1.736	1.079
90.0	19.5	88.5	0.519	9.017	14.273	0.076	1.855	0.987
105.0	19.5	103.6	0.741	11.008	13.328	0.100	1.932	0.744
120.0	19.2	117.8	0.641	8.741	11.959	0.112	2.312	0.665
135.0	19.4	134.5	0.726	6.515	10.901	0.115	2.047	0.391
150.0	19.4	149.3	0.705	4.560	10.722	0.136	1.402	0.263
165.0	19.5	164.1	0.833	3.631	10.882	0.146	0.784	0.210
180.0	19.6	179.6	0.671	3.969	10.461	0.154	0.626	0.202
195.0	19.6	194.7	0.766	5.263	10.560	0.141	1.038	0.206
210.0	19.3	210.6	0.818	6.486	10.767	0.122	1.550	0.248
225.0	19.5	225.5	0.616	7.265	11.577	0.103	2.060	0.314
240.0	19.2	242.8	0.594	8.082	12.373	0.118	2.630	0.444
255.0	19.3	257.3	0.549	11.642	13.386	0.111	2.355	0.651
270.0	19.4	271.9	1.348	15.883	14.607	0.093	2.325	0.989
285.0	19.6	286.1	1.755	9.377	14.520	0.232	2.102	1.145
300.0	19.6	300.0	1.306	5.717	13.159	0.363	1.667	1.069
315.0	19.5	314.5	1.731	4.461	12.598	0.429	1.195	0.937
330.0	19.5	329.4	1.860	3.796	12.563	0.471	0.837	0.858
345.0	19.5	344.5	2.059	2.634	12.296	0.493	0.555	0.814

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.34:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.5	-0.2	2.031	3.433	13.201	0.521	0.595	1.045
15.0	24.5	14.9	1.985	4.017	13.198	0.520	0.739	1.026
30.0	24.5	30.0	2.077	4.876	12.939	0.499	1.010	1.034
45.0	24.5	45.0	1.776	5.881	12.989	0.457	1.266	1.059
60.0	24.5	59.7	1.549	7.162	14.045	0.388	1.572	1.145
75.0	24.5	74.3	0.971	8.219	14.513	0.240	1.640	1.170
90.0	24.5	89.0	0.471	8.743	13.869	0.083	1.771	0.978
105.0	24.5	104.2	0.756	10.104	12.503	0.107	2.033	0.688
120.0	24.4	119.6	0.812	8.205	11.580	0.127	2.798	0.606
135.0	24.1	133.8	0.909	7.195	11.171	0.163	2.223	0.427
150.0	24.3	149.3	0.764	4.320	10.273	0.169	1.278	0.247
165.0	24.7	164.5	0.783	4.417	10.407	0.168	0.806	0.203
180.0	24.9	179.5	0.772	4.749	10.297	0.167	0.686	0.195
195.0	24.9	194.9	0.674	4.752	10.109	0.147	0.870	0.207
210.0	24.5	210.3	0.664	5.848	10.061	0.144	1.384	0.269
225.0	24.1	226.5	0.728	7.694	10.979	0.138	2.405	0.446
240.0	24.3	240.8	0.771	9.505	12.446	0.123	3.030	0.488
255.0	24.4	256.3	0.805	11.485	12.868	0.118	2.497	0.538
270.0	24.4	271.2	1.153	17.229	14.373	0.100	2.427	0.950
285.0	24.6	285.7	0.884	10.784	13.595	0.230	2.174	1.229
300.0	24.6	300.0	1.437	8.308	13.724	0.374	1.768	1.255
315.0	24.5	314.7	1.791	6.135	13.223	0.448	1.211	1.166
330.0	24.5	329.6	2.008	3.956	13.113	0.492	0.852	1.109
345.0	24.5	344.7	2.017	3.180	13.457	0.516	0.630	1.068

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.35:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.5	-0.0	2.030	4.789	14.056	0.541	0.787	1.323
15.0	29.5	15.0	1.973	5.175	13.625	0.537	0.899	1.299
30.0	29.5	30.1	1.946	6.426	13.469	0.519	1.107	1.286
45.0	29.5	45.0	1.840	7.235	14.027	0.478	1.323	1.291
60.0	29.5	59.8	1.519	8.031	14.424	0.402	1.581	1.324
75.0	29.4	74.4	1.040	8.203	14.598	0.250	1.614	1.252
90.0	29.4	89.3	0.435	8.628	14.282	0.094	1.816	0.964
105.0	29.4	104.5	1.051	9.176	13.288	0.123	2.136	0.664
120.0	29.0	119.1	1.105	12.282	13.547	0.176	2.889	0.634
135.0	29.0	134.3	1.009	6.969	10.587	0.189	1.939	0.362
150.0	29.7	148.9	1.059	5.663	10.532	0.206	1.341	0.304
165.0	30.1	163.9	0.991	6.176	10.016	0.229	1.029	0.294
180.0	30.0	178.8	1.123	5.768	10.140	0.252	0.969	0.304
195.0	30.5	194.9	1.054	5.575	10.096	0.217	1.031	0.269
210.0	30.3	210.5	0.906	5.992	10.072	0.174	1.305	0.276
225.0	29.3	225.8	0.884	7.987	10.802	0.160	1.984	0.408
240.0	29.0	241.2	0.963	9.785	13.215	0.153	3.087	0.602
255.0	29.4	255.7	0.494	9.822	12.433	0.124	2.651	0.466
270.0	29.4	270.8	1.265	12.813	15.594	0.110	2.474	0.909
285.0	29.5	285.6	1.093	10.607	14.535	0.232	2.354	1.293
300.0	29.5	300.1	1.460	7.590	14.037	0.378	1.828	1.422
315.0	29.5	314.9	1.879	6.164	13.939	0.457	1.350	1.404
330.0	29.5	329.9	1.969	5.147	14.158	0.508	1.021	1.387
345.0	29.5	344.9	1.995	4.581	13.833	0.530	0.844	1.352

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.36:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.8	-19.3	0.770	4.357	10.839	0.198	0.803	0.359
15.0	-2.3	-123.0	0.764	4.759	11.602	0.177	1.140	0.414
30.0	-2.2	-106.0	0.737	5.069	11.950	0.150	1.335	0.448
45.0	-1.7	-90.7	0.627	4.808	11.408	0.116	1.442	0.468
60.0	0.1	47.4	0.574	4.443	11.709	0.151	1.296	0.419
75.0	0.2	65.1	0.474	4.461	11.491	0.098	1.393	0.452
90.0	-0.1	83.0	0.294	4.993	11.843	0.040	1.397	0.475
105.0	-0.5	95.6	0.292	4.522	12.092	0.038	1.400	0.488
120.0	-1.3	104.6	0.347	5.550	11.961	0.059	1.396	0.485
135.0	-2.1	113.9	0.364	4.910	11.694	0.088	1.364	0.484
150.0	-3.0	123.2	0.524	5.520	12.184	0.121	1.275	0.472
165.0	-3.2	103.4	0.756	4.767	11.506	0.163	1.281	0.434
180.0	-2.9	154.2	0.790	4.282	11.479	0.184	0.804	0.409
195.0	1.1	225.9	0.749	5.675	11.268	0.137	1.185	0.376
210.0	1.1	241.1	0.607	5.870	11.452	0.101	1.331	0.420
225.0	0.8	252.4	0.511	5.537	12.057	0.070	1.376	0.458
240.0	0.5	263.1	0.379	6.007	12.064	0.041	1.392	0.484
255.0	0.3	274.5	0.324	6.239	12.238	0.033	1.376	0.488
270.0	0.3	285.8	0.393	6.113	12.272	0.062	1.345	0.476
285.0	0.1	295.9	0.457	5.468	12.416	0.098	1.290	0.455
300.0	-0.0	304.8	0.636	5.618	11.568	0.128	1.227	0.433
315.0	-0.1	313.8	0.770	5.829	11.696	0.153	1.141	0.411
330.0	-0.2	322.2	0.705	5.329	11.368	0.171	1.050	0.394
345.0	-0.4	331.1	0.741	4.790	11.241	0.186	0.929	0.377

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.37:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	3.4	-25.3	1.224	5.087	11.197	0.223	0.957	0.366
15.0	2.8	-19.1	1.153	4.627	11.050	0.227	0.931	0.348
30.0	2.7	-11.5	1.241	4.003	10.925	0.229	0.971	0.360
45.0	2.9	1.5	1.016	3.865	11.413	0.227	1.019	0.377
60.0	3.6	37.4	0.772	4.309	11.481	0.196	1.117	0.426
75.0	4.1	58.7	0.571	4.757	11.777	0.126	1.327	0.478
90.0	4.1	74.2	0.324	4.822	11.926	0.061	1.356	0.504
105.0	4.0	88.9	0.195	5.186	12.145	0.022	1.371	0.512
120.0	3.8	101.3	0.213	5.963	12.389	0.036	1.339	0.507
135.0	3.4	111.2	0.360	5.955	12.061	0.058	1.319	0.503
150.0	2.9	121.0	0.434	5.667	11.921	0.081	1.286	0.493
165.0	2.6	132.2	0.516	5.792	11.644	0.106	1.215	0.456
180.0	2.9	55.9	0.799	5.033	11.851	0.187	1.365	0.377
195.0	4.3	196.0	0.928	3.139	11.492	0.138	0.663	0.286
210.0	4.2	225.2	0.687	4.538	11.337	0.112	1.065	0.341
225.0	4.3	242.9	0.471	4.782	11.650	0.079	1.249	0.402
240.0	4.4	254.8	0.314	4.728	11.575	0.052	1.322	0.440
255.0	4.4	264.8	0.226	5.581	11.697	0.031	1.353	0.472
270.0	4.5	277.9	0.349	5.566	12.342	0.032	1.382	0.495
285.0	4.6	290.8	0.382	6.183	11.980	0.079	1.355	0.485
300.0	4.7	303.0	0.663	5.374	12.208	0.133	1.279	0.459
315.0	4.7	314.8	0.760	4.645	11.619	0.179	1.146	0.428
330.0	4.5	326.1	0.873	5.520	11.406	0.209	0.996	0.404
345.0	4.1	334.4	1.193	4.666	11.279	0.224	0.882	0.386

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.38:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	9.5	-1.6	1.057	1.690	11.063	0.273	0.266	0.391
15.0	9.5	13.5	1.237	2.494	11.115	0.269	0.562	0.403
30.0	9.5	28.6	1.097	3.280	11.147	0.246	0.889	0.429
45.0	9.6	43.6	0.960	4.162	11.946	0.204	1.107	0.462
60.0	9.6	58.1	0.795	5.193	12.559	0.144	1.270	0.503
75.0	9.7	73.0	0.339	4.813	12.152	0.070	1.257	0.526
90.0	9.7	87.8	0.126	4.585	11.954	0.029	1.254	0.524
105.0	9.6	102.7	0.257	5.156	12.013	0.041	1.216	0.488
120.0	9.2	116.1	0.465	4.669	11.691	0.061	1.236	0.457
135.0	9.0	130.4	0.433	4.921	11.534	0.079	1.110	0.399
150.0	9.0	145.7	0.565	3.734	11.433	0.095	0.938	0.337
165.0	9.1	161.3	0.584	3.262	11.249	0.103	0.843	0.291
180.0	9.3	178.0	0.511	2.795	10.666	0.107	0.702	0.250
195.0	9.5	194.7	0.669	2.840	11.123	0.106	0.655	0.219
210.0	9.4	211.7	0.613	3.335	11.292	0.098	0.975	0.244
225.0	9.3	228.7	0.623	5.045	11.441	0.085	1.256	0.302
240.0	9.3	243.7	0.409	4.765	11.469	0.066	1.395	0.371
255.0	9.6	257.3	0.294	5.142	12.063	0.047	1.391	0.426
270.0	9.7	271.8	0.222	5.759	12.294	0.031	1.415	0.484
285.0	9.7	286.2	0.412	7.193	12.392	0.063	1.387	0.504
300.0	9.7	300.7	0.598	5.425	12.002	0.136	1.337	0.494
315.0	9.7	314.7	0.761	4.141	11.586	0.197	1.116	0.454
330.0	9.6	329.0	1.109	3.255	11.261	0.239	0.848	0.420
345.0	9.5	343.6	1.025	2.868	11.063	0.264	0.547	0.398

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.39:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	14.5	-0.7	1.373	1.751	11.085	0.303	0.269	0.425
15.0	14.5	14.5	1.095	2.679	11.167	0.294	0.552	0.434
30.0	14.6	29.6	1.175	3.583	11.249	0.269	0.885	0.464
45.0	14.6	44.5	0.791	4.358	11.472	0.220	1.119	0.501
60.0	14.6	59.2	0.616	5.354	12.201	0.149	1.327	0.543
75.0	14.7	74.1	0.365	5.486	12.374	0.073	1.191	0.547
90.0	14.7	89.0	0.145	4.430	11.985	0.042	1.167	0.526
105.0	14.7	104.0	0.422	4.667	11.778	0.054	1.135	0.469
120.0	14.5	118.2	0.439	5.814	11.690	0.070	1.435	0.466
135.0	14.4	133.4	0.366	5.081	10.949	0.080	1.313	0.385
150.0	14.5	148.7	0.482	3.809	10.921	0.088	0.960	0.306
165.0	14.5	164.0	0.480	3.286	10.733	0.091	0.651	0.255
180.0	14.6	179.2	0.487	2.360	10.517	0.096	0.510	0.218
195.0	14.6	194.6	0.607	3.843	10.267	0.090	0.653	0.182
210.0	14.6	210.2	0.561	4.174	10.562	0.084	1.064	0.169
225.0	14.5	226.2	0.509	4.518	10.858	0.083	1.519	0.221
240.0	14.5	241.7	0.548	6.063	11.381	0.073	1.697	0.310
255.0	14.7	255.9	0.316	6.337	11.315	0.058	1.495	0.377
270.0	14.7	270.8	0.237	6.947	11.693	0.045	1.483	0.466
285.0	14.8	285.4	0.381	7.197	12.537	0.063	1.439	0.517
300.0	14.7	300.2	0.519	5.557	11.725	0.141	1.433	0.535
315.0	14.6	314.6	0.780	4.490	11.661	0.214	1.147	0.500
330.0	14.6	329.3	1.092	3.364	11.438	0.264	0.837	0.460
345.0	14.5	344.2	1.240	2.258	11.055	0.292	0.472	0.432

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.



**Table S.40:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.6	-0.4	1.471	2.301	11.514	0.327	0.342	0.514
15.0	19.6	14.8	1.408	2.880	11.241	0.322	0.615	0.519
30.0	19.6	29.9	1.228	3.997	11.670	0.293	0.934	0.541
45.0	19.6	44.9	0.922	4.678	11.793	0.239	1.204	0.570
60.0	19.6	59.7	0.631	5.611	12.117	0.158	1.427	0.594
75.0	19.7	74.5	0.489	5.534	13.173	0.078	1.134	0.563
90.0	19.7	89.4	0.206	4.305	11.929	0.056	1.088	0.523
105.0	19.7	104.4	0.401	4.424	11.817	0.071	1.057	0.452
120.0	19.6	119.1	0.358	5.907	10.935	0.088	1.686	0.471
135.0	19.6	134.3	0.513	5.607	11.119	0.096	1.398	0.346
150.0	19.6	149.3	0.444	3.914	10.421	0.109	1.058	0.274
165.0	19.6	164.3	0.558	2.708	10.573	0.121	0.709	0.255
180.0	19.6	179.6	0.423	2.943	10.282	0.110	0.552	0.205
195.0	19.6	194.9	0.395	4.697	10.183	0.111	0.877	0.196
210.0	19.6	210.1	0.578	6.422	10.109	0.104	1.316	0.227
225.0	19.6	225.2	0.531	6.314	10.041	0.081	1.366	0.177
240.0	19.6	240.8	0.526	7.233	10.463	0.085	1.941	0.239
255.0	19.7	255.4	0.475	6.261	11.123	0.070	1.556	0.326
270.0	19.7	270.4	0.248	7.614	11.670	0.057	1.527	0.445
285.0	19.7	285.2	0.359	6.956	12.191	0.067	1.455	0.523
300.0	19.6	299.9	0.621	6.783	12.136	0.148	1.519	0.584
315.0	19.6	314.6	0.844	4.847	11.446	0.230	1.151	0.579
330.0	19.6	329.5	1.166	3.740	11.557	0.287	0.790	0.552
345.0	19.5	344.5	1.267	2.634	11.379	0.317	0.464	0.526

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.41:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	24.5	-0.2	1.477	3.317	12.173	0.354	0.478	0.672
15.0	24.5	14.9	1.318	3.823	12.235	0.345	0.733	0.674
30.0	24.5	30.0	1.251	4.579	12.058	0.315	1.019	0.683
45.0	24.5	45.0	1.098	5.011	12.325	0.258	1.260	0.676
60.0	24.5	59.9	0.611	6.225	12.404	0.172	1.501	0.666
75.0	24.6	74.6	0.472	4.850	13.162	0.085	1.104	0.586
90.0	24.6	89.5	0.257	4.495	11.705	0.069	1.021	0.521
105.0	24.6	104.6	0.367	4.396	11.409	0.089	0.979	0.429
120.0	24.5	119.5	0.393	6.057	10.736	0.108	1.849	0.456
135.0	24.5	134.5	0.484	6.317	10.304	0.128	1.631	0.336
150.0	24.6	149.5	0.417	3.647	10.149	0.125	1.039	0.253
165.0	24.7	164.5	0.603	3.624	10.297	0.150	0.741	0.244
180.0	25.0	179.7	0.487	2.709	10.232	0.112	0.337	0.147
195.0	24.8	195.0	0.525	4.125	10.232	0.140	0.667	0.217
210.0	24.6	210.0	0.534	5.634	10.203	0.109	1.104	0.280
225.0	24.6	225.2	0.396	7.264	10.035	0.104	1.554	0.316
240.0	24.6	240.3	0.323	7.776	10.062	0.093	2.026	0.273
255.0	24.6	255.2	0.375	7.560	10.762	0.084	1.571	0.294
270.0	24.6	270.2	0.306	7.865	11.588	0.068	1.546	0.427
285.0	24.6	285.1	0.412	7.800	12.057	0.071	1.530	0.534
300.0	24.6	299.9	0.608	7.653	11.747	0.156	1.529	0.644
315.0	24.6	314.7	0.944	5.351	11.989	0.247	1.135	0.689
330.0	24.5	329.6	1.381	4.671	12.160	0.309	0.770	0.695
345.0	24.5	344.7	1.367	3.280	11.896	0.342	0.498	0.681

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.42:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	29.5	-0.1	1.695	4.543	12.623	0.376	0.671	0.862
15.0	29.5	15.0	1.436	4.800	12.680	0.365	0.884	0.859
30.0	29.5	30.0	1.342	5.344	12.967	0.339	1.118	0.855
45.0	29.5	45.0	1.162	5.990	12.644	0.279	1.327	0.826
60.0	29.5	59.9	0.671	6.469	13.047	0.188	1.536	0.753
75.0	29.5	74.7	0.376	4.904	12.550	0.095	1.135	0.611
90.0	29.5	89.6	0.327	4.760	11.748	0.082	1.077	0.513
105.0	29.5	104.6	0.482	4.643	11.225	0.108	0.940	0.395
120.0	29.5	119.7	0.463	6.412	10.510	0.131	1.790	0.431
135.0	29.4	134.4	1.009	6.723	10.334	0.170	1.693	0.336
150.0	29.6	149.3	0.638	4.663	10.170	0.196	1.179	0.288
165.0	29.7	164.0	0.659	3.844	10.092	0.183	0.645	0.219
180.0	30.5	179.5	0.582	3.704	9.958	0.157	0.413	0.147
195.0	29.8	194.5	0.618	4.254	9.932	0.168	0.548	0.186
210.0	29.6	209.9	0.546	5.200	10.137	0.160	0.949	0.280
225.0	29.5	225.2	0.565	6.947	10.150	0.153	1.704	0.462
240.0	29.5	240.0	0.390	7.469	9.967	0.104	1.681	0.359
255.0	29.5	255.0	0.426	7.040	11.096	0.099	1.525	0.318
270.0	29.5	270.0	0.362	7.598	11.233	0.081	1.551	0.433
285.0	29.6	285.0	0.363	7.514	11.847	0.078	1.588	0.564
300.0	29.5	299.8	0.659	7.642	11.989	0.166	1.458	0.712
315.0	29.5	314.7	1.114	6.380	12.129	0.264	1.074	0.819
330.0	29.5	329.8	1.557	5.100	12.582	0.329	0.791	0.863
345.0	29.5	344.8	1.453	4.669	13.190	0.362	0.641	0.867

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table S.43:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-3.0	-643.3	1.763	10.629	14.066	0.298	2.454	0.880
15.0	-1.2	-768.4	1.725	10.220	13.874	0.317	2.384	0.797
30.0	-4.5	-140.3	1.505	10.139	14.589	0.325	1.933	0.900
45.0	-4.0	-99.0	1.810	9.685	15.438	0.277	2.322	1.000
60.0	1.5	54.9	1.436	8.616	13.903	0.301	2.037	0.866
75.0	1.3	72.6	1.991	16.517	15.926	0.212	2.168	0.944
90.0	0.5	87.6	1.255	18.795	14.614	0.129	2.218	0.991
105.0	-0.7	98.4	1.220	17.077	16.056	0.123	2.226	1.023
120.0	-3.5	106.6	1.104	8.711	14.601	0.183	2.253	1.024
135.0	-5.0	117.0	1.474	9.538	14.558	0.252	2.149	1.011
150.0	-6.3	129.9	1.858	10.403	14.649	0.305	1.948	0.959
165.0	-2.2	437.5	1.879	9.092	13.637	0.326	2.297	0.832
180.0	-2.4	1212.3	1.820	10.859	13.364	0.294	2.524	0.853
195.0	-2.5	344.7	1.675	10.262	13.947	0.298	2.416	0.851
210.0	0.7	344.3	1.652	10.547	13.705	0.255	2.618	0.786
225.0	2.3	262.1	0.972	12.534	13.030	0.129	2.587	0.833
240.0	-0.1	267.3	1.533	15.641	14.273	0.126	2.525	0.916
255.0	0.4	276.8	0.776	11.876	13.768	0.104	2.401	0.909
270.0	0.2	283.1	1.025	11.274	13.838	0.159	2.279	0.888
285.0	-0.9	286.8	1.225	11.130	13.828	0.205	2.204	0.864
300.0	-0.9	292.8	1.194	11.142	13.920	0.243	2.134	0.825
315.0	-1.7	252.4	1.955	11.938	13.566	0.263	2.552	0.818
330.0	-0.6	197.5	1.700	12.768	14.554	0.250	2.699	0.816
345.0	-2.4	-266.1	1.637	13.002	13.732	0.260	2.543	0.872

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.44:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	1.0	-51.8	2.132	10.082	13.837	0.339	2.236	0.777
15.0	0.9	-97.9	1.937	8.776	14.319	0.276	2.481	0.876
30.0	1.3	-108.8	2.312	10.737	14.821	0.239	2.257	0.976
45.0	2.6	-92.0	2.197	7.793	14.198	0.212	2.307	0.991
60.0	3.4	-79.5	1.328	10.498	14.518	0.171	2.346	1.015
75.0	4.4	63.7	1.349	8.459	13.569	0.267	2.039	0.929
90.0	4.2	78.5	1.393	11.344	15.244	0.159	2.173	1.014
105.0	3.9	91.2	0.795	10.758	15.656	0.084	2.168	1.031
120.0	3.2	104.3	1.428	9.724	14.558	0.138	2.125	1.019
135.0	2.3	112.8	1.661	8.809	14.208	0.171	2.094	1.001
150.0	1.1	121.7	1.663	9.451	14.673	0.210	2.050	0.996
165.0	0.3	125.8	1.828	9.226	14.002	0.243	2.044	0.940
180.0	1.0	62.8	1.799	10.034	13.340	0.305	2.307	0.792
195.0	1.6	58.1	2.766	10.964	13.359	0.332	2.473	0.747
210.0	5.0	260.2	1.701	12.827	13.813	0.182	2.564	0.810
225.0	4.3	260.1	1.603	14.436	14.111	0.157	2.547	0.835
240.0	4.5	270.2	0.783	13.665	13.130	0.089	2.520	0.900
255.0	3.8	277.2	3.660	11.971	15.019	0.162	2.390	0.943
270.0	4.0	285.9	2.879	11.320	14.705	0.207	2.287	0.928
285.0	4.2	292.4	1.973	11.142	14.115	0.254	2.125	0.883
300.0	4.4	300.2	3.077	16.727	14.447	0.315	2.059	0.893
315.0	3.9	304.9	1.527	10.516	14.338	0.335	1.940	0.792
330.0	2.7	306.1	2.194	11.205	14.196	0.342	2.013	0.762
345.0	1.5	307.4	1.827	11.806	14.110	0.340	2.088	0.752

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.45:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	6.0	-43.9	2.355	11.041	12.753	0.415	2.177	0.756
15.0	6.2	-35.5	2.429	10.750	12.619	0.442	2.119	0.745
30.0	6.4	-26.2	2.179	9.799	12.185	0.455	2.077	0.743
45.0	6.9	-1.3	2.221	6.669	13.764	0.471	1.784	0.750
60.0	9.0	54.9	2.897	11.304	16.782	0.351	1.987	0.933
75.0	9.1	70.1	2.566	10.760	17.129	0.228	2.087	1.026
90.0	9.0	83.0	0.526	10.428	14.324	0.094	2.111	1.067
105.0	8.9	99.2	0.972	7.670	14.322	0.091	2.024	0.990
120.0	8.3	111.0	3.205	10.786	14.673	0.159	1.948	0.925
135.0	7.6	120.5	1.549	8.315	13.514	0.167	1.865	0.880
150.0	7.0	129.2	2.088	9.249	13.640	0.186	1.799	0.856
165.0	6.6	141.0	2.147	9.991	13.270	0.197	1.750	0.775
180.0	6.5	154.9	2.353	9.678	13.211	0.215	1.757	0.699
195.0	8.6	206.7	2.124	10.949	11.590	0.216	1.550	0.417
210.0	8.3	237.8	2.908	22.553	12.635	0.216	2.327	0.650
225.0	8.3	252.9	1.972	11.843	12.753	0.153	2.420	0.764
240.0	8.3	261.7	1.275	14.198	13.707	0.124	2.456	0.878
255.0	8.4	271.0	0.877	15.053	13.676	0.098	2.517	0.944
270.0	8.7	279.3	1.105	12.689	14.011	0.119	2.497	0.979
285.0	9.0	289.1	3.160	24.153	14.062	0.230	2.430	0.968
300.0	9.3	301.0	3.158	16.997	15.807	0.331	2.129	0.928
315.0	8.9	310.7	2.161	9.494	13.672	0.387	1.917	0.802
330.0	8.1	317.8	2.261	11.286	12.976	0.427	1.833	0.761
345.0	6.4	312.4	2.347	10.862	12.373	0.401	2.124	0.764

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.46:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	13.9	-2.3	3.013	4.860	12.337	0.557	0.918	0.767
15.0	14.0	13.2	2.719	5.634	12.190	0.546	1.093	0.779
30.0	14.1	28.8	2.117	5.436	12.211	0.514	1.428	0.821
45.0	14.2	44.2	1.914	7.811	13.491	0.444	1.786	0.914
60.0	14.2	58.2	3.394	7.960	13.666	0.351	1.999	1.024
75.0	14.3	73.0	4.185	9.811	15.779	0.225	2.012	1.089
90.0	14.4	87.5	0.420	9.223	14.451	0.081	2.029	1.069
105.0	14.5	103.4	1.038	13.455	14.057	0.117	2.001	0.904
120.0	13.8	116.2	1.871	14.186	13.541	0.161	2.065	0.846
135.0	13.3	129.3	1.414	8.832	12.797	0.158	1.921	0.756
150.0	13.6	145.8	1.753	9.818	12.558	0.165	1.491	0.583
165.0	14.5	163.0	1.226	4.791	11.859	0.186	1.018	0.422
180.0	14.7	178.6	1.045	4.099	11.299	0.204	0.758	0.347
195.0	14.6	194.9	1.223	7.158	11.383	0.177	1.173	0.276
210.0	13.7	216.1	1.383	9.678	11.961	0.176	1.924	0.353
225.0	13.6	233.1	1.528	10.740	13.564	0.181	2.296	0.545
240.0	13.5	248.4	2.049	15.097	13.567	0.161	2.519	0.690
255.0	13.8	260.8	0.873	11.734	14.913	0.117	2.566	0.819
270.0	14.0	274.2	1.016	13.183	14.596	0.093	2.641	0.976
285.0	14.3	287.4	2.416	15.620	18.564	0.205	2.577	1.020
300.0	14.4	300.6	1.407	10.449	14.012	0.337	2.220	0.973
315.0	14.2	313.7	1.770	8.771	12.838	0.433	1.778	0.878
330.0	14.0	327.7	2.196	6.493	12.434	0.503	1.406	0.818
345.0	13.9	342.6	2.507	5.752	12.289	0.539	1.105	0.785

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.47:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.3	-0.8	2.816	3.987	13.171	0.588	0.828	0.953
15.0	19.3	14.4	2.603	5.466	12.906	0.580	1.110	0.952
30.0	19.3	29.7	2.245	6.311	12.921	0.544	1.475	0.979
45.0	19.3	44.7	1.954	7.697	13.806	0.475	1.763	1.046
60.0	19.4	59.2	1.428	9.189	14.569	0.359	2.043	1.140
75.0	19.4	73.7	2.701	20.951	15.423	0.207	2.101	1.153
90.0	19.5	88.6	0.460	8.850	14.131	0.097	1.958	1.052
105.0	19.5	104.2	1.944	16.087	13.947	0.137	2.001	0.842
120.0	19.0	117.8	0.813	7.798	12.821	0.158	2.483	0.832
135.0	19.1	133.8	1.108	8.534	12.521	0.184	2.367	0.607
150.0	19.1	148.8	0.957	6.110	11.429	0.178	1.354	0.412
165.0	19.1	164.1	1.277	4.749	11.838	0.212	0.953	0.355
180.0	19.4	179.9	1.087	5.607	11.372	0.217	0.876	0.310
195.0	19.3	194.8	1.421	7.017	11.323	0.196	1.368	0.318
210.0	19.2	210.4	1.015	7.781	10.715	0.170	1.819	0.377
225.0	19.2	226.8	0.938	8.542	11.369	0.161	2.338	0.390
240.0	18.9	243.8	0.893	9.692	13.063	0.165	2.825	0.533
255.0	19.2	257.7	1.041	14.476	13.578	0.137	2.746	0.691
270.0	19.3	272.3	1.620	13.611	14.387	0.117	2.767	0.925
285.0	19.4	286.6	2.086	15.979	13.909	0.198	2.803	1.023
300.0	19.4	300.4	1.555	11.514	13.988	0.349	2.342	1.087
315.0	19.3	314.3	1.762	8.395	13.102	0.460	1.819	1.029
330.0	19.3	328.9	2.413	5.462	12.709	0.534	1.282	0.990
345.0	19.3	343.9	2.873	4.479	12.628	0.575	0.970	0.967

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.



**Table S.48:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.4	-0.3	2.988	4.781	13.619	0.613	0.940	1.223
15.0	24.4	14.9	2.532	6.372	13.305	0.603	1.185	1.224
30.0	24.4	30.0	2.340	6.933	13.545	0.572	1.509	1.215
45.0	24.4	45.0	1.998	7.927	13.435	0.499	1.823	1.238
60.0	24.4	59.6	1.396	9.887	15.019	0.375	2.137	1.286
75.0	24.4	74.0	2.596	10.291	16.775	0.217	2.058	1.188
90.0	24.5	89.1	0.501	8.803	14.007	0.116	1.887	1.023
105.0	24.5	104.4	2.273	14.802	13.083	0.166	2.027	0.762
120.0	24.1	119.1	1.036	8.969	12.912	0.188	2.798	0.740
135.0	23.9	134.3	1.367	8.971	12.104	0.244	2.549	0.531
150.0	24.2	148.8	1.182	8.017	11.344	0.241	1.820	0.411
165.0	24.9	163.9	1.018	4.323	10.734	0.195	0.950	0.296
180.0	25.6	179.5	0.861	4.373	10.503	0.197	0.639	0.230
195.0	25.3	195.3	0.992	5.597	10.401	0.209	1.077	0.285
210.0	24.3	211.5	0.949	7.086	10.689	0.204	1.929	0.426
225.0	23.8	227.0	3.528	13.574	13.257	0.232	2.807	0.582
240.0	24.1	241.6	0.996	12.163	12.066	0.187	3.091	0.523
255.0	24.4	256.5	0.979	13.811	13.070	0.157	2.816	0.590
270.0	24.3	271.5	1.143	19.140	14.597	0.130	2.914	0.895
285.0	24.4	286.2	3.424	15.641	13.966	0.200	2.869	1.066
300.0	24.4	300.3	1.385	11.069	14.061	0.365	2.511	1.229
315.0	24.4	314.7	2.094	9.412	13.692	0.488	1.849	1.250
330.0	24.4	329.5	2.240	6.744	13.895	0.561	1.325	1.246
345.0	24.4	344.5	2.758	6.635	13.619	0.601	1.035	1.244

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.49:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.5	-0.1	2.649	6.373	14.714	0.635	1.117	1.541
15.0	29.5	15.1	2.584	6.763	13.979	0.626	1.321	1.515
30.0	29.4	30.2	2.451	9.258	14.429	0.588	1.657	1.484
45.0	29.4	45.1	2.229	8.982	14.891	0.523	1.877	1.462
60.0	29.4	59.7	1.563	10.159	15.758	0.396	2.163	1.441
75.0	29.4	74.3	0.949	8.904	15.430	0.209	2.052	1.219
90.0	29.4	89.3	0.673	11.610	14.819	0.136	1.978	0.990
105.0	29.3	104.4	1.797	11.008	12.790	0.199	2.139	0.709
120.0	29.0	119.6	2.257	9.824	13.174	0.241	3.138	0.709
135.0	28.4	132.9	1.756	9.596	12.405	0.320	2.770	0.602
150.0	28.9	146.6	1.500	8.503	11.223	0.342	1.997	0.555
165.0	29.9	162.3	2.444	6.523	10.702	0.390	1.388	0.469
180.0	30.7	178.3	1.818	9.592	10.301	0.356	1.050	0.463
195.0	30.8	194.8	1.763	8.651	10.215	0.385	1.342	0.500
210.0	29.5	212.5	2.767	15.354	10.662	0.331	2.182	0.513
225.0	28.9	226.8	1.329	16.079	11.986	0.256	2.671	0.631
240.0	29.2	240.2	1.216	11.689	12.974	0.200	2.926	0.738
255.0	29.2	255.8	3.558	19.333	13.060	0.204	2.867	0.621
270.0	29.4	271.0	0.946	14.399	15.506	0.142	2.885	0.868
285.0	29.4	285.9	0.951	14.441	14.213	0.194	2.971	1.104
300.0	29.5	300.3	1.401	12.617	14.589	0.378	2.657	1.386
315.0	29.5	314.9	1.969	9.560	15.139	0.509	2.000	1.490
330.0	29.5	329.8	2.509	10.055	15.519	0.581	1.543	1.535
345.0	29.5	344.8	2.733	6.987	14.389	0.621	1.221	1.546

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.50:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	0.5	132.0	1.398	8.947	13.567	0.243	1.992	0.555
15.0	-2.9	-158.5	1.403	7.753	13.089	0.278	1.643	0.672
30.0	-3.9	-112.9	1.654	8.261	12.752	0.265	1.931	0.746
45.0	-3.1	-96.3	1.062	7.669	13.585	0.206	2.055	0.784
60.0	1.3	58.0	0.927	7.343	13.513	0.200	1.856	0.727
75.0	1.1	74.8	1.052	6.700	13.057	0.118	1.866	0.767
90.0	0.3	92.3	0.704	7.976	14.078	0.073	1.834	0.799
105.0	-1.0	101.9	0.755	6.371	12.875	0.094	1.854	0.811
120.0	-2.5	109.9	0.823	7.031	12.696	0.130	1.880	0.796
135.0	-4.2	117.7	1.074	7.208	14.124	0.177	1.809	0.803
150.0	-4.8	112.6	1.407	8.103	13.271	0.241	1.890	0.774
165.0	-3.8	69.3	1.462	8.549	13.259	0.260	2.096	0.719
180.0	-0.6	408.4	1.297	9.562	12.299	0.252	2.242	0.641
195.0	-1.5	286.9	1.426	8.741	12.954	0.220	2.208	0.655
210.0	2.7	246.3	1.149	9.292	12.109	0.149	2.120	0.583
225.0	1.0	254.4	0.889	11.318	12.988	0.117	2.102	0.678
240.0	0.2	263.9	0.752	11.574	13.703	0.073	2.068	0.716
255.0	-0.4	272.3	0.689	10.341	13.891	0.063	1.975	0.731
270.0	-0.4	279.9	1.054	10.880	13.239	0.093	1.896	0.719
285.0	-0.1	288.6	0.791	8.700	13.752	0.131	1.818	0.695
300.0	-0.3	296.2	0.889	9.687	12.695	0.172	1.746	0.659
315.0	-2.1	301.5	0.991	9.099	12.083	0.194	1.750	0.620
330.0	-3.2	306.6	1.545	9.394	12.272	0.224	1.771	0.624
345.0	2.4	136.5	1.285	9.755	12.115	0.193	2.175	0.534

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.51:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	1.3	-45.3	1.578	9.961	12.660	0.273	1.905	0.621
15.0	1.1	-117.6	1.758	9.040	12.302	0.211	2.143	0.750
30.0	1.8	-107.0	2.014	7.296	12.662	0.188	2.108	0.800
45.0	2.6	-93.5	1.532	7.035	12.369	0.171	2.181	0.810
60.0	3.7	40.0	1.244	6.406	12.281	0.292	1.609	0.719
75.0	4.4	64.2	0.759	6.629	13.462	0.174	1.787	0.770
90.0	4.3	80.9	0.578	6.495	13.373	0.075	1.818	0.811
105.0	4.0	95.5	0.640	6.511	14.216	0.053	1.773	0.821
120.0	3.5	107.4	1.423	7.218	13.065	0.095	1.740	0.810
135.0	2.7	115.7	0.836	7.429	13.753	0.118	1.762	0.821
150.0	1.9	125.2	0.959	7.666	13.070	0.153	1.710	0.816
165.0	1.1	135.8	1.223	7.785	13.245	0.188	1.615	0.776
180.0	0.9	141.9	1.807	7.851	11.913	0.218	1.688	0.701
195.0	2.0	68.7	1.688	11.175	12.088	0.257	1.972	0.584
210.0	4.7	241.1	1.615	10.399	11.949	0.154	1.990	0.548
225.0	4.4	251.9	0.818	12.217	13.336	0.112	2.040	0.632
240.0	4.4	262.8	0.723	10.373	12.494	0.073	2.018	0.682
255.0	4.1	272.2	0.687	9.288	12.623	0.061	1.989	0.724
270.0	4.3	283.4	0.822	9.240	12.927	0.088	1.965	0.725
285.0	4.3	292.2	0.874	9.496	12.702	0.148	1.867	0.708
300.0	4.5	302.2	0.963	10.031	12.853	0.208	1.746	0.671
315.0	4.2	308.6	1.470	10.781	12.590	0.247	1.644	0.645
330.0	3.3	312.0	1.593	10.703	12.028	0.262	1.660	0.611
345.0	2.1	315.8	1.702	10.356	11.618	0.275	1.663	0.577

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.52:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	6.1	-36.8	2.050	9.690	11.557	0.341	1.830	0.628
15.0	6.1	-30.3	2.004	9.505	11.863	0.360	1.882	0.632
30.0	6.3	-19.0	1.733	7.513	11.936	0.380	1.808	0.640
45.0	9.1	41.0	1.684	5.771	13.066	0.324	1.546	0.730
60.0	9.2	56.0	1.433	7.009	14.208	0.237	1.724	0.793
75.0	9.4	71.4	0.627	7.066	13.383	0.128	1.738	0.828
90.0	9.4	86.3	0.313	6.318	13.167	0.051	1.693	0.839
105.0	9.3	102.1	0.603	6.015	13.006	0.069	1.624	0.784
120.0	8.5	113.5	0.766	6.328	13.241	0.097	1.585	0.755
135.0	7.9	124.4	0.860	6.994	13.144	0.122	1.501	0.711
150.0	7.5	134.3	1.518	7.278	12.375	0.139	1.383	0.673
165.0	6.9	141.6	1.036	6.803	12.869	0.152	1.418	0.665
180.0	6.7	155.3	1.147	6.502	12.297	0.173	1.456	0.615
195.0	8.9	198.3	1.450	9.494	12.180	0.179	1.223	0.319
210.0	8.5	223.9	1.368	9.058	11.887	0.159	1.665	0.422
225.0	8.5	240.6	1.365	8.003	12.058	0.128	1.881	0.533
240.0	8.6	251.4	0.913	8.317	12.616	0.103	1.963	0.615
255.0	8.9	262.7	0.539	10.367	13.332	0.072	2.077	0.682
270.0	9.1	275.7	0.450	10.115	13.650	0.058	2.118	0.741
285.0	9.3	288.1	1.088	10.693	13.601	0.121	2.071	0.740
300.0	9.4	301.0	2.327	7.786	13.341	0.223	1.833	0.717
315.0	9.2	313.1	1.833	8.896	12.554	0.294	1.562	0.671
330.0	8.7	324.0	1.784	6.677	12.304	0.349	1.357	0.629
345.0	7.3	323.5	2.033	8.844	11.725	0.348	1.618	0.606

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.53:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.1	-1.8	1.790	3.250	11.763	0.458	0.686	0.659
15.0	14.2	13.5	2.021	4.307	11.900	0.448	0.951	0.679
30.0	14.3	28.9	1.682	5.617	12.218	0.410	1.300	0.728
45.0	14.4	43.9	1.282	7.270	12.905	0.337	1.532	0.784
60.0	14.4	58.3	1.150	6.783	13.971	0.239	1.739	0.853
75.0	14.5	73.3	1.514	7.092	14.165	0.131	1.639	0.865
90.0	14.6	88.4	0.242	6.069	13.319	0.067	1.567	0.829
105.0	14.6	103.8	0.920	11.134	13.308	0.093	1.542	0.734
120.0	14.0	117.1	0.893	6.132	12.567	0.117	1.739	0.732
135.0	13.8	131.8	0.894	6.617	12.588	0.137	1.572	0.628
150.0	13.8	147.2	0.772	5.350	12.048	0.147	1.210	0.510
165.0	14.1	163.0	0.948	4.237	11.666	0.145	0.844	0.410
180.0	14.3	178.7	0.785	4.275	10.709	0.145	0.780	0.326
195.0	14.3	195.1	1.288	7.580	11.131	0.151	1.129	0.265
210.0	14.0	212.8	0.994	6.675	11.199	0.149	1.666	0.269
225.0	13.9	229.9	1.234	7.419	13.287	0.138	2.064	0.396
240.0	13.9	244.7	0.839	8.948	13.693	0.123	2.254	0.494
255.0	14.3	258.2	0.674	8.121	13.107	0.102	2.221	0.592
270.0	14.4	272.5	0.592	11.104	13.083	0.076	2.265	0.711
285.0	14.5	286.5	0.695	12.599	13.128	0.111	2.207	0.762
300.0	14.4	300.7	1.362	9.092	12.791	0.227	2.014	0.774
315.0	14.4	314.3	1.342	7.403	12.743	0.323	1.582	0.725
330.0	14.2	328.3	2.040	5.660	12.160	0.395	1.204	0.690
345.0	14.1	342.9	1.974	4.985	11.781	0.438	0.908	0.664

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.54:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.3	-0.8	2.357	3.495	12.130	0.495	0.729	0.797
15.0	19.4	14.5	2.112	4.553	12.510	0.482	1.020	0.812
30.0	19.4	29.7	2.015	6.118	12.723	0.439	1.350	0.847
45.0	19.4	44.7	1.301	6.538	12.827	0.360	1.642	0.888
60.0	19.4	59.1	1.061	7.426	13.940	0.248	1.848	0.933
75.0	19.6	74.0	1.143	8.291	15.358	0.130	1.602	0.881
90.0	19.6	89.2	0.348	6.308	13.296	0.088	1.507	0.804
105.0	19.6	104.4	2.234	12.079	12.336	0.125	1.521	0.672
120.0	19.2	118.5	1.389	11.466	13.566	0.147	2.127	0.706
135.0	19.2	133.7	0.828	6.789	11.314	0.156	1.761	0.540
150.0	19.3	148.8	1.358	7.368	12.055	0.184	1.512	0.439
165.0	19.3	163.9	0.905	4.013	11.152	0.183	0.844	0.355
180.0	19.6	179.3	0.847	4.264	10.695	0.167	0.788	0.305
195.0	19.5	194.8	0.638	6.334	10.272	0.155	1.171	0.297
210.0	19.3	210.7	1.268	8.456	11.642	0.177	1.847	0.406
225.0	19.2	226.4	0.797	8.128	10.360	0.150	2.189	0.312
240.0	19.2	242.2	0.949	9.216	13.172	0.140	2.550	0.400
255.0	19.5	256.6	0.857	13.752	12.657	0.120	2.376	0.519
270.0	19.5	271.3	0.716	10.949	12.987	0.092	2.362	0.680
285.0	19.6	285.9	1.802	10.103	13.301	0.119	2.287	0.771
300.0	19.5	300.4	1.062	9.476	13.134	0.234	2.145	0.844
315.0	19.4	314.5	1.407	7.573	12.841	0.346	1.623	0.835
330.0	19.3	329.0	1.845	5.973	12.206	0.431	1.135	0.819
345.0	19.3	344.0	1.915	4.647	12.178	0.475	0.834	0.803

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.55:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.4	-0.3	2.399	4.659	13.287	0.525	0.850	1.019
15.0	24.4	14.9	2.349	5.318	13.342	0.513	1.097	1.021
30.0	24.4	30.0	2.020	6.364	13.277	0.470	1.440	1.028
45.0	24.4	44.9	1.617	7.462	13.758	0.385	1.698	1.023
60.0	24.4	59.6	1.039	9.092	14.083	0.264	1.947	1.038
75.0	24.5	74.3	0.899	6.639	15.312	0.136	1.598	0.897
90.0	24.6	89.3	0.427	5.986	12.764	0.106	1.482	0.788
105.0	24.6	104.5	2.141	11.596	12.204	0.150	1.420	0.609
120.0	24.3	119.2	0.720	7.631	11.531	0.170	2.386	0.646
135.0	24.1	134.4	1.039	7.165	11.367	0.221	2.299	0.469
150.0	24.2	148.9	1.285	6.001	11.350	0.236	1.700	0.415
165.0	24.8	164.2	1.156	4.383	10.799	0.240	1.003	0.371
180.0	25.4	179.5	0.692	3.467	10.298	0.157	0.407	0.192
195.0	25.0	195.4	0.977	5.353	10.389	0.211	1.076	0.313
210.0	24.3	210.6	1.103	7.166	10.230	0.203	1.891	0.462
225.0	24.3	225.5	1.056	9.094	10.496	0.182	2.371	0.558
240.0	24.3	241.0	0.928	10.076	11.142	0.158	2.762	0.440
255.0	24.5	255.8	0.861	9.288	12.886	0.134	2.379	0.489
270.0	24.5	270.9	0.708	10.860	13.124	0.108	2.418	0.663
285.0	24.5	285.7	0.887	13.128	13.424	0.120	2.443	0.790
300.0	24.5	300.2	1.062	11.313	13.163	0.246	2.307	0.921
315.0	24.5	314.7	1.433	8.097	13.566	0.369	1.659	0.983
330.0	24.4	329.4	1.948	6.960	12.850	0.459	1.200	1.014
345.0	24.4	344.5	2.019	5.441	13.379	0.503	0.908	1.017

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.



**Table S.56:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.5	-0.1	2.405	5.641	13.663	0.549	1.044	1.286
15.0	29.5	15.1	2.256	7.533	13.956	0.536	1.245	1.271
30.0	29.5	30.2	2.109	8.181	14.005	0.494	1.542	1.259
45.0	29.5	45.1	1.674	8.290	14.234	0.411	1.815	1.221
60.0	29.4	59.8	1.092	9.439	14.557	0.280	2.015	1.137
75.0	29.5	74.4	1.304	6.905	14.422	0.150	1.686	0.933
90.0	29.5	89.4	0.514	6.364	13.235	0.126	1.592	0.784
105.0	29.4	104.4	3.121	13.767	13.631	0.187	1.543	0.577
120.0	29.3	119.5	1.054	7.859	10.922	0.198	2.315	0.565
135.0	29.0	133.9	1.254	7.022	11.442	0.279	2.428	0.503
150.0	29.4	147.9	1.218	7.181	10.879	0.265	1.577	0.453
165.0	30.1	162.9	1.070	6.511	10.243	0.281	1.032	0.397
180.0	30.7	178.6	1.305	5.529	10.177	0.294	0.793	0.327
195.0	30.2	194.7	1.249	6.082	10.179	0.287	0.973	0.306
210.0	29.8	210.4	1.113	7.006	10.251	0.222	1.412	0.363
225.0	29.2	225.7	0.979	8.448	10.174	0.237	2.405	0.598
240.0	29.3	240.4	1.187	11.310	11.042	0.186	2.618	0.605
255.0	29.5	255.5	0.930	11.124	11.764	0.162	2.344	0.497
270.0	29.5	270.5	0.651	13.032	12.822	0.127	2.407	0.671
285.0	29.5	285.5	0.616	11.745	13.036	0.127	2.510	0.828
300.0	29.5	300.1	1.030	12.529	12.819	0.257	2.378	0.999
315.0	29.5	314.8	1.665	9.377	13.328	0.393	1.844	1.164
330.0	29.5	329.7	2.036	8.324	13.995	0.483	1.352	1.253
345.0	29.5	344.8	2.183	6.443	14.349	0.526	1.073	1.281

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table S.57:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.6	-136.9	1.685	11.143	12.709	0.307	2.359	0.706
15.0	-2.8	-134.4	1.867	9.467	13.040	0.321	2.364	0.787
30.0	-4.0	-116.3	1.514	8.778	13.786	0.300	2.280	0.871
45.0	2.1	38.6	1.217	6.392	12.940	0.292	1.831	0.832
60.0	2.6	64.0	0.909	6.526	13.197	0.175	1.998	0.883
75.0	2.2	83.3	1.283	6.721	13.589	0.100	1.909	0.910
90.0	0.9	100.0	1.008	7.745	14.678	0.098	1.924	0.913
105.0	-1.4	109.9	0.920	7.798	14.214	0.129	1.954	0.916
120.0	-3.3	116.2	1.417	7.258	13.162	0.174	1.956	0.915
135.0	-5.3	125.7	1.304	7.871	13.641	0.228	1.899	0.915
150.0	-5.5	143.3	1.960	8.104	13.360	0.288	1.647	0.864
165.0	-4.9	154.4	1.599	7.893	13.084	0.333	1.429	0.845
180.0	-0.4	239.9	2.118	8.524	12.553	0.309	1.636	0.637
195.0	3.0	226.1	1.706	10.965	12.007	0.240	2.195	0.604
210.0	3.1	241.6	1.259	11.474	12.013	0.182	2.395	0.653
225.0	1.4	252.5	1.384	11.569	12.277	0.152	2.368	0.740
240.0	-0.4	261.6	1.177	13.154	12.751	0.108	2.339	0.769
255.0	-1.2	269.3	0.639	12.466	13.769	0.076	2.184	0.772
270.0	-1.7	276.9	0.681	9.484	13.233	0.088	2.078	0.768
285.0	-1.8	284.4	0.768	9.106	13.465	0.114	2.023	0.743
300.0	-3.5	288.1	0.973	10.403	13.080	0.156	2.061	0.711
315.0	-5.4	290.7	2.121	13.391	12.193	0.202	2.185	0.723
330.0	-6.9	273.9	1.195	10.591	12.907	0.242	2.465	0.775
345.0	1.7	-171.5	1.787	11.314	12.314	0.245	2.663	0.668

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.58:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	0.1	-131.1	1.793	10.811	12.488	0.266	2.547	0.851
15.0	0.4	-118.9	1.696	9.809	14.015	0.241	2.501	0.885
30.0	1.4	-107.9	1.777	8.780	13.930	0.223	2.489	0.897
45.0	2.4	20.1	1.506	7.212	12.219	0.367	1.709	0.849
60.0	4.5	49.4	1.217	6.699	13.022	0.264	1.845	0.867
75.0	5.0	71.3	0.836	7.205	13.679	0.135	1.879	0.909
90.0	4.6	89.6	0.576	7.249	13.990	0.062	1.817	0.915
105.0	4.0	104.5	0.992	6.803	14.761	0.087	1.807	0.896
120.0	3.4	113.6	2.015	12.876	13.535	0.133	1.837	0.892
135.0	2.4	122.2	1.567	7.797	13.192	0.157	1.764	0.898
150.0	1.4	130.1	2.036	8.504	13.757	0.183	1.734	0.924
165.0	0.5	139.8	1.089	8.314	13.806	0.215	1.611	0.905
180.0	0.2	152.6	1.330	9.065	13.369	0.251	1.477	0.836
195.0	4.6	217.9	2.209	11.298	11.661	0.234	1.989	0.532
210.0	4.9	238.0	1.734	12.652	11.678	0.188	2.247	0.614
225.0	4.6	250.4	1.411	11.552	12.551	0.139	2.299	0.674
240.0	4.5	260.9	0.796	11.635	12.474	0.094	2.224	0.698
255.0	3.9	270.8	1.395	11.699	13.314	0.078	2.192	0.760
270.0	3.6	279.9	1.225	12.131	13.876	0.100	2.167	0.758
285.0	4.0	290.0	0.908	9.886	13.184	0.129	2.100	0.736
300.0	3.9	297.4	0.995	11.685	13.091	0.189	1.948	0.708
315.0	3.1	302.6	1.121	11.619	12.766	0.222	1.893	0.681
330.0	1.9	307.2	1.330	12.723	12.016	0.242	1.915	0.740
345.0	0.3	312.8	1.604	12.291	11.502	0.265	1.996	0.812

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.59:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	6.1	-28.6	2.274	12.179	11.494	0.403	2.157	1.260
15.0	5.0	-32.0	2.607	11.218	12.262	0.372	2.330	0.905
30.0	6.2	-104.3	2.484	9.718	12.281	0.201	2.652	0.882
45.0	6.1	-9.8	2.259	9.479	12.871	0.400	2.144	0.853
60.0	9.0	54.1	2.810	7.337	13.998	0.265	1.796	0.920
75.0	9.6	72.2	0.745	6.988	13.935	0.131	1.733	0.923
90.0	9.5	88.5	0.378	6.765	13.561	0.061	1.664	0.921
105.0	9.2	104.8	0.836	6.718	12.937	0.090	1.617	0.855
120.0	8.5	115.5	1.299	6.465	13.742	0.114	1.597	0.842
135.0	7.8	126.8	0.914	6.842	13.320	0.141	1.499	0.799
150.0	7.1	135.2	1.590	7.677	14.125	0.165	1.455	0.783
165.0	6.3	141.0	1.420	7.195	12.993	0.178	1.407	0.804
180.0	5.6	151.2	1.845	7.864	13.674	0.200	1.383	0.802
195.0	8.6	202.2	1.918	11.702	12.644	0.213	1.605	0.419
210.0	8.6	229.6	1.510	10.827	11.599	0.179	2.120	0.494
225.0	8.6	243.3	1.459	10.132	11.994	0.151	2.182	0.576
240.0	8.6	252.4	1.234	14.134	14.145	0.126	2.206	0.647
255.0	8.8	265.2	0.660	10.015	12.730	0.083	2.314	0.700
270.0	9.0	275.9	0.624	11.527	13.898	0.071	2.357	0.757
285.0	9.2	288.1	0.930	12.760	13.283	0.117	2.316	0.753
300.0	9.2	300.9	1.210	13.985	12.753	0.218	2.054	0.733
315.0	8.8	311.9	1.901	10.341	12.406	0.295	1.728	0.708
330.0	7.5	315.3	2.149	11.905	12.224	0.318	1.799	0.678
345.0	6.7	322.0	1.897	11.052	11.629	0.377	1.865	1.015

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.60:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	13.3	-4.8	2.525	7.004	12.309	0.496	1.166	0.761
15.0	13.7	11.7	2.220	6.044	12.259	0.488	1.230	0.797
30.0	14.0	27.8	2.131	7.135	12.934	0.439	1.464	0.853
45.0	14.2	43.1	1.412	8.302	13.062	0.353	1.648	0.914
60.0	14.3	57.7	1.612	8.168	15.231	0.252	1.812	0.988
75.0	14.5	73.4	1.064	8.692	15.201	0.131	1.679	0.956
90.0	14.5	89.1	0.479	6.301	14.291	0.084	1.600	0.906
105.0	14.5	104.6	1.874	12.625	12.798	0.119	1.556	0.780
120.0	13.9	117.6	0.957	6.624	13.468	0.137	1.745	0.804
135.0	13.7	132.5	1.589	6.305	12.750	0.166	1.472	0.675
150.0	13.6	146.9	1.000	5.987	12.526	0.177	1.173	0.582
165.0	13.6	162.1	1.187	5.319	11.879	0.192	1.022	0.496
180.0	13.9	178.6	1.489	5.986	12.071	0.185	0.990	0.377
195.0	13.9	196.8	1.504	9.867	10.614	0.193	1.522	0.321
210.0	13.6	216.6	1.326	9.539	11.176	0.181	2.023	0.337
225.0	13.5	232.8	1.671	12.472	12.571	0.165	2.320	0.446
240.0	13.8	245.6	1.184	13.252	14.248	0.149	2.495	0.542
255.0	14.2	258.9	0.855	14.376	14.694	0.124	2.506	0.631
270.0	14.2	273.2	0.896	12.554	13.359	0.096	2.569	0.724
285.0	14.3	286.8	1.824	12.194	13.686	0.122	2.536	0.768
300.0	14.2	301.0	1.503	13.649	13.006	0.231	2.245	0.774
315.0	14.1	314.0	1.371	9.582	12.420	0.324	1.751	0.764
330.0	13.8	327.1	2.203	8.529	12.258	0.406	1.453	0.750
345.0	13.4	340.6	2.170	7.754	12.319	0.465	1.276	0.756

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.61:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.1	-1.3	2.398	5.160	12.909	0.532	1.060	0.898
15.0	19.2	14.0	2.522	6.227	12.999	0.522	1.235	0.914
30.0	19.2	29.3	2.322	7.409	12.920	0.467	1.522	0.951
45.0	19.3	44.2	1.680	8.021	13.767	0.370	1.767	0.998
60.0	19.3	58.6	1.191	8.325	14.389	0.259	1.909	1.057
75.0	19.5	73.9	1.572	7.110	15.559	0.143	1.674	0.973
90.0	19.6	89.2	0.521	9.681	13.830	0.107	1.548	0.856
105.0	19.5	104.4	5.396	16.720	12.733	0.194	1.486	0.690
120.0	19.2	118.6	1.102	8.447	13.420	0.177	1.983	0.763
135.0	19.0	133.5	0.937	6.998	12.129	0.193	1.685	0.610
150.0	18.9	148.2	1.177	7.108	11.468	0.224	1.524	0.529
165.0	19.1	164.0	1.420	4.731	11.806	0.246	1.040	0.456
180.0	19.3	179.4	0.882	6.146	10.382	0.219	0.989	0.376
195.0	19.4	194.9	1.545	7.439	10.475	0.229	1.563	0.443
210.0	19.2	211.3	1.215	9.463	10.377	0.190	1.876	0.430
225.0	19.0	227.7	1.030	9.037	11.854	0.186	2.431	0.417
240.0	19.0	242.8	1.289	14.214	11.834	0.172	2.787	0.427
255.0	19.4	257.1	1.176	15.507	12.358	0.145	2.667	0.558
270.0	19.4	271.8	1.020	12.135	13.232	0.111	2.725	0.703
285.0	19.4	286.3	3.456	16.924	16.396	0.159	2.720	0.798
300.0	19.4	300.7	1.098	12.588	12.490	0.232	2.419	0.843
315.0	19.3	314.6	1.572	10.144	12.711	0.348	1.949	0.841
330.0	19.1	328.8	2.356	7.927	12.572	0.444	1.404	0.866
345.0	19.1	343.5	2.475	7.689	12.733	0.508	1.122	0.886

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.62:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.3	-0.5	2.915	5.285	13.998	0.568	1.128	1.114
15.0	24.3	14.7	2.757	7.227	13.891	0.555	1.343	1.127
30.0	24.3	29.9	2.264	8.530	13.452	0.499	1.637	1.129
45.0	24.3	44.7	2.017	8.812	14.545	0.397	1.849	1.129
60.0	24.3	59.2	1.441	9.312	14.801	0.270	2.107	1.146
75.0	24.4	74.2	3.608	21.734	14.419	0.169	1.824	0.997
90.0	24.5	89.2	1.414	16.236	13.374	0.134	1.628	0.831
105.0	24.4	104.3	3.469	12.919	13.876	0.198	1.445	0.622
120.0	24.2	119.1	0.941	7.035	13.725	0.206	2.347	0.715
135.0	24.2	134.2	0.976	6.887	11.668	0.228	1.900	0.521
150.0	24.2	149.0	1.110	6.856	11.077	0.253	1.658	0.456
165.0	24.6	164.1	1.467	5.162	11.531	0.277	0.972	0.413
180.0	25.4	179.8	1.325	5.411	10.548	0.275	0.677	0.333
195.0	24.9	195.3	1.114	6.218	10.419	0.240	1.219	0.381
210.0	24.1	211.5	1.621	12.777	10.399	0.252	2.138	0.541
225.0	24.4	225.2	0.892	8.877	10.276	0.192	2.165	0.626
240.0	24.1	241.3	1.083	11.516	11.622	0.197	2.929	0.535
255.0	24.4	256.1	10.378	11.566	13.720	0.290	2.700	0.612
270.0	24.4	271.2	0.881	13.970	12.587	0.135	2.790	0.720
285.0	24.4	285.9	0.645	14.935	13.100	0.127	2.835	0.835
300.0	24.4	300.6	1.312	13.130	13.140	0.243	2.616	0.897
315.0	24.3	314.8	1.677	11.533	13.449	0.375	2.048	0.979
330.0	24.3	329.4	2.290	8.018	13.468	0.480	1.515	1.051
345.0	24.3	344.3	2.326	7.930	13.150	0.542	1.211	1.087

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.63:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.4	-0.1	2.836	6.593	14.539	0.595	1.292	1.392
15.0	29.4	15.1	2.922	7.725	14.287	0.582	1.505	1.393
30.0	29.4	30.1	2.122	8.558	14.414	0.524	1.774	1.350
45.0	29.4	45.0	1.871	8.674	14.087	0.422	1.942	1.279
60.0	29.3	59.6	1.109	9.804	14.380	0.284	2.176	1.235
75.0	29.4	74.2	1.185	8.874	15.995	0.167	1.876	1.027
90.0	29.4	89.2	1.152	14.609	13.209	0.157	1.729	0.828
105.0	29.3	104.1	1.454	8.933	13.264	0.222	1.511	0.577
120.0	29.1	119.3	1.213	7.868	12.062	0.251	2.505	0.652
135.0	28.9	134.1	1.598	7.259	11.061	0.306	2.252	0.504
150.0	29.1	147.9	1.689	7.013	11.070	0.324	1.555	0.512
165.0	29.9	162.3	1.357	7.833	10.435	0.370	1.187	0.546
180.0	30.4	178.3	2.210	7.283	10.405	0.420	0.929	0.415
195.0	30.9	194.9	1.625	7.450	10.326	0.356	1.159	0.368
210.0	29.7	211.0	1.657	8.824	10.581	0.313	1.804	0.513
225.0	29.2	225.2	1.073	9.145	10.308	0.243	2.231	0.691
240.0	29.3	240.4	1.794	12.433	10.326	0.215	2.570	0.685
255.0	29.4	255.7	1.312	12.370	11.980	0.194	2.617	0.648
270.0	29.4	270.8	2.058	16.866	12.221	0.165	2.829	0.804
285.0	29.4	285.8	1.574	13.245	14.035	0.142	2.945	0.908
300.0	29.4	300.4	1.159	12.348	12.800	0.255	2.707	0.981
315.0	29.4	315.0	1.825	11.114	13.918	0.400	2.169	1.142
330.0	29.4	329.8	2.180	9.499	14.624	0.510	1.732	1.286
345.0	29.4	344.8	2.286	7.808	14.643	0.565	1.415	1.371

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.



**Table S.64:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-2.0	-9.4	0.678	7.449	11.060	0.166	1.094	0.503
15.0	-0.2	8.4	0.710	5.520	11.082	0.170	1.146	0.526
30.0	1.3	26.3	0.623	4.804	11.457	0.159	1.262	0.555
45.0	2.1	46.8	0.518	4.588	11.566	0.117	1.378	0.576
60.0	2.1	65.7	0.442	4.713	11.739	0.070	1.345	0.575
75.0	1.5	83.5	0.249	4.901	12.126	0.039	1.258	0.561
90.0	0.9	100.8	0.260	7.102	11.717	0.040	1.262	0.555
105.0	-0.3	112.8	0.290	5.222	11.350	0.050	1.304	0.551
120.0	-1.6	123.2	0.385	4.987	11.212	0.070	1.329	0.555
135.0	-2.8	133.7	0.455	5.038	11.662	0.098	1.262	0.548
150.0	-3.5	146.7	0.567	5.729	11.722	0.127	1.056	0.525
165.0	-3.5	159.6	0.644	5.796	11.399	0.153	0.779	0.488
180.0	-2.7	176.8	0.788	4.439	11.456	0.163	0.606	0.443
195.0	-1.3	196.2	0.791	5.750	11.288	0.151	0.862	0.415
210.0	-0.2	218.4	0.710	7.163	11.235	0.119	1.269	0.424
225.0	-0.1	234.8	0.608	7.030	11.213	0.085	1.393	0.444
240.0	-0.4	248.9	0.341	7.347	11.447	0.056	1.406	0.452
255.0	-1.1	261.8	0.332	6.449	11.703	0.039	1.403	0.462
270.0	-1.7	272.9	0.246	6.941	11.699	0.036	1.396	0.456
285.0	-2.3	283.0	0.358	6.235	11.716	0.052	1.378	0.452
300.0	-2.7	291.8	0.449	5.958	11.487	0.069	1.339	0.443
315.0	-3.9	303.0	0.533	6.536	11.042	0.092	1.323	0.426
330.0	-4.3	318.6	0.714	8.245	10.899	0.130	1.271	0.488
345.0	-3.6	333.4	0.618	6.884	10.899	0.149	1.150	0.478

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.65:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	2.0	-23.0	0.894	7.120	10.855	0.165	1.241	0.506
15.0	2.3	-7.0	0.893	6.895	10.951	0.186	1.227	0.548
30.0	3.0	10.2	0.845	6.024	11.209	0.190	1.207	0.563
45.0	4.0	31.8	0.704	5.269	11.485	0.163	1.228	0.576
60.0	4.7	54.7	0.477	4.877	11.954	0.103	1.305	0.588
75.0	4.9	72.7	0.291	4.782	11.761	0.050	1.256	0.581
90.0	4.6	89.6	0.187	4.945	11.786	0.029	1.151	0.565
105.0	4.4	104.9	0.328	5.001	11.863	0.039	1.126	0.546
120.0	3.8	115.6	0.361	5.147	12.054	0.053	1.115	0.549
135.0	3.3	126.1	0.615	5.810	11.839	0.071	1.071	0.539
150.0	2.7	134.6	0.576	5.755	11.733	0.086	1.003	0.541
165.0	2.1	143.8	0.631	5.568	11.495	0.104	0.919	0.547
180.0	1.6	155.2	0.668	5.481	11.487	0.120	0.828	0.533
195.0	1.6	169.6	0.734	5.435	10.956	0.133	0.773	0.486
210.0	2.6	191.1	0.926	5.084	10.879	0.131	0.926	0.391
225.0	4.2	227.0	0.645	5.601	10.830	0.089	1.283	0.338
240.0	4.3	243.6	0.331	5.405	11.298	0.060	1.387	0.378
255.0	4.3	255.4	0.349	5.761	11.525	0.047	1.412	0.395
270.0	4.2	270.1	0.309	6.252	11.455	0.036	1.440	0.419
285.0	4.1	283.9	0.299	6.193	11.654	0.034	1.438	0.430
300.0	3.9	296.4	0.339	7.122	11.221	0.058	1.424	0.405
315.0	3.3	304.7	0.404	6.628	11.013	0.080	1.345	0.399
330.0	2.7	312.4	0.565	6.794	10.702	0.104	1.296	0.401
345.0	2.1	323.2	0.656	6.977	10.690	0.132	1.244	0.447

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.66:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	7.0	-21.3	1.078	8.012	11.181	0.193	1.282	0.519
15.0	6.7	-9.4	1.062	8.100	11.170	0.213	1.297	0.596
30.0	8.3	19.8	0.815	6.629	11.551	0.203	1.172	0.587
45.0	9.2	40.8	0.801	4.711	12.644	0.154	1.171	0.601
60.0	9.3	56.4	0.608	5.143	12.566	0.105	1.203	0.616
75.0	9.6	72.8	0.307	5.036	12.270	0.054	1.116	0.582
90.0	9.6	88.5	0.177	4.555	11.737	0.045	1.040	0.561
105.0	9.5	103.7	0.294	4.437	11.323	0.058	0.915	0.501
120.0	9.0	116.6	0.342	4.678	11.671	0.071	0.829	0.510
135.0	8.7	130.7	0.411	4.018	11.440	0.086	0.602	0.453
150.0	8.2	142.9	0.579	4.169	11.723	0.098	0.458	0.426
165.0	7.2	144.8	0.562	5.668	10.847	0.093	0.500	0.425
180.0	6.8	155.9	0.584	6.172	10.669	0.102	0.590	0.410
195.0	8.9	192.7	0.769	5.761	10.513	0.112	0.907	0.313
210.0	9.1	210.5	0.981	7.918	10.650	0.107	1.182	0.285
225.0	9.2	227.5	0.829	6.333	10.922	0.092	1.429	0.282
240.0	9.3	242.6	0.597	6.206	10.672	0.079	1.596	0.313
255.0	9.6	256.1	0.429	6.660	10.789	0.065	1.610	0.353
270.0	9.5	270.6	0.355	7.271	11.133	0.056	1.632	0.383
285.0	9.5	285.1	0.348	7.414	10.976	0.044	1.611	0.411
300.0	9.4	299.8	0.504	8.979	11.037	0.073	1.550	0.402
315.0	9.3	313.5	0.893	9.242	10.825	0.117	1.330	0.412
330.0	9.0	326.5	0.960	7.647	10.947	0.158	1.091	0.420
345.0	7.9	334.7	1.199	7.110	11.270	0.184	1.113	0.432

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.67:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.2	-2.2	0.954	4.633	11.088	0.238	0.693	0.510
15.0	14.2	12.9	0.891	4.532	11.616	0.234	0.822	0.554
30.0	14.3	28.1	0.847	4.944	11.937	0.206	1.011	0.598
45.0	14.3	43.0	0.719	5.887	12.059	0.162	1.150	0.634
60.0	14.4	57.9	0.672	5.758	12.653	0.116	1.196	0.654
75.0	14.6	73.6	0.274	4.748	12.016	0.068	1.007	0.576
90.0	14.6	88.8	0.252	4.353	11.550	0.069	0.917	0.528
105.0	14.5	103.8	0.378	5.591	11.242	0.086	0.736	0.430
120.0	14.3	118.1	0.516	4.537	11.939	0.107	0.781	0.505
135.0	14.1	133.0	0.648	4.988	11.198	0.119	0.727	0.452
150.0	14.0	147.7	0.733	5.332	11.151	0.134	0.672	0.415
165.0	13.9	162.5	0.486	3.792	10.533	0.135	0.668	0.387
180.0	14.1	178.2	0.595	5.553	10.409	0.134	0.817	0.359
195.0	14.3	194.2	0.510	6.556	10.345	0.129	1.103	0.337
210.0	14.2	210.5	0.866	8.737	10.526	0.128	1.400	0.315
225.0	14.3	226.1	0.635	7.015	10.379	0.113	1.632	0.287
240.0	14.4	241.3	0.729	8.443	10.632	0.101	1.837	0.285
255.0	14.5	255.6	0.735	7.517	10.891	0.091	1.827	0.367
270.0	14.5	270.4	0.575	8.261	11.206	0.072	1.853	0.407
285.0	14.6	285.1	0.431	10.344	11.018	0.056	1.823	0.441
300.0	14.5	300.1	0.557	8.029	11.188	0.080	1.675	0.428
315.0	14.4	314.4	0.560	7.117	11.376	0.129	1.430	0.444
330.0	14.3	328.6	0.913	7.012	11.076	0.180	1.102	0.454
345.0	14.2	343.1	1.138	6.314	11.250	0.218	0.812	0.475

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.68:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.4	-1.1	1.064	4.807	11.213	0.260	0.688	0.563
15.0	19.4	14.0	1.024	4.560	11.689	0.252	0.866	0.609
30.0	19.4	29.1	0.953	5.553	12.021	0.221	1.110	0.653
45.0	19.4	44.0	0.715	5.590	12.318	0.174	1.276	0.685
60.0	19.4	58.7	0.662	6.447	12.769	0.129	1.331	0.708
75.0	19.6	74.0	0.415	5.869	12.415	0.085	1.024	0.577
90.0	19.6	89.0	0.340	5.100	11.444	0.093	0.892	0.488
105.0	19.6	103.9	0.792	8.921	10.698	0.116	0.721	0.352
120.0	19.4	118.8	0.568	4.718	11.787	0.145	1.095	0.526
135.0	19.3	133.6	0.546	4.693	10.943	0.162	0.935	0.478
150.0	19.2	148.5	0.629	5.092	10.711	0.175	0.862	0.434
165.0	19.3	163.6	0.889	4.320	10.534	0.174	0.725	0.378
180.0	19.4	179.0	0.666	5.301	10.415	0.180	0.852	0.381
195.0	19.4	194.3	0.859	7.059	10.434	0.160	1.065	0.385
210.0	19.5	209.9	0.578	7.670	10.315	0.152	1.513	0.428
225.0	19.5	225.2	0.562	8.192	10.313	0.136	1.744	0.410
240.0	19.5	240.6	0.657	9.536	10.485	0.123	1.951	0.358
255.0	19.5	255.2	0.581	8.833	10.613	0.110	1.945	0.457
270.0	19.5	270.3	0.584	8.436	11.247	0.089	1.998	0.463
285.0	19.5	285.1	0.484	8.910	11.569	0.069	1.965	0.517
300.0	19.5	300.1	0.477	8.567	11.441	0.087	1.831	0.451
315.0	19.5	314.6	0.638	7.581	11.075	0.139	1.472	0.483
330.0	19.4	329.2	1.012	7.700	11.067	0.195	1.116	0.504
345.0	19.4	344.0	1.101	6.163	11.427	0.240	0.802	0.526

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.69:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.4	-0.6	1.189	4.762	11.785	0.280	0.754	0.640
15.0	24.4	14.5	1.219	5.201	12.244	0.272	0.960	0.679
30.0	24.4	29.5	1.157	5.893	12.095	0.237	1.218	0.713
45.0	24.4	44.4	0.851	6.374	12.637	0.186	1.453	0.753
60.0	24.4	59.3	0.560	6.175	12.602	0.139	1.489	0.751
75.0	24.5	74.3	0.491	6.430	12.921	0.102	1.163	0.594
90.0	24.5	89.2	0.417	6.318	11.345	0.116	0.994	0.458
105.0	24.5	104.0	0.768	8.551	10.440	0.146	0.821	0.301
120.0	24.4	119.1	0.951	5.481	11.195	0.182	1.348	0.510
135.0	24.4	134.0	0.873	5.023	11.209	0.198	1.125	0.448
150.0	24.3	148.8	0.903	4.893	10.661	0.226	0.979	0.437
165.0	24.4	164.1	1.040	4.673	10.769	0.224	0.719	0.376
180.0	24.6	179.4	0.789	5.120	10.428	0.239	0.670	0.355
195.0	24.6	194.6	0.945	7.190	10.332	0.213	0.971	0.393
210.0	24.5	210.1	0.653	6.892	10.401	0.203	1.653	0.525
225.0	24.5	225.1	0.631	7.908	10.308	0.169	1.816	0.552
240.0	24.5	240.2	0.921	9.823	10.547	0.149	1.946	0.491
255.0	24.4	255.0	0.800	10.481	10.710	0.132	1.910	0.563
270.0	24.4	270.2	0.465	9.037	11.000	0.107	2.044	0.557
285.0	24.5	285.1	0.465	11.405	11.467	0.084	2.016	0.603
300.0	24.5	300.0	0.430	9.244	11.110	0.095	1.766	0.482
315.0	24.5	314.8	0.633	8.743	11.044	0.152	1.524	0.519
330.0	24.4	329.5	0.866	8.061	11.478	0.212	1.112	0.560
345.0	24.4	344.4	1.224	6.487	11.240	0.259	0.783	0.599

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table S.70:** Accelerations at Hangar Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.4	-0.4	1.442	6.168	11.804	0.304	0.874	0.737
15.0	29.4	14.7	1.186	6.140	12.563	0.290	1.111	0.774
30.0	29.4	29.7	1.084	6.492	12.336	0.253	1.375	0.796
45.0	29.5	44.6	0.791	6.974	12.550	0.201	1.529	0.808
60.0	29.5	59.5	0.709	6.780	12.817	0.153	1.653	0.801
75.0	29.5	74.3	0.816	7.771	12.868	0.121	1.367	0.628
90.0	29.5	89.2	0.519	7.734	11.023	0.135	1.207	0.467
105.0	29.4	104.0	0.744	9.268	10.024	0.171	1.029	0.313
120.0	29.4	119.2	0.700	5.898	10.771	0.212	1.556	0.479
135.0	29.3	134.2	0.731	5.465	10.525	0.237	1.405	0.412
150.0	29.3	149.1	1.494	5.861	10.474	0.280	1.196	0.387
165.0	29.5	164.1	1.301	5.290	10.450	0.298	0.697	0.347
180.0	29.8	179.3	1.022	5.236	10.228	0.284	0.502	0.313
195.0	29.8	194.8	1.205	7.575	10.302	0.303	0.956	0.392
210.0	29.5	210.0	1.355	8.714	10.515	0.260	1.390	0.498
225.0	29.5	225.0	1.166	8.684	10.387	0.213	1.752	0.590
240.0	29.5	240.1	0.736	8.699	10.335	0.175	1.947	0.595
255.0	29.4	255.0	1.040	9.868	10.725	0.152	1.739	0.625
270.0	29.4	270.1	0.462	9.265	11.021	0.125	1.990	0.651
285.0	29.5	285.1	0.448	9.355	11.761	0.101	2.009	0.703
300.0	29.5	299.9	0.466	11.649	10.819	0.108	1.756	0.493
315.0	29.5	314.8	0.698	8.987	11.174	0.163	1.370	0.563
330.0	29.5	329.6	0.899	7.241	11.540	0.229	1.035	0.626
345.0	29.4	344.6	1.267	6.640	11.743	0.280	0.841	0.687

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

This page intentionally left blank.



**Annex T**  
**Tables of Hangar Deck Accelerations –**  
**JONSWAP Spectrum (Coastal Waters)**

---

**Table T.1:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.4	-27.7	0.719	1.826	10.620	0.184	0.386	0.261
15.0	-0.0	12.7	0.749	0.743	10.442	0.170	0.180	0.221
30.0	-0.1	30.9	0.789	1.836	10.567	0.186	0.403	0.248
45.0	-0.2	39.3	0.779	2.136	10.573	0.195	0.536	0.272
60.0	-0.3	44.1	0.864	3.239	10.802	0.197	0.613	0.287
75.0	-0.6	50.4	0.796	2.881	10.657	0.201	0.757	0.314
90.0	-1.1	57.2	0.775	3.631	11.325	0.197	0.895	0.347
105.0	-1.1	-36.3	0.968	5.101	12.329	0.196	0.833	0.335
120.0	-0.8	-19.3	0.909	7.174	12.806	0.188	0.813	0.354
135.0	-2.3	102.3	0.895	5.781	12.048	0.163	1.045	0.505
150.0	-3.1	107.6	0.919	4.787	11.943	0.176	1.002	0.460
165.0	-2.8	101.7	0.869	4.984	12.124	0.153	1.038	0.541
180.0	-1.0	66.4	0.742	4.217	11.957	0.157	0.612	0.345
195.0	-0.4	18.6	0.819	4.550	11.958	0.190	0.626	0.324
210.0	-0.2	387.7	0.802	2.793	11.380	0.196	0.616	0.328
225.0	0.5	314.2	0.740	2.931	11.407	0.199	0.602	0.328
240.0	1.5	291.9	0.743	5.558	12.707	0.198	0.927	0.515
255.0	1.0	293.6	0.763	4.037	11.733	0.204	0.937	0.493
270.0	0.5	299.3	0.695	3.787	11.463	0.208	0.883	0.438
285.0	0.2	304.9	0.827	3.467	11.437	0.208	0.800	0.387
300.0	0.0	309.2	0.857	3.055	11.070	0.206	0.722	0.356
315.0	-0.1	312.9	0.834	2.770	10.845	0.205	0.666	0.333
330.0	-0.2	315.9	0.773	3.014	10.807	0.202	0.615	0.319
345.0	-0.3	321.4	0.772	2.363	10.762	0.196	0.520	0.296

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.2:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	4.7	-1.1	0.692	0.637	10.613	0.192	0.105	0.268
15.0	4.7	13.8	0.819	0.869	10.673	0.195	0.197	0.267
30.0	4.7	28.6	0.765	1.451	10.781	0.212	0.324	0.288
45.0	4.6	43.0	0.924	1.785	10.745	0.227	0.510	0.322
60.0	4.4	55.1	0.840	3.045	11.070	0.230	0.711	0.375
75.0	4.0	56.2	0.828	3.213	11.226	0.225	0.753	0.377
90.0	3.6	57.8	0.766	4.020	11.669	0.221	0.793	0.378
105.0	3.6	60.6	0.824	4.281	11.525	0.218	0.830	0.404
120.0	3.8	61.1	0.851	3.425	11.337	0.220	0.820	0.413
135.0	3.9	61.5	0.809	4.290	11.390	0.221	0.811	0.416
150.0	4.4	145.5	0.387	1.601	10.400	0.112	0.411	0.140
165.0	4.8	163.8	0.394	1.029	10.328	0.096	0.229	0.104
180.0	4.8	179.2	0.343	0.492	10.301	0.090	0.097	0.095
195.0	4.8	194.7	0.356	0.965	10.305	0.094	0.227	0.106
210.0	4.7	211.2	0.378	1.475	10.420	0.106	0.404	0.138
225.0	4.7	284.5	0.813	5.572	12.932	0.191	0.936	0.615
240.0	4.5	286.4	1.299	4.909	13.228	0.193	0.958	0.616
255.0	4.4	289.9	0.763	4.316	12.462	0.207	0.920	0.553
270.0	4.3	293.3	0.908	4.855	12.138	0.216	0.889	0.509
285.0	4.4	295.0	0.831	3.320	11.709	0.221	0.852	0.484
300.0	4.7	302.5	0.840	3.079	11.115	0.233	0.754	0.413
315.0	4.7	315.1	0.903	2.173	10.824	0.231	0.536	0.340
330.0	4.7	329.4	0.798	1.505	10.770	0.216	0.338	0.300
345.0	4.7	344.1	0.854	0.966	10.674	0.199	0.196	0.273

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.3:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	9.7	-0.4	0.809	0.655	10.765	0.214	0.078	0.310
15.0	9.7	14.5	0.787	0.846	10.696	0.220	0.134	0.307
30.0	9.7	29.5	0.902	1.384	10.685	0.238	0.280	0.312
45.0	9.7	44.5	1.017	2.404	10.739	0.254	0.476	0.332
60.0	9.7	59.2	0.931	3.454	11.251	0.252	0.699	0.429
75.0	9.7	72.9	0.868	4.480	12.215	0.213	0.860	0.628
90.0	9.3	85.2	0.398	5.220	12.479	0.098	0.965	0.794
105.0	9.0	99.8	0.891	7.751	13.565	0.111	1.033	0.517
120.0	9.2	115.7	0.518	4.495	11.354	0.103	0.935	0.286
135.0	9.6	133.2	0.266	2.716	10.253	0.090	0.939	0.143
150.0	9.7	148.9	0.228	2.856	10.070	0.078	0.979	0.102
165.0	9.8	164.3	0.235	2.792	10.076	0.068	0.810	0.081
180.0	9.8	179.4	0.236	1.831	10.026	0.066	0.472	0.056
195.0	9.8	194.9	0.270	1.688	10.196	0.068	0.517	0.063
210.0	9.8	210.4	0.251	2.359	10.158	0.075	0.819	0.089
225.0	9.7	226.1	0.327	2.699	10.407	0.089	0.888	0.145
240.0	9.3	243.5	0.823	5.894	12.224	0.106	0.938	0.288
255.0	9.1	260.3	0.662	7.561	12.774	0.117	1.050	0.532
270.0	9.4	274.3	0.455	5.818	13.044	0.085	0.996	0.834
285.0	9.8	286.8	0.832	5.412	12.364	0.213	0.886	0.691
300.0	9.7	300.3	0.955	2.783	11.222	0.255	0.720	0.471
315.0	9.7	314.8	0.973	1.924	10.950	0.257	0.484	0.347
330.0	9.7	329.8	0.905	1.254	10.733	0.241	0.286	0.317
345.0	9.7	344.7	0.816	0.804	10.741	0.222	0.139	0.310

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.4:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.7	-0.3	0.815	0.995	10.871	0.236	0.104	0.304
15.0	14.7	14.7	0.879	1.194	10.788	0.242	0.150	0.300
30.0	14.6	29.8	0.954	1.633	10.811	0.261	0.271	0.317
45.0	14.6	44.8	1.050	2.375	10.887	0.277	0.452	0.377
60.0	14.7	59.6	0.972	3.514	11.356	0.269	0.672	0.524
75.0	14.7	74.0	0.751	5.097	12.270	0.214	0.818	0.736
90.0	14.6	88.3	0.299	5.099	12.806	0.051	0.928	0.786
105.0	14.4	103.1	0.573	6.256	13.072	0.090	1.018	0.433
120.0	14.5	118.1	0.431	4.913	11.487	0.070	1.328	0.254
135.0	14.6	133.9	0.205	4.332	10.200	0.059	1.534	0.221
150.0	14.7	149.6	0.180	2.861	10.067	0.061	0.888	0.114
165.0	14.7	164.6	0.298	2.127	10.033	0.060	0.461	0.063
180.0	14.7	179.6	0.245	2.064	9.974	0.069	0.318	0.057
195.0	14.8	194.7	0.213	2.822	9.988	0.061	0.403	0.042
210.0	14.7	209.9	0.192	3.287	9.874	0.061	0.875	0.053
225.0	14.7	225.6	0.251	3.694	10.423	0.058	1.386	0.120
240.0	14.6	241.2	0.272	3.886	10.613	0.075	1.348	0.207
255.0	14.5	256.8	0.487	7.523	12.650	0.098	1.063	0.428
270.0	14.6	271.6	0.316	4.559	12.941	0.044	1.035	0.843
285.0	14.8	285.9	0.836	3.901	12.284	0.214	0.895	0.824
300.0	14.7	300.1	1.016	2.799	11.649	0.270	0.686	0.593
315.0	14.6	314.8	0.953	1.891	11.119	0.279	0.443	0.416
330.0	14.6	329.8	0.973	1.333	10.944	0.263	0.259	0.335
345.0	14.7	344.8	0.894	1.098	10.827	0.244	0.143	0.308

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.5:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.2	0.847	1.478	11.143	0.253	0.139	0.380
15.0	19.6	14.8	0.871	1.534	11.208	0.261	0.170	0.387
30.0	19.6	29.8	1.002	1.948	11.326	0.281	0.273	0.441
45.0	19.6	44.8	1.008	2.520	11.323	0.296	0.432	0.529
60.0	19.6	59.8	1.006	3.407	11.616	0.283	0.635	0.673
75.0	19.6	74.4	0.727	4.442	12.655	0.217	0.776	0.837
90.0	19.6	89.0	0.244	5.083	12.695	0.042	0.890	0.781
105.0	19.6	104.0	0.380	4.960	11.576	0.071	1.033	0.389
120.0	19.6	119.1	0.199	5.317	10.703	0.049	1.920	0.341
135.0	19.6	134.8	0.210	4.077	10.094	0.053	1.211	0.161
150.0	19.8	149.7	0.515	2.706	9.982	0.064	0.608	0.075
165.0	19.9	164.7	0.227	2.325	9.911	0.067	0.311	0.049
180.0	19.6	179.6	0.506	3.319	9.869	0.071	0.424	0.075
195.0	19.7	194.8	0.325	3.705	9.864	0.069	0.527	0.090
210.0	19.7	209.9	0.292	4.100	9.874	0.063	0.761	0.107
225.0	19.6	225.1	0.204	5.014	10.026	0.052	1.407	0.151
240.0	19.6	240.7	0.213	5.829	10.458	0.051	1.844	0.182
255.0	19.6	255.9	0.415	4.997	11.841	0.080	1.158	0.368
270.0	19.6	270.9	0.268	6.493	13.365	0.040	1.101	0.844
285.0	19.7	285.5	0.785	3.775	12.595	0.212	0.932	0.937
300.0	19.6	300.1	0.979	2.956	11.992	0.281	0.689	0.755
315.0	19.6	314.9	1.047	2.022	11.500	0.295	0.441	0.583
330.0	19.6	329.9	0.968	1.530	11.193	0.281	0.264	0.467
345.0	19.6	344.9	0.850	1.347	11.299	0.261	0.162	0.401

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.6:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.7	-0.1	0.935	1.448	11.620	0.262	0.149	0.544
15.0	24.7	14.9	0.877	1.577	11.384	0.270	0.169	0.565
30.0	24.7	29.9	0.930	1.928	11.715	0.292	0.253	0.640
45.0	24.7	44.9	1.012	2.752	11.811	0.309	0.407	0.747
60.0	24.7	59.8	0.955	3.705	12.199	0.294	0.616	0.856
75.0	24.7	74.6	0.721	3.990	12.727	0.219	0.766	0.949
90.0	24.6	89.4	0.199	5.178	13.122	0.040	0.874	0.780
105.0	24.6	104.4	0.320	5.862	11.529	0.057	1.184	0.363
120.0	24.6	119.9	0.241	5.409	10.106	0.048	1.910	0.274
135.0	24.6	134.8	0.647	3.812	9.943	0.069	1.071	0.123
150.0	24.6	149.8	0.641	2.561	9.934	0.082	0.481	0.067
165.0	24.6	164.8	0.710	3.017	9.961	0.101	0.449	0.085
180.0	24.7	179.9	0.676	3.293	9.989	0.083	0.424	0.087
195.0	24.7	194.7	0.652	3.551	9.970	0.091	0.601	0.113
210.0	24.4	209.7	0.652	3.928	9.913	0.080	0.743	0.117
225.0	24.6	225.1	0.244	5.482	9.908	0.063	1.212	0.177
240.0	24.6	240.3	0.217	6.293	10.252	0.053	2.292	0.276
255.0	24.6	255.6	0.410	5.744	11.384	0.068	1.309	0.309
270.0	24.6	270.6	0.297	7.199	13.048	0.044	1.114	0.827
285.0	24.7	285.4	0.727	4.198	13.024	0.210	0.959	1.028
300.0	24.7	300.1	0.986	3.131	12.503	0.288	0.713	0.923
315.0	24.7	315.1	0.945	2.032	12.098	0.304	0.460	0.786
330.0	24.7	330.0	0.926	1.611	11.844	0.290	0.282	0.660
345.0	24.7	345.0	0.893	1.377	11.511	0.269	0.180	0.573

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.7:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.7	-0.1	0.848	1.289	11.802	0.262	0.143	0.691
15.0	29.8	14.9	0.878	1.441	12.051	0.271	0.148	0.721
30.0	29.8	29.9	0.944	1.820	12.227	0.294	0.225	0.822
45.0	29.7	44.9	1.039	2.397	12.533	0.315	0.385	0.955
60.0	29.7	59.8	1.056	3.442	12.747	0.300	0.605	1.042
75.0	29.7	74.7	0.781	4.346	13.262	0.219	0.772	1.054
90.0	29.7	89.5	0.202	5.450	12.918	0.041	0.906	0.775
105.0	29.7	104.6	0.340	6.765	11.352	0.054	1.445	0.341
120.0	29.6	119.9	0.432	5.970	10.073	0.073	1.989	0.258
135.0	29.7	134.6	0.313	3.458	9.922	0.074	0.916	0.092
150.0	29.6	150.0	0.320	2.531	10.036	0.082	0.564	0.085
165.0	29.8	164.8	0.361	2.738	10.035	0.084	0.446	0.095
180.0	29.7	179.9	0.747	2.829	10.093	0.085	0.481	0.107
195.0	29.9	195.0	0.739	3.636	10.058	0.086	0.629	0.114
210.0	29.4	209.5	0.829	3.762	9.985	0.097	0.869	0.152
225.0	29.5	224.8	0.814	4.184	9.883	0.072	1.006	0.134
240.0	29.6	240.2	0.465	6.847	10.001	0.071	2.059	0.289
255.0	29.7	255.3	0.433	6.765	12.179	0.061	1.475	0.262
270.0	29.7	270.4	0.305	5.310	12.995	0.048	1.087	0.806
285.0	29.7	285.3	0.783	4.294	13.344	0.208	0.995	1.105
300.0	29.7	300.2	0.942	3.018	12.913	0.291	0.750	1.088
315.0	29.7	315.1	0.966	2.125	12.758	0.309	0.488	0.978
330.0	29.7	330.1	0.889	1.671	12.233	0.291	0.296	0.831
345.0	29.7	345.0	0.832	1.351	12.015	0.269	0.185	0.725

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table T.8:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	0.0	-7.5	0.578	2.003	10.382	0.136	0.337	0.207
15.0	-0.1	-2.3	0.485	1.467	10.414	0.136	0.218	0.200
30.0	-0.4	4.2	0.572	1.682	10.336	0.135	0.300	0.197
45.0	-0.4	19.7	0.504	2.516	10.415	0.132	0.622	0.206
60.0	-0.4	35.8	0.444	3.205	10.550	0.123	0.849	0.227
75.0	-0.4	50.0	0.408	3.219	10.771	0.111	0.972	0.251
90.0	-0.4	63.9	0.308	3.282	10.881	0.087	1.026	0.281
105.0	-0.4	78.6	0.194	3.119	10.966	0.044	1.036	0.314
120.0	-0.6	93.4	0.165	3.225	11.010	0.023	1.036	0.324
135.0	-1.1	103.6	0.284	3.362	11.035	0.052	1.037	0.314
150.0	-1.6	110.3	0.322	3.529	10.897	0.073	1.012	0.301
165.0	-0.3	14.7	0.467	3.446	10.640	0.130	0.376	0.212
180.0	0.3	269.3	0.490	2.654	10.567	0.117	0.613	0.214
195.0	0.2	357.0	0.607	3.645	10.695	0.129	0.570	0.224
210.0	0.3	363.7	0.514	3.786	10.840	0.125	0.692	0.235
225.0	0.8	262.8	0.243	3.704	11.196	0.039	1.024	0.351
240.0	0.8	273.9	0.212	3.962	11.115	0.032	1.030	0.365
255.0	0.8	286.8	0.310	4.183	11.345	0.069	1.022	0.342
270.0	0.6	298.1	0.425	3.848	11.078	0.096	0.999	0.307
285.0	0.3	307.8	0.398	3.476	10.951	0.111	0.935	0.277
300.0	0.2	317.8	0.555	3.439	10.747	0.119	0.881	0.254
315.0	0.1	328.1	0.547	3.312	10.638	0.126	0.774	0.235
330.0	0.1	338.9	0.529	2.766	10.493	0.131	0.629	0.220
345.0	0.1	347.1	0.582	2.157	10.418	0.135	0.462	0.211

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.9:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.8	-1.2	0.659	0.577	10.489	0.158	0.097	0.222
15.0	4.8	13.1	0.620	1.392	10.480	0.156	0.354	0.224
30.0	4.7	27.5	0.743	2.212	10.694	0.151	0.623	0.236
45.0	4.7	42.0	0.653	2.528	10.705	0.140	0.799	0.253
60.0	4.6	55.9	0.486	3.380	10.998	0.122	0.929	0.284
75.0	4.6	69.8	0.324	3.523	11.102	0.081	0.980	0.330
90.0	4.5	83.1	0.131	3.377	11.414	0.026	0.994	0.354
105.0	4.3	93.7	0.160	3.127	11.176	0.019	0.996	0.341
120.0	4.0	99.6	0.205	3.249	11.110	0.031	0.982	0.323
135.0	3.9	108.3	0.267	3.811	10.948	0.050	0.951	0.297
150.0	4.3	141.5	0.312	2.335	10.626	0.082	0.626	0.193
165.0	4.6	161.8	0.390	1.367	10.508	0.086	0.352	0.160
180.0	4.8	178.8	0.362	0.931	10.432	0.088	0.179	0.150
195.0	4.8	195.3	0.402	1.313	10.504	0.086	0.389	0.153
210.0	4.7	212.6	0.344	2.080	10.518	0.082	0.614	0.173
225.0	4.5	231.0	0.325	2.841	10.732	0.075	0.811	0.216
240.0	4.5	247.6	0.265	2.979	10.886	0.059	0.931	0.278
255.0	4.6	260.4	0.178	3.272	11.229	0.032	0.972	0.332
270.0	4.7	274.3	0.135	3.404	11.206	0.019	0.987	0.370
285.0	4.8	288.1	0.337	3.587	11.517	0.074	0.970	0.353
300.0	4.8	302.1	0.429	3.253	10.828	0.119	0.946	0.302
315.0	4.8	316.0	0.678	2.851	10.835	0.139	0.793	0.263
330.0	4.8	330.2	0.615	2.196	10.645	0.149	0.613	0.242
345.0	4.8	344.5	0.639	1.630	10.498	0.155	0.381	0.229

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.10:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.7	-0.4	0.727	0.553	10.574	0.179	0.060	0.242
15.0	9.7	14.6	0.810	1.101	10.711	0.176	0.260	0.240
30.0	9.7	29.6	0.655	2.048	10.622	0.168	0.490	0.246
45.0	9.8	44.5	0.624	2.437	10.742	0.155	0.677	0.262
60.0	9.8	59.3	0.533	2.907	11.272	0.128	0.827	0.313
75.0	9.8	74.0	0.355	3.484	11.596	0.070	0.867	0.364
90.0	9.8	88.8	0.057	3.347	11.143	0.014	0.892	0.358
105.0	9.8	103.6	0.155	3.585	11.234	0.032	0.897	0.302
120.0	9.7	118.2	0.189	3.608	10.752	0.050	0.928	0.245
135.0	9.7	133.4	0.254	3.574	10.691	0.056	0.812	0.196
150.0	9.7	148.9	0.206	2.686	10.250	0.060	0.749	0.158
165.0	9.7	164.2	0.196	2.051	10.179	0.062	0.552	0.135
180.0	9.8	179.4	0.226	1.496	10.230	0.063	0.317	0.120
195.0	9.8	194.7	0.223	1.430	10.170	0.063	0.385	0.115
210.0	9.8	210.3	0.250	2.018	10.282	0.060	0.688	0.126
225.0	9.7	225.9	0.248	2.765	10.592	0.057	0.829	0.166
240.0	9.7	241.3	0.218	3.594	10.899	0.051	0.955	0.217
255.0	9.8	256.1	0.162	3.199	11.083	0.035	0.939	0.289
270.0	9.8	270.9	0.064	3.527	11.330	0.015	0.942	0.365
285.0	9.9	285.5	0.284	3.569	11.354	0.068	0.910	0.383
300.0	9.8	300.1	0.488	3.103	11.315	0.127	0.845	0.335
315.0	9.8	314.9	0.614	2.586	10.848	0.155	0.688	0.278
330.0	9.8	329.7	0.657	1.908	10.665	0.168	0.486	0.255
345.0	9.8	344.6	0.657	1.175	10.615	0.176	0.266	0.246

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.11:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.7	-0.3	0.739	0.892	10.638	0.199	0.081	0.258
15.0	14.7	14.8	0.731	1.320	10.579	0.195	0.242	0.254
30.0	14.7	29.8	0.779	2.150	10.646	0.185	0.441	0.260
45.0	14.7	44.8	0.635	2.593	10.816	0.170	0.619	0.288
60.0	14.7	59.7	0.497	3.098	11.145	0.138	0.790	0.349
75.0	14.8	74.6	0.374	3.212	11.914	0.072	0.793	0.386
90.0	14.8	89.4	0.070	3.288	11.116	0.020	0.821	0.356
105.0	14.7	104.3	0.168	3.839	11.245	0.031	0.836	0.290
120.0	14.7	119.1	0.181	3.920	10.601	0.040	1.088	0.247
135.0	14.7	134.4	0.217	3.899	10.386	0.041	1.035	0.201
150.0	14.7	149.6	0.160	2.492	10.177	0.046	0.686	0.144
165.0	14.7	164.7	0.188	1.664	10.168	0.045	0.351	0.113
180.0	14.7	179.7	0.183	1.403	10.088	0.047	0.220	0.100
195.0	14.7	194.7	0.202	1.975	10.036	0.048	0.329	0.092
210.0	14.7	209.8	0.190	3.211	10.015	0.045	0.647	0.091
225.0	14.7	225.3	0.273	3.423	10.369	0.044	1.082	0.118
240.0	14.7	240.6	0.232	3.930	10.791	0.043	1.134	0.180
255.0	14.8	255.4	0.193	3.904	10.936	0.035	0.973	0.252
270.0	14.8	270.3	0.100	3.734	11.102	0.023	0.947	0.359
285.0	14.8	285.1	0.260	3.376	11.238	0.069	0.881	0.414
300.0	14.7	299.9	0.466	3.306	11.162	0.137	0.803	0.393
315.0	14.7	314.7	0.623	2.572	10.896	0.170	0.611	0.321
330.0	14.7	329.7	0.770	1.900	10.719	0.186	0.412	0.282
345.0	14.7	344.7	0.702	1.342	10.634	0.195	0.208	0.264

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.12:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.2	0.848	1.361	11.028	0.216	0.131	0.317
15.0	19.6	14.9	0.964	1.747	10.827	0.213	0.266	0.314
30.0	19.6	29.9	0.814	2.428	10.851	0.202	0.439	0.327
45.0	19.6	44.9	0.644	2.656	11.073	0.183	0.612	0.360
60.0	19.6	59.9	0.563	3.604	11.341	0.147	0.784	0.413
75.0	19.7	74.8	0.348	3.508	11.925	0.076	0.718	0.411
90.0	19.7	89.7	0.088	3.160	11.119	0.026	0.737	0.354
105.0	19.7	104.7	0.147	3.350	10.932	0.033	0.765	0.278
120.0	19.6	119.6	0.149	4.320	10.345	0.039	1.281	0.263
135.0	19.7	134.8	0.147	3.289	10.137	0.037	0.761	0.153
150.0	19.7	149.8	0.144	2.255	10.070	0.044	0.517	0.118
165.0	19.7	164.8	0.168	1.978	9.988	0.044	0.263	0.077
180.0	19.6	179.8	0.155	2.523	9.961	0.044	0.239	0.071
195.0	19.7	194.9	0.164	2.578	9.938	0.047	0.333	0.067
210.0	19.7	209.9	0.151	3.528	9.974	0.039	0.539	0.079
225.0	19.6	225.0	0.175	4.846	9.958	0.042	1.110	0.119
240.0	19.7	240.3	0.207	4.593	10.229	0.040	1.404	0.126
255.0	19.7	255.2	0.168	4.352	10.607	0.037	0.994	0.212
270.0	19.7	270.1	0.133	3.884	11.038	0.030	0.934	0.344
285.0	19.7	285.0	0.241	3.781	11.405	0.071	0.839	0.445
300.0	19.7	299.9	0.495	3.326	11.331	0.145	0.741	0.469
315.0	19.6	314.8	0.650	2.758	11.026	0.181	0.534	0.406
330.0	19.6	329.8	0.819	2.106	10.991	0.202	0.342	0.359
345.0	19.6	344.8	0.798	1.525	10.880	0.213	0.176	0.331

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.13:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.7	-0.1	0.963	1.466	11.342	0.231	0.147	0.446
15.0	24.7	15.0	0.874	1.849	11.305	0.228	0.267	0.442
30.0	24.7	30.0	0.877	2.493	11.213	0.216	0.425	0.453
45.0	24.7	45.0	0.728	2.918	11.280	0.194	0.590	0.476
60.0	24.7	60.0	0.634	3.665	11.623	0.156	0.774	0.503
75.0	24.7	74.9	0.274	3.192	11.608	0.080	0.675	0.449
90.0	24.7	89.8	0.112	3.038	11.094	0.031	0.692	0.344
105.0	24.7	104.8	0.185	3.493	10.917	0.039	0.737	0.253
120.0	24.7	119.9	0.167	3.867	10.137	0.043	1.125	0.200
135.0	24.7	134.9	0.167	2.679	10.045	0.047	0.768	0.121
150.0	24.7	149.9	0.214	2.248	9.990	0.066	0.587	0.102
165.0	24.7	164.9	0.236	1.824	10.007	0.067	0.271	0.070
180.0	24.8	179.9	0.225	1.806	9.960	0.066	0.173	0.055
195.0	24.7	194.9	0.173	2.543	9.933	0.057	0.307	0.055
210.0	24.7	210.0	0.217	3.571	9.981	0.053	0.620	0.091
225.0	24.7	225.0	0.139	4.473	9.939	0.046	0.982	0.125
240.0	24.7	240.1	0.172	5.693	9.909	0.043	1.420	0.129
255.0	24.7	255.1	0.197	4.416	10.598	0.042	0.933	0.184
270.0	24.7	270.1	0.142	3.729	11.202	0.037	0.880	0.328
285.0	24.7	285.0	0.278	3.690	11.529	0.075	0.780	0.480
300.0	24.7	299.9	0.554	3.514	11.601	0.151	0.694	0.553
315.0	24.7	314.9	0.712	2.887	11.392	0.191	0.491	0.517
330.0	24.7	329.9	0.861	2.063	11.380	0.214	0.308	0.482
345.0	24.7	344.9	0.873	1.518	11.388	0.227	0.164	0.457

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.14:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.7	-0.0	0.974	1.370	11.860	0.244	0.146	0.610
15.0	29.7	15.0	0.880	1.636	11.722	0.240	0.251	0.605
30.0	29.7	30.0	0.895	2.335	11.761	0.228	0.399	0.607
45.0	29.7	45.0	0.849	2.959	11.638	0.203	0.567	0.608
60.0	29.7	60.0	0.585	3.201	11.563	0.162	0.773	0.604
75.0	29.7	74.9	0.266	3.078	11.488	0.083	0.656	0.494
90.0	29.7	89.9	0.135	3.169	10.995	0.037	0.699	0.331
105.0	29.7	104.9	0.178	3.042	10.596	0.047	0.794	0.231
120.0	29.7	119.9	0.285	5.804	10.000	0.060	1.440	0.205
135.0	29.7	134.9	0.242	3.483	9.949	0.062	0.883	0.104
150.0	29.8	149.9	0.272	2.394	9.941	0.083	0.546	0.074
165.0	29.6	164.9	0.315	1.749	9.924	0.091	0.311	0.049
180.0	30.1	179.9	0.329	1.941	9.874	0.092	0.209	0.035
195.0	29.7	194.9	0.323	2.518	9.913	0.090	0.397	0.055
210.0	29.8	210.0	0.233	2.965	9.918	0.074	0.615	0.077
225.0	29.8	225.2	0.156	3.622	9.914	0.049	0.791	0.089
240.0	29.7	240.1	0.221	5.949	9.880	0.051	1.402	0.149
255.0	29.7	255.1	0.186	3.842	10.422	0.049	0.852	0.162
270.0	29.7	270.0	0.161	3.589	11.066	0.042	0.788	0.318
285.0	29.7	285.0	0.266	3.596	11.658	0.079	0.709	0.523
300.0	29.7	299.9	0.561	3.160	11.765	0.156	0.677	0.642
315.0	29.7	314.9	0.749	2.600	11.802	0.199	0.469	0.639
330.0	29.7	329.9	0.823	1.981	11.893	0.225	0.300	0.629
345.0	29.7	344.9	0.954	1.373	11.985	0.239	0.171	0.616

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table T.15:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.1	-14.8	1.338	2.804	10.766	0.280	0.483	0.379
15.0	-0.3	-8.0	1.166	1.755	10.742	0.278	0.311	0.364
30.0	-0.8	2.9	1.165	1.534	10.851	0.275	0.311	0.346
45.0	-1.2	14.5	1.355	3.142	10.963	0.274	0.631	0.346
60.0	-2.4	-38.4	1.295	11.165	14.224	0.240	1.531	0.589
75.0	-2.0	-24.4	1.186	10.766	14.221	0.249	1.648	0.569
90.0	-2.7	-27.4	1.460	7.789	12.661	0.257	1.591	0.511
105.0	-2.5	-4.7	1.339	8.760	13.943	0.254	1.540	0.494
120.0	-1.5	23.5	1.283	10.345	14.405	0.224	1.584	0.593
135.0	-3.6	104.8	2.245	10.614	13.617	0.224	1.727	0.715
150.0	-4.6	112.2	1.794	8.647	13.120	0.244	1.570	0.651
165.0	-2.6	39.5	1.185	7.384	12.775	0.250	1.234	0.529
180.0	-0.3	358.6	1.246	9.068	13.225	0.272	0.682	0.399
195.0	-0.1	372.2	1.192	4.618	11.908	0.278	0.706	0.407
210.0	-0.3	378.0	1.279	3.797	11.817	0.275	0.852	0.437
225.0	-0.3	382.0	1.213	4.626	12.278	0.272	1.031	0.473
240.0	0.1	385.1	1.106	7.059	13.066	0.278	1.150	0.515
255.0	0.7	332.4	2.124	5.349	13.386	0.278	1.396	0.620
270.0	0.8	335.1	1.220	5.600	12.314	0.283	1.345	0.582
285.0	0.3	309.4	1.143	5.352	11.853	0.285	1.215	0.533
300.0	0.1	316.4	1.179	5.004	11.579	0.283	1.071	0.482
315.0	-0.2	324.7	1.266	4.435	11.135	0.282	0.940	0.443
330.0	-0.1	331.9	1.214	4.495	10.864	0.281	0.764	0.412
345.0	-0.0	338.4	1.337	3.782	11.133	0.282	0.595	0.394

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table T.16:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.5	-2.4	1.201	1.133	10.863	0.312	0.192	0.396
15.0	4.4	11.9	1.303	1.306	10.981	0.314	0.305	0.397
30.0	4.2	24.6	1.452	2.040	10.945	0.317	0.547	0.414
45.0	3.8	29.7	1.445	2.914	11.283	0.316	0.697	0.419
60.0	3.3	30.9	1.391	3.415	10.962	0.310	0.744	0.404
75.0	3.0	37.8	1.280	4.551	11.369	0.305	0.931	0.419
90.0	3.1	40.6	1.212	5.323	11.828	0.302	1.019	0.448
105.0	3.4	42.5	1.242	5.571	12.202	0.304	1.011	0.473
120.0	3.6	43.3	1.395	5.059	11.994	0.306	1.004	0.483
135.0	3.6	43.1	1.405	5.647	12.104	0.306	0.974	0.483
150.0	3.5	41.8	1.342	4.624	11.572	0.307	0.935	0.478
165.0	3.3	51.9	1.296	5.172	11.798	0.300	0.938	0.464
180.0	4.6	179.4	0.611	1.083	10.710	0.153	0.247	0.192
195.0	4.3	199.3	0.653	2.079	10.785	0.161	0.515	0.223
210.0	4.1	353.6	1.413	3.828	12.181	0.309	0.466	0.415
225.0	4.3	308.0	1.165	5.122	12.993	0.301	1.118	0.544
240.0	4.2	360.6	1.802	7.574	14.272	0.306	0.985	0.546
255.0	4.5	292.7	1.187	5.660	12.595	0.276	1.410	0.707
270.0	4.3	298.9	1.155	5.779	13.326	0.292	1.321	0.636
285.0	4.2	303.3	1.271	6.596	12.860	0.301	1.277	0.594
300.0	4.3	306.9	1.246	4.828	11.724	0.307	1.154	0.557
315.0	4.4	316.9	1.223	4.364	11.151	0.319	0.926	0.496
330.0	4.5	329.6	1.384	3.431	11.224	0.323	0.674	0.446
345.0	4.5	343.5	1.286	1.932	10.959	0.318	0.381	0.413

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.17:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.5	-0.7	1.463	1.350	11.039	0.348	0.198	0.437
15.0	9.5	14.2	1.520	1.366	11.074	0.350	0.287	0.435
30.0	9.4	29.1	1.311	2.174	11.166	0.353	0.532	0.454
45.0	9.4	44.0	1.533	4.216	11.256	0.347	0.850	0.494
60.0	9.4	58.3	1.108	6.247	11.704	0.322	1.129	0.587
75.0	9.2	70.1	3.741	6.275	13.373	0.280	1.360	0.765
90.0	8.3	76.0	1.252	7.702	13.451	0.229	1.492	0.845
105.0	8.0	77.5	1.027	9.239	14.176	0.215	1.509	0.842
120.0	8.0	82.5	1.136	9.644	14.501	0.173	1.614	0.894
135.0	8.1	83.6	1.094	12.607	14.312	0.188	1.614	0.874
150.0	9.2	146.2	0.410	3.454	10.594	0.120	1.281	0.217
165.0	9.5	162.8	0.368	3.550	10.345	0.114	1.104	0.171
180.0	9.7	178.8	0.411	2.971	10.280	0.112	0.725	0.129
195.0	9.7	195.2	0.421	2.332	10.484	0.114	0.715	0.129
210.0	9.4	212.2	0.391	3.349	10.606	0.120	1.131	0.182
225.0	8.4	264.4	0.949	12.665	14.040	0.124	1.712	0.842
240.0	8.5	275.7	1.722	10.072	14.428	0.160	1.643	0.957
255.0	8.5	278.2	1.656	10.240	13.998	0.173	1.632	0.961
270.0	8.7	281.1	1.428	17.710	14.317	0.201	1.596	0.974
285.0	9.5	288.1	1.552	8.153	14.637	0.272	1.411	0.860
300.0	9.6	300.8	1.183	5.328	11.743	0.325	1.143	0.648
315.0	9.5	314.8	1.495	4.807	11.240	0.350	0.859	0.525
330.0	9.5	329.6	1.358	2.415	11.187	0.357	0.570	0.476
345.0	9.5	344.4	1.406	2.048	11.084	0.351	0.331	0.443

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.18:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.5	-0.4	1.391	1.352	11.201	0.380	0.216	0.460
15.0	14.5	14.6	1.464	1.694	11.311	0.381	0.290	0.462
30.0	14.5	29.7	1.448	2.422	11.259	0.385	0.512	0.493
45.0	14.5	44.7	1.570	3.715	11.387	0.375	0.768	0.555
60.0	14.6	59.4	1.224	5.597	11.992	0.340	1.079	0.696
75.0	14.6	73.5	1.281	8.951	14.056	0.265	1.286	0.918
90.0	14.3	87.1	0.626	8.088	14.175	0.092	1.484	0.981
105.0	14.0	100.9	1.487	13.947	14.521	0.114	1.705	0.726
120.0	14.1	116.3	0.452	6.434	11.733	0.105	1.853	0.465
135.0	14.4	132.7	0.359	6.060	11.490	0.083	1.742	0.335
150.0	14.5	148.8	0.380	4.237	10.571	0.095	1.317	0.225
165.0	14.6	164.3	0.401	3.284	10.310	0.095	0.727	0.139
180.0	14.7	179.4	0.347	2.519	10.198	0.104	0.465	0.115
195.0	14.7	194.5	0.352	3.195	9.996	0.090	0.625	0.086
210.0	14.6	209.8	0.354	4.458	10.039	0.092	1.187	0.107
225.0	14.4	227.3	0.424	5.115	11.407	0.089	1.790	0.234
240.0	14.2	243.7	0.561	5.850	11.759	0.111	1.844	0.388
255.0	14.0	259.3	0.882	12.908	13.935	0.127	1.825	0.700
270.0	14.2	273.5	1.558	9.074	14.618	0.109	1.655	1.040
285.0	14.7	286.4	1.551	6.362	13.157	0.265	1.382	1.008
300.0	14.6	300.1	1.229	4.551	12.141	0.340	1.088	0.782
315.0	14.5	314.7	1.486	2.990	11.633	0.377	0.781	0.613
330.0	14.5	329.6	1.453	2.179	11.573	0.387	0.508	0.525
345.0	14.5	344.6	1.452	1.517	11.470	0.384	0.282	0.478

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.19:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.3	1.484	2.009	11.857	0.409	0.284	0.604
15.0	19.6	14.8	1.567	2.263	11.692	0.410	0.344	0.607
30.0	19.6	29.8	1.530	3.446	11.828	0.413	0.527	0.649
45.0	19.5	44.9	1.461	4.083	11.895	0.399	0.756	0.720
60.0	19.6	59.6	1.448	6.321	12.308	0.357	1.035	0.849
75.0	19.6	74.1	1.112	7.048	13.951	0.268	1.205	1.033
90.0	19.4	88.4	0.813	8.916	14.393	0.079	1.416	0.986
105.0	19.4	103.2	0.533	11.751	13.874	0.096	1.702	0.645
120.0	19.5	118.4	0.368	6.555	11.769	0.072	2.172	0.496
135.0	19.3	134.2	0.488	6.141	10.689	0.091	1.966	0.335
150.0	19.6	149.3	0.557	4.090	10.322	0.107	1.120	0.174
165.0	19.8	164.5	0.597	3.222	10.191	0.108	0.569	0.109
180.0	19.6	179.3	0.849	3.505	10.161	0.116	0.557	0.117
195.0	19.8	194.9	0.575	3.864	10.014	0.094	0.660	0.113
210.0	19.6	210.1	0.592	5.852	9.967	0.095	1.257	0.189
225.0	19.4	225.5	0.559	6.675	10.317	0.085	2.050	0.262
240.0	19.5	241.9	0.493	10.868	13.328	0.081	2.365	0.339
255.0	19.3	257.1	0.934	15.411	14.641	0.113	1.939	0.595
270.0	19.4	271.8	1.475	10.190	15.064	0.085	1.748	1.046
285.0	19.6	285.9	0.997	5.717	13.914	0.262	1.436	1.151
300.0	19.6	300.0	1.263	5.447	12.535	0.354	1.083	0.975
315.0	19.6	314.8	1.382	2.831	12.271	0.396	0.742	0.809
330.0	19.6	329.8	1.576	2.430	12.027	0.411	0.488	0.706
345.0	19.6	344.8	1.560	1.664	11.765	0.411	0.296	0.634

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.20:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.6	-0.1	1.468	2.617	12.422	0.430	0.365	0.858
15.0	24.6	14.8	1.515	2.913	12.513	0.431	0.420	0.862
30.0	24.6	29.9	1.499	3.784	12.369	0.435	0.569	0.899
45.0	24.5	44.9	1.614	4.898	12.691	0.421	0.766	0.953
60.0	24.5	59.7	1.382	5.888	12.781	0.374	0.993	1.034
75.0	24.5	74.3	0.998	7.278	13.954	0.271	1.139	1.135
90.0	24.4	88.9	0.504	8.315	14.602	0.075	1.371	0.982
105.0	24.5	104.1	0.471	8.090	12.525	0.083	1.816	0.584
120.0	24.4	119.5	0.643	7.170	11.050	0.080	2.435	0.477
135.0	24.3	134.5	0.681	5.712	10.188	0.119	1.667	0.259
150.0	24.2	149.6	0.812	3.899	10.052	0.149	0.960	0.176
165.0	24.5	164.4	1.000	3.812	10.187	0.147	0.653	0.146
180.0	24.8	179.7	0.743	4.273	9.899	0.125	0.554	0.121
195.0	24.6	194.6	0.813	4.453	10.025	0.130	0.804	0.178
210.0	24.2	209.4	0.752	4.947	9.931	0.145	1.107	0.220
225.0	24.4	225.6	0.707	6.512	10.094	0.107	1.873	0.323
240.0	24.3	241.1	0.674	12.898	12.664	0.088	2.844	0.432
255.0	24.4	256.3	0.664	13.298	13.814	0.103	2.143	0.501
270.0	24.4	271.2	1.984	9.608	15.171	0.083	1.822	1.038
285.0	24.6	285.6	1.059	6.437	14.071	0.257	1.524	1.268
300.0	24.6	300.1	1.321	4.440	13.234	0.360	1.141	1.170
315.0	24.6	314.9	1.479	3.197	12.816	0.413	0.801	1.058
330.0	24.6	329.9	1.457	2.605	12.817	0.430	0.547	0.965
345.0	24.6	344.9	1.453	2.432	12.636	0.430	0.407	0.892

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.21:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.1	1.359	3.047	13.178	0.440	0.439	1.132
15.0	29.6	14.9	1.362	3.342	12.962	0.445	0.456	1.143
30.0	29.6	29.9	1.470	4.031	13.134	0.448	0.582	1.181
45.0	29.6	44.9	1.460	5.675	13.023	0.435	0.761	1.209
60.0	29.5	59.8	1.411	5.661	13.112	0.386	0.976	1.235
75.0	29.5	74.5	0.917	6.231	13.819	0.275	1.086	1.252
90.0	29.5	89.2	0.658	9.202	14.021	0.073	1.341	0.969
105.0	29.5	104.5	1.028	8.243	11.590	0.094	2.282	0.551
120.0	29.2	119.5	0.951	8.855	11.190	0.132	2.573	0.470
135.0	29.3	134.5	0.904	5.141	10.402	0.133	1.436	0.217
150.0	29.4	149.7	1.004	4.160	10.070	0.152	0.918	0.175
165.0	29.7	164.1	1.083	4.752	10.087	0.157	0.785	0.194
180.0	29.2	179.5	1.081	4.685	10.050	0.181	0.833	0.210
195.0	29.8	194.6	1.072	5.229	10.126	0.157	0.977	0.232
210.0	29.5	209.8	0.937	4.904	9.964	0.148	1.122	0.234
225.0	29.3	224.9	0.820	5.661	10.401	0.125	1.491	0.276
240.0	29.3	240.8	0.780	8.447	11.371	0.107	2.570	0.438
255.0	29.4	255.7	0.864	11.014	13.373	0.104	2.444	0.414
270.0	29.5	270.8	1.345	12.517	14.371	0.086	1.844	1.011
285.0	29.6	285.5	1.055	7.693	14.807	0.255	1.643	1.368
300.0	29.6	300.2	1.261	5.128	13.645	0.366	1.197	1.365
315.0	29.6	315.1	1.403	3.507	13.359	0.421	0.863	1.308
330.0	29.6	330.1	1.489	3.147	13.465	0.439	0.618	1.242
345.0	29.6	345.0	1.444	2.747	13.226	0.440	0.484	1.168

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.22:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	0.0	-11.0	0.990	3.314	10.772	0.206	0.591	0.319
15.0	-0.4	-7.0	0.800	2.801	10.672	0.203	0.511	0.306
30.0	-1.1	-0.7	0.816	2.373	10.712	0.202	0.519	0.295
45.0	-1.6	-77.7	0.603	5.619	12.128	0.118	1.400	0.457
60.0	-0.6	35.0	0.862	4.316	11.072	0.186	1.117	0.344
75.0	-0.5	50.5	0.677	4.208	11.155	0.165	1.270	0.382
90.0	-0.4	65.8	0.628	4.569	12.112	0.126	1.373	0.431
105.0	-0.4	80.4	0.326	4.761	12.285	0.063	1.403	0.476
120.0	-1.0	95.1	0.381	4.663	12.172	0.044	1.403	0.489
135.0	-2.0	104.1	0.447	5.356	11.572	0.084	1.402	0.480
150.0	-1.2	15.5	0.802	4.596	11.342	0.184	0.911	0.341
165.0	-0.6	9.6	0.881	4.346	10.779	0.199	0.618	0.315
180.0	-0.2	354.8	0.770	4.213	10.764	0.197	0.731	0.319
195.0	0.1	367.9	0.932	3.831	11.125	0.198	0.833	0.334
210.0	0.0	382.4	0.806	4.630	11.135	0.191	1.007	0.356
225.0	1.6	270.7	0.419	5.759	11.704	0.064	1.401	0.517
240.0	1.4	276.8	0.377	6.184	12.229	0.060	1.392	0.532
255.0	1.3	287.6	0.533	6.393	12.489	0.110	1.369	0.501
270.0	1.0	297.2	0.670	6.075	12.435	0.145	1.310	0.455
285.0	0.7	305.8	0.755	5.285	11.598	0.164	1.253	0.421
300.0	0.4	314.7	0.768	4.997	11.243	0.177	1.161	0.390
315.0	0.1	322.5	0.836	4.965	11.301	0.185	1.085	0.369
330.0	-0.1	331.8	0.803	4.678	11.147	0.192	0.965	0.349
345.0	0.0	343.1	0.968	3.925	10.772	0.200	0.785	0.330

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.23:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.6	-2.9	1.001	1.642	10.723	0.236	0.290	0.332
15.0	4.2	5.5	1.165	2.093	10.940	0.236	0.480	0.331
30.0	3.5	0.1	1.288	3.076	11.071	0.233	0.587	0.314
45.0	3.4	10.1	1.083	3.821	11.021	0.227	0.784	0.327
60.0	3.5	24.4	0.991	4.539	11.485	0.217	0.992	0.354
75.0	3.8	50.0	0.751	5.590	11.643	0.188	1.251	0.414
90.0	3.7	61.7	0.664	5.574	11.798	0.156	1.324	0.451
105.0	3.7	75.0	0.422	4.909	11.685	0.091	1.361	0.500
120.0	3.6	89.8	0.232	5.009	12.320	0.027	1.369	0.519
135.0	3.4	101.4	0.356	5.571	11.878	0.055	1.345	0.495
150.0	3.6	48.6	0.836	5.433	12.287	0.190	1.175	0.407
165.0	3.4	49.4	0.961	5.708	12.204	0.194	1.133	0.386
180.0	4.5	177.6	0.705	1.801	11.031	0.132	0.333	0.226
195.0	4.5	197.9	0.633	2.118	11.209	0.129	0.570	0.235
210.0	4.4	244.0	0.651	4.763	11.472	0.096	1.223	0.397
225.0	4.4	257.1	0.553	4.660	11.723	0.068	1.333	0.472
240.0	4.4	267.8	0.308	4.978	11.720	0.042	1.356	0.522
255.0	4.4	278.7	0.354	7.257	12.394	0.069	1.385	0.537
270.0	4.4	287.7	0.489	6.219	12.021	0.111	1.388	0.521
285.0	4.5	295.5	0.650	5.402	12.034	0.150	1.342	0.485
300.0	4.6	305.1	0.764	4.913	11.580	0.185	1.246	0.438
315.0	4.6	317.5	1.066	4.026	11.312	0.209	1.065	0.390
330.0	4.7	330.5	0.977	4.024	11.020	0.223	0.870	0.364
345.0	4.7	343.9	0.979	2.507	10.754	0.232	0.588	0.344

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table T.24:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	9.6	-0.8	1.210	1.011	10.856	0.265	0.147	0.361
15.0	9.6	14.1	1.237	1.801	10.884	0.261	0.404	0.359
30.0	9.6	29.1	1.119	2.636	10.982	0.249	0.721	0.368
45.0	9.6	44.0	0.967	3.253	11.152	0.230	0.977	0.397
60.0	9.7	58.7	0.860	4.675	12.010	0.192	1.172	0.467
75.0	9.7	73.1	0.659	5.192	12.698	0.111	1.234	0.541
90.0	9.6	87.5	0.172	5.441	12.009	0.027	1.270	0.548
105.0	9.5	102.1	0.301	5.760	11.813	0.048	1.257	0.476
120.0	9.2	115.8	0.404	5.509	11.738	0.074	1.241	0.401
135.0	9.2	130.7	0.449	5.096	11.405	0.084	1.096	0.321
150.0	9.4	147.3	0.402	3.303	10.788	0.092	1.029	0.254
165.0	9.5	163.2	0.373	3.021	10.578	0.095	0.815	0.215
180.0	9.6	178.9	0.370	2.406	10.343	0.094	0.545	0.181
195.0	9.7	194.8	0.400	1.915	10.440	0.095	0.561	0.171
210.0	9.6	211.2	0.388	2.675	10.608	0.093	0.964	0.195
225.0	9.4	228.3	0.468	4.264	11.264	0.087	1.139	0.267
240.0	9.3	243.9	0.428	4.391	11.693	0.078	1.308	0.356
255.0	9.5	258.0	0.360	4.848	11.956	0.054	1.339	0.452
270.0	9.7	272.3	0.211	5.847	12.505	0.028	1.347	0.555
285.0	9.8	286.5	0.540	6.090	12.351	0.108	1.307	0.567
300.0	9.7	300.6	0.732	4.669	12.105	0.189	1.192	0.494
315.0	9.7	314.9	0.897	3.578	11.340	0.229	0.958	0.415
330.0	9.7	329.6	1.173	2.920	11.092	0.250	0.704	0.383
345.0	9.6	344.4	1.276	1.933	11.104	0.261	0.392	0.367

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.25:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.6	-0.4	1.322	1.135	11.012	0.293	0.147	0.389
15.0	14.6	14.7	1.136	1.729	11.084	0.288	0.372	0.387
30.0	14.6	29.8	1.221	2.602	11.176	0.273	0.650	0.397
45.0	14.6	44.8	0.965	3.354	11.314	0.248	0.890	0.435
60.0	14.7	59.5	0.741	4.302	11.835	0.203	1.117	0.523
75.0	14.7	74.2	0.655	5.306	13.163	0.111	1.155	0.583
90.0	14.7	88.9	0.131	4.846	12.006	0.032	1.182	0.547
105.0	14.7	103.8	0.277	4.850	11.678	0.049	1.179	0.451
120.0	14.5	118.1	0.429	5.971	11.874	0.065	1.413	0.402
135.0	14.5	133.7	0.411	5.002	11.132	0.066	1.375	0.317
150.0	14.6	149.1	0.383	3.840	10.672	0.072	1.016	0.233
165.0	14.7	164.4	0.348	2.787	10.441	0.068	0.523	0.174
180.0	14.7	179.5	0.341	2.241	10.229	0.071	0.374	0.152
195.0	14.7	194.6	0.308	2.936	10.137	0.073	0.525	0.134
210.0	14.7	209.9	0.374	3.959	10.236	0.071	0.964	0.133
225.0	14.6	226.0	0.330	4.107	10.476	0.070	1.497	0.195
240.0	14.5	241.7	0.417	5.334	11.416	0.068	1.551	0.300
255.0	14.7	256.2	0.376	6.039	11.705	0.055	1.400	0.396
270.0	14.7	270.9	0.195	5.514	12.336	0.035	1.365	0.542
285.0	14.8	285.5	0.475	5.751	12.160	0.106	1.299	0.612
300.0	14.7	300.0	0.724	4.247	11.802	0.201	1.152	0.574
315.0	14.6	314.6	0.896	3.333	11.270	0.248	0.874	0.477
330.0	14.6	329.5	1.201	2.731	11.247	0.274	0.585	0.426
345.0	14.6	344.5	1.165	1.638	10.961	0.288	0.313	0.400

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.26:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.6	-0.3	1.363	1.771	11.408	0.318	0.225	0.477
15.0	19.6	14.8	1.224	2.295	11.414	0.311	0.402	0.472
30.0	19.6	29.9	1.280	2.980	11.424	0.296	0.647	0.487
45.0	19.6	44.9	1.032	3.580	11.398	0.266	0.894	0.526
60.0	19.6	59.8	0.838	4.607	12.135	0.216	1.111	0.608
75.0	19.6	74.6	0.600	5.844	13.160	0.115	1.072	0.618
90.0	19.7	89.4	0.144	4.632	11.991	0.040	1.085	0.542
105.0	19.7	104.4	0.260	5.084	11.485	0.053	1.139	0.434
120.0	19.6	119.1	0.315	6.461	11.064	0.065	1.729	0.425
135.0	19.6	134.6	0.378	5.251	10.772	0.068	1.383	0.277
150.0	19.6	149.5	0.328	3.628	10.529	0.078	0.921	0.207
165.0	19.7	164.6	0.500	2.782	10.102	0.070	0.471	0.130
180.0	19.5	179.5	0.406	2.951	10.029	0.067	0.441	0.116
195.0	19.7	194.8	0.274	3.891	10.018	0.071	0.582	0.116
210.0	19.6	210.0	0.245	5.164	10.004	0.065	0.945	0.141
225.0	19.5	225.3	0.462	6.140	9.980	0.065	1.567	0.177
240.0	19.6	240.8	0.327	5.988	10.837	0.066	1.949	0.225
255.0	19.7	255.6	0.376	5.943	11.128	0.058	1.457	0.328
270.0	19.7	270.5	0.207	6.551	12.421	0.045	1.404	0.523
285.0	19.7	285.2	0.427	5.806	12.141	0.107	1.297	0.655
300.0	19.6	299.9	0.753	4.650	12.071	0.211	1.117	0.686
315.0	19.6	314.6	0.974	3.664	11.504	0.264	0.805	0.599
330.0	19.6	329.6	1.218	2.855	11.502	0.295	0.531	0.536
345.0	19.6	344.6	1.334	2.062	11.359	0.312	0.289	0.498

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.27:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	24.5	-0.2	1.268	2.675	12.160	0.339	0.334	0.643
15.0	24.5	14.9	1.392	2.850	12.025	0.333	0.467	0.632
30.0	24.5	30.0	1.394	3.799	11.842	0.316	0.676	0.640
45.0	24.5	45.0	1.115	4.063	11.781	0.284	0.890	0.667
60.0	24.5	59.9	0.870	4.997	12.194	0.228	1.115	0.712
75.0	24.6	74.7	0.439	5.111	12.453	0.122	1.000	0.662
90.0	24.6	89.6	0.174	4.746	11.824	0.049	1.012	0.539
105.0	24.6	104.6	0.335	5.330	11.635	0.063	1.098	0.406
120.0	24.6	119.8	0.261	5.306	10.341	0.073	1.752	0.373
135.0	24.5	134.7	0.372	4.768	10.229	0.086	1.257	0.238
150.0	24.5	149.7	0.326	2.951	10.136	0.099	0.843	0.178
165.0	24.6	164.7	0.406	3.181	10.139	0.100	0.509	0.135
180.0	24.9	179.8	0.369	3.136	10.088	0.098	0.359	0.109
195.0	24.6	194.6	0.298	3.736	9.990	0.087	0.529	0.130
210.0	24.6	209.9	0.392	4.987	10.054	0.075	0.857	0.182
225.0	24.5	225.1	0.518	7.028	9.977	0.075	1.432	0.254
240.0	24.5	240.3	0.260	7.267	9.991	0.071	2.160	0.273
255.0	24.6	255.3	0.354	7.891	10.991	0.065	1.485	0.274
270.0	24.6	270.3	0.262	6.597	12.306	0.055	1.405	0.495
285.0	24.6	285.1	0.382	6.439	12.119	0.111	1.288	0.703
300.0	24.6	299.9	0.854	5.316	12.317	0.219	1.084	0.803
315.0	24.5	314.7	1.077	4.115	11.952	0.276	0.761	0.744
330.0	24.5	329.7	1.240	2.976	11.999	0.312	0.512	0.697
345.0	24.5	344.8	1.330	2.546	12.306	0.332	0.335	0.661

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.28:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.1	1.524	3.004	12.715	0.355	0.408	0.849
15.0	29.6	15.0	1.451	3.143	12.797	0.350	0.515	0.839
30.0	29.6	30.0	1.389	3.851	12.647	0.332	0.688	0.833
45.0	29.6	45.0	1.273	4.163	12.401	0.298	0.885	0.839
60.0	29.6	60.0	0.798	4.764	12.416	0.240	1.114	0.840
75.0	29.6	74.8	0.418	4.991	12.604	0.129	0.975	0.721
90.0	29.6	89.7	0.217	4.745	11.763	0.057	1.011	0.528
105.0	29.6	104.8	0.298	4.249	11.084	0.075	1.139	0.383
120.0	29.5	119.8	0.367	5.916	10.137	0.093	1.855	0.346
135.0	29.5	134.7	0.347	3.836	10.012	0.093	1.154	0.179
150.0	29.6	149.7	0.424	3.463	10.059	0.127	0.773	0.146
165.0	29.6	164.5	0.533	3.518	9.999	0.146	0.599	0.129
180.0	30.4	179.8	0.523	4.059	9.969	0.138	0.486	0.107
195.0	29.7	194.8	0.524	4.171	9.972	0.141	0.666	0.146
210.0	29.7	210.0	0.362	4.333	9.903	0.112	0.835	0.166
225.0	29.5	225.0	0.297	5.951	10.025	0.089	1.262	0.262
240.0	29.6	240.1	0.281	6.444	9.905	0.073	1.684	0.279
255.0	29.6	255.1	0.306	6.777	10.677	0.075	1.424	0.240
270.0	29.6	270.1	0.299	6.725	11.687	0.065	1.363	0.471
285.0	29.6	285.1	0.488	6.247	12.304	0.116	1.255	0.754
300.0	29.6	299.9	0.853	5.046	12.413	0.225	1.023	0.915
315.0	29.6	314.9	1.153	4.230	12.473	0.287	0.735	0.903
330.0	29.6	329.9	1.320	3.373	12.749	0.326	0.533	0.883
345.0	29.6	344.9	1.354	2.967	12.593	0.347	0.433	0.864

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table T.29:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-1.0	-23.1	1.902	11.526	13.392	0.372	1.413	0.610
15.0	-1.9	-121.3	1.821	9.310	13.214	0.351	1.657	0.636
30.0	-2.9	-77.1	2.560	15.034	14.702	0.337	2.176	0.923
45.0	-4.3	97.6	2.248	15.292	14.829	0.303	2.336	0.998
60.0	-2.8	-80.0	1.873	13.919	15.065	0.273	2.491	1.059
75.0	-0.7	-40.2	1.905	13.003	14.504	0.282	2.514	0.967
90.0	-0.7	-18.6	2.331	13.732	15.266	0.329	2.468	0.856
105.0	-1.4	-40.0	2.416	16.984	15.399	0.333	2.183	0.763
120.0	-1.2	95.7	1.605	12.593	14.676	0.167	2.614	1.082
135.0	-4.2	105.0	2.060	12.545	14.482	0.272	2.508	1.040
150.0	-5.4	58.8	2.173	12.558	15.182	0.322	2.273	0.888
165.0	-8.0	-10.4	1.449	11.923	14.129	0.332	2.397	0.958
180.0	-0.7	10.3	1.720	7.884	12.771	0.372	1.332	0.603
195.0	-1.0	20.6	1.686	8.878	13.206	0.368	1.500	0.618
210.0	-0.3	382.9	2.256	11.007	15.100	0.366	1.606	0.670
225.0	0.2	395.2	1.514	11.889	13.305	0.363	1.727	0.689
240.0	2.7	283.8	1.447	12.946	14.636	0.265	2.364	1.029
255.0	1.1	287.6	3.209	12.146	14.074	0.321	2.249	0.941
270.0	1.5	295.8	2.146	12.591	15.774	0.347	2.184	0.869
285.0	1.3	304.0	1.542	10.168	14.942	0.361	1.945	0.781
300.0	0.9	312.0	2.657	17.528	15.233	0.373	1.766	0.718
315.0	0.3	320.4	1.553	7.979	13.057	0.372	1.563	0.665
330.0	-0.1	327.4	1.789	7.167	12.512	0.375	1.436	0.629
345.0	-0.5	332.8	1.883	7.471	12.986	0.377	1.364	0.607

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.30:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	3.6	-17.0	1.952	6.942	12.390	0.430	1.013	0.598
15.0	2.6	-23.9	2.153	5.951	12.196	0.422	1.273	0.607
30.0	2.4	-17.3	1.862	6.437	12.537	0.416	1.273	0.590
45.0	2.2	-6.9	2.072	5.041	11.712	0.414	1.220	0.566
60.0	2.3	-9.1	1.909	11.329	14.697	0.395	1.575	0.635
75.0	2.4	-1.8	1.801	7.188	14.065	0.399	1.579	0.623
90.0	2.5	21.5	1.830	9.032	14.341	0.388	1.705	0.673
105.0	2.7	26.4	1.836	12.811	14.978	0.380	1.755	0.732
120.0	2.6	17.6	2.015	8.147	13.001	0.404	1.350	0.622
135.0	2.3	22.0	1.868	7.255	13.550	0.390	1.483	0.640
150.0	2.4	27.5	2.002	7.034	13.120	0.398	1.370	0.627
165.0	2.4	32.1	1.745	7.408	12.358	0.401	1.437	0.636
180.0	2.8	71.0	1.534	8.277	13.113	0.368	1.611	0.607
195.0	3.7	365.9	2.040	7.053	12.553	0.424	1.038	0.605
210.0	3.8	372.1	1.873	7.217	12.693	0.420	1.192	0.622
225.0	4.2	351.2	2.007	11.519	13.896	0.389	1.612	0.746
240.0	4.5	295.7	3.462	12.646	15.332	0.308	2.395	1.047
255.0	4.7	289.5	2.136	12.962	15.907	0.320	2.271	1.018
270.0	4.5	296.2	2.850	21.917	14.302	0.360	2.108	0.880
285.0	4.3	303.0	2.503	10.919	14.339	0.375	1.824	0.797
300.0	4.3	309.2	1.750	8.173	14.374	0.387	1.792	0.751
315.0	4.2	316.8	2.136	6.072	13.520	0.405	1.530	0.700
330.0	4.1	329.9	1.815	5.303	12.163	0.421	1.194	0.635
345.0	4.0	340.0	1.966	5.780	11.729	0.431	1.009	0.608

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.31:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.2	-1.8	1.996	3.239	11.497	0.482	0.445	0.618
15.0	9.0	12.4	2.163	2.633	11.315	0.478	0.617	0.615
30.0	8.8	26.9	2.156	4.000	11.596	0.464	1.006	0.634
45.0	8.8	41.8	1.897	6.221	11.900	0.434	1.397	0.682
60.0	8.8	55.5	1.715	8.254	13.245	0.394	1.746	0.773
75.0	8.4	64.2	2.606	13.698	14.613	0.365	2.002	0.924
90.0	7.9	68.6	1.804	14.348	16.177	0.326	2.087	1.003
105.0	7.8	77.0	1.558	11.175	15.776	0.253	2.237	1.115
120.0	7.7	90.7	1.893	18.081	15.254	0.118	2.467	1.162
135.0	7.5	91.3	1.402	19.122	14.907	0.212	2.350	1.051
150.0	7.8	72.5	1.740	13.137	16.128	0.323	2.159	0.950
165.0	7.7	71.5	2.253	14.258	16.229	0.341	2.092	0.915
180.0	9.2	177.7	0.880	3.889	10.861	0.163	0.997	0.256
195.0	9.2	197.6	0.862	5.337	11.190	0.165	1.006	0.246
210.0	8.4	299.8	3.316	15.365	15.404	0.347	2.036	0.951
225.0	8.3	271.4	2.414	19.787	14.987	0.177	2.771	1.166
240.0	8.3	280.0	3.016	20.683	15.047	0.242	2.516	1.159
255.0	8.4	283.0	1.970	14.972	15.032	0.263	2.399	1.139
270.0	8.5	285.7	3.383	22.165	15.066	0.300	2.366	1.148
285.0	9.1	290.5	2.322	12.942	16.539	0.339	2.150	1.050
300.0	9.3	301.6	3.424	7.657	13.317	0.398	1.797	0.852
315.0	9.2	314.7	1.767	6.045	12.483	0.436	1.486	0.736
330.0	9.2	329.1	2.096	4.914	11.811	0.463	1.063	0.678
345.0	9.2	343.7	2.162	4.032	11.518	0.478	0.711	0.642

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.



**Table T.32:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.4	-0.8	2.240	2.162	12.029	0.522	0.397	0.688
15.0	14.3	14.3	2.155	2.968	11.743	0.517	0.587	0.682
30.0	14.3	29.4	2.049	4.551	11.690	0.500	0.919	0.705
45.0	14.3	44.5	1.889	6.638	12.076	0.460	1.305	0.760
60.0	14.4	59.1	1.515	9.001	13.111	0.404	1.716	0.898
75.0	14.3	72.3	3.807	13.744	15.019	0.325	2.035	1.162
90.0	13.7	85.3	1.745	12.812	15.665	0.155	2.382	1.247
105.0	13.5	99.1	1.384	22.305	15.793	0.126	2.460	1.040
120.0	13.2	110.4	1.993	15.843	16.172	0.154	2.370	0.882
135.0	13.5	127.8	0.819	14.539	13.672	0.129	2.113	0.612
150.0	14.4	148.3	0.594	5.304	11.295	0.114	1.398	0.338
165.0	14.3	163.2	0.714	4.281	10.987	0.148	1.016	0.280
180.0	14.4	178.6	0.669	4.308	10.754	0.135	0.687	0.213
195.0	14.3	193.9	0.728	4.578	10.502	0.151	0.938	0.179
210.0	14.6	209.8	0.689	5.090	10.937	0.127	1.404	0.195
225.0	13.6	236.2	1.099	14.077	13.427	0.153	2.402	0.574
240.0	13.1	253.2	1.357	18.982	14.164	0.163	2.633	0.836
255.0	13.1	265.1	1.611	22.482	14.925	0.136	2.698	1.061
270.0	13.6	275.9	1.484	14.993	15.700	0.166	2.558	1.250
285.0	14.4	287.3	2.040	10.011	16.191	0.314	2.179	1.198
300.0	14.5	300.2	1.620	6.879	13.863	0.402	1.728	0.989
315.0	14.4	314.4	1.918	6.032	12.424	0.462	1.288	0.835
330.0	14.4	329.2	1.971	4.229	12.029	0.499	0.919	0.760
345.0	14.3	344.2	2.032	2.960	11.950	0.515	0.606	0.708

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.33:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.5	-0.4	2.096	2.254	12.578	0.552	0.450	0.882
15.0	19.5	14.7	2.001	3.128	12.493	0.545	0.615	0.874
30.0	19.4	29.8	1.993	4.847	12.255	0.529	0.929	0.885
45.0	19.4	44.9	2.018	6.414	12.380	0.489	1.249	0.931
60.0	19.5	59.5	1.612	8.192	13.641	0.422	1.644	1.064
75.0	19.4	73.7	2.441	15.304	15.361	0.314	1.949	1.271
90.0	19.2	87.7	1.306	13.132	15.457	0.121	2.292	1.224
105.0	19.2	102.7	0.792	16.389	14.254	0.126	2.374	0.897
120.0	19.1	117.2	0.901	9.586	12.456	0.124	2.580	0.709
135.0	19.2	134.2	0.877	8.477	11.134	0.133	2.185	0.423
150.0	19.1	149.0	0.657	5.455	10.787	0.160	1.668	0.296
165.0	19.5	164.0	0.923	3.764	10.625	0.167	0.883	0.207
180.0	19.6	179.5	0.842	3.926	11.067	0.176	0.659	0.194
195.0	19.6	194.8	0.878	4.736	10.259	0.156	1.010	0.182
210.0	19.2	210.4	0.669	6.726	10.620	0.147	1.748	0.267
225.0	19.1	227.3	1.577	12.779	12.927	0.132	2.445	0.419
240.0	18.9	244.4	0.747	15.845	13.030	0.135	2.868	0.566
255.0	18.8	259.5	1.052	18.874	14.497	0.141	2.807	0.881
270.0	19.0	273.1	1.193	15.489	15.423	0.132	2.651	1.246
285.0	19.5	286.3	1.561	10.666	15.287	0.304	2.219	1.333
300.0	19.6	300.0	1.677	8.607	13.760	0.418	1.681	1.189
315.0	19.5	314.5	2.189	5.110	12.643	0.485	1.212	1.041
330.0	19.5	329.4	2.260	3.718	12.764	0.526	0.845	0.960
345.0	19.5	344.5	2.148	2.612	12.526	0.544	0.566	0.908

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.34:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.5	-0.2	2.061	3.349	13.562	0.576	0.588	1.180
15.0	24.5	14.9	2.148	4.045	13.451	0.571	0.730	1.157
30.0	24.5	29.9	2.057	6.376	13.124	0.554	0.986	1.148
45.0	24.4	44.9	2.021	6.463	12.976	0.513	1.256	1.164
60.0	24.4	59.7	1.594	8.192	13.219	0.442	1.561	1.244
75.0	24.4	74.0	2.153	10.208	15.605	0.311	1.822	1.358
90.0	24.3	88.5	1.462	13.916	15.167	0.117	2.247	1.218
105.0	24.3	104.1	1.209	15.150	13.306	0.133	2.632	0.808
120.0	24.1	119.0	0.736	8.859	13.494	0.146	3.159	0.702
135.0	23.7	132.6	0.942	8.625	13.519	0.200	2.582	0.565
150.0	24.2	148.8	0.908	6.596	10.866	0.189	1.584	0.293
165.0	24.8	164.3	0.799	5.486	10.254	0.184	0.931	0.213
180.0	25.3	179.6	0.721	4.439	10.185	0.172	0.695	0.181
195.0	25.2	195.3	0.885	5.100	10.042	0.167	0.874	0.176
210.0	24.2	210.8	0.773	5.849	10.978	0.179	1.635	0.297
225.0	23.7	228.7	0.972	14.149	14.420	0.160	2.669	0.503
240.0	24.1	241.3	0.853	10.439	11.856	0.132	3.220	0.523
255.0	24.0	257.4	1.337	21.886	14.837	0.145	2.945	0.719
270.0	24.2	271.9	1.246	16.230	15.105	0.128	2.767	1.211
285.0	24.5	286.0	2.105	10.396	14.765	0.300	2.380	1.447
300.0	24.5	300.1	1.530	7.265	13.644	0.426	1.727	1.398
315.0	24.5	314.7	2.162	5.295	13.692	0.501	1.262	1.299
330.0	24.5	329.7	2.084	3.674	13.863	0.546	0.884	1.251
345.0	24.5	344.7	2.140	3.035	13.773	0.566	0.657	1.211

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.35:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.0	2.060	4.684	14.286	0.592	0.801	1.502
15.0	29.5	15.0	2.021	5.126	14.120	0.591	0.892	1.469
30.0	29.5	30.1	2.145	6.755	13.556	0.574	1.097	1.436
45.0	29.5	45.0	2.023	8.380	13.724	0.534	1.305	1.415
60.0	29.4	59.7	1.706	8.780	14.676	0.457	1.539	1.425
75.0	29.4	74.2	2.773	10.497	16.173	0.321	1.778	1.476
90.0	29.3	88.9	0.895	14.322	15.136	0.119	2.253	1.209
105.0	29.3	104.4	1.131	14.205	14.238	0.133	2.612	0.738
120.0	28.7	118.1	0.987	11.044	14.811	0.184	3.076	0.733
135.0	28.8	133.9	1.179	7.856	11.487	0.257	2.398	0.433
150.0	29.6	148.2	1.062	6.786	10.847	0.238	1.509	0.347
165.0	29.7	163.3	1.120	6.379	10.232	0.283	1.104	0.327
180.0	30.2	178.7	2.413	6.142	10.513	0.312	1.029	0.312
195.0	30.7	194.8	1.213	5.885	10.851	0.252	1.132	0.302
210.0	30.0	210.9	1.059	5.904	10.610	0.217	1.550	0.306
225.0	28.8	227.5	1.045	10.810	12.498	0.230	2.608	0.527
240.0	28.9	241.6	1.171	20.050	13.661	0.156	3.108	0.664
255.0	29.2	256.1	1.083	12.919	14.394	0.142	3.111	0.568
270.0	29.2	271.3	1.135	16.248	15.479	0.133	2.876	1.175
285.0	29.5	285.8	1.283	10.514	15.753	0.298	2.489	1.557
300.0	29.5	300.1	1.625	7.115	14.576	0.434	1.848	1.596
315.0	29.5	314.9	1.914	5.589	14.328	0.514	1.376	1.573
330.0	29.5	329.9	1.932	4.663	14.579	0.558	1.040	1.556
345.0	29.5	345.0	1.934	4.365	14.226	0.583	0.853	1.533

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.36:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-1.0	-20.7	0.764	4.400	10.887	0.204	0.860	0.372
15.0	-2.2	-124.4	0.905	4.795	11.675	0.183	1.158	0.429
30.0	-2.3	-110.4	0.841	5.174	11.888	0.163	1.305	0.459
45.0	-1.8	-91.3	0.650	5.144	11.751	0.121	1.448	0.487
60.0	0.1	49.7	0.586	4.947	11.479	0.152	1.319	0.440
75.0	0.2	66.2	0.500	4.541	11.600	0.102	1.404	0.470
90.0	-0.1	84.2	0.329	4.980	11.755	0.045	1.407	0.498
105.0	-0.6	96.0	0.317	4.711	12.004	0.044	1.400	0.505
120.0	-1.4	105.3	0.355	5.348	12.065	0.067	1.415	0.508
135.0	-2.2	114.0	0.450	4.956	11.582	0.094	1.383	0.505
150.0	-3.1	123.7	0.566	5.304	11.943	0.130	1.292	0.493
165.0	-2.9	87.6	0.832	5.023	11.548	0.174	1.322	0.441
180.0	-1.0	25.0	0.801	4.703	11.081	0.202	0.880	0.381
195.0	1.0	225.4	0.783	4.906	11.714	0.144	1.202	0.395
210.0	1.1	242.1	0.630	5.666	11.617	0.106	1.361	0.441
225.0	0.8	253.0	0.524	5.812	12.232	0.074	1.401	0.480
240.0	0.4	263.2	0.439	6.120	12.247	0.045	1.407	0.504
255.0	0.3	274.2	0.327	5.852	12.536	0.037	1.397	0.510
270.0	0.2	284.7	0.397	5.684	12.610	0.067	1.372	0.499
285.0	0.0	294.0	0.529	5.721	12.480	0.101	1.322	0.480
300.0	-0.2	302.6	0.667	5.975	11.702	0.132	1.264	0.457
315.0	-0.2	311.4	0.804	6.396	11.800	0.157	1.191	0.432
330.0	-0.3	319.8	0.838	6.185	11.524	0.175	1.102	0.413
345.0	-0.5	329.1	0.802	5.297	11.353	0.192	0.972	0.394

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.37:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	3.2	-27.7	1.356	5.547	11.244	0.227	1.043	0.382
15.0	2.8	-20.8	1.363	4.927	11.116	0.233	0.989	0.371
30.0	2.7	-13.3	1.295	4.065	10.929	0.235	0.999	0.377
45.0	2.9	3.4	1.088	3.919	11.536	0.234	1.049	0.397
60.0	3.9	41.9	0.787	4.416	11.716	0.195	1.202	0.457
75.0	4.1	60.1	0.595	4.670	11.932	0.129	1.341	0.495
90.0	4.2	76.0	0.379	4.965	11.850	0.061	1.372	0.525
105.0	4.0	89.6	0.236	4.959	12.033	0.026	1.373	0.530
120.0	3.7	101.3	0.235	5.822	12.496	0.040	1.360	0.525
135.0	3.4	111.1	0.379	6.267	12.159	0.063	1.343	0.521
150.0	2.9	120.9	0.536	6.029	12.099	0.088	1.299	0.505
165.0	2.6	131.7	0.629	6.010	11.890	0.112	1.236	0.469
180.0	2.8	56.5	0.868	4.713	11.831	0.193	1.391	0.396
195.0	4.2	194.8	1.018	3.378	11.400	0.145	0.683	0.300
210.0	4.2	227.1	0.838	4.917	11.596	0.116	1.101	0.361
225.0	4.3	244.3	0.502	4.547	11.833	0.081	1.277	0.426
240.0	4.3	255.9	0.346	5.329	11.592	0.055	1.356	0.463
255.0	4.4	265.5	0.266	6.078	12.005	0.033	1.373	0.498
270.0	4.5	278.2	0.354	5.782	12.307	0.036	1.397	0.517
285.0	4.6	290.8	0.404	6.500	12.095	0.087	1.388	0.509
300.0	4.7	302.8	0.724	5.688	12.349	0.143	1.314	0.480
315.0	4.6	313.9	0.823	5.172	11.786	0.187	1.196	0.445
330.0	4.4	324.5	0.931	6.524	11.484	0.215	1.072	0.419
345.0	4.0	331.6	1.284	5.548	11.332	0.228	0.976	0.401

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.38:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	9.5	-1.7	1.185	1.929	11.101	0.283	0.313	0.406
15.0	9.5	13.5	1.148	2.689	11.206	0.277	0.592	0.421
30.0	9.5	28.7	1.180	3.293	11.280	0.257	0.926	0.447
45.0	9.6	43.7	0.972	4.278	11.960	0.215	1.152	0.483
60.0	9.6	58.1	0.825	4.886	12.633	0.154	1.315	0.524
75.0	9.7	73.0	0.356	5.130	12.388	0.076	1.282	0.549
90.0	9.7	87.7	0.142	4.823	12.025	0.030	1.275	0.546
105.0	9.6	102.6	0.247	4.980	11.976	0.042	1.244	0.508
120.0	9.1	115.8	0.528	4.671	11.764	0.064	1.252	0.473
135.0	9.0	130.1	0.501	5.449	11.647	0.084	1.133	0.413
150.0	9.0	145.5	0.564	4.182	11.529	0.099	0.982	0.348
165.0	9.0	160.9	0.697	3.896	11.300	0.108	0.908	0.304
180.0	9.3	177.8	0.521	2.874	10.788	0.110	0.726	0.259
195.0	9.5	194.7	0.607	2.804	10.984	0.109	0.658	0.226
210.0	9.4	211.9	0.581	4.427	11.080	0.103	1.007	0.253
225.0	9.2	229.1	0.562	4.905	11.405	0.089	1.271	0.320
240.0	9.3	244.0	0.453	5.008	11.451	0.071	1.419	0.389
255.0	9.6	257.5	0.325	4.812	12.336	0.050	1.419	0.447
270.0	9.7	271.9	0.214	6.028	12.539	0.032	1.451	0.509
285.0	9.7	286.3	0.474	7.665	12.478	0.070	1.440	0.531
300.0	9.7	300.8	0.568	5.789	11.853	0.147	1.390	0.514
315.0	9.6	314.6	0.789	4.712	11.698	0.208	1.169	0.468
330.0	9.6	328.9	1.158	3.457	11.321	0.250	0.893	0.431
345.0	9.5	343.5	1.085	2.649	11.170	0.275	0.593	0.412

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.39:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	14.5	-0.7	1.307	1.789	11.345	0.312	0.286	0.440
15.0	14.5	14.5	1.224	2.786	11.364	0.305	0.594	0.451
30.0	14.6	29.6	1.214	3.699	11.611	0.280	0.944	0.481
45.0	14.6	44.5	0.952	4.442	11.721	0.232	1.181	0.523
60.0	14.6	59.2	0.511	5.070	11.969	0.160	1.382	0.569
75.0	14.7	74.1	0.402	5.688	12.642	0.078	1.235	0.576
90.0	14.7	89.0	0.154	4.594	12.070	0.043	1.192	0.547
105.0	14.7	103.9	0.443	4.872	12.086	0.056	1.174	0.490
120.0	14.4	118.1	0.624	5.532	11.761	0.073	1.477	0.481
135.0	14.4	133.3	0.400	4.952	11.144	0.084	1.368	0.406
150.0	14.4	148.6	0.452	4.057	10.903	0.092	1.009	0.319
165.0	14.6	163.9	0.450	3.174	10.615	0.091	0.663	0.258
180.0	14.6	179.2	0.542	2.281	10.509	0.103	0.546	0.228
195.0	14.6	194.6	0.515	3.526	10.279	0.091	0.660	0.184
210.0	14.6	210.2	0.438	4.104	10.276	0.087	1.113	0.173
225.0	14.5	226.3	0.373	4.412	10.634	0.085	1.579	0.225
240.0	14.5	241.9	0.556	5.796	11.278	0.076	1.723	0.324
255.0	14.7	256.1	0.382	6.500	11.391	0.061	1.536	0.398
270.0	14.7	270.9	0.246	6.859	11.839	0.045	1.534	0.490
285.0	14.8	285.5	0.458	8.120	12.733	0.069	1.492	0.540
300.0	14.7	300.2	0.610	5.453	11.937	0.153	1.494	0.555
315.0	14.6	314.6	0.905	4.610	12.001	0.227	1.220	0.516
330.0	14.5	329.3	1.154	3.414	11.428	0.276	0.881	0.474
345.0	14.5	344.2	1.395	2.550	11.296	0.304	0.523	0.446

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.



**Table T.40:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.5	-0.4	1.484	2.338	11.359	0.338	0.367	0.529
15.0	19.6	14.8	1.388	2.938	11.407	0.330	0.660	0.538
30.0	19.6	29.9	1.302	3.790	11.707	0.304	0.993	0.564
45.0	19.6	44.9	0.907	4.652	12.024	0.252	1.276	0.602
60.0	19.6	59.7	0.690	5.532	12.488	0.172	1.479	0.634
75.0	19.7	74.5	0.508	5.451	13.083	0.083	1.189	0.596
90.0	19.7	89.4	0.204	4.430	12.051	0.056	1.115	0.544
105.0	19.7	104.4	0.452	4.463	12.279	0.072	1.097	0.468
120.0	19.6	119.0	0.359	5.580	11.209	0.090	1.754	0.492
135.0	19.6	134.3	0.586	5.444	10.949	0.097	1.368	0.353
150.0	19.5	149.3	0.631	4.473	10.522	0.115	1.108	0.290
165.0	19.6	164.4	0.414	2.733	10.438	0.108	0.646	0.234
180.0	19.6	179.5	0.597	2.999	10.434	0.113	0.543	0.207
195.0	19.7	194.7	0.397	4.765	10.168	0.095	0.764	0.189
210.0	19.6	210.0	0.533	6.874	10.079	0.102	1.283	0.230
225.0	19.6	225.3	0.678	6.499	10.368	0.092	1.634	0.219
240.0	19.6	240.9	0.557	6.659	10.921	0.088	1.986	0.256
255.0	19.7	255.5	0.365	7.021	11.246	0.072	1.609	0.343
270.0	19.7	270.4	0.245	7.836	11.794	0.058	1.587	0.468
285.0	19.7	285.3	0.338	6.672	12.344	0.072	1.562	0.545
300.0	19.6	300.0	0.679	7.445	12.098	0.161	1.580	0.614
315.0	19.6	314.6	0.905	5.069	11.656	0.244	1.233	0.601
330.0	19.6	329.4	1.166	3.887	11.643	0.298	0.862	0.573
345.0	19.5	344.5	1.514	2.988	11.563	0.329	0.484	0.542

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.41:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	24.5	-0.2	1.505	3.376	12.073	0.363	0.508	0.689
15.0	24.5	14.9	1.518	3.873	12.100	0.355	0.761	0.690
30.0	24.5	30.0	1.389	5.014	12.028	0.328	1.066	0.708
45.0	24.5	45.0	1.086	5.283	12.337	0.270	1.342	0.711
60.0	24.5	59.9	0.747	6.019	12.689	0.184	1.569	0.707
75.0	24.6	74.6	0.526	5.429	13.538	0.091	1.154	0.618
90.0	24.6	89.5	0.247	4.536	11.838	0.069	1.050	0.542
105.0	24.6	104.6	0.410	4.568	11.734	0.091	1.035	0.446
120.0	24.5	119.5	0.472	6.705	10.724	0.111	1.890	0.466
135.0	24.5	134.5	0.706	6.274	10.913	0.133	1.722	0.347
150.0	24.5	149.4	0.671	4.877	10.661	0.144	1.236	0.280
165.0	24.8	164.5	0.477	3.200	10.218	0.111	0.548	0.174
180.0	24.8	179.7	0.508	3.526	10.343	0.145	0.444	0.200
195.0	24.8	194.9	0.409	3.606	10.099	0.103	0.479	0.147
210.0	24.6	210.1	0.557	5.748	10.156	0.120	1.218	0.295
225.0	24.5	225.2	0.599	7.953	10.062	0.111	1.677	0.356
240.0	24.6	240.3	0.371	8.108	10.029	0.096	2.062	0.283
255.0	24.6	255.2	0.440	7.178	11.320	0.086	1.630	0.315
270.0	24.6	270.2	0.310	8.161	11.646	0.069	1.608	0.451
285.0	24.6	285.1	0.397	8.105	11.995	0.076	1.621	0.560
300.0	24.6	299.9	0.687	7.426	12.109	0.170	1.599	0.679
315.0	24.6	314.7	1.005	5.830	12.068	0.261	1.182	0.725
330.0	24.5	329.6	1.440	4.796	11.959	0.322	0.800	0.718
345.0	24.5	344.7	1.483	3.510	11.797	0.352	0.524	0.702

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table T.42:** Accelerations at Hangar Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.5	-0.1	1.951	4.728	12.671	0.383	0.707	0.877
15.0	29.5	15.0	1.627	5.037	12.591	0.378	0.901	0.880
30.0	29.5	30.1	1.621	5.824	12.603	0.349	1.163	0.883
45.0	29.5	45.0	1.140	6.071	12.709	0.294	1.384	0.872
60.0	29.5	59.9	0.726	7.157	12.911	0.200	1.611	0.801
75.0	29.5	74.7	0.382	4.961	12.321	0.100	1.185	0.644
90.0	29.5	89.6	0.341	4.807	11.669	0.084	1.112	0.536
105.0	29.5	104.6	0.535	5.972	11.730	0.112	0.992	0.408
120.0	29.4	119.7	0.457	6.607	10.486	0.139	2.098	0.482
135.0	29.4	134.5	0.486	4.926	10.186	0.153	1.521	0.325
150.0	29.6	149.4	0.564	4.491	10.140	0.178	1.040	0.278
165.0	29.8	164.5	0.636	3.857	10.060	0.181	0.613	0.205
180.0	29.7	179.3	0.735	4.167	10.045	0.185	0.494	0.182
195.0	30.1	194.8	0.520	4.219	10.069	0.166	0.573	0.185
210.0	29.8	210.1	0.525	4.420	10.126	0.148	0.865	0.237
225.0	29.5	225.0	0.457	6.608	10.036	0.123	1.402	0.375
240.0	29.5	240.1	0.448	8.477	9.926	0.114	1.973	0.424
255.0	29.5	255.1	0.452	7.196	10.933	0.102	1.589	0.331
270.0	29.5	270.1	0.369	7.988	11.461	0.082	1.611	0.458
285.0	29.6	285.1	0.394	8.328	11.619	0.083	1.684	0.586
300.0	29.5	299.9	0.657	8.290	12.049	0.180	1.595	0.753
315.0	29.5	314.8	1.209	6.942	12.483	0.279	1.169	0.863
330.0	29.5	329.8	1.463	5.894	12.692	0.339	0.856	0.892
345.0	29.5	344.8	1.673	4.764	12.615	0.372	0.666	0.886

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

This page intentionally left blank.

**Annex U**  
**Tables of Flight Deck Accelerations –**  
**Bretschneider Spectrum (Open Ocean)**

---

**Table U.1:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.3	-23.9	0.701	1.762	11.093	0.166	0.358	0.450
15.0	-0.2	-1.1	0.670	0.634	10.881	0.155	0.118	0.403
30.0	-0.1	26.5	0.671	1.573	10.956	0.166	0.427	0.433
45.0	-0.2	38.1	0.753	2.898	11.114	0.179	0.591	0.481
60.0	-0.3	44.6	0.753	4.038	11.558	0.184	0.704	0.512
75.0	-0.5	51.7	0.758	3.258	11.597	0.193	0.871	0.557
90.0	-1.0	58.4	0.772	3.858	11.870	0.196	1.010	0.591
105.0	-1.3	66.4	1.131	7.141	13.358	0.195	1.157	0.649
120.0	-0.7	-18.9	0.863	6.485	12.893	0.177	0.864	0.541
135.0	-2.5	102.8	0.799	5.604	12.847	0.172	1.173	0.707
150.0	-3.0	108.4	0.746	6.624	12.440	0.181	1.136	0.691
165.0	-1.3	19.3	0.756	6.287	13.570	0.161	0.782	0.529
180.0	-1.1	148.2	0.505	1.813	11.360	0.138	0.439	0.388
195.0	-0.3	371.7	0.797	3.564	11.625	0.174	0.621	0.511
210.0	-0.2	378.5	0.849	5.633	12.759	0.180	0.792	0.567
225.0	0.5	308.3	0.847	5.886	12.501	0.174	0.799	0.583
240.0	1.6	290.7	0.968	7.009	14.169	0.208	1.122	0.815
255.0	1.0	293.4	0.986	5.238	13.448	0.211	1.098	0.789
270.0	0.5	298.5	0.801	4.464	12.834	0.210	1.028	0.728
285.0	0.2	303.5	0.848	5.064	13.069	0.205	0.938	0.666
300.0	-0.0	308.0	0.811	3.794	11.925	0.200	0.860	0.625
315.0	-0.1	312.1	0.765	3.813	11.451	0.193	0.775	0.585
330.0	-0.2	316.1	0.714	3.029	11.446	0.188	0.702	0.554
345.0	-0.3	322.9	0.682	2.388	11.372	0.180	0.554	0.511

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.2:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	4.8	-1.1	0.748	0.639	11.293	0.179	0.103	0.519
15.0	4.7	13.7	0.785	0.895	11.291	0.182	0.170	0.522
30.0	4.7	28.4	0.824	1.313	11.481	0.195	0.360	0.564
45.0	4.6	42.9	0.868	2.204	11.511	0.212	0.581	0.623
60.0	4.4	55.4	0.838	3.133	12.284	0.225	0.846	0.701
75.0	4.0	58.1	0.842	3.612	12.400	0.223	0.920	0.710
90.0	3.7	59.3	0.797	4.601	12.308	0.219	0.919	0.696
105.0	3.6	61.5	0.749	4.364	12.487	0.218	0.970	0.710
120.0	3.8	62.7	0.774	3.614	12.830	0.220	0.980	0.734
135.0	3.9	62.8	0.813	4.017	12.781	0.223	0.974	0.741
150.0	4.5	146.7	0.381	1.637	10.796	0.100	0.460	0.225
165.0	4.8	163.9	0.350	1.110	10.666	0.088	0.251	0.177
180.0	4.8	179.2	0.333	0.573	10.797	0.084	0.101	0.169
195.0	4.8	194.6	0.338	1.044	10.737	0.087	0.260	0.182
210.0	4.7	210.8	0.381	2.033	10.829	0.096	0.465	0.225
225.0	4.7	285.0	0.997	5.719	14.061	0.207	1.101	0.887
240.0	4.6	285.7	0.814	7.384	14.396	0.205	1.136	0.911
255.0	4.4	290.0	0.842	4.099	13.377	0.218	1.089	0.868
270.0	4.4	293.0	0.967	5.737	13.542	0.225	1.062	0.838
285.0	4.4	294.5	0.881	4.363	13.332	0.228	1.040	0.820
300.0	4.7	302.3	0.799	3.448	12.430	0.231	0.905	0.751
315.0	4.7	315.3	0.803	2.826	11.854	0.217	0.637	0.650
330.0	4.7	329.6	0.823	1.641	11.445	0.198	0.395	0.585
345.0	4.8	344.3	0.755	1.101	11.221	0.185	0.205	0.536

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.3:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.7	-0.4	0.818	0.648	11.771	0.200	0.079	0.615
15.0	9.7	14.5	0.810	0.857	11.667	0.204	0.156	0.615
30.0	9.7	29.5	0.868	1.441	11.700	0.218	0.328	0.649
45.0	9.7	44.5	0.937	2.185	11.845	0.237	0.563	0.694
60.0	9.7	59.2	0.917	3.533	12.379	0.250	0.856	0.815
75.0	9.7	72.8	0.843	4.626	13.704	0.225	1.021	0.976
90.0	9.2	84.6	0.480	6.042	13.511	0.118	1.033	0.964
105.0	8.9	99.1	0.832	8.950	14.739	0.117	1.139	0.613
120.0	9.3	116.3	0.779	10.164	12.868	0.104	1.062	0.358
135.0	9.6	133.5	0.323	3.125	10.661	0.081	0.963	0.181
150.0	9.7	149.2	0.278	3.330	10.366	0.069	0.927	0.124
165.0	9.8	164.3	0.234	2.862	10.259	0.064	0.773	0.105
180.0	9.8	179.4	0.228	1.870	10.230	0.062	0.409	0.086
195.0	9.8	194.8	0.216	1.682	10.278	0.065	0.498	0.096
210.0	9.8	210.3	0.275	2.285	10.440	0.071	0.822	0.131
225.0	9.7	225.9	0.287	2.787	10.607	0.081	0.941	0.198
240.0	9.4	242.9	0.460	3.614	11.738	0.103	1.027	0.361
255.0	9.0	260.8	0.952	8.173	13.891	0.127	1.159	0.641
270.0	9.3	274.8	0.446	6.745	13.410	0.102	1.082	0.971
285.0	9.8	286.9	0.917	6.717	13.396	0.225	1.083	1.029
300.0	9.7	300.3	0.951	3.446	12.646	0.254	0.892	0.850
315.0	9.7	314.9	0.850	2.469	11.820	0.240	0.591	0.708
330.0	9.7	329.9	0.849	1.512	11.753	0.221	0.361	0.658
345.0	9.7	344.7	0.749	1.050	11.658	0.205	0.184	0.620

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table U.4:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	14.7	-0.3	0.791	1.070	11.726	0.220	0.115	0.646
15.0	14.7	14.7	0.840	1.199	12.008	0.224	0.165	0.649
30.0	14.7	29.7	0.901	1.778	11.836	0.238	0.319	0.689
45.0	14.6	44.8	0.952	2.432	12.205	0.257	0.534	0.762
60.0	14.7	59.6	0.923	3.365	12.697	0.266	0.810	0.927
75.0	14.7	73.9	0.792	5.272	13.707	0.226	0.984	1.083
90.0	14.6	88.2	0.327	5.868	13.210	0.057	0.977	0.850
105.0	14.4	103.1	0.506	8.987	12.865	0.093	1.097	0.483
120.0	14.5	118.5	0.253	4.644	10.956	0.070	1.418	0.255
135.0	14.6	134.1	0.202	4.552	10.347	0.055	1.542	0.222
150.0	14.7	149.6	0.193	2.986	10.186	0.055	0.821	0.116
165.0	14.8	164.7	0.235	2.277	10.246	0.065	0.487	0.086
180.0	14.6	179.5	0.270	2.153	10.045	0.063	0.323	0.061
195.0	14.7	194.7	0.223	2.435	10.101	0.066	0.428	0.054
210.0	14.6	209.8	0.233	3.563	10.267	0.068	0.970	0.078
225.0	14.7	225.4	0.272	4.146	10.427	0.059	1.451	0.150
240.0	14.6	241.1	0.245	4.358	10.881	0.073	1.375	0.256
255.0	14.4	256.9	0.468	7.252	12.711	0.103	1.146	0.504
270.0	14.6	271.8	0.358	5.391	13.296	0.052	1.120	0.924
285.0	14.8	285.9	0.895	4.319	14.156	0.226	1.113	1.161
300.0	14.7	300.1	0.982	3.481	13.066	0.268	0.896	0.972
315.0	14.7	314.9	0.933	2.359	12.007	0.260	0.575	0.784
330.0	14.7	329.9	0.937	1.794	11.890	0.241	0.343	0.702
345.0	14.7	344.8	0.808	1.201	11.826	0.225	0.183	0.654

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.5:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.2	0.835	1.546	12.244	0.236	0.150	0.717
15.0	19.6	14.8	0.869	1.596	12.165	0.241	0.185	0.729
30.0	19.6	29.8	0.919	2.045	12.132	0.256	0.310	0.794
45.0	19.6	44.8	1.048	2.565	12.525	0.273	0.501	0.903
60.0	19.6	59.7	0.967	3.534	13.073	0.279	0.768	1.079
75.0	19.6	74.3	0.820	4.547	14.246	0.229	0.941	1.194
90.0	19.6	89.0	0.286	5.532	13.254	0.047	0.947	0.831
105.0	19.5	104.0	0.427	5.337	12.189	0.075	1.088	0.411
120.0	19.6	119.3	0.223	5.237	10.943	0.045	1.915	0.333
135.0	19.6	134.7	0.202	4.498	10.396	0.057	1.332	0.198
150.0	19.7	149.7	0.405	2.708	10.066	0.067	0.597	0.088
165.0	19.4	164.6	0.550	2.851	10.015	0.079	0.434	0.087
180.0	20.1	179.8	0.513	2.710	9.987	0.072	0.340	0.076
195.0	19.6	194.6	0.528	3.678	9.984	0.071	0.545	0.093
210.0	19.6	209.9	0.444	4.514	9.948	0.065	0.741	0.099
225.0	19.6	225.1	0.183	5.264	10.048	0.049	1.330	0.142
240.0	19.6	240.7	0.226	5.209	10.978	0.046	1.738	0.198
255.0	19.5	256.0	0.520	5.854	12.319	0.086	1.217	0.414
270.0	19.6	271.1	0.342	7.831	13.662	0.043	1.179	0.922
285.0	19.7	285.6	0.862	5.307	14.593	0.223	1.173	1.272
300.0	19.6	300.1	0.969	3.649	13.446	0.276	0.897	1.125
315.0	19.6	315.0	0.922	2.510	12.566	0.272	0.575	0.924
330.0	19.6	329.9	0.862	1.910	12.306	0.256	0.348	0.805
345.0	19.6	344.9	0.879	1.505	12.165	0.241	0.205	0.735

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.6:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.7	-0.1	0.829	1.539	12.783	0.246	0.164	0.868
15.0	24.7	14.9	0.878	1.687	12.680	0.251	0.185	0.888
30.0	24.7	29.9	0.867	2.098	12.738	0.266	0.295	0.968
45.0	24.7	44.9	0.913	2.475	12.993	0.284	0.476	1.089
60.0	24.7	59.8	1.072	3.905	13.781	0.287	0.742	1.256
75.0	24.7	74.6	0.807	4.333	14.889	0.231	0.917	1.312
90.0	24.6	89.3	0.328	5.825	13.064	0.043	0.942	0.835
105.0	24.6	104.4	0.330	5.597	11.541	0.061	1.184	0.364
120.0	24.6	119.8	0.284	6.155	10.882	0.055	2.077	0.317
135.0	24.7	134.8	0.267	3.760	9.970	0.063	1.003	0.122
150.0	24.5	149.9	0.711	3.176	10.023	0.095	0.564	0.112
165.0	24.8	164.8	0.610	2.877	10.158	0.085	0.349	0.113
180.0	24.4	179.8	0.670	3.098	10.134	0.097	0.481	0.148
195.0	24.7	194.9	0.708	3.514	10.167	0.088	0.526	0.128
210.0	24.8	210.1	0.726	3.876	10.150	0.081	0.687	0.112
225.0	24.7	225.1	0.250	4.756	9.901	0.061	1.167	0.160
240.0	24.6	240.2	0.206	6.367	10.236	0.051	2.171	0.258
255.0	24.6	255.6	0.406	6.512	12.386	0.070	1.328	0.343
270.0	24.6	270.7	0.305	8.151	13.428	0.046	1.196	0.914
285.0	24.7	285.4	0.813	5.556	14.797	0.221	1.194	1.368
300.0	24.7	300.1	1.006	3.793	14.011	0.279	0.903	1.283
315.0	24.7	315.1	0.924	3.086	13.144	0.279	0.577	1.104
330.0	24.7	330.0	0.911	2.046	12.937	0.265	0.353	0.977
345.0	24.7	344.9	0.899	1.585	12.787	0.251	0.219	0.892

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.7:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 8.3$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.7	-0.1	0.792	1.340	12.855	0.250	0.160	1.037
15.0	29.7	14.9	0.877	1.587	13.032	0.255	0.168	1.065
30.0	29.7	29.9	0.925	1.831	13.331	0.271	0.268	1.154
45.0	29.7	44.9	1.017	2.374	13.690	0.288	0.446	1.283
60.0	29.7	59.8	0.972	3.622	14.335	0.289	0.718	1.430
75.0	29.7	74.7	0.816	4.735	14.935	0.229	0.943	1.417
90.0	29.7	89.5	0.231	5.819	13.037	0.043	0.975	0.835
105.0	29.7	104.7	0.263	5.571	11.247	0.054	1.416	0.334
120.0	29.6	119.9	0.302	5.539	10.074	0.071	1.962	0.261
135.0	29.6	135.0	0.847	3.308	10.033	0.083	0.907	0.100
150.0	30.0	149.4	0.373	2.826	10.189	0.084	0.605	0.148
165.0	29.8	164.9	0.796	2.549	10.331	0.091	0.444	0.171
180.0	29.6	179.8	0.808	3.144	10.510	0.090	0.486	0.188
195.0	29.8	194.9	0.735	2.979	10.405	0.090	0.575	0.174
210.0	30.0	210.3	0.323	3.608	10.259	0.084	0.774	0.149
225.0	29.6	225.0	0.297	4.391	10.013	0.079	1.047	0.136
240.0	29.6	240.1	0.268	6.076	9.955	0.065	1.837	0.239
255.0	29.6	255.4	0.309	8.023	11.729	0.067	1.618	0.297
270.0	29.7	270.5	0.352	6.054	13.467	0.049	1.177	0.901
285.0	29.7	285.3	0.806	4.661	15.316	0.220	1.195	1.464
300.0	29.7	300.2	0.898	3.549	14.620	0.280	0.914	1.438
315.0	29.7	315.1	0.869	2.859	13.640	0.281	0.575	1.284
330.0	29.7	330.0	0.880	2.020	13.302	0.268	0.354	1.155
345.0	29.7	345.0	0.862	1.487	13.247	0.255	0.222	1.066

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.8:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	0.0	-7.8	0.461	1.501	10.699	0.123	0.297	0.294
15.0	-0.2	-2.3	0.468	1.454	10.632	0.123	0.206	0.288
30.0	-0.3	7.3	0.488	1.898	10.644	0.123	0.309	0.285
45.0	-0.3	23.2	0.497	2.673	10.606	0.117	0.590	0.289
60.0	-0.3	37.9	0.439	3.059	10.789	0.109	0.771	0.301
75.0	-0.3	52.1	0.317	3.005	10.905	0.094	0.881	0.311
90.0	-0.3	66.2	0.277	2.843	11.015	0.067	0.918	0.308
105.0	-0.3	82.5	0.110	2.834	10.899	0.023	0.913	0.287
120.0	-0.5	96.1	0.153	2.891	10.862	0.022	0.925	0.285
135.0	-0.9	106.3	0.220	3.021	11.004	0.047	0.938	0.299
150.0	-1.3	115.7	0.263	3.301	10.869	0.069	0.923	0.311
165.0	-1.5	119.2	0.284	3.546	10.823	0.077	0.887	0.311
180.0	-1.4	139.3	0.369	2.482	11.102	0.101	0.667	0.300
195.0	0.7	230.8	0.368	3.146	11.041	0.084	0.818	0.321
210.0	0.7	245.3	0.286	3.505	11.184	0.064	0.895	0.335
225.0	0.5	256.2	0.221	3.534	11.115	0.042	0.910	0.331
240.0	0.4	267.9	0.159	3.499	11.049	0.020	0.901	0.321
255.0	0.5	282.1	0.191	3.511	11.070	0.039	0.898	0.335
270.0	0.5	295.1	0.299	3.546	11.177	0.073	0.901	0.351
285.0	0.3	306.0	0.321	3.628	11.082	0.093	0.862	0.347
300.0	0.2	316.1	0.429	3.631	11.079	0.105	0.801	0.334
315.0	0.1	326.5	0.474	3.410	10.890	0.113	0.708	0.320
330.0	0.1	336.0	0.486	2.726	10.780	0.118	0.594	0.308
345.0	0.1	345.0	0.474	1.748	10.785	0.122	0.444	0.300

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.9:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.8	-1.3	0.559	0.588	10.762	0.143	0.085	0.345
15.0	4.8	13.5	0.643	1.334	10.858	0.142	0.326	0.348
30.0	4.8	28.2	0.704	2.108	11.171	0.136	0.575	0.356
45.0	4.8	42.8	0.498	2.887	11.189	0.125	0.739	0.366
60.0	4.7	57.0	0.443	3.298	11.523	0.101	0.851	0.367
75.0	4.7	71.4	0.218	3.286	11.219	0.058	0.860	0.344
90.0	4.7	86.0	0.064	3.012	10.904	0.012	0.857	0.309
105.0	4.6	99.9	0.108	2.795	10.938	0.023	0.872	0.296
120.0	4.3	111.6	0.237	3.033	11.206	0.046	0.875	0.288
135.0	4.1	120.0	0.274	3.048	10.972	0.057	0.838	0.271
150.0	4.4	144.5	0.324	2.211	10.944	0.075	0.595	0.224
165.0	4.7	162.4	0.369	1.350	10.747	0.078	0.340	0.198
180.0	4.8	178.9	0.360	0.719	10.870	0.080	0.166	0.190
195.0	4.8	195.1	0.333	1.268	10.860	0.078	0.374	0.196
210.0	4.7	211.6	0.338	2.103	10.879	0.075	0.599	0.215
225.0	4.6	228.6	0.268	2.745	10.875	0.067	0.776	0.250
240.0	4.6	244.2	0.223	2.801	11.109	0.051	0.865	0.285
255.0	4.8	258.1	0.137	2.921	11.062	0.028	0.870	0.301
270.0	4.8	272.3	0.063	3.225	11.121	0.009	0.848	0.318
285.0	4.9	286.9	0.241	3.717	11.365	0.052	0.853	0.355
300.0	4.9	301.2	0.394	3.789	11.507	0.098	0.836	0.379
315.0	4.9	315.4	0.536	3.080	11.496	0.124	0.752	0.375
330.0	4.8	329.7	0.641	2.684	11.076	0.135	0.588	0.361
345.0	4.8	344.2	0.570	1.749	10.800	0.141	0.372	0.351

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.10:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.8	-0.4	0.684	0.599	10.901	0.162	0.057	0.393
15.0	9.8	14.6	0.587	1.133	10.931	0.159	0.257	0.392
30.0	9.8	29.6	0.649	2.008	11.104	0.153	0.498	0.398
45.0	9.8	44.6	0.529	2.384	11.234	0.138	0.677	0.403
60.0	9.8	59.4	0.429	3.268	11.471	0.105	0.803	0.396
75.0	9.8	74.2	0.256	3.405	11.740	0.052	0.783	0.360
90.0	9.8	89.0	0.045	2.987	11.009	0.013	0.789	0.315
105.0	9.8	103.8	0.126	3.529	10.946	0.026	0.817	0.281
120.0	9.7	118.5	0.194	3.536	11.091	0.042	0.887	0.246
135.0	9.7	133.7	0.225	3.480	10.750	0.051	0.827	0.206
150.0	9.7	149.0	0.190	2.519	10.372	0.055	0.729	0.171
165.0	9.8	164.3	0.196	2.059	10.229	0.057	0.520	0.150
180.0	9.8	179.4	0.191	1.380	10.257	0.058	0.290	0.136
195.0	9.8	194.7	0.212	1.479	10.275	0.057	0.363	0.134
210.0	9.8	210.1	0.181	1.985	10.313	0.055	0.679	0.147
225.0	9.8	225.7	0.227	2.739	10.670	0.051	0.836	0.186
240.0	9.8	241.0	0.231	3.603	11.003	0.043	0.930	0.233
255.0	9.8	255.7	0.165	2.930	11.014	0.028	0.868	0.273
270.0	9.9	270.5	0.068	3.029	11.110	0.014	0.829	0.318
285.0	9.9	285.3	0.253	3.626	11.577	0.050	0.828	0.370
300.0	9.8	300.1	0.462	3.633	11.857	0.105	0.835	0.408
315.0	9.8	314.8	0.542	2.506	11.282	0.138	0.700	0.408
330.0	9.8	329.6	0.562	2.156	11.052	0.153	0.519	0.398
345.0	9.8	344.6	0.688	1.403	11.057	0.160	0.298	0.393

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.11:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.7	-0.3	0.630	0.889	10.978	0.180	0.084	0.430
15.0	14.7	14.8	0.627	1.411	11.133	0.178	0.259	0.428
30.0	14.7	29.8	0.647	2.143	11.206	0.169	0.474	0.435
45.0	14.7	44.8	0.563	2.610	11.411	0.152	0.659	0.443
60.0	14.7	59.8	0.413	2.982	11.574	0.115	0.804	0.435
75.0	14.8	74.6	0.267	3.815	11.969	0.055	0.727	0.379
90.0	14.8	89.5	0.067	3.061	10.924	0.019	0.726	0.318
105.0	14.8	104.4	0.132	3.233	11.057	0.027	0.759	0.270
120.0	14.7	119.3	0.174	4.376	10.862	0.036	1.024	0.244
135.0	14.7	134.5	0.189	3.702	10.437	0.039	1.021	0.203
150.0	14.7	149.6	0.140	2.200	10.262	0.041	0.597	0.148
165.0	14.8	164.7	0.165	1.675	10.170	0.046	0.372	0.125
180.0	14.7	179.7	0.192	1.425	10.128	0.048	0.223	0.106
195.0	14.7	194.7	0.149	1.723	10.070	0.045	0.302	0.096
210.0	14.7	209.8	0.178	3.004	10.022	0.044	0.648	0.092
225.0	14.7	225.2	0.197	3.645	10.222	0.041	1.075	0.126
240.0	14.7	240.4	0.202	4.106	10.733	0.038	1.104	0.188
255.0	14.8	255.3	0.189	3.650	10.968	0.030	0.902	0.241
270.0	14.8	270.2	0.081	3.280	11.103	0.021	0.841	0.315
285.0	14.8	285.0	0.256	3.860	11.750	0.052	0.821	0.391
300.0	14.7	299.9	0.368	3.340	11.520	0.113	0.830	0.448
315.0	14.7	314.7	0.533	3.072	11.393	0.151	0.676	0.448
330.0	14.7	329.7	0.616	2.341	11.213	0.169	0.473	0.435
345.0	14.7	344.7	0.696	1.456	11.127	0.178	0.257	0.428

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table U.12:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.2	0.721	1.357	11.329	0.197	0.137	0.492
15.0	19.6	14.9	0.759	1.856	11.438	0.195	0.299	0.493
30.0	19.6	29.9	0.702	2.687	11.244	0.185	0.495	0.504
45.0	19.6	44.9	0.681	3.267	11.488	0.165	0.672	0.515
60.0	19.6	59.9	0.432	3.645	11.818	0.124	0.825	0.488
75.0	19.7	74.8	0.226	3.768	11.683	0.058	0.669	0.396
90.0	19.7	89.7	0.088	3.087	10.949	0.025	0.649	0.319
105.0	19.7	104.7	0.147	3.301	10.988	0.031	0.689	0.259
120.0	19.7	119.7	0.159	4.342	10.513	0.037	1.191	0.253
135.0	19.6	134.8	0.206	3.288	10.270	0.043	1.012	0.192
150.0	19.6	149.8	0.205	2.253	10.227	0.049	0.589	0.141
165.0	19.7	164.8	0.183	1.678	10.068	0.047	0.277	0.092
180.0	19.7	179.8	0.177	2.033	10.030	0.053	0.225	0.091
195.0	19.7	194.8	0.165	2.793	9.969	0.044	0.316	0.067
210.0	19.7	209.9	0.151	3.274	9.934	0.038	0.480	0.067
225.0	19.6	225.0	0.144	4.445	9.942	0.038	0.990	0.086
240.0	19.7	240.2	0.152	4.400	10.172	0.037	1.314	0.128
255.0	19.7	255.1	0.235	4.027	10.915	0.034	0.913	0.207
270.0	19.7	270.1	0.115	3.598	11.014	0.028	0.833	0.308
285.0	19.7	285.0	0.248	4.055	11.787	0.054	0.798	0.411
300.0	19.7	299.9	0.418	3.789	11.709	0.121	0.795	0.505
315.0	19.6	314.8	0.620	3.211	11.581	0.164	0.615	0.521
330.0	19.6	329.8	0.675	2.358	11.278	0.184	0.413	0.505
345.0	19.6	344.8	0.743	1.699	11.332	0.194	0.219	0.493

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.13:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.7	-0.1	0.954	1.558	11.822	0.213	0.163	0.610
15.0	24.7	15.0	0.809	1.948	11.824	0.209	0.309	0.609
30.0	24.7	30.0	0.722	2.692	11.782	0.198	0.496	0.618
45.0	24.7	45.0	0.640	3.334	11.893	0.176	0.676	0.624
60.0	24.7	60.0	0.446	3.413	12.068	0.133	0.846	0.574
75.0	24.7	74.9	0.209	3.091	11.618	0.062	0.640	0.422
90.0	24.7	89.8	0.111	2.976	10.925	0.031	0.619	0.312
105.0	24.7	104.8	0.165	2.929	10.751	0.038	0.656	0.237
120.0	24.7	119.9	0.152	4.028	10.143	0.045	1.237	0.222
135.0	24.7	134.9	0.158	2.905	10.051	0.047	0.729	0.127
150.0	24.7	149.9	0.236	2.450	10.048	0.065	0.571	0.110
165.0	24.8	164.8	0.252	1.758	10.040	0.063	0.256	0.070
180.0	24.8	179.9	0.166	1.837	9.919	0.059	0.141	0.050
195.0	24.8	195.0	0.174	2.477	9.949	0.058	0.275	0.054
210.0	24.6	209.8	0.166	3.373	9.907	0.041	0.463	0.063
225.0	24.7	225.0	0.176	4.918	9.911	0.049	0.959	0.099
240.0	24.7	240.0	0.132	5.065	9.896	0.040	1.255	0.094
255.0	24.7	255.0	0.196	4.660	10.571	0.040	0.855	0.182
270.0	24.7	270.0	0.138	3.702	11.026	0.034	0.786	0.300
285.0	24.7	285.0	0.200	3.394	11.516	0.057	0.748	0.436
300.0	24.7	299.9	0.470	3.858	11.889	0.128	0.756	0.589
315.0	24.7	314.9	0.624	3.232	11.834	0.173	0.565	0.627
330.0	24.7	329.9	0.835	2.191	11.785	0.196	0.371	0.621
345.0	24.7	344.9	0.790	1.645	11.721	0.208	0.197	0.610

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.14:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 4.0$  m and  $T_p = 15.5$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.7	-0.0	0.971	1.477	12.538	0.226	0.160	0.771
15.0	29.7	15.0	0.761	1.865	12.119	0.221	0.297	0.769
30.0	29.7	30.0	0.811	2.490	12.678	0.209	0.476	0.765
45.0	29.7	45.0	0.663	3.272	12.160	0.185	0.661	0.751
60.0	29.7	60.0	0.483	3.509	12.302	0.140	0.866	0.673
75.0	29.7	74.9	0.232	2.968	11.504	0.065	0.623	0.452
90.0	29.7	89.9	0.130	2.824	10.974	0.036	0.625	0.304
105.0	29.7	104.9	0.218	2.912	10.585	0.046	0.697	0.216
120.0	29.7	119.9	0.218	4.101	10.008	0.058	1.355	0.197
135.0	29.7	134.9	0.188	2.717	9.932	0.051	0.678	0.091
150.0	29.7	149.9	0.276	2.417	9.965	0.078	0.525	0.076
165.0	30.0	164.7	0.279	1.595	9.918	0.090	0.258	0.053
180.0	29.9	179.9	0.273	1.755	9.900	0.087	0.177	0.036
195.0	30.2	195.1	0.286	2.116	9.891	0.085	0.321	0.044
210.0	29.7	210.0	0.246	3.237	9.906	0.066	0.553	0.068
225.0	29.7	225.0	0.164	3.390	9.889	0.045	0.739	0.078
240.0	29.7	240.0	0.207	5.730	9.892	0.050	1.308	0.128
255.0	29.7	255.0	0.195	3.891	10.505	0.048	0.762	0.164
270.0	29.7	270.0	0.148	3.508	10.916	0.040	0.694	0.294
285.0	29.7	285.0	0.190	3.352	11.350	0.061	0.667	0.466
300.0	29.7	299.9	0.448	3.415	12.185	0.135	0.745	0.686
315.0	29.7	314.9	0.616	2.800	12.207	0.181	0.546	0.754
330.0	29.7	329.9	0.768	2.176	12.345	0.207	0.354	0.768
345.0	29.7	344.9	0.854	1.510	12.330	0.220	0.191	0.770

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table U.15:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.0	-11.0	1.256	2.772	11.390	0.261	0.488	0.657
15.0	-0.3	-5.0	1.223	3.145	11.289	0.261	0.408	0.647
30.0	-0.9	0.7	1.229	1.997	11.438	0.257	0.376	0.617
45.0	-1.5	8.1	1.192	6.038	14.013	0.252	0.900	0.618
60.0	-1.5	-38.2	1.138	10.159	13.305	0.186	1.605	0.706
75.0	-2.0	-19.2	1.003	7.374	13.281	0.228	1.589	0.720
90.0	-2.2	58.1	1.347	7.128	13.317	0.247	1.650	0.732
105.0	-2.0	-23.5	1.785	11.531	15.527	0.244	1.551	0.725
120.0	-1.3	32.1	1.071	11.609	14.329	0.203	1.630	0.734
135.0	-3.5	104.4	1.202	11.219	14.340	0.193	1.849	0.865
150.0	-4.5	110.9	1.435	10.374	13.449	0.218	1.762	0.875
165.0	-1.2	16.1	1.096	6.429	12.837	0.249	0.857	0.655
180.0	-0.3	354.5	1.244	7.590	12.753	0.253	0.750	0.661
195.0	-0.1	368.1	1.197	4.881	12.022	0.259	0.767	0.676
210.0	-0.1	374.0	1.183	4.990	12.710	0.257	0.940	0.700
225.0	-0.1	381.7	1.085	6.002	12.582	0.255	1.158	0.734
240.0	1.6	322.0	0.907	7.939	13.771	0.249	1.499	0.903
255.0	1.7	294.4	1.173	8.118	14.599	0.257	1.583	0.963
270.0	1.0	300.9	1.134	6.437	14.049	0.265	1.489	0.900
285.0	0.5	308.7	1.070	5.945	13.557	0.270	1.364	0.840
300.0	0.1	317.3	1.108	6.013	13.152	0.266	1.213	0.775
315.0	-0.0	324.9	1.080	5.387	12.279	0.266	1.035	0.734
330.0	0.0	333.9	1.241	5.774	12.491	0.262	0.846	0.694
345.0	0.1	342.6	1.187	4.434	11.679	0.262	0.685	0.672

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.16:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.5	-2.4	1.276	1.469	11.734	0.296	0.243	0.766
15.0	4.4	11.2	1.311	1.643	12.093	0.296	0.389	0.760
30.0	4.1	22.8	1.346	3.009	12.050	0.296	0.665	0.770
45.0	3.5	20.2	1.265	3.908	12.521	0.292	0.665	0.739
60.0	3.2	28.1	1.228	3.524	11.830	0.288	0.826	0.738
75.0	3.1	38.0	1.336	4.588	12.804	0.285	1.108	0.764
90.0	3.2	41.2	1.245	5.711	12.669	0.282	1.179	0.788
105.0	3.4	41.7	1.091	4.912	12.605	0.286	1.167	0.812
120.0	3.6	42.7	1.138	4.830	12.421	0.288	1.148	0.823
135.0	3.6	43.1	1.250	5.694	12.301	0.287	1.152	0.825
150.0	3.5	40.4	1.254	4.893	12.220	0.287	1.099	0.812
165.0	3.3	44.4	1.219	5.401	12.505	0.285	1.060	0.802
180.0	4.6	179.3	0.583	1.446	11.473	0.148	0.291	0.321
195.0	4.2	242.6	1.117	4.672	12.325	0.198	0.799	0.518
210.0	4.1	352.9	1.303	4.420	12.270	0.290	0.596	0.759
225.0	4.4	307.6	1.134	5.480	13.230	0.287	1.315	0.891
240.0	4.7	287.2	2.159	9.042	15.144	0.237	1.644	1.057
255.0	4.6	291.5	1.171	6.579	14.117	0.259	1.603	1.024
270.0	4.4	298.1	1.194	6.467	14.324	0.278	1.516	0.976
285.0	4.3	302.4	1.277	6.016	14.354	0.287	1.437	0.942
300.0	4.3	307.7	1.251	5.297	13.033	0.292	1.309	0.906
315.0	4.5	316.9	1.130	4.742	12.298	0.301	1.084	0.867
330.0	4.5	330.0	1.268	3.774	12.547	0.302	0.827	0.823
345.0	4.6	343.7	1.310	3.225	11.919	0.299	0.479	0.786

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.17:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.5	-0.8	1.546	1.348	12.238	0.329	0.194	0.878
15.0	9.5	14.1	1.351	1.582	12.066	0.329	0.333	0.886
30.0	9.5	29.1	1.546	2.380	12.307	0.332	0.642	0.906
45.0	9.5	44.0	1.447	3.577	12.808	0.328	0.975	0.933
60.0	9.5	58.4	1.063	6.130	13.260	0.308	1.304	0.998
75.0	9.3	71.0	2.633	7.005	15.481	0.262	1.515	1.101
90.0	8.5	78.5	1.576	9.755	15.056	0.192	1.604	1.079
105.0	8.1	81.7	1.139	9.708	14.295	0.154	1.588	1.006
120.0	7.9	94.1	0.675	12.227	14.184	0.087	1.714	0.815
135.0	8.2	116.3	0.588	8.637	13.070	0.122	1.591	0.585
150.0	9.2	146.6	0.456	3.728	11.068	0.114	1.267	0.274
165.0	9.5	162.9	0.433	3.437	10.727	0.109	1.033	0.224
180.0	9.7	178.8	0.418	3.026	10.749	0.107	0.681	0.188
195.0	9.7	195.1	0.449	2.515	11.011	0.108	0.725	0.201
210.0	9.4	212.0	0.434	3.584	11.102	0.113	1.142	0.263
225.0	8.8	235.2	0.587	12.875	13.194	0.130	1.517	0.481
240.0	8.3	268.6	1.223	11.459	16.339	0.111	1.751	0.915
255.0	8.5	273.6	0.705	11.672	13.430	0.108	1.633	0.978
270.0	8.8	279.0	0.719	7.895	14.817	0.158	1.624	1.105
285.0	9.6	287.9	1.451	9.174	16.736	0.256	1.602	1.164
300.0	9.6	300.8	1.164	5.956	13.620	0.311	1.355	1.043
315.0	9.5	314.9	1.402	5.030	13.125	0.331	1.023	0.953
330.0	9.5	329.6	1.303	3.064	12.412	0.335	0.700	0.919
345.0	9.5	344.5	1.404	2.929	12.343	0.331	0.402	0.887

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.18:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.6	-0.4	1.410	1.379	12.316	0.361	0.195	0.953
15.0	14.5	14.6	1.494	1.750	12.810	0.362	0.328	0.956
30.0	14.5	29.7	1.445	2.432	12.777	0.362	0.608	0.987
45.0	14.5	44.7	1.390	3.902	12.794	0.355	0.925	1.030
60.0	14.6	59.4	1.177	4.929	13.583	0.326	1.251	1.129
75.0	14.6	73.6	1.363	9.780	16.455	0.253	1.433	1.232
90.0	14.4	87.4	0.453	8.862	13.976	0.075	1.439	0.966
105.0	14.2	101.8	0.669	11.719	13.988	0.102	1.656	0.702
120.0	14.1	116.5	0.377	6.570	12.187	0.095	1.850	0.498
135.0	14.3	132.2	0.383	5.455	11.584	0.081	1.831	0.371
150.0	14.6	149.2	0.522	4.545	11.063	0.085	1.206	0.236
165.0	14.6	164.3	0.432	3.278	10.797	0.103	0.759	0.184
180.0	14.7	179.4	0.288	2.545	10.372	0.091	0.473	0.130
195.0	14.7	194.4	0.405	3.404	10.531	0.092	0.625	0.108
210.0	14.7	209.8	0.415	4.270	10.551	0.079	1.066	0.125
225.0	14.5	226.8	0.406	6.903	11.245	0.086	1.833	0.278
240.0	14.3	243.0	0.609	6.172	11.944	0.103	1.923	0.444
255.0	14.2	258.5	0.842	11.206	14.265	0.115	1.803	0.702
270.0	14.4	272.8	0.950	11.238	15.093	0.080	1.665	1.041
285.0	14.7	286.3	1.149	7.852	15.360	0.250	1.566	1.293
300.0	14.7	300.1	1.191	4.629	13.648	0.327	1.308	1.180
315.0	14.6	314.7	1.330	3.482	12.713	0.357	0.961	1.058
330.0	14.5	329.6	1.354	2.839	12.589	0.364	0.638	0.998
345.0	14.5	344.6	1.427	1.804	12.593	0.363	0.350	0.961

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.19:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.3	1.558	1.880	13.162	0.388	0.273	1.086
15.0	19.6	14.8	1.544	2.500	12.898	0.389	0.367	1.087
30.0	19.6	29.8	1.433	2.907	13.191	0.388	0.605	1.143
45.0	19.6	44.8	1.438	4.025	13.222	0.380	0.895	1.199
60.0	19.6	59.6	1.242	6.071	14.201	0.343	1.216	1.293
75.0	19.6	74.1	1.118	7.803	15.971	0.255	1.338	1.336
90.0	19.5	88.6	0.499	8.299	14.712	0.064	1.365	0.942
105.0	19.4	103.5	0.452	7.838	13.020	0.087	1.645	0.635
120.0	19.4	118.3	0.433	7.066	12.464	0.076	2.263	0.527
135.0	19.5	134.6	0.443	5.416	10.678	0.070	1.533	0.278
150.0	19.6	149.5	0.517	4.100	10.341	0.091	0.953	0.164
165.0	19.9	164.4	0.569	3.096	10.296	0.102	0.584	0.136
180.0	19.6	179.5	0.539	3.542	10.166	0.105	0.521	0.117
195.0	19.9	194.9	0.547	4.871	10.006	0.094	0.748	0.129
210.0	19.6	210.1	0.402	5.374	10.164	0.083	1.137	0.164
225.0	19.5	225.5	0.460	6.168	10.757	0.071	1.839	0.227
240.0	19.5	241.5	0.447	7.938	11.964	0.082	2.431	0.387
255.0	19.4	256.8	0.472	11.572	13.707	0.102	1.909	0.593
270.0	19.5	271.6	0.869	11.155	15.909	0.070	1.760	1.038
285.0	19.7	285.8	0.919	7.595	14.747	0.248	1.630	1.424
300.0	19.6	300.0	1.114	5.179	14.386	0.340	1.319	1.358
315.0	19.6	314.8	1.442	3.967	13.844	0.377	0.947	1.233
330.0	19.6	329.7	1.387	2.844	13.244	0.388	0.625	1.157
345.0	19.6	344.7	1.488	2.311	13.183	0.388	0.384	1.095

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table U.20:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.6	-0.1	1.552	2.620	13.896	0.407	0.394	1.310
15.0	24.6	14.9	1.465	3.078	13.418	0.410	0.451	1.322
30.0	24.5	29.9	1.405	3.623	13.823	0.408	0.629	1.367
45.0	24.5	44.9	1.399	4.985	14.297	0.397	0.880	1.422
60.0	24.5	59.7	1.287	5.543	14.399	0.358	1.160	1.484
75.0	24.5	74.4	0.938	7.496	15.528	0.259	1.256	1.439
90.0	24.5	89.1	0.795	8.837	14.417	0.066	1.310	0.937
105.0	24.5	104.1	0.428	7.029	13.230	0.077	1.695	0.584
120.0	24.4	119.5	0.547	7.799	12.303	0.078	2.279	0.481
135.0	24.4	134.4	0.696	5.964	11.021	0.119	1.776	0.304
150.0	24.3	149.4	0.801	4.510	10.291	0.139	1.037	0.196
165.0	24.4	164.6	0.729	4.047	10.064	0.143	0.644	0.157
180.0	24.9	179.6	0.737	4.404	10.376	0.126	0.564	0.142
195.0	24.4	194.6	0.733	4.637	9.942	0.131	0.745	0.177
210.0	24.4	210.0	0.652	6.833	10.033	0.122	1.086	0.195
225.0	24.5	226.1	0.788	12.066	13.395	0.094	1.856	0.350
240.0	24.4	240.7	0.543	9.091	12.520	0.073	2.685	0.415
255.0	24.4	256.2	0.537	14.564	14.195	0.097	2.128	0.533
270.0	24.5	271.0	1.172	9.736	14.933	0.071	1.813	1.022
285.0	24.6	285.6	1.086	7.667	16.174	0.245	1.743	1.527
300.0	24.6	300.1	1.288	5.529	15.077	0.348	1.371	1.550
315.0	24.6	314.9	1.509	3.916	14.451	0.390	0.983	1.460
330.0	24.5	329.9	1.470	3.482	14.317	0.402	0.669	1.386
345.0	24.5	344.9	1.542	2.734	13.755	0.407	0.461	1.328

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.21:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 10.3$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.1	1.386	3.167	14.494	0.418	0.470	1.577
15.0	29.6	14.9	1.411	3.410	14.675	0.422	0.503	1.593
30.0	29.6	29.9	1.479	4.325	14.519	0.422	0.647	1.633
45.0	29.6	44.9	1.427	5.147	14.655	0.410	0.862	1.671
60.0	29.6	59.8	1.296	5.643	15.253	0.370	1.110	1.689
75.0	29.5	74.5	0.892	6.904	16.129	0.264	1.199	1.566
90.0	29.5	89.3	0.565	9.303	14.255	0.067	1.312	0.938
105.0	29.5	104.6	0.530	9.014	11.826	0.085	2.143	0.555
120.0	29.3	119.5	0.525	6.943	10.657	0.110	2.479	0.455
135.0	29.3	134.6	0.876	5.424	10.855	0.136	1.469	0.228
150.0	29.6	149.6	1.006	5.322	10.142	0.144	0.871	0.183
165.0	29.4	164.5	1.007	4.671	10.120	0.157	0.799	0.209
180.0	30.2	179.5	1.038	5.313	10.287	0.149	0.788	0.220
195.0	29.6	194.6	0.909	5.355	10.151	0.155	0.946	0.235
210.0	29.7	209.9	0.899	4.751	10.048	0.135	1.082	0.221
225.0	29.3	224.9	0.928	6.800	10.031	0.130	1.465	0.275
240.0	29.3	240.6	0.862	9.298	10.787	0.119	2.696	0.478
255.0	29.5	255.6	0.465	12.288	13.327	0.089	2.161	0.414
270.0	29.5	270.7	0.968	15.859	15.559	0.082	1.832	1.011
285.0	29.6	285.4	0.904	8.307	15.481	0.242	1.753	1.629
300.0	29.6	300.1	1.324	5.861	15.292	0.351	1.408	1.737
315.0	29.6	315.0	1.421	4.713	15.290	0.397	1.028	1.698
330.0	29.6	330.0	1.413	3.498	14.531	0.413	0.731	1.645
345.0	29.6	345.0	1.402	3.156	14.516	0.418	0.549	1.596

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.22:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.1	-12.1	0.781	3.171	11.168	0.173	0.555	0.427
15.0	-0.4	-6.9	0.658	2.611	10.948	0.174	0.388	0.414
30.0	-0.8	4.0	0.807	2.624	10.919	0.172	0.444	0.403
45.0	-0.6	21.9	0.623	3.748	11.060	0.165	0.774	0.411
60.0	-0.3	40.0	0.539	3.724	11.195	0.149	1.026	0.427
75.0	-0.3	55.3	0.456	3.652	11.591	0.121	1.142	0.432
90.0	-0.3	72.1	0.365	3.717	11.625	0.072	1.190	0.417
105.0	-0.4	87.5	0.164	3.942	11.444	0.026	1.187	0.397
120.0	-0.9	98.6	0.276	4.101	11.421	0.040	1.214	0.404
135.0	-1.5	108.2	0.314	4.507	11.518	0.068	1.223	0.426
150.0	-2.2	116.0	0.336	4.209	11.263	0.094	1.195	0.443
165.0	-0.8	18.7	0.621	4.011	11.149	0.168	0.576	0.416
180.0	-0.6	28.6	0.587	3.180	11.318	0.168	0.617	0.422
195.0	0.1	364.9	0.702	4.274	11.169	0.162	0.763	0.431
210.0	1.1	247.9	0.441	4.854	11.935	0.080	1.194	0.453
225.0	0.9	257.7	0.322	4.920	11.681	0.054	1.206	0.449
240.0	0.7	268.7	0.249	4.891	11.884	0.031	1.191	0.439
255.0	0.7	281.8	0.370	4.843	12.039	0.052	1.174	0.451
270.0	0.6	293.5	0.514	4.831	12.382	0.091	1.150	0.469
285.0	0.4	303.5	0.542	4.871	11.928	0.120	1.114	0.472
300.0	0.2	312.3	0.603	4.928	11.718	0.138	1.048	0.466
315.0	0.1	321.2	0.600	4.761	11.655	0.152	0.965	0.457
330.0	0.0	331.1	0.696	3.571	11.416	0.162	0.837	0.445
345.0	0.1	341.0	0.706	2.990	11.200	0.171	0.671	0.437

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.23:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.6	-2.9	1.020	1.302	11.390	0.202	0.236	0.486
15.0	4.5	10.7	1.117	2.002	11.603	0.201	0.455	0.489
30.0	4.4	24.5	0.987	2.473	11.791	0.193	0.753	0.496
45.0	4.4	38.4	0.716	3.959	11.677	0.177	0.983	0.509
60.0	4.3	51.0	0.630	4.571	12.261	0.151	1.100	0.504
75.0	4.2	60.0	0.470	4.385	11.984	0.122	1.141	0.487
90.0	4.1	70.8	0.323	4.048	11.853	0.077	1.161	0.462
105.0	4.0	84.0	0.174	3.999	11.362	0.028	1.168	0.430
120.0	3.8	96.5	0.175	4.505	11.813	0.026	1.179	0.419
135.0	3.6	107.1	0.258	4.840	11.671	0.049	1.173	0.415
150.0	3.3	116.8	0.316	4.515	11.631	0.071	1.164	0.406
165.0	3.3	124.6	0.426	4.365	11.558	0.086	1.148	0.392
180.0	4.5	177.7	0.661	1.318	11.704	0.115	0.297	0.279
195.0	4.6	195.8	0.527	2.048	11.298	0.111	0.524	0.286
210.0	4.4	216.9	0.511	3.263	11.415	0.103	0.836	0.328
225.0	4.3	241.4	0.474	3.687	11.607	0.075	1.102	0.397
240.0	4.3	252.8	0.343	3.843	11.639	0.054	1.157	0.415
255.0	4.5	264.0	0.192	4.111	11.348	0.028	1.168	0.423
270.0	4.6	276.6	0.164	4.542	11.600	0.028	1.159	0.449
285.0	4.7	289.7	0.354	5.459	12.101	0.081	1.164	0.488
300.0	4.8	302.6	0.632	5.322	12.476	0.134	1.114	0.514
315.0	4.8	315.7	0.771	3.590	12.248	0.170	0.993	0.518
330.0	4.7	329.4	0.965	3.523	11.944	0.189	0.804	0.508
345.0	4.7	343.2	1.023	3.161	11.480	0.198	0.545	0.494

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.24:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.7	-0.8	1.094	1.056	11.571	0.228	0.126	0.552
15.0	9.7	14.3	0.939	1.772	11.443	0.224	0.405	0.551
30.0	9.7	29.3	0.858	2.809	11.569	0.213	0.713	0.561
45.0	9.7	44.2	0.680	3.341	11.605	0.189	0.936	0.564
60.0	9.7	58.9	0.551	4.738	12.163	0.141	1.083	0.546
75.0	9.8	73.6	0.354	5.209	12.525	0.071	1.059	0.498
90.0	9.7	88.3	0.099	4.196	11.566	0.021	1.062	0.441
105.0	9.7	103.0	0.208	4.700	11.733	0.035	1.085	0.404
120.0	9.5	117.2	0.330	5.073	11.954	0.056	1.148	0.371
135.0	9.4	132.2	0.335	4.479	11.380	0.070	1.042	0.315
150.0	9.5	147.9	0.324	3.104	10.977	0.077	0.898	0.260
165.0	9.6	163.5	0.296	2.733	10.613	0.081	0.727	0.225
180.0	9.7	178.9	0.397	2.177	10.731	0.084	0.485	0.201
195.0	9.7	194.7	0.305	2.034	10.521	0.082	0.517	0.193
210.0	9.6	210.8	0.499	3.208	11.384	0.078	0.857	0.223
225.0	9.6	226.9	0.467	4.143	11.646	0.072	1.115	0.280
240.0	9.6	242.3	0.267	4.276	11.391	0.059	1.227	0.341
255.0	9.7	256.6	0.232	4.516	11.550	0.040	1.175	0.384
270.0	9.8	271.3	0.111	4.539	11.586	0.022	1.153	0.439
285.0	9.8	285.8	0.411	6.009	12.467	0.066	1.138	0.500
300.0	9.8	300.4	0.693	4.262	12.688	0.138	1.126	0.548
315.0	9.7	314.8	0.760	3.380	11.843	0.188	0.957	0.562
330.0	9.7	329.5	0.742	3.002	11.623	0.213	0.726	0.558
345.0	9.7	344.3	0.958	1.908	11.254	0.224	0.429	0.551

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.25:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.6	-0.4	1.083	1.188	11.571	0.253	0.132	0.604
15.0	14.6	14.7	1.069	1.937	11.733	0.248	0.387	0.605
30.0	14.6	29.8	0.839	2.590	11.576	0.235	0.684	0.615
45.0	14.7	44.8	0.812	3.607	11.819	0.206	0.926	0.616
60.0	14.7	59.6	0.550	3.995	12.298	0.151	1.102	0.596
75.0	14.8	74.4	0.371	5.674	12.805	0.072	1.001	0.523
90.0	14.8	89.2	0.099	4.076	11.653	0.029	0.989	0.448
105.0	14.7	104.1	0.281	4.702	11.675	0.040	1.019	0.393
120.0	14.6	118.6	0.285	5.515	11.460	0.053	1.335	0.368
135.0	14.6	134.0	0.271	4.322	10.837	0.059	1.289	0.307
150.0	14.7	149.3	0.280	3.280	10.575	0.058	0.789	0.222
165.0	14.8	164.4	0.381	2.695	10.669	0.068	0.528	0.185
180.0	14.7	179.5	0.386	1.851	10.602	0.076	0.386	0.168
195.0	14.7	194.6	0.292	2.885	10.234	0.066	0.464	0.137
210.0	14.7	209.9	0.273	3.742	10.211	0.059	0.860	0.129
225.0	14.7	225.6	0.345	3.978	10.834	0.060	1.386	0.193
240.0	14.6	241.1	0.353	5.396	11.277	0.056	1.474	0.286
255.0	14.8	255.7	0.261	5.443	11.364	0.044	1.242	0.343
270.0	14.8	270.5	0.150	4.942	11.529	0.032	1.187	0.432
285.0	14.8	285.3	0.420	6.413	12.786	0.067	1.153	0.521
300.0	14.7	299.9	0.558	4.885	12.200	0.147	1.159	0.600
315.0	14.7	314.6	0.772	3.553	12.089	0.204	0.947	0.614
330.0	14.6	329.5	0.926	2.924	11.582	0.234	0.679	0.609
345.0	14.6	344.5	1.156	1.869	11.654	0.247	0.381	0.601

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.26:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.3	1.224	1.856	11.751	0.275	0.209	0.690
15.0	19.6	14.8	1.151	2.400	11.757	0.271	0.429	0.694
30.0	19.6	29.9	1.043	3.099	11.816	0.256	0.713	0.707
45.0	19.6	44.9	0.942	3.995	12.718	0.225	0.939	0.713
60.0	19.6	59.8	0.605	5.177	12.442	0.162	1.147	0.656
75.0	19.7	74.6	0.305	5.096	12.166	0.077	0.941	0.549
90.0	19.7	89.5	0.136	4.098	11.482	0.038	0.905	0.451
105.0	19.7	104.5	0.216	4.334	11.281	0.048	0.945	0.380
120.0	19.6	119.4	0.247	5.228	10.943	0.059	1.538	0.386
135.0	19.6	134.6	0.269	3.910	10.565	0.062	1.159	0.266
150.0	19.6	149.6	0.270	2.834	10.377	0.066	0.769	0.196
165.0	19.6	164.6	0.347	2.362	10.286	0.075	0.496	0.163
180.0	19.7	179.7	0.324	2.860	10.166	0.070	0.385	0.126
195.0	19.7	194.8	0.279	3.771	10.076	0.068	0.558	0.120
210.0	19.6	209.9	0.292	4.951	10.000	0.063	0.891	0.120
225.0	19.6	225.0	0.308	6.164	9.945	0.055	1.225	0.134
240.0	19.6	240.5	0.240	5.841	10.391	0.057	1.753	0.202
255.0	19.7	255.3	0.347	6.032	11.585	0.050	1.289	0.292
270.0	19.7	270.2	0.190	5.395	11.562	0.041	1.213	0.419
285.0	19.7	285.1	0.369	6.107	12.594	0.069	1.201	0.541
300.0	19.6	299.8	0.548	5.161	12.104	0.156	1.173	0.662
315.0	19.6	314.7	0.842	4.546	12.272	0.220	0.911	0.705
330.0	19.6	329.6	0.970	3.103	11.825	0.253	0.631	0.702
345.0	19.6	344.6	1.147	2.090	11.859	0.270	0.339	0.689

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.27: Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	24.5	-0.2	1.230	2.645	12.449	0.295	0.324	0.837
15.0	24.5	14.9	1.304	3.100	12.188	0.290	0.511	0.841
30.0	24.5	30.0	1.094	3.684	12.278	0.275	0.752	0.853
45.0	24.5	45.0	0.930	4.419	12.451	0.241	0.990	0.846
60.0	24.6	59.9	0.627	5.349	12.654	0.176	1.179	0.753
75.0	24.6	74.7	0.365	4.507	12.926	0.083	0.887	0.575
90.0	24.6	89.7	0.169	4.075	11.436	0.047	0.844	0.451
105.0	24.6	104.7	0.270	3.883	11.291	0.060	0.891	0.360
120.0	24.6	119.7	0.286	5.714	10.531	0.072	1.559	0.362
135.0	24.5	134.7	0.267	4.020	10.286	0.087	1.222	0.258
150.0	24.6	149.7	0.283	2.960	10.198	0.089	0.733	0.178
165.0	24.6	164.7	0.382	2.460	10.281	0.085	0.404	0.123
180.0	24.9	179.8	0.376	2.712	10.076	0.093	0.277	0.107
195.0	24.6	194.8	0.253	3.166	9.958	0.072	0.382	0.096
210.0	24.6	210.0	0.328	4.847	10.072	0.082	0.917	0.188
225.0	24.6	224.9	0.215	5.956	9.954	0.061	1.099	0.190
240.0	24.6	240.1	0.293	7.487	9.930	0.060	1.591	0.168
255.0	24.6	255.1	0.274	6.156	10.892	0.059	1.294	0.251
270.0	24.6	270.1	0.232	5.874	11.466	0.050	1.216	0.406
285.0	24.6	285.0	0.295	5.550	11.938	0.072	1.167	0.569
300.0	24.6	299.8	0.573	5.492	12.507	0.165	1.109	0.751
315.0	24.6	314.7	0.859	4.672	12.579	0.234	0.847	0.835
330.0	24.5	329.7	1.069	3.566	12.599	0.270	0.580	0.842
345.0	24.5	344.8	1.240	2.641	12.327	0.288	0.359	0.835

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table U.28:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 6.0$  m and  $T_p = 16.2$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.1	1.166	3.173	13.042	0.313	0.418	1.036
15.0	29.6	15.0	1.202	3.624	13.187	0.307	0.576	1.033
30.0	29.6	30.0	1.150	3.934	13.374	0.290	0.778	1.031
45.0	29.6	45.0	0.891	4.864	13.031	0.254	0.996	1.004
60.0	29.6	60.0	0.733	4.994	13.396	0.189	1.175	0.882
75.0	29.6	74.8	0.318	4.063	12.501	0.089	0.885	0.602
90.0	29.6	89.8	0.207	4.059	11.398	0.055	0.862	0.444
105.0	29.6	104.8	0.357	4.099	11.447	0.072	0.902	0.329
120.0	29.6	119.8	0.309	5.178	10.214	0.088	1.552	0.325
135.0	29.5	134.7	0.390	4.218	10.094	0.124	1.335	0.232
150.0	29.6	149.7	0.348	2.998	9.976	0.105	0.611	0.133
165.0	29.5	164.7	0.413	2.985	9.966	0.133	0.416	0.112
180.0	30.3	179.8	0.473	3.448	9.908	0.131	0.356	0.092
195.0	29.7	194.7	0.375	3.897	9.912	0.127	0.533	0.123
210.0	29.7	210.0	0.336	4.077	9.934	0.091	0.644	0.126
225.0	29.6	225.1	0.323	5.911	9.978	0.095	1.302	0.263
240.0	29.6	240.1	0.327	7.025	9.914	0.075	1.657	0.245
255.0	29.6	255.0	0.334	7.110	11.115	0.071	1.234	0.236
270.0	29.6	270.0	0.262	6.125	11.467	0.059	1.171	0.399
285.0	29.6	285.0	0.324	5.823	11.949	0.077	1.141	0.603
300.0	29.6	299.9	0.610	5.603	12.771	0.175	1.041	0.866
315.0	29.6	314.8	0.906	4.578	13.068	0.244	0.803	0.988
330.0	29.6	329.9	1.168	3.419	13.039	0.284	0.573	1.022
345.0	29.6	344.9	1.212	3.077	13.242	0.304	0.414	1.029

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table U.29:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-1.9	-33.1	1.386	7.706	15.299	0.321	1.504	0.873
15.0	-3.0	21.2	1.593	10.511	13.984	0.266	1.836	0.920
30.0	-3.6	5.1	1.517	10.638	15.185	0.282	1.946	0.953
45.0	-3.3	-81.5	1.333	10.233	14.240	0.234	2.203	1.015
60.0	-2.1	-71.2	1.406	12.262	16.768	0.191	2.291	0.972
75.0	-0.9	-54.0	1.595	12.696	16.027	0.182	2.194	0.938
90.0	-0.2	66.0	1.726	14.940	15.869	0.247	2.073	0.958
105.0	-0.3	80.6	1.344	12.461	15.668	0.161	2.118	0.940
120.0	-2.1	97.2	1.373	11.652	15.285	0.128	2.234	0.929
135.0	-4.3	105.3	1.093	9.980	14.445	0.187	2.267	1.003
150.0	-5.4	102.4	1.163	9.378	14.306	0.228	2.199	1.022
165.0	-2.3	32.1	1.869	9.795	15.786	0.309	1.493	0.850
180.0	-1.0	14.2	1.293	7.086	13.955	0.315	1.422	0.860
195.0	-0.9	24.9	1.366	8.364	13.293	0.315	1.453	0.861
210.0	-0.2	31.0	1.303	8.621	13.918	0.317	1.554	0.909
225.0	1.2	343.8	1.397	9.656	13.806	0.248	1.987	0.942
240.0	2.2	278.6	1.126	11.012	15.117	0.144	2.149	1.006
255.0	1.9	286.6	1.296	11.854	16.109	0.220	2.120	1.046
270.0	1.6	294.1	1.353	10.399	16.132	0.270	1.996	1.040
285.0	1.3	303.2	1.418	9.762	15.066	0.302	1.834	1.005
300.0	0.8	307.6	1.468	10.708	14.780	0.308	1.765	0.979
315.0	0.4	314.7	1.598	8.019	15.256	0.321	1.636	0.954
330.0	-0.5	322.3	1.332	8.120	14.006	0.321	1.574	0.907
345.0	-0.6	330.6	1.458	7.236	14.607	0.326	1.394	0.883

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.30:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	3.1	-30.3	1.887	7.483	13.732	0.374	1.351	0.975
15.0	2.7	-26.0	1.852	6.568	13.226	0.370	1.386	0.949
30.0	2.5	-18.4	1.810	5.546	12.565	0.366	1.323	0.928
45.0	2.6	-9.8	1.742	5.278	12.976	0.370	1.238	0.919
60.0	2.7	6.8	1.835	5.134	13.615	0.360	1.353	0.928
75.0	3.0	24.9	1.497	10.353	15.674	0.349	1.536	0.965
90.0	3.0	32.3	1.758	6.921	14.644	0.335	1.625	0.975
105.0	3.3	59.4	1.263	9.966	16.488	0.255	1.942	1.015
120.0	3.3	89.7	0.803	15.181	14.190	0.083	2.142	0.950
135.0	2.6	101.1	1.169	12.886	15.016	0.122	2.155	0.947
150.0	2.7	35.8	1.645	6.807	15.262	0.336	1.598	0.953
165.0	2.4	38.5	1.766	5.799	13.713	0.346	1.577	0.950
180.0	2.8	59.9	1.531	8.706	13.271	0.335	1.599	0.920
195.0	3.9	362.7	1.639	9.461	14.914	0.358	1.392	0.962
210.0	4.1	367.4	1.602	6.241	14.128	0.363	1.391	0.980
225.0	5.0	273.3	1.094	11.931	14.328	0.119	2.190	0.974
240.0	4.8	279.1	1.122	12.290	15.070	0.147	2.216	1.039
255.0	4.7	287.4	1.310	9.233	15.396	0.228	2.086	1.094
270.0	4.6	293.5	1.569	11.126	17.337	0.282	1.997	1.101
285.0	4.4	300.4	1.884	9.200	16.173	0.311	1.891	1.073
300.0	4.4	306.5	3.377	7.619	14.466	0.344	1.812	1.058
315.0	4.4	316.7	1.780	7.381	14.601	0.355	1.578	1.012
330.0	4.2	326.7	1.632	8.764	14.276	0.368	1.410	0.989
345.0	3.9	331.4	1.727	7.831	13.139	0.373	1.349	0.984

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.31:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.2	-2.0	1.974	3.242	12.850	0.433	0.480	1.081
15.0	9.1	12.6	1.950	3.049	12.852	0.430	0.718	1.087
30.0	9.0	27.5	1.754	4.375	12.925	0.415	1.112	1.087
45.0	9.1	42.8	1.574	5.137	13.480	0.384	1.479	1.089
60.0	9.3	57.1	1.629	9.100	15.960	0.341	1.787	1.145
75.0	9.1	70.1	1.811	8.460	18.926	0.258	1.945	1.166
90.0	8.4	77.5	1.163	15.832	16.547	0.176	1.995	1.104
105.0	8.2	89.0	0.785	12.961	15.886	0.085	2.072	0.995
120.0	7.9	100.1	0.775	16.797	14.202	0.100	2.079	0.922
135.0	7.6	111.3	1.204	10.712	14.737	0.131	1.978	0.851
150.0	7.5	124.6	1.326	9.808	14.009	0.153	1.864	0.748
165.0	8.1	150.8	2.286	10.691	13.385	0.169	1.517	0.500
180.0	9.2	177.8	0.808	3.866	11.719	0.157	0.971	0.323
195.0	9.3	195.8	0.793	3.332	11.662	0.155	0.961	0.327
210.0	8.5	234.4	1.851	13.779	13.793	0.160	1.951	0.679
225.0	8.3	257.0	1.163	15.205	14.851	0.129	2.233	0.864
240.0	8.4	268.4	0.785	16.888	14.642	0.105	2.274	0.978
255.0	8.5	274.6	0.866	12.640	14.734	0.115	2.236	1.036
270.0	8.7	280.8	1.278	13.777	15.991	0.165	2.165	1.125
285.0	9.3	289.3	3.292	10.031	17.571	0.265	2.092	1.195
300.0	9.5	301.1	1.411	6.990	16.107	0.342	1.840	1.166
315.0	9.4	314.5	1.479	6.831	13.901	0.386	1.525	1.102
330.0	9.3	328.9	1.843	5.599	13.438	0.414	1.166	1.094
345.0	9.3	343.4	1.892	4.740	12.798	0.429	0.806	1.088

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.32:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.4	-0.8	2.093	2.316	13.017	0.473	0.387	1.196
15.0	14.4	14.3	1.756	2.522	12.877	0.468	0.628	1.197
30.0	14.4	29.5	1.907	5.047	13.436	0.450	1.049	1.198
45.0	14.4	44.6	1.550	5.883	13.475	0.414	1.415	1.205
60.0	14.5	59.1	1.186	7.764	14.908	0.358	1.775	1.280
75.0	14.5	73.2	2.103	11.065	20.320	0.240	1.867	1.242
90.0	14.3	87.2	0.604	11.887	15.374	0.078	1.957	1.039
105.0	14.3	102.0	0.765	16.036	14.838	0.097	2.018	0.853
120.0	13.7	114.5	1.150	18.980	14.661	0.119	2.156	0.792
135.0	13.7	130.2	0.705	8.012	12.705	0.116	2.047	0.608
150.0	14.5	148.0	0.728	5.710	12.151	0.120	1.503	0.398
165.0	14.5	163.5	0.649	4.084	11.574	0.122	0.919	0.307
180.0	14.5	178.8	0.679	3.124	11.225	0.130	0.681	0.253
195.0	14.6	194.2	0.645	4.572	11.038	0.125	0.879	0.199
210.0	14.7	211.0	0.904	8.407	12.123	0.120	1.435	0.271
225.0	13.9	230.8	0.893	8.915	12.729	0.125	2.196	0.496
240.0	13.7	246.7	1.143	12.588	13.621	0.128	2.332	0.687
255.0	13.9	259.8	0.726	18.345	13.746	0.106	2.329	0.831
270.0	14.2	273.5	0.887	11.953	15.538	0.084	2.240	1.058
285.0	14.5	286.8	2.226	9.530	17.462	0.239	2.128	1.275
300.0	14.6	300.2	1.429	6.588	15.541	0.356	1.866	1.299
315.0	14.5	314.4	1.645	5.082	14.614	0.413	1.447	1.213
330.0	14.4	329.1	1.857	4.606	13.688	0.445	1.050	1.196
345.0	14.4	344.2	2.001	2.940	12.739	0.467	0.604	1.196

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.33:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.5	-0.4	2.198	2.300	13.584	0.505	0.430	1.367
15.0	19.5	14.7	1.972	3.307	13.434	0.499	0.673	1.372
30.0	19.5	29.9	2.079	4.569	13.622	0.482	1.024	1.374
45.0	19.5	44.9	1.682	5.768	13.890	0.441	1.386	1.377
60.0	19.5	59.6	1.419	7.586	15.597	0.374	1.736	1.440
75.0	19.5	74.0	1.463	9.379	18.068	0.236	1.828	1.327
90.0	19.5	88.5	0.503	9.505	14.495	0.076	1.860	1.022
105.0	19.5	103.6	0.818	12.304	13.971	0.100	2.003	0.787
120.0	19.2	117.8	0.675	9.890	12.628	0.112	2.414	0.720
135.0	19.4	134.5	0.749	7.396	11.318	0.115	2.142	0.428
150.0	19.4	149.3	0.727	4.755	11.303	0.137	1.460	0.294
165.0	19.5	164.1	0.832	3.691	11.332	0.146	0.802	0.230
180.0	19.6	179.6	0.685	4.099	10.870	0.155	0.631	0.216
195.0	19.6	194.7	0.760	5.581	11.050	0.141	1.062	0.198
210.0	19.3	210.6	0.840	7.258	11.138	0.122	1.619	0.247
225.0	19.5	225.5	0.662	7.845	12.313	0.102	2.170	0.319
240.0	19.2	242.8	0.618	9.299	12.907	0.117	2.758	0.533
255.0	19.3	257.3	0.593	12.739	13.585	0.111	2.436	0.706
270.0	19.4	271.9	1.291	18.184	14.720	0.092	2.363	1.040
285.0	19.6	286.1	1.611	10.232	16.318	0.233	2.232	1.372
300.0	19.6	300.0	1.343	6.905	15.020	0.368	1.876	1.468
315.0	19.5	314.5	1.694	4.880	13.906	0.436	1.377	1.399
330.0	19.5	329.4	1.823	4.400	13.850	0.478	0.960	1.381
345.0	19.5	344.5	2.033	2.966	13.604	0.499	0.606	1.371

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.34:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.5	-0.2	1.995	3.383	14.575	0.527	0.597	1.629
15.0	24.5	14.9	1.945	4.065	14.359	0.526	0.757	1.622
30.0	24.5	30.0	2.037	5.003	14.404	0.506	1.078	1.628
45.0	24.5	45.0	1.730	6.056	14.714	0.463	1.383	1.615
60.0	24.5	59.7	1.507	7.865	16.278	0.392	1.709	1.643
75.0	24.5	74.3	1.029	9.283	16.244	0.241	1.727	1.424
90.0	24.5	89.0	0.460	8.942	14.292	0.083	1.776	1.016
105.0	24.5	104.2	0.731	11.143	12.947	0.106	2.093	0.723
120.0	24.4	119.6	0.839	9.320	12.086	0.126	2.904	0.649
135.0	24.1	133.8	0.952	7.551	11.585	0.163	2.301	0.462
150.0	24.3	149.3	0.764	4.335	10.508	0.169	1.301	0.263
165.0	24.7	164.5	0.783	4.413	10.664	0.168	0.813	0.214
180.0	24.9	179.5	0.771	4.778	10.438	0.167	0.686	0.200
195.0	24.9	194.9	0.680	4.741	10.109	0.147	0.877	0.208
210.0	24.5	210.3	0.663	6.120	10.070	0.144	1.414	0.261
225.0	24.1	226.5	0.753	8.465	11.458	0.138	2.505	0.450
240.0	24.3	240.8	0.735	10.469	13.271	0.122	3.159	0.519
255.0	24.4	256.3	0.788	12.982	13.389	0.118	2.573	0.597
270.0	24.4	271.2	1.126	19.331	14.561	0.099	2.465	1.006
285.0	24.6	285.7	0.917	11.413	14.914	0.231	2.300	1.459
300.0	24.6	300.0	1.368	8.183	15.780	0.379	1.977	1.659
315.0	24.5	314.7	1.742	6.229	15.057	0.455	1.396	1.633
330.0	24.5	329.6	1.954	4.769	14.817	0.499	0.983	1.631
345.0	24.5	344.7	1.962	3.275	14.978	0.522	0.681	1.629

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.35:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 13.1$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.5	-0.0	1.990	4.865	15.645	0.547	0.813	1.928
15.0	29.5	15.0	1.923	5.687	15.379	0.544	0.931	1.915
30.0	29.5	30.1	1.919	6.942	15.566	0.525	1.175	1.904
45.0	29.5	45.0	1.785	7.681	16.402	0.484	1.429	1.879
60.0	29.5	59.8	1.485	8.362	16.731	0.407	1.712	1.840
75.0	29.4	74.4	0.940	8.983	16.330	0.251	1.698	1.517
90.0	29.4	89.3	0.434	8.910	14.628	0.094	1.828	1.006
105.0	29.4	104.5	1.022	10.011	13.235	0.123	2.183	0.695
120.0	29.0	119.1	1.086	13.662	13.907	0.174	2.977	0.675
135.0	29.0	134.3	1.007	7.106	10.891	0.189	1.969	0.381
150.0	29.7	148.9	1.053	5.681	10.904	0.207	1.352	0.319
165.0	30.1	163.9	0.990	6.599	10.147	0.229	1.031	0.305
180.0	30.0	178.8	1.123	6.257	10.296	0.252	0.969	0.312
195.0	30.5	194.9	1.053	5.527	10.023	0.217	1.036	0.273
210.0	30.3	210.5	0.905	6.072	10.021	0.174	1.317	0.275
225.0	29.3	225.8	0.881	8.672	11.156	0.160	2.029	0.405
240.0	29.0	241.2	0.877	10.991	13.361	0.152	3.195	0.614
255.0	29.4	255.7	0.525	10.704	12.871	0.125	2.711	0.525
270.0	29.4	270.8	1.225	14.102	15.966	0.110	2.506	0.974
285.0	29.5	285.6	1.050	12.111	16.295	0.233	2.478	1.532
300.0	29.5	300.1	1.434	8.591	15.940	0.383	2.037	1.830
315.0	29.5	314.9	1.818	6.506	16.127	0.463	1.526	1.883
330.0	29.5	329.9	1.919	5.104	15.583	0.515	1.147	1.931
345.0	29.5	344.9	1.952	4.414	15.981	0.536	0.904	1.928

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.



**Table U.36:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.8	-19.3	0.761	4.535	11.313	0.198	0.794	0.514
15.0	-2.3	-123.0	0.795	5.170	12.244	0.177	1.165	0.553
30.0	-2.2	-106.0	0.728	5.510	12.364	0.151	1.374	0.553
45.0	-1.7	-90.7	0.605	4.985	11.888	0.116	1.477	0.534
60.0	0.1	47.4	0.595	4.663	12.590	0.151	1.282	0.522
75.0	0.2	65.1	0.492	4.395	12.072	0.098	1.370	0.509
90.0	-0.1	83.0	0.302	5.044	12.166	0.040	1.376	0.484
105.0	-0.5	95.6	0.290	4.541	11.986	0.038	1.405	0.493
120.0	-1.3	104.6	0.377	5.970	12.035	0.059	1.426	0.505
135.0	-2.1	113.9	0.384	5.043	11.646	0.088	1.412	0.529
150.0	-3.0	123.2	0.547	5.914	12.534	0.121	1.336	0.550
165.0	-3.2	103.4	0.735	5.030	12.059	0.163	1.315	0.550
180.0	-2.9	154.2	0.823	4.702	12.188	0.185	0.838	0.561
195.0	1.1	225.9	0.791	6.487	12.003	0.137	1.277	0.505
210.0	1.1	241.1	0.663	6.234	11.888	0.101	1.417	0.514
225.0	0.8	252.4	0.558	5.726	12.482	0.070	1.435	0.513
240.0	0.5	263.1	0.416	6.325	11.998	0.041	1.417	0.502
255.0	0.3	274.5	0.307	6.473	12.040	0.033	1.375	0.494
270.0	0.3	285.8	0.407	6.352	12.350	0.063	1.337	0.504
285.0	0.1	295.9	0.478	5.661	12.749	0.099	1.287	0.518
300.0	-0.0	304.8	0.625	5.784	12.121	0.129	1.228	0.526
315.0	-0.1	313.8	0.764	5.988	12.473	0.154	1.144	0.528
330.0	-0.2	322.2	0.702	5.508	11.906	0.172	1.051	0.528
345.0	-0.4	331.1	0.723	4.994	11.979	0.187	0.926	0.524

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.37:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	3.4	-25.3	1.183	5.533	11.978	0.224	0.949	0.565
15.0	2.8	-19.1	1.116	4.900	11.746	0.228	0.911	0.553
30.0	2.7	-11.5	1.228	3.830	11.532	0.229	0.945	0.564
45.0	2.9	1.5	0.978	3.688	12.351	0.227	0.998	0.573
60.0	3.6	37.4	0.767	4.261	12.328	0.197	1.117	0.585
75.0	4.1	58.7	0.546	4.538	12.401	0.127	1.315	0.571
90.0	4.1	74.2	0.329	4.687	12.058	0.062	1.331	0.538
105.0	4.0	88.9	0.201	5.214	12.094	0.022	1.359	0.515
120.0	3.8	101.3	0.224	6.078	12.325	0.036	1.358	0.517
135.0	3.4	111.2	0.389	6.259	12.355	0.058	1.361	0.529
150.0	2.9	121.0	0.468	5.898	12.337	0.081	1.340	0.532
165.0	2.6	132.2	0.560	6.170	12.174	0.106	1.266	0.510
180.0	2.9	55.9	0.775	5.287	12.557	0.189	1.370	0.533
195.0	4.3	196.0	0.981	3.577	12.286	0.138	0.708	0.374
210.0	4.2	225.2	0.740	4.777	11.943	0.112	1.158	0.431
225.0	4.3	242.9	0.497	5.374	11.918	0.079	1.333	0.466
240.0	4.4	254.8	0.333	4.952	11.684	0.052	1.377	0.475
255.0	4.4	264.8	0.237	5.972	11.809	0.031	1.378	0.484
270.0	4.5	277.9	0.362	5.698	12.386	0.032	1.380	0.506
285.0	4.6	290.8	0.403	6.421	12.348	0.079	1.359	0.536
300.0	4.7	303.0	0.709	5.486	13.177	0.134	1.297	0.566
315.0	4.7	314.8	0.744	5.131	12.617	0.180	1.166	0.584
330.0	4.5	326.1	0.846	6.158	12.247	0.210	1.007	0.591
345.0	4.1	334.4	1.148	5.094	12.099	0.225	0.884	0.587

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.38:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.5	-1.6	1.034	1.697	11.756	0.275	0.255	0.668
15.0	9.5	13.5	1.218	2.420	11.968	0.270	0.558	0.675
30.0	9.5	28.6	1.081	3.183	11.877	0.248	0.901	0.677
45.0	9.6	43.6	0.922	4.106	13.006	0.205	1.129	0.657
60.0	9.6	58.1	0.846	5.173	13.673	0.145	1.286	0.629
75.0	9.7	73.0	0.328	5.196	12.363	0.070	1.250	0.576
90.0	9.7	87.8	0.123	4.510	12.018	0.029	1.241	0.534
105.0	9.6	102.7	0.272	5.319	12.167	0.041	1.240	0.504
120.0	9.2	116.1	0.501	4.932	11.953	0.061	1.285	0.488
135.0	9.0	130.4	0.459	5.247	11.985	0.079	1.175	0.439
150.0	9.0	145.7	0.601	3.902	11.919	0.095	0.992	0.376
165.0	9.1	161.3	0.617	3.360	11.697	0.103	0.869	0.325
180.0	9.3	178.0	0.527	2.949	10.918	0.107	0.709	0.278
195.0	9.5	194.7	0.708	3.210	11.671	0.107	0.699	0.257
210.0	9.4	211.7	0.649	3.843	11.784	0.098	1.060	0.295
225.0	9.3	228.7	0.673	5.962	11.967	0.084	1.354	0.359
240.0	9.3	243.7	0.433	5.407	11.809	0.066	1.472	0.417
255.0	9.6	257.3	0.309	5.571	12.152	0.048	1.440	0.447
270.0	9.7	271.8	0.235	5.992	12.261	0.032	1.427	0.493
285.0	9.7	286.2	0.423	7.603	12.804	0.063	1.400	0.544
300.0	9.7	300.7	0.630	6.041	12.812	0.136	1.374	0.601
315.0	9.7	314.7	0.735	4.533	12.441	0.198	1.161	0.630
330.0	9.6	329.0	1.084	3.266	12.135	0.241	0.885	0.651
345.0	9.5	343.6	1.015	2.853	11.733	0.265	0.562	0.661

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.39:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	14.5	-0.7	1.348	1.637	12.016	0.305	0.259	0.735
15.0	14.5	14.5	1.083	2.560	11.809	0.296	0.555	0.740
30.0	14.6	29.6	1.154	3.521	12.123	0.271	0.911	0.740
45.0	14.6	44.5	0.782	4.431	12.144	0.221	1.158	0.718
60.0	14.6	59.2	0.650	5.463	13.064	0.150	1.362	0.677
75.0	14.7	74.1	0.370	6.008	12.742	0.073	1.192	0.603
90.0	14.7	89.0	0.145	4.397	12.090	0.042	1.157	0.542
105.0	14.7	104.0	0.446	4.761	11.912	0.055	1.153	0.487
120.0	14.5	118.2	0.462	6.050	12.105	0.070	1.477	0.491
135.0	14.4	133.4	0.382	5.290	11.351	0.080	1.370	0.416
150.0	14.5	148.7	0.502	3.935	11.345	0.088	1.004	0.334
165.0	14.5	164.0	0.495	3.357	11.051	0.091	0.673	0.276
180.0	14.6	179.2	0.499	2.454	10.661	0.096	0.519	0.231
195.0	14.6	194.6	0.624	4.169	10.651	0.091	0.685	0.185
210.0	14.6	210.2	0.584	4.504	11.010	0.085	1.129	0.177
225.0	14.5	226.2	0.532	4.952	11.272	0.083	1.606	0.256
240.0	14.5	241.7	0.579	6.863	11.865	0.074	1.766	0.353
255.0	14.7	255.9	0.333	6.900	11.453	0.059	1.541	0.399
270.0	14.7	270.8	0.249	7.359	11.715	0.045	1.498	0.480
285.0	14.8	285.4	0.404	7.395	12.723	0.064	1.456	0.558
300.0	14.7	300.2	0.554	5.935	12.388	0.141	1.480	0.637
315.0	14.6	314.6	0.794	4.872	12.615	0.215	1.205	0.680
330.0	14.6	329.3	1.061	3.664	12.401	0.266	0.884	0.709
345.0	14.5	344.2	1.220	2.369	11.809	0.294	0.498	0.723

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.40:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.6	-0.4	1.451	2.179	12.119	0.330	0.331	0.834
15.0	19.6	14.8	1.395	2.846	11.942	0.324	0.617	0.839
30.0	19.6	29.9	1.212	4.020	12.318	0.295	0.961	0.831
45.0	19.6	44.9	0.901	4.713	12.740	0.240	1.245	0.799
60.0	19.6	59.7	0.610	5.784	12.795	0.159	1.470	0.735
75.0	19.7	74.5	0.502	5.596	13.846	0.078	1.138	0.625
90.0	19.7	89.4	0.206	4.276	12.067	0.056	1.079	0.544
105.0	19.7	104.4	0.406	4.512	12.026	0.071	1.071	0.471
120.0	19.6	119.1	0.372	6.029	11.217	0.088	1.728	0.496
135.0	19.6	134.3	0.532	5.727	11.566	0.097	1.445	0.372
150.0	19.6	149.3	0.453	4.134	10.649	0.109	1.091	0.295
165.0	19.6	164.3	0.568	2.764	10.912	0.122	0.725	0.272
180.0	19.6	179.6	0.430	3.001	10.391	0.111	0.558	0.209
195.0	19.6	194.9	0.402	4.842	10.169	0.111	0.896	0.181
210.0	19.6	210.1	0.593	6.811	10.080	0.104	1.367	0.201
225.0	19.6	225.2	0.553	6.932	10.209	0.081	1.422	0.166
240.0	19.6	240.8	0.549	7.996	10.822	0.086	2.008	0.272
255.0	19.7	255.4	0.507	6.575	11.213	0.071	1.597	0.348
270.0	19.7	270.4	0.261	8.023	11.705	0.057	1.541	0.465
285.0	19.7	285.2	0.340	7.578	12.376	0.067	1.472	0.567
300.0	19.6	299.9	0.656	7.399	12.893	0.149	1.563	0.681
315.0	19.6	314.6	0.829	5.147	12.255	0.232	1.211	0.750
330.0	19.6	329.5	1.154	3.881	12.410	0.289	0.844	0.794
345.0	19.5	344.5	1.259	2.668	12.092	0.320	0.488	0.820

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.41:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.5	-0.2	1.450	3.201	13.130	0.357	0.470	1.003
15.0	24.5	14.9	1.291	3.764	13.102	0.348	0.735	1.005
30.0	24.5	30.0	1.239	4.535	12.927	0.318	1.043	0.984
45.0	24.5	45.0	1.078	5.061	13.387	0.259	1.301	0.912
60.0	24.5	59.9	0.600	6.462	13.147	0.173	1.540	0.823
75.0	24.6	74.6	0.486	4.961	13.732	0.085	1.107	0.654
90.0	24.6	89.5	0.257	4.481	11.853	0.069	1.014	0.546
105.0	24.6	104.6	0.365	4.439	11.569	0.090	0.990	0.448
120.0	24.5	119.5	0.404	6.102	10.958	0.108	1.888	0.479
135.0	24.5	134.5	0.496	6.718	10.458	0.129	1.667	0.358
150.0	24.6	149.5	0.422	3.690	10.214	0.125	1.056	0.267
165.0	24.7	164.5	0.610	3.647	10.383	0.151	0.752	0.256
180.0	25.0	179.7	0.492	2.722	10.269	0.112	0.340	0.151
195.0	24.8	195.0	0.530	4.167	10.270	0.140	0.677	0.214
210.0	24.6	210.0	0.543	5.762	10.153	0.110	1.126	0.270
225.0	24.6	225.2	0.405	7.584	9.972	0.104	1.597	0.298
240.0	24.6	240.3	0.331	8.252	10.085	0.093	2.085	0.271
255.0	24.6	255.2	0.397	7.989	10.865	0.084	1.608	0.312
270.0	24.6	270.2	0.306	8.214	11.707	0.068	1.559	0.453
285.0	24.6	285.1	0.440	8.239	12.465	0.071	1.544	0.582
300.0	24.6	299.9	0.630	7.813	12.506	0.157	1.567	0.734
315.0	24.6	314.7	0.909	5.762	12.931	0.249	1.191	0.850
330.0	24.5	329.6	1.357	4.496	13.027	0.311	0.821	0.940
345.0	24.5	344.7	1.350	3.259	12.701	0.345	0.519	0.980

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.42:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 9.0$  m and  $T_p = 18.5$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	29.5	-0.1	1.665	4.531	13.861	0.379	0.673	1.215
15.0	29.5	15.0	1.395	4.895	13.732	0.369	0.890	1.215
30.0	29.5	30.0	1.315	5.449	14.017	0.342	1.141	1.186
45.0	29.5	45.0	1.135	6.041	13.570	0.281	1.364	1.080
60.0	29.5	59.9	0.679	6.578	13.998	0.189	1.573	0.921
75.0	29.5	74.7	0.384	4.956	13.146	0.095	1.142	0.682
90.0	29.5	89.6	0.327	4.750	11.948	0.082	1.077	0.538
105.0	29.5	104.6	0.478	4.602	11.372	0.108	0.951	0.414
120.0	29.5	119.7	0.462	6.451	10.693	0.131	1.819	0.453
135.0	29.4	134.4	0.988	7.063	10.507	0.170	1.719	0.353
150.0	29.6	149.3	0.644	4.663	10.202	0.196	1.192	0.301
165.0	29.7	164.0	0.659	3.863	10.149	0.183	0.650	0.227
180.0	30.5	179.5	0.582	3.712	9.972	0.157	0.415	0.149
195.0	29.8	194.5	0.618	4.278	9.915	0.169	0.553	0.183
210.0	29.6	209.9	0.549	5.286	10.110	0.160	0.962	0.273
225.0	29.5	225.2	0.564	7.271	10.082	0.153	1.739	0.452
240.0	29.5	240.0	0.386	7.682	9.943	0.104	1.719	0.343
255.0	29.5	255.0	0.444	7.266	11.233	0.100	1.558	0.330
270.0	29.5	270.0	0.362	7.816	11.399	0.081	1.564	0.464
285.0	29.6	285.0	0.359	7.592	12.169	0.079	1.596	0.622
300.0	29.5	299.8	0.680	8.392	12.906	0.167	1.489	0.801
315.0	29.5	314.7	1.091	6.555	12.817	0.266	1.127	0.991
330.0	29.5	329.8	1.516	5.111	13.575	0.331	0.842	1.130
345.0	29.5	344.8	1.416	4.479	14.454	0.365	0.661	1.189

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table U.43:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-3.0	-643.3	1.953	11.369	15.116	0.305	2.525	1.109
15.0	-1.2	-768.4	1.889	12.231	15.682	0.323	2.475	1.050
30.0	-4.5	-140.3	1.610	11.853	16.385	0.330	2.071	1.182
45.0	-4.0	-99.0	1.857	12.022	16.590	0.282	2.440	1.214
60.0	1.5	54.9	1.582	8.908	16.028	0.307	2.021	1.083
75.0	1.3	72.6	1.859	18.039	17.211	0.217	2.149	1.064
90.0	0.5	87.6	1.198	20.530	15.710	0.132	2.230	1.036
105.0	-0.7	98.4	1.243	18.981	16.338	0.125	2.298	1.063
120.0	-3.5	106.6	1.159	10.176	15.579	0.185	2.384	1.133
135.0	-5.0	117.0	1.668	10.676	15.924	0.257	2.323	1.186
150.0	-6.3	129.9	1.980	12.408	16.242	0.308	2.107	1.202
165.0	-2.2	437.5	1.813	11.313	14.681	0.331	2.353	1.090
180.0	-2.4	1212.3	1.977	13.593	14.855	0.299	2.608	1.086
195.0	-2.5	344.7	1.781	10.509	14.802	0.303	2.438	1.072
210.0	0.7	344.3	2.063	11.039	14.976	0.264	2.696	0.965
225.0	2.3	262.1	1.100	13.199	13.733	0.129	2.745	0.902
240.0	-0.1	267.3	1.821	16.438	16.844	0.133	2.617	0.951
255.0	0.4	276.8	0.818	12.579	14.364	0.105	2.436	0.938
270.0	0.2	283.1	1.075	11.656	15.126	0.161	2.302	0.974
285.0	-0.9	286.8	1.231	11.424	15.609	0.211	2.227	0.992
300.0	-0.9	292.8	1.337	11.410	15.900	0.251	2.155	0.989
315.0	-1.7	252.4	1.799	12.645	15.463	0.271	2.602	1.000
330.0	-0.6	197.5	1.957	14.863	14.325	0.256	2.801	0.982
345.0	-2.4	-266.1	1.630	13.767	14.030	0.265	2.601	1.052

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.



**Table U.44:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	1.0	-51.8	2.512	10.444	15.698	0.347	2.209	1.056
15.0	0.9	-97.9	1.855	9.989	16.683	0.281	2.544	1.065
30.0	1.3	-108.8	2.424	14.217	15.179	0.243	2.390	1.133
45.0	2.6	-92.0	2.106	8.495	15.880	0.217	2.410	1.125
60.0	3.4	-79.5	1.400	10.922	15.949	0.175	2.406	1.092
75.0	4.4	63.7	1.449	8.974	15.344	0.272	2.030	1.131
90.0	4.2	78.5	1.291	12.324	16.894	0.161	2.154	1.094
105.0	3.9	91.2	0.829	11.633	16.597	0.085	2.189	1.050
120.0	3.2	104.3	1.613	12.392	15.506	0.141	2.240	1.087
135.0	2.3	112.8	1.910	10.289	16.226	0.174	2.258	1.118
150.0	1.1	121.7	1.927	11.696	16.579	0.211	2.224	1.136
165.0	0.3	125.8	1.760	12.222	15.341	0.247	2.174	1.089
180.0	1.0	62.8	1.776	11.094	15.203	0.312	2.283	1.031
195.0	1.6	58.1	2.580	11.140	15.348	0.340	2.476	1.019
210.0	5.0	260.2	1.638	13.649	15.009	0.180	2.761	0.930
225.0	4.3	260.1	1.557	15.790	14.838	0.157	2.713	0.920
240.0	4.5	270.2	0.872	14.471	13.671	0.087	2.605	0.924
255.0	3.8	277.2	3.405	12.974	15.587	0.162	2.439	0.989
270.0	4.0	285.9	2.702	12.570	15.565	0.210	2.325	1.043
285.0	4.2	292.4	1.858	11.562	16.448	0.257	2.166	1.079
300.0	4.4	300.2	3.047	16.403	16.600	0.323	2.109	1.146
315.0	3.9	304.9	1.475	11.493	16.320	0.342	1.983	1.097
330.0	2.7	306.1	2.131	11.798	16.632	0.351	2.026	1.077
345.0	1.5	307.4	2.019	12.459	15.557	0.349	2.071	1.059

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.45:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	6.0	-43.9	2.296	11.323	14.754	0.423	2.154	1.174
15.0	6.2	-35.5	2.378	10.462	14.270	0.451	2.090	1.191
30.0	6.4	-26.2	2.152	9.707	13.587	0.463	2.039	1.198
45.0	6.9	-1.3	2.179	6.682	16.030	0.476	1.759	1.213
60.0	9.0	54.9	2.826	12.555	19.909	0.357	2.022	1.274
75.0	9.1	70.1	2.472	11.548	19.778	0.229	2.093	1.203
90.0	9.0	83.0	0.563	11.103	14.789	0.095	2.098	1.106
105.0	8.9	99.2	1.013	8.262	14.748	0.093	2.099	1.026
120.0	8.3	111.0	3.393	12.428	16.248	0.162	2.098	1.010
135.0	7.6	120.5	1.714	9.671	14.922	0.168	2.023	0.986
150.0	7.0	129.2	2.313	11.902	15.089	0.189	1.943	0.959
165.0	6.6	141.0	2.362	12.869	14.719	0.200	1.862	0.871
180.0	6.5	154.9	2.571	12.553	14.620	0.220	1.822	0.775
195.0	8.6	206.7	2.329	13.568	12.613	0.219	1.738	0.538
210.0	8.3	237.8	2.949	26.668	13.654	0.215	2.589	0.801
225.0	8.3	252.9	2.261	14.895	14.141	0.153	2.628	0.870
240.0	8.3	261.7	1.393	15.985	14.382	0.122	2.601	0.937
255.0	8.4	271.0	0.814	16.012	14.482	0.097	2.600	0.977
270.0	8.7	279.3	1.044	13.470	14.617	0.118	2.548	1.032
285.0	9.0	289.1	2.617	27.926	15.486	0.229	2.495	1.125
300.0	9.3	301.0	3.125	16.758	17.520	0.337	2.207	1.220
315.0	8.9	310.7	2.032	9.715	16.297	0.396	1.955	1.192
330.0	8.1	317.8	2.201	11.011	14.904	0.436	1.858	1.193
345.0	6.4	312.4	2.280	11.816	14.060	0.410	2.109	1.175

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.46:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	13.9	-2.3	2.942	4.693	14.493	0.566	0.884	1.355
15.0	14.0	13.2	2.659	5.229	13.523	0.555	1.086	1.367
30.0	14.1	28.8	2.075	5.224	13.660	0.522	1.468	1.385
45.0	14.2	44.2	1.850	7.920	15.354	0.452	1.851	1.389
60.0	14.2	58.2	3.090	8.626	15.608	0.355	2.082	1.369
75.0	14.3	73.0	3.938	10.633	17.187	0.224	2.036	1.256
90.0	14.4	87.5	0.390	9.742	14.671	0.081	2.029	1.098
105.0	14.5	103.4	1.143	15.919	14.661	0.118	2.096	0.951
120.0	13.8	116.2	1.947	16.708	14.726	0.162	2.212	0.930
135.0	13.3	129.3	1.514	10.022	13.751	0.159	2.064	0.840
150.0	13.6	145.8	1.896	12.207	13.645	0.167	1.591	0.652
165.0	14.5	163.0	1.286	5.019	12.728	0.187	1.065	0.473
180.0	14.7	178.6	1.089	4.421	12.145	0.206	0.777	0.381
195.0	14.6	194.9	1.269	8.297	12.346	0.178	1.255	0.276
210.0	13.7	216.1	1.486	11.588	12.887	0.178	2.107	0.434
225.0	13.6	233.1	1.643	12.335	14.819	0.182	2.505	0.656
240.0	13.5	248.4	2.125	17.420	14.091	0.161	2.703	0.789
255.0	13.8	260.8	0.959	12.690	15.030	0.120	2.693	0.864
270.0	14.0	274.2	0.984	14.123	14.720	0.094	2.709	1.004
285.0	14.3	287.4	2.395	18.594	22.124	0.204	2.650	1.159
300.0	14.4	300.6	1.555	10.385	16.177	0.341	2.327	1.278
315.0	14.2	313.7	1.713	8.705	14.637	0.442	1.853	1.311
330.0	14.0	327.7	2.134	6.560	14.114	0.512	1.441	1.336
345.0	13.9	342.6	2.459	5.893	13.936	0.549	1.099	1.348

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.47:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.3	-0.8	2.749	4.276	13.878	0.598	0.798	1.555
15.0	19.3	14.4	2.517	5.478	14.326	0.591	1.117	1.562
30.0	19.3	29.7	2.204	6.369	14.197	0.554	1.533	1.570
45.0	19.3	44.7	1.867	7.599	15.819	0.484	1.856	1.556
60.0	19.4	59.2	1.594	9.659	16.585	0.364	2.149	1.503
75.0	19.4	73.7	2.686	23.665	16.709	0.207	2.146	1.314
90.0	19.5	88.6	0.457	9.440	14.349	0.097	1.964	1.087
105.0	19.5	104.2	1.874	18.303	14.091	0.137	2.080	0.886
120.0	19.0	117.8	0.774	8.789	13.760	0.158	2.599	0.899
135.0	19.1	133.8	1.169	9.981	13.435	0.183	2.494	0.664
150.0	19.1	148.8	1.003	6.243	12.217	0.179	1.407	0.446
165.0	19.1	164.1	1.341	4.826	12.674	0.214	0.980	0.393
180.0	19.4	179.9	1.112	6.216	12.024	0.220	0.900	0.330
195.0	19.3	194.8	1.478	7.824	11.961	0.198	1.420	0.307
210.0	19.2	210.4	1.059	8.684	11.362	0.170	1.902	0.360
225.0	19.2	226.8	0.982	9.846	12.114	0.162	2.482	0.405
240.0	18.9	243.8	0.953	10.812	13.677	0.166	2.984	0.628
255.0	19.2	257.7	1.118	16.011	13.862	0.140	2.866	0.741
270.0	19.3	272.3	1.593	14.546	14.664	0.118	2.834	0.956
285.0	19.4	286.6	1.982	16.490	16.088	0.198	2.879	1.158
300.0	19.4	300.4	1.669	12.016	16.211	0.353	2.457	1.390
315.0	19.3	314.3	1.715	7.684	14.777	0.470	1.903	1.469
330.0	19.3	328.9	2.340	5.239	14.267	0.545	1.333	1.524
345.0	19.3	343.9	2.818	3.954	14.339	0.586	0.968	1.542

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.48:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.4	-0.3	2.945	4.580	15.382	0.624	0.922	1.837
15.0	24.4	14.9	2.457	6.685	14.967	0.614	1.203	1.850
30.0	24.4	30.0	2.282	7.136	15.592	0.583	1.573	1.828
45.0	24.4	45.0	1.968	7.882	15.211	0.508	1.925	1.772
60.0	24.4	59.6	1.494	10.497	16.825	0.380	2.250	1.662
75.0	24.4	74.0	2.531	11.096	19.282	0.217	2.104	1.362
90.0	24.5	89.1	0.500	9.431	14.416	0.116	1.894	1.065
105.0	24.5	104.4	2.211	16.970	13.365	0.166	2.094	0.803
120.0	24.1	119.1	0.982	10.102	13.404	0.187	2.908	0.790
135.0	23.9	134.3	1.438	10.427	12.966	0.244	2.657	0.570
150.0	24.2	148.8	1.214	8.162	12.093	0.242	1.872	0.436
165.0	24.9	163.9	1.033	4.358	11.168	0.196	0.966	0.312
180.0	25.6	179.5	0.860	4.388	10.607	0.198	0.643	0.235
195.0	25.3	195.3	1.014	5.927	10.347	0.210	1.096	0.279
210.0	24.3	211.5	0.982	7.756	11.257	0.205	1.992	0.413
225.0	23.8	227.0	3.395	15.294	14.172	0.230	2.948	0.588
240.0	24.1	241.6	1.041	13.874	12.531	0.187	3.233	0.570
255.0	24.4	256.5	1.061	15.165	13.478	0.160	2.920	0.640
270.0	24.3	271.5	1.142	20.867	14.729	0.131	2.976	0.934
285.0	24.4	286.2	3.232	16.418	14.996	0.200	2.941	1.204
300.0	24.4	300.3	1.505	11.617	16.185	0.370	2.635	1.532
315.0	24.4	314.7	2.024	9.208	15.720	0.497	1.962	1.707
330.0	24.4	329.5	2.213	6.418	15.483	0.572	1.392	1.794
345.0	24.4	344.5	2.672	5.916	15.857	0.612	1.032	1.832

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.49:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 16.4$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.5	-0.1	2.598	6.624	16.778	0.646	1.125	2.184
15.0	29.5	15.1	2.528	7.004	16.005	0.638	1.355	2.168
30.0	29.4	30.2	2.391	9.222	16.400	0.599	1.724	2.130
45.0	29.4	45.1	2.175	9.008	17.075	0.532	1.977	2.040
60.0	29.4	59.7	1.625	10.598	18.069	0.401	2.277	1.844
75.0	29.4	74.3	1.008	9.654	16.851	0.209	2.099	1.392
90.0	29.4	89.3	0.672	12.531	15.313	0.136	1.993	1.032
105.0	29.3	104.4	1.764	12.562	13.344	0.199	2.192	0.748
120.0	29.0	119.6	2.214	11.362	13.665	0.239	3.236	0.747
135.0	28.4	132.9	1.808	11.438	13.219	0.320	2.854	0.643
150.0	28.9	146.6	1.524	8.625	11.781	0.342	2.028	0.573
165.0	29.9	162.3	2.471	6.609	11.089	0.391	1.400	0.479
180.0	30.7	178.3	1.821	9.970	10.650	0.357	1.058	0.468
195.0	30.8	194.8	1.777	9.060	10.217	0.385	1.360	0.502
210.0	29.5	212.5	2.715	18.961	11.395	0.330	2.245	0.520
225.0	28.9	226.8	1.412	18.792	12.866	0.257	2.759	0.633
240.0	29.2	240.2	1.220	13.084	13.518	0.199	3.027	0.735
255.0	29.2	255.8	3.516	21.086	13.441	0.205	2.959	0.669
270.0	29.4	271.0	0.994	15.203	15.835	0.143	2.936	0.919
285.0	29.4	285.9	1.009	15.096	15.509	0.194	3.026	1.252
300.0	29.5	300.3	1.413	12.908	16.494	0.383	2.783	1.701
315.0	29.5	314.9	1.884	9.326	17.113	0.518	2.127	1.972
330.0	29.5	329.8	2.397	9.891	17.915	0.590	1.616	2.102
345.0	29.5	344.8	2.656	6.573	16.536	0.631	1.242	2.158

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.50:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	0.5	132.0	1.456	10.556	14.657	0.246	2.098	0.745
15.0	-2.9	-158.5	1.499	8.735	14.159	0.281	1.716	0.893
30.0	-3.9	-112.9	1.828	9.417	13.831	0.268	1.979	0.950
45.0	-3.1	-96.3	1.179	8.491	14.059	0.209	2.122	0.920
60.0	1.3	58.0	0.934	7.690	15.130	0.202	1.820	0.850
75.0	1.1	74.8	0.912	6.234	14.494	0.119	1.830	0.820
90.0	0.3	92.3	0.768	8.462	14.252	0.074	1.839	0.818
105.0	-1.0	101.9	0.833	6.613	13.583	0.096	1.900	0.847
120.0	-2.5	109.9	0.908	7.471	12.993	0.132	1.957	0.860
135.0	-4.2	117.7	1.167	8.126	14.860	0.179	1.914	0.914
150.0	-4.8	112.6	1.366	8.895	14.450	0.245	1.966	0.944
165.0	-3.8	69.3	1.564	10.060	14.169	0.263	2.125	0.906
180.0	-0.6	408.4	1.243	10.172	13.319	0.255	2.285	0.821
195.0	-1.5	286.9	1.390	10.610	13.949	0.223	2.225	0.798
210.0	2.7	246.3	1.247	10.338	12.805	0.151	2.310	0.701
225.0	1.0	254.4	0.984	12.266	13.687	0.116	2.241	0.757
240.0	0.2	263.9	0.847	12.080	13.954	0.073	2.144	0.742
255.0	-0.4	272.3	0.655	10.589	14.085	0.063	2.006	0.739
270.0	-0.4	279.9	0.908	11.659	13.912	0.093	1.904	0.746
285.0	-0.1	288.6	0.788	8.947	14.518	0.133	1.819	0.762
300.0	-0.3	296.2	0.911	10.321	14.133	0.176	1.746	0.768
315.0	-2.1	301.5	1.087	9.330	13.191	0.196	1.745	0.743
330.0	-3.2	306.6	1.837	10.006	13.494	0.230	1.757	0.766
345.0	2.4	136.5	1.405	11.222	12.764	0.194	2.368	0.695

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.51:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	1.3	-45.3	1.497	9.756	12.904	0.277	1.857	0.835
15.0	1.1	-117.6	1.696	8.784	13.226	0.213	2.182	0.867
30.0	1.8	-107.0	1.959	7.800	13.464	0.190	2.159	0.908
45.0	2.6	-93.5	1.474	7.349	12.988	0.173	2.223	0.902
60.0	3.7	40.0	1.165	6.311	13.529	0.295	1.590	0.940
75.0	4.4	64.2	0.839	6.872	14.368	0.176	1.758	0.884
90.0	4.3	80.9	0.628	6.742	13.488	0.076	1.790	0.839
105.0	4.0	95.5	0.695	6.660	14.291	0.054	1.791	0.834
120.0	3.5	107.4	1.534	7.434	13.696	0.097	1.799	0.851
135.0	2.7	115.7	0.934	7.976	14.555	0.119	1.851	0.889
150.0	1.9	125.2	1.073	8.108	13.859	0.154	1.805	0.903
165.0	1.1	135.8	1.347	8.397	14.324	0.189	1.698	0.875
180.0	0.9	141.9	1.687	7.573	12.810	0.219	1.732	0.802
195.0	2.0	68.7	1.567	10.884	13.418	0.261	1.963	0.790
210.0	4.7	241.1	1.828	12.826	12.810	0.155	2.193	0.672
225.0	4.4	251.9	0.904	13.454	14.017	0.111	2.191	0.709
240.0	4.4	262.8	0.795	10.929	12.818	0.074	2.112	0.711
255.0	4.1	272.2	0.648	9.832	12.881	0.060	2.033	0.737
270.0	4.3	283.4	0.761	9.647	13.595	0.088	1.983	0.761
285.0	4.3	292.2	0.889	9.911	13.959	0.148	1.884	0.799
300.0	4.5	302.2	0.903	10.658	14.023	0.210	1.770	0.829
315.0	4.2	308.6	1.333	11.505	14.272	0.251	1.656	0.849
330.0	3.3	312.0	1.463	11.269	13.573	0.266	1.654	0.833
345.0	2.1	315.8	1.593	10.724	12.902	0.279	1.630	0.815

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.



**Table U.52:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	6.1	-36.8	2.012	9.791	12.758	0.346	1.770	0.948
15.0	6.1	-30.3	1.971	9.573	13.011	0.365	1.820	0.967
30.0	6.3	-19.0	1.699	7.078	13.045	0.384	1.745	0.991
45.0	9.1	41.0	1.590	5.485	14.769	0.327	1.553	1.029
60.0	9.2	56.0	1.619	6.996	16.188	0.239	1.729	0.995
75.0	9.4	71.4	0.657	7.435	14.105	0.128	1.721	0.916
90.0	9.4	86.3	0.297	6.354	13.237	0.051	1.675	0.854
105.0	9.3	102.1	0.661	6.200	13.320	0.070	1.674	0.811
120.0	8.5	113.5	0.859	6.803	13.904	0.099	1.670	0.811
135.0	7.9	124.4	0.953	7.566	13.932	0.123	1.594	0.781
150.0	7.5	134.3	1.688	7.920	13.374	0.140	1.461	0.740
165.0	6.9	141.6	1.124	7.276	13.951	0.154	1.477	0.724
180.0	6.7	155.3	1.261	6.785	13.298	0.175	1.491	0.658
195.0	8.9	198.3	1.573	11.120	13.260	0.181	1.344	0.383
210.0	8.5	223.9	1.498	10.636	12.846	0.160	1.852	0.525
225.0	8.5	240.6	1.519	9.399	12.872	0.129	2.053	0.621
240.0	8.6	251.4	1.009	8.960	13.259	0.104	2.103	0.677
255.0	8.9	262.7	0.574	11.380	13.267	0.073	2.165	0.706
270.0	9.1	275.7	0.475	10.794	13.521	0.058	2.164	0.753
285.0	9.3	288.1	1.143	11.207	14.950	0.120	2.102	0.807
300.0	9.4	301.0	2.210	8.245	15.204	0.224	1.885	0.886
315.0	9.2	313.1	1.706	8.338	14.446	0.298	1.597	0.930
330.0	8.7	324.0	1.711	6.826	13.622	0.354	1.370	0.955
345.0	7.3	323.5	1.986	9.585	13.231	0.354	1.595	0.936

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.53:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.1	-1.8	1.758	3.373	12.730	0.464	0.652	1.122
15.0	14.2	13.5	1.982	4.056	12.944	0.454	0.941	1.137
30.0	14.3	28.9	1.619	5.399	13.453	0.415	1.317	1.140
45.0	14.4	43.9	1.346	7.139	14.089	0.341	1.578	1.108
60.0	14.4	58.3	1.243	7.334	15.654	0.240	1.781	1.068
75.0	14.5	73.3	1.474	6.982	15.822	0.131	1.638	0.957
90.0	14.6	88.4	0.250	6.064	13.450	0.067	1.558	0.851
105.0	14.6	103.8	1.016	12.704	13.519	0.095	1.589	0.765
120.0	14.0	117.1	0.968	7.122	13.104	0.118	1.818	0.783
135.0	13.8	131.8	0.970	7.077	13.442	0.138	1.669	0.691
150.0	13.8	147.2	0.824	5.696	12.918	0.148	1.279	0.561
165.0	14.1	163.0	1.000	4.308	12.399	0.147	0.876	0.441
180.0	14.3	178.7	0.809	4.627	11.120	0.147	0.812	0.334
195.0	14.3	195.1	1.344	8.783	11.741	0.152	1.200	0.262
210.0	14.0	212.8	1.060	7.863	11.939	0.150	1.797	0.306
225.0	13.9	229.9	1.357	8.800	13.898	0.140	2.220	0.467
240.0	13.9	244.7	0.918	10.068	13.980	0.124	2.392	0.563
255.0	14.3	258.2	0.735	8.974	13.290	0.105	2.323	0.623
270.0	14.4	272.5	0.588	12.050	13.087	0.077	2.320	0.726
285.0	14.5	286.5	0.719	12.783	13.748	0.111	2.253	0.825
300.0	14.4	300.7	1.218	9.138	14.099	0.228	2.081	0.940
315.0	14.4	314.3	1.384	7.404	14.324	0.327	1.644	1.005
330.0	14.2	328.3	1.960	5.418	13.789	0.401	1.235	1.062
345.0	14.1	342.9	1.934	4.484	12.912	0.444	0.896	1.099

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.54:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.3	-0.8	2.303	3.364	13.270	0.503	0.700	1.277
15.0	19.4	14.5	2.077	4.521	13.588	0.490	1.019	1.288
30.0	19.4	29.7	1.966	6.064	14.050	0.446	1.390	1.274
45.0	19.4	44.7	1.281	6.530	14.042	0.365	1.704	1.229
60.0	19.4	59.1	1.117	7.937	15.337	0.250	1.906	1.162
75.0	19.6	74.0	1.202	8.187	16.760	0.130	1.612	0.979
90.0	19.6	89.2	0.348	6.331	13.509	0.088	1.504	0.832
105.0	19.6	104.4	2.171	14.438	12.622	0.124	1.568	0.706
120.0	19.2	118.5	1.475	13.460	14.353	0.148	2.213	0.754
135.0	19.2	133.7	0.874	7.041	12.099	0.156	1.837	0.584
150.0	19.3	148.8	1.446	8.704	13.124	0.185	1.579	0.480
165.0	19.3	163.9	0.933	4.012	11.681	0.184	0.867	0.380
180.0	19.6	179.3	0.877	4.527	11.014	0.168	0.803	0.305
195.0	19.5	194.8	0.654	6.675	10.240	0.156	1.201	0.278
210.0	19.3	210.7	1.359	9.813	12.564	0.177	1.940	0.382
225.0	19.2	226.4	0.836	8.922	10.891	0.151	2.305	0.315
240.0	19.2	242.2	1.001	10.541	13.688	0.142	2.672	0.459
255.0	19.5	256.6	0.929	15.341	12.759	0.123	2.468	0.551
270.0	19.5	271.3	0.789	11.649	13.042	0.094	2.412	0.702
285.0	19.6	285.9	1.735	10.883	13.829	0.119	2.331	0.841
300.0	19.5	300.4	1.161	9.694	14.371	0.235	2.212	1.009
315.0	19.4	314.5	1.362	7.618	14.217	0.350	1.697	1.110
330.0	19.3	329.0	1.778	5.433	13.613	0.437	1.180	1.199
345.0	19.3	344.0	1.856	4.054	13.198	0.483	0.832	1.247

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.55:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.4	-0.3	2.352	4.354	14.284	0.533	0.828	1.515
15.0	24.4	14.9	2.293	5.329	14.687	0.521	1.102	1.512
30.0	24.4	30.0	1.961	6.308	14.587	0.478	1.477	1.478
45.0	24.4	44.9	1.561	7.710	15.210	0.390	1.763	1.379
60.0	24.4	59.6	1.070	9.666	15.574	0.266	2.015	1.276
75.0	24.5	74.3	0.943	6.697	16.302	0.136	1.611	0.999
90.0	24.6	89.3	0.427	5.973	13.099	0.106	1.482	0.822
105.0	24.6	104.5	2.090	13.818	12.763	0.150	1.453	0.642
120.0	24.3	119.2	0.756	7.815	12.096	0.170	2.460	0.684
135.0	24.1	134.4	1.074	7.946	11.848	0.221	2.380	0.497
150.0	24.2	148.9	1.323	6.534	11.912	0.237	1.748	0.443
165.0	24.8	164.2	1.181	4.404	11.188	0.241	1.021	0.390
180.0	25.4	179.5	0.691	3.491	10.348	0.157	0.412	0.196
195.0	25.0	195.4	0.996	5.641	10.471	0.212	1.096	0.307
210.0	24.3	210.6	1.144	7.840	10.188	0.204	1.952	0.444
225.0	24.3	225.5	1.099	10.326	11.087	0.182	2.468	0.541
240.0	24.3	241.0	0.978	10.998	11.722	0.159	2.866	0.455
255.0	24.5	255.8	0.920	9.992	13.201	0.136	2.455	0.518
270.0	24.5	270.9	0.752	11.475	13.108	0.110	2.462	0.696
285.0	24.5	285.7	0.977	13.928	14.089	0.121	2.480	0.866
300.0	24.5	300.2	1.135	11.444	14.712	0.247	2.369	1.080
315.0	24.5	314.7	1.370	8.181	14.856	0.374	1.732	1.256
330.0	24.4	329.4	1.906	6.268	14.331	0.467	1.248	1.403
345.0	24.4	344.5	1.969	4.810	14.613	0.512	0.907	1.475

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.56:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 14.0$  m and  $T_p = 18.6$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.5	-0.1	2.350	5.773	15.212	0.557	1.042	1.808
15.0	29.5	15.1	2.227	7.623	15.410	0.545	1.263	1.792
30.0	29.5	30.2	2.066	8.424	15.701	0.502	1.586	1.739
45.0	29.5	45.1	1.596	8.461	16.017	0.416	1.879	1.598
60.0	29.4	59.8	1.192	9.691	15.954	0.283	2.081	1.389
75.0	29.5	74.4	1.282	7.103	15.363	0.150	1.702	1.039
90.0	29.5	89.4	0.514	6.392	13.664	0.126	1.598	0.820
105.0	29.4	104.4	3.069	16.030	13.962	0.186	1.574	0.607
120.0	29.3	119.5	1.005	8.026	11.139	0.198	2.366	0.595
135.0	29.0	133.9	1.293	7.560	12.212	0.279	2.480	0.531
150.0	29.4	147.9	1.242	7.217	11.363	0.265	1.598	0.469
165.0	30.1	162.9	1.065	6.544	10.296	0.281	1.042	0.406
180.0	30.7	178.6	1.304	5.574	10.206	0.294	0.798	0.330
195.0	30.2	194.7	1.266	6.212	10.148	0.288	0.984	0.300
210.0	29.8	210.4	1.137	7.250	10.235	0.222	1.435	0.353
225.0	29.2	225.7	0.969	9.314	10.125	0.237	2.471	0.589
240.0	29.3	240.4	1.162	12.725	11.619	0.186	2.697	0.600
255.0	29.5	255.5	0.992	11.915	11.974	0.164	2.407	0.519
270.0	29.5	270.5	0.706	13.849	13.207	0.129	2.443	0.713
285.0	29.5	285.5	0.615	11.901	13.825	0.128	2.536	0.922
300.0	29.5	300.1	1.030	12.770	14.266	0.259	2.425	1.165
315.0	29.5	314.8	1.609	9.316	14.644	0.398	1.904	1.458
330.0	29.5	329.7	1.999	7.745	15.570	0.490	1.400	1.670
345.0	29.5	344.8	2.112	6.046	15.590	0.535	1.088	1.764

Wind at 56.4 knots (29.0 m/s) is from the starboard beam in all cases.

**Table U.57:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.6	-136.9	1.819	12.121	14.026	0.312	2.476	0.904
15.0	-2.8	-134.4	1.922	11.617	14.128	0.327	2.417	1.006
30.0	-4.0	-116.3	1.618	9.661	15.083	0.307	2.322	1.078
45.0	2.1	38.6	1.297	6.470	14.149	0.296	1.782	1.018
60.0	2.6	64.0	0.866	6.406	14.738	0.176	1.941	0.974
75.0	2.2	83.3	1.249	6.764	13.989	0.101	1.876	0.935
90.0	0.9	100.0	1.101	7.944	14.993	0.102	1.935	0.943
105.0	-1.4	109.9	1.017	8.363	13.811	0.133	2.011	0.976
120.0	-3.3	116.2	1.582	7.886	13.718	0.179	2.029	1.014
135.0	-5.3	125.7	1.450	8.759	14.831	0.234	1.997	1.059
150.0	-5.5	143.3	2.229	9.102	14.548	0.293	1.742	1.066
165.0	-4.9	154.4	1.736	9.035	14.243	0.337	1.538	1.085
180.0	-0.4	239.9	2.305	9.944	13.951	0.314	1.796	0.847
195.0	3.0	226.1	1.869	13.097	13.151	0.244	2.454	0.740
210.0	3.1	241.6	1.379	13.502	12.878	0.185	2.651	0.758
225.0	1.4	252.5	1.276	12.468	13.067	0.155	2.566	0.806
240.0	-0.4	261.6	1.075	13.944	13.287	0.107	2.453	0.793
255.0	-1.2	269.3	0.751	12.902	14.112	0.079	2.246	0.769
270.0	-1.7	276.9	0.685	9.941	13.389	0.088	2.106	0.771
285.0	-1.8	284.4	0.735	9.639	13.841	0.115	2.029	0.771
300.0	-3.5	288.1	1.158	11.177	13.443	0.161	2.059	0.768
315.0	-5.4	290.7	2.352	13.965	13.125	0.210	2.181	0.811
330.0	-6.9	273.9	1.378	12.234	13.942	0.257	2.469	0.894
345.0	1.7	-171.5	1.967	13.698	13.590	0.249	2.842	0.804

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.58:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	0.1	-131.1	1.703	10.708	13.456	0.270	2.551	0.973
15.0	0.4	-118.9	1.663	9.915	14.273	0.245	2.515	1.012
30.0	1.4	-107.9	1.764	8.830	14.069	0.226	2.509	1.024
45.0	2.4	20.1	1.474	7.175	13.249	0.369	1.636	1.101
60.0	4.5	49.4	1.140	6.921	14.243	0.266	1.808	1.044
75.0	5.0	71.3	0.852	7.182	14.313	0.137	1.828	0.973
90.0	4.6	89.6	0.562	7.825	14.056	0.063	1.808	0.928
105.0	4.0	104.5	1.085	6.774	15.151	0.090	1.852	0.929
120.0	3.4	113.6	2.199	15.610	13.949	0.137	1.914	0.956
135.0	2.4	122.2	1.855	8.084	14.972	0.161	1.841	0.986
150.0	1.4	130.1	2.300	11.148	14.662	0.186	1.815	1.028
165.0	0.5	139.8	1.247	8.723	14.895	0.218	1.673	1.012
180.0	0.2	152.6	1.532	9.728	14.441	0.254	1.520	0.945
195.0	4.6	217.9	2.452	13.702	12.787	0.238	2.230	0.656
210.0	4.9	238.0	1.927	15.126	12.511	0.193	2.500	0.720
225.0	4.6	250.4	1.593	12.876	13.493	0.143	2.510	0.748
240.0	4.5	260.9	0.888	12.277	12.963	0.097	2.362	0.727
255.0	3.9	270.8	1.349	11.863	13.375	0.078	2.269	0.759
270.0	3.6	279.9	1.192	12.614	13.806	0.098	2.200	0.767
285.0	4.0	290.0	0.971	10.346	14.375	0.129	2.114	0.789
300.0	3.9	297.4	1.092	12.249	14.616	0.189	1.947	0.822
315.0	3.1	302.6	1.188	11.881	14.374	0.224	1.873	0.833
330.0	1.9	307.2	1.442	12.566	13.397	0.247	1.862	0.902
345.0	0.3	312.8	1.515	12.469	12.434	0.270	1.904	0.981

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.59:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	6.1	-28.6	2.192	12.701	12.953	0.409	2.068	1.492
15.0	5.0	-32.0	2.536	11.210	13.044	0.377	2.216	1.170
30.0	6.2	-104.3	2.408	10.104	13.576	0.204	2.641	0.999
45.0	6.1	-9.8	2.210	9.258	13.931	0.404	2.066	1.156
60.0	9.0	54.1	2.598	7.845	15.383	0.266	1.769	1.117
75.0	9.6	72.2	0.727	7.437	14.628	0.132	1.695	0.997
90.0	9.5	88.5	0.401	6.696	13.592	0.062	1.652	0.932
105.0	9.2	104.8	0.926	6.953	13.421	0.091	1.676	0.895
120.0	8.5	115.5	1.450	6.653	14.643	0.116	1.670	0.903
135.0	7.8	126.8	1.013	7.055	14.237	0.143	1.573	0.876
150.0	7.1	135.2	1.523	8.029	15.065	0.168	1.524	0.864
165.0	6.3	141.0	1.447	7.368	14.022	0.182	1.454	0.879
180.0	5.6	151.2	2.068	8.253	15.108	0.204	1.409	0.865
195.0	8.6	202.2	2.112	14.669	13.707	0.218	1.789	0.474
210.0	8.6	229.6	1.654	12.785	12.492	0.183	2.354	0.583
225.0	8.6	243.3	1.612	11.452	12.740	0.156	2.399	0.659
240.0	8.6	252.4	1.176	15.057	14.528	0.129	2.381	0.703
255.0	8.8	265.2	0.711	10.887	12.931	0.086	2.429	0.718
270.0	9.0	275.9	0.631	12.186	13.684	0.073	2.429	0.760
285.0	9.2	288.1	0.984	12.629	13.942	0.116	2.354	0.801
300.0	9.2	300.9	1.147	13.680	13.977	0.219	2.081	0.882
315.0	8.8	311.9	1.785	10.803	13.897	0.297	1.740	0.945
330.0	7.5	315.3	2.032	12.027	13.587	0.322	1.762	0.946
345.0	6.7	322.0	1.821	10.774	12.881	0.384	1.780	1.246

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.



**Table U.60:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	13.3	-4.8	2.436	6.546	13.987	0.504	1.107	1.232
15.0	13.7	11.7	2.124	5.691	13.669	0.495	1.187	1.259
30.0	14.0	27.8	2.021	6.566	14.560	0.446	1.454	1.262
45.0	14.2	43.1	1.470	8.412	14.495	0.358	1.662	1.234
60.0	14.3	57.7	1.803	8.357	17.338	0.254	1.815	1.199
75.0	14.5	73.4	1.123	8.876	16.278	0.131	1.664	1.039
90.0	14.5	89.1	0.510	6.223	14.362	0.084	1.596	0.925
105.0	14.5	104.6	2.057	15.557	13.202	0.120	1.617	0.819
120.0	13.9	117.6	1.058	7.695	14.525	0.139	1.824	0.860
135.0	13.7	132.5	1.760	7.117	14.005	0.168	1.562	0.749
150.0	13.6	146.9	1.061	6.181	13.522	0.179	1.239	0.638
165.0	13.6	162.1	1.257	5.720	12.776	0.195	1.073	0.533
180.0	13.9	178.6	1.582	6.617	13.050	0.188	1.052	0.378
195.0	13.9	196.8	1.589	11.692	11.367	0.195	1.638	0.313
210.0	13.6	216.6	1.411	11.149	11.965	0.184	2.195	0.381
225.0	13.5	232.8	1.818	14.696	12.959	0.169	2.512	0.517
240.0	13.8	245.6	1.281	15.083	14.885	0.153	2.667	0.611
255.0	14.2	258.9	0.919	16.200	14.513	0.130	2.645	0.659
270.0	14.2	273.2	0.888	13.627	13.130	0.100	2.655	0.734
285.0	14.3	286.8	1.765	12.929	14.123	0.122	2.588	0.820
300.0	14.2	301.0	1.355	13.970	14.888	0.231	2.289	0.936
315.0	14.1	314.0	1.297	9.106	13.981	0.328	1.789	1.029
330.0	13.8	327.1	2.112	8.071	14.155	0.412	1.439	1.118
345.0	13.4	340.6	2.073	6.965	13.898	0.472	1.225	1.189

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.61:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.1	-1.3	2.373	4.745	13.998	0.542	1.013	1.387
15.0	19.2	14.0	2.463	6.025	14.243	0.532	1.215	1.397
30.0	19.2	29.3	2.253	7.076	14.142	0.475	1.542	1.381
45.0	19.3	44.2	1.582	8.380	15.570	0.375	1.813	1.330
60.0	19.3	58.6	1.322	8.471	16.058	0.260	1.952	1.282
75.0	19.5	73.9	1.539	7.098	16.450	0.143	1.672	1.064
90.0	19.6	89.2	0.520	10.457	14.041	0.107	1.553	0.881
105.0	19.5	104.4	5.355	20.268	13.197	0.193	1.535	0.729
120.0	19.2	118.6	1.185	9.983	14.370	0.178	2.066	0.816
135.0	19.0	133.5	0.997	7.227	13.018	0.193	1.757	0.657
150.0	18.9	148.2	1.233	7.317	12.101	0.225	1.589	0.569
165.0	19.1	164.0	1.500	4.842	12.659	0.249	1.070	0.494
180.0	19.3	179.4	0.912	6.433	10.711	0.221	1.020	0.371
195.0	19.4	194.9	1.608	8.541	10.361	0.230	1.630	0.409
210.0	19.2	211.3	1.280	10.840	10.984	0.192	1.974	0.410
225.0	19.0	227.7	1.086	10.209	12.652	0.188	2.574	0.425
240.0	19.0	242.8	1.356	16.720	12.332	0.175	2.931	0.483
255.0	19.4	257.1	1.276	17.577	12.506	0.151	2.794	0.588
270.0	19.4	271.8	1.132	12.884	12.975	0.116	2.808	0.727
285.0	19.4	286.3	3.402	19.610	18.790	0.159	2.774	0.874
300.0	19.4	300.7	1.039	12.563	13.592	0.233	2.471	0.998
315.0	19.3	314.6	1.475	10.215	14.159	0.353	1.966	1.118
330.0	19.1	328.8	2.244	7.217	14.730	0.452	1.398	1.247
345.0	19.1	343.5	2.412	7.076	14.015	0.518	1.081	1.341

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.62:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.3	-0.5	2.816	4.945	15.410	0.580	1.095	1.612
15.0	24.3	14.7	2.698	7.493	15.104	0.566	1.340	1.618
30.0	24.3	29.9	2.192	8.310	14.875	0.508	1.668	1.572
45.0	24.3	44.7	1.885	8.611	16.690	0.403	1.903	1.477
60.0	24.3	59.2	1.302	9.700	16.224	0.272	2.160	1.384
75.0	24.4	74.2	3.603	23.890	15.254	0.168	1.841	1.092
90.0	24.5	89.2	1.412	18.189	13.662	0.134	1.639	0.861
105.0	24.4	104.3	3.429	15.039	14.296	0.198	1.475	0.659
120.0	24.2	119.1	0.936	7.985	14.295	0.207	2.420	0.758
135.0	24.2	134.2	1.009	6.937	12.305	0.228	1.949	0.552
150.0	24.2	149.0	1.145	6.898	11.518	0.253	1.696	0.482
165.0	24.6	164.1	1.521	5.187	12.133	0.278	0.993	0.436
180.0	25.4	179.8	1.364	5.617	10.729	0.277	0.696	0.338
195.0	24.9	195.3	1.147	6.540	10.415	0.242	1.249	0.368
210.0	24.1	211.5	1.698	15.054	10.264	0.252	2.229	0.523
225.0	24.4	225.2	0.916	9.781	10.301	0.193	2.239	0.611
240.0	24.1	241.3	1.131	12.923	12.209	0.199	3.054	0.546
255.0	24.4	256.1	10.259	12.547	14.010	0.285	2.799	0.635
270.0	24.4	271.2	0.973	14.942	12.492	0.139	2.863	0.756
285.0	24.4	285.9	0.638	14.714	13.589	0.129	2.877	0.926
300.0	24.4	300.6	1.168	13.259	14.521	0.244	2.656	1.061
315.0	24.3	314.8	1.584	11.646	14.631	0.380	2.068	1.262
330.0	24.3	329.4	2.206	7.520	14.812	0.489	1.510	1.443
345.0	24.3	344.3	2.252	7.452	14.558	0.553	1.173	1.548

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.63:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 20.0$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.4	-0.1	2.802	6.669	16.003	0.607	1.283	1.917
15.0	29.4	15.1	2.867	7.717	15.778	0.593	1.518	1.911
30.0	29.4	30.1	2.068	8.897	15.992	0.534	1.814	1.810
45.0	29.4	45.0	1.820	8.770	15.711	0.429	2.007	1.640
60.0	29.3	59.6	1.207	10.076	15.872	0.286	2.239	1.482
75.0	29.4	74.2	1.259	9.538	17.072	0.167	1.888	1.128
90.0	29.4	89.2	1.152	16.214	13.533	0.157	1.741	0.856
105.0	29.3	104.1	1.450	9.732	13.674	0.222	1.529	0.609
120.0	29.1	119.3	1.242	8.569	12.674	0.251	2.566	0.689
135.0	28.9	134.1	1.645	7.426	11.719	0.306	2.302	0.531
150.0	29.1	147.9	1.732	6.960	11.800	0.325	1.578	0.532
165.0	29.9	162.3	1.341	8.443	10.598	0.370	1.200	0.555
180.0	30.4	178.3	2.210	7.390	10.468	0.421	0.941	0.415
195.0	30.9	194.9	1.624	7.742	10.335	0.356	1.174	0.361
210.0	29.7	211.0	1.687	9.807	10.739	0.313	1.842	0.500
225.0	29.2	225.2	1.102	9.863	10.266	0.243	2.290	0.685
240.0	29.3	240.4	1.764	14.706	10.310	0.215	2.648	0.678
255.0	29.4	255.7	1.286	14.099	12.302	0.196	2.700	0.671
270.0	29.4	270.8	2.050	18.759	12.499	0.167	2.890	0.854
285.0	29.4	285.8	1.547	13.687	14.630	0.143	2.972	1.018
300.0	29.4	300.4	1.136	12.759	14.075	0.257	2.739	1.149
315.0	29.4	315.0	1.738	10.947	15.386	0.406	2.188	1.432
330.0	29.4	329.8	2.075	9.359	15.999	0.519	1.733	1.693
345.0	29.4	344.8	2.205	7.319	16.179	0.577	1.393	1.857

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.64:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-2.0	-9.4	0.625	7.383	11.411	0.167	1.042	0.592
15.0	-0.2	8.4	0.678	5.269	11.422	0.171	1.104	0.617
30.0	1.3	26.3	0.589	4.678	11.783	0.159	1.221	0.633
45.0	2.1	46.8	0.496	4.439	12.026	0.118	1.326	0.626
60.0	2.1	65.7	0.487	4.629	11.946	0.070	1.297	0.592
75.0	1.5	83.5	0.267	4.971	12.037	0.040	1.240	0.561
90.0	0.9	100.8	0.281	7.052	11.855	0.042	1.266	0.564
105.0	-0.3	112.8	0.289	5.335	11.515	0.051	1.315	0.576
120.0	-1.6	123.2	0.379	5.059	11.394	0.070	1.340	0.595
135.0	-2.8	133.7	0.442	5.169	11.871	0.098	1.275	0.600
150.0	-3.5	146.7	0.567	5.975	12.190	0.127	1.067	0.590
165.0	-3.5	159.6	0.679	6.134	11.724	0.153	0.796	0.566
180.0	-2.7	176.8	0.846	4.748	11.967	0.164	0.650	0.524
195.0	-1.3	196.2	0.851	6.005	11.619	0.152	0.935	0.481
210.0	-0.2	218.4	0.770	7.737	11.519	0.120	1.368	0.464
225.0	-0.1	234.8	0.655	7.383	11.471	0.088	1.487	0.465
240.0	-0.4	248.9	0.368	7.717	11.636	0.057	1.477	0.458
255.0	-1.1	261.8	0.324	6.605	11.792	0.039	1.440	0.454
270.0	-1.7	272.9	0.242	7.183	11.705	0.036	1.404	0.445
285.0	-2.3	283.0	0.332	6.368	11.633	0.051	1.365	0.451
300.0	-2.7	291.8	0.481	6.200	11.526	0.068	1.315	0.454
315.0	-3.9	303.0	0.505	6.659	11.213	0.092	1.286	0.458
330.0	-4.3	318.6	0.648	8.391	11.380	0.131	1.224	0.542
345.0	-3.6	333.4	0.624	6.777	11.277	0.150	1.094	0.552

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.65:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	2.0	-23.0	0.862	6.894	11.312	0.166	1.154	0.610
15.0	2.3	-7.0	0.867	6.579	11.433	0.187	1.150	0.661
30.0	3.0	10.2	0.792	5.790	11.685	0.191	1.151	0.676
45.0	4.0	31.8	0.649	5.443	11.910	0.163	1.192	0.663
60.0	4.7	54.7	0.455	4.884	12.304	0.103	1.257	0.632
75.0	4.9	72.7	0.306	4.605	12.139	0.050	1.218	0.591
90.0	4.6	89.6	0.202	4.970	11.785	0.030	1.144	0.567
105.0	4.4	104.9	0.317	5.050	11.954	0.039	1.138	0.560
120.0	3.8	115.6	0.393	5.139	12.119	0.054	1.125	0.575
135.0	3.3	126.1	0.593	5.816	11.917	0.072	1.078	0.577
150.0	2.7	134.6	0.618	5.790	12.080	0.087	1.003	0.588
165.0	2.1	143.8	0.684	5.562	11.856	0.104	0.908	0.599
180.0	1.6	155.2	0.654	5.263	11.883	0.120	0.811	0.582
195.0	1.6	169.6	0.805	5.382	11.219	0.134	0.775	0.520
210.0	2.6	191.1	0.998	5.697	11.325	0.132	0.989	0.395
225.0	4.2	227.0	0.683	6.206	11.151	0.091	1.398	0.349
240.0	4.3	243.6	0.356	5.907	11.410	0.062	1.490	0.385
255.0	4.3	255.4	0.367	6.292	11.722	0.050	1.496	0.394
270.0	4.2	270.1	0.326	6.724	11.480	0.037	1.483	0.411
285.0	4.1	283.9	0.277	6.573	11.535	0.034	1.445	0.426
300.0	3.9	296.4	0.321	7.242	11.144	0.057	1.404	0.422
315.0	3.3	304.7	0.383	6.689	11.158	0.079	1.308	0.436
330.0	2.7	312.4	0.541	6.757	11.037	0.104	1.238	0.461
345.0	2.1	323.2	0.628	6.720	11.065	0.133	1.165	0.532

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.66:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	7.0	-21.3	1.041	8.055	11.761	0.194	1.193	0.660
15.0	6.7	-9.4	1.037	7.521	11.709	0.214	1.195	0.748
30.0	8.3	19.8	0.779	6.244	11.958	0.204	1.123	0.725
45.0	9.2	40.8	0.863	4.571	13.354	0.155	1.133	0.699
60.0	9.3	56.4	0.653	4.992	13.136	0.105	1.159	0.672
75.0	9.6	72.8	0.317	4.976	12.529	0.054	1.086	0.601
90.0	9.6	88.5	0.178	4.522	11.739	0.046	1.032	0.567
105.0	9.5	103.7	0.289	4.618	11.394	0.058	0.930	0.518
120.0	9.0	116.6	0.334	4.567	11.815	0.071	0.835	0.533
135.0	8.7	130.7	0.403	4.070	11.590	0.086	0.610	0.486
150.0	8.2	142.9	0.623	4.305	12.094	0.098	0.465	0.460
165.0	7.2	144.8	0.607	5.663	11.131	0.093	0.507	0.453
180.0	6.8	155.9	0.598	6.278	10.962	0.102	0.612	0.426
195.0	8.9	192.7	0.811	6.393	10.717	0.113	0.980	0.298
210.0	9.1	210.5	1.042	9.134	10.555	0.108	1.285	0.269
225.0	9.2	227.5	0.882	7.247	11.225	0.094	1.545	0.279
240.0	9.3	242.6	0.631	7.000	10.774	0.082	1.705	0.318
255.0	9.6	256.1	0.460	7.312	10.843	0.069	1.711	0.352
270.0	9.5	270.6	0.415	7.856	11.039	0.060	1.698	0.381
285.0	9.5	285.1	0.415	7.760	11.001	0.046	1.646	0.417
300.0	9.4	299.8	0.452	9.325	11.239	0.072	1.553	0.429
315.0	9.3	313.5	0.815	9.393	11.152	0.116	1.325	0.478
330.0	9.0	326.5	0.907	7.164	11.678	0.158	1.068	0.527
345.0	7.9	334.7	1.138	6.773	12.031	0.185	1.056	0.564

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.67:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.2	-2.2	0.923	4.601	11.778	0.240	0.655	0.698
15.0	14.2	12.9	0.877	4.434	12.233	0.236	0.788	0.739
30.0	14.3	28.1	0.816	4.597	12.610	0.207	0.990	0.757
45.0	14.3	43.0	0.679	6.112	12.593	0.162	1.135	0.751
60.0	14.4	57.9	0.647	5.547	13.368	0.115	1.174	0.727
75.0	14.6	73.6	0.281	4.828	12.152	0.068	0.990	0.601
90.0	14.6	88.8	0.252	4.350	11.604	0.069	0.914	0.539
105.0	14.5	103.8	0.373	5.760	11.302	0.086	0.750	0.449
120.0	14.3	118.1	0.514	4.505	12.183	0.107	0.795	0.528
135.0	14.1	133.0	0.645	5.051	11.563	0.119	0.750	0.477
150.0	14.0	147.7	0.715	5.462	11.573	0.134	0.700	0.435
165.0	13.9	162.5	0.511	3.982	10.691	0.136	0.706	0.392
180.0	14.1	178.2	0.624	5.914	10.454	0.135	0.865	0.348
195.0	14.3	194.2	0.530	6.958	10.388	0.129	1.163	0.312
210.0	14.2	210.5	0.905	9.865	10.477	0.129	1.483	0.293
225.0	14.3	226.1	0.661	7.733	10.447	0.114	1.726	0.271
240.0	14.4	241.3	0.761	9.324	10.759	0.103	1.932	0.283
255.0	14.5	255.6	0.801	8.106	10.746	0.095	1.926	0.369
270.0	14.5	270.4	0.678	8.809	11.157	0.076	1.923	0.419
285.0	14.6	285.1	0.511	10.710	11.035	0.059	1.867	0.464
300.0	14.5	300.1	0.486	8.333	11.279	0.079	1.688	0.461
315.0	14.4	314.4	0.560	7.181	11.773	0.129	1.439	0.518
330.0	14.3	328.6	0.864	6.612	11.879	0.181	1.101	0.580
345.0	14.2	343.1	1.078	5.882	12.132	0.220	0.792	0.643

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.



**Table U.68:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.4	-1.1	1.056	4.636	11.820	0.263	0.658	0.767
15.0	19.4	14.0	1.011	4.399	12.336	0.254	0.846	0.810
30.0	19.4	29.1	0.921	5.480	12.682	0.222	1.105	0.829
45.0	19.4	44.0	0.696	5.660	12.836	0.175	1.280	0.822
60.0	19.4	58.7	0.617	6.747	13.321	0.128	1.334	0.797
75.0	19.6	74.0	0.425	5.886	12.636	0.085	1.016	0.607
90.0	19.6	89.0	0.340	5.190	11.531	0.093	0.893	0.503
105.0	19.6	103.9	0.788	9.136	10.771	0.116	0.731	0.372
120.0	19.4	118.8	0.585	4.774	12.080	0.145	1.116	0.551
135.0	19.3	133.6	0.544	4.706	11.205	0.162	0.960	0.503
150.0	19.2	148.5	0.624	5.090	10.859	0.175	0.888	0.452
165.0	19.3	163.6	0.881	4.466	10.672	0.174	0.750	0.383
180.0	19.4	179.0	0.659	5.527	10.459	0.181	0.882	0.374
195.0	19.4	194.3	0.823	7.377	10.409	0.160	1.099	0.372
210.0	19.5	209.9	0.575	8.074	10.296	0.153	1.564	0.408
225.0	19.5	225.2	0.579	8.774	10.279	0.136	1.811	0.393
240.0	19.5	240.6	0.679	10.515	10.489	0.124	2.027	0.351
255.0	19.5	255.2	0.649	9.418	10.619	0.113	2.035	0.466
270.0	19.5	270.3	0.655	8.832	11.292	0.093	2.062	0.487
285.0	19.5	285.1	0.573	9.271	11.634	0.071	2.006	0.554
300.0	19.5	300.1	0.425	9.246	11.622	0.087	1.842	0.491
315.0	19.5	314.6	0.608	7.672	11.497	0.140	1.480	0.566
330.0	19.4	329.2	0.951	7.506	11.834	0.197	1.117	0.637
345.0	19.4	344.0	1.057	5.999	12.166	0.242	0.784	0.706

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.69:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.4	-0.6	1.173	4.629	12.533	0.283	0.726	0.852
15.0	24.4	14.5	1.174	5.094	12.870	0.275	0.946	0.890
30.0	24.4	29.5	1.116	5.782	13.041	0.238	1.220	0.903
45.0	24.4	44.4	0.806	6.327	13.417	0.187	1.463	0.902
60.0	24.4	59.3	0.588	6.126	13.166	0.139	1.502	0.851
75.0	24.5	74.3	0.507	6.448	13.227	0.102	1.162	0.628
90.0	24.5	89.2	0.417	6.348	11.455	0.116	0.998	0.472
105.0	24.5	104.0	0.766	8.668	10.534	0.146	0.825	0.320
120.0	24.4	119.1	0.932	5.468	11.424	0.182	1.372	0.536
135.0	24.4	134.0	0.839	5.335	11.540	0.198	1.148	0.473
150.0	24.3	148.8	0.892	4.854	10.885	0.226	1.000	0.458
165.0	24.4	164.1	1.033	4.737	10.918	0.225	0.734	0.389
180.0	24.6	179.4	0.783	5.224	10.542	0.240	0.688	0.355
195.0	24.6	194.6	0.937	7.464	10.347	0.213	0.995	0.385
210.0	24.5	210.1	0.658	7.115	10.330	0.203	1.693	0.513
225.0	24.5	225.1	0.630	8.223	10.264	0.169	1.863	0.541
240.0	24.5	240.2	0.879	10.759	10.499	0.149	2.004	0.486
255.0	24.4	255.0	0.796	11.172	10.650	0.133	1.980	0.574
270.0	24.4	270.2	0.506	9.329	11.076	0.109	2.099	0.589
285.0	24.5	285.1	0.462	11.793	11.588	0.086	2.050	0.653
300.0	24.5	300.0	0.406	9.698	11.333	0.095	1.774	0.526
315.0	24.5	314.8	0.596	8.560	11.516	0.152	1.519	0.614
330.0	24.4	329.5	0.834	7.668	12.220	0.214	1.099	0.704
345.0	24.4	344.4	1.190	6.306	11.960	0.262	0.757	0.786

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

**Table U.70:** Accelerations at Flight Deck: Bretschneider Spectrum with  $H_s = 17.7$  m and  $T_p = 25.7$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.4	-0.4	1.406	5.929	12.633	0.307	0.847	0.957
15.0	29.4	14.7	1.160	6.035	13.363	0.293	1.102	0.990
30.0	29.4	29.7	1.053	6.401	12.877	0.255	1.381	0.994
45.0	29.5	44.6	0.771	6.990	13.172	0.202	1.544	0.969
60.0	29.5	59.5	0.674	6.991	13.425	0.153	1.669	0.911
75.0	29.5	74.3	0.815	7.727	13.315	0.121	1.372	0.659
90.0	29.5	89.2	0.519	7.702	11.115	0.135	1.214	0.476
105.0	29.4	104.0	0.744	9.259	10.075	0.171	1.030	0.323
120.0	29.4	119.2	0.698	5.898	10.945	0.212	1.576	0.506
135.0	29.3	134.2	0.731	5.448	10.651	0.237	1.423	0.437
150.0	29.3	149.1	1.486	5.877	10.781	0.280	1.211	0.405
165.0	29.5	164.1	1.296	5.327	10.556	0.299	0.706	0.357
180.0	29.8	179.3	1.021	5.297	10.225	0.284	0.512	0.313
195.0	29.8	194.8	1.197	7.809	10.240	0.304	0.971	0.382
210.0	29.5	210.0	1.339	9.488	10.389	0.260	1.416	0.489
225.0	29.5	225.0	1.112	9.176	10.338	0.213	1.787	0.585
240.0	29.5	240.1	0.734	9.148	10.294	0.175	1.986	0.588
255.0	29.4	255.0	1.038	10.330	10.754	0.153	1.790	0.635
270.0	29.4	270.1	0.517	9.466	11.105	0.126	2.035	0.687
285.0	29.5	285.1	0.493	9.609	11.822	0.102	2.036	0.765
300.0	29.5	299.9	0.480	11.828	10.918	0.108	1.754	0.548
315.0	29.5	314.8	0.679	8.950	11.400	0.164	1.360	0.661
330.0	29.5	329.6	0.879	6.984	11.938	0.231	1.010	0.777
345.0	29.4	344.6	1.223	6.336	12.363	0.283	0.803	0.884

Wind at 69.4 knots (35.7 m/s) is from the starboard beam in all cases.

This page intentionally left blank.

**Annex V**  
**Tables of Flight Deck Accelerations –**  
**JONSWAP Spectrum (Coastal Waters)**

---

**Table V.1: Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 0.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.4	-27.7	0.718	2.162	11.091	0.184	0.443	0.490
15.0	-0.0	12.7	0.749	0.812	10.891	0.170	0.197	0.424
30.0	-0.1	30.9	0.789	1.971	11.025	0.186	0.462	0.474
45.0	-0.2	39.3	0.776	2.278	11.212	0.195	0.620	0.511
60.0	-0.3	44.1	0.858	3.697	11.416	0.197	0.712	0.528
75.0	-0.6	50.4	0.786	3.104	11.545	0.200	0.869	0.558
90.0	-1.1	57.2	0.837	4.014	11.928	0.197	1.022	0.580
105.0	-1.1	-36.3	1.041	5.576	13.513	0.196	0.943	0.561
120.0	-0.8	-19.3	0.915	7.229	14.163	0.188	0.889	0.555
135.0	-2.3	102.3	0.853	6.638	12.787	0.162	1.168	0.685
150.0	-3.1	107.6	0.860	5.744	12.720	0.174	1.147	0.681
165.0	-2.8	101.7	0.817	5.476	12.771	0.151	1.137	0.683
180.0	-1.0	66.4	0.740	4.301	12.213	0.156	0.647	0.489
195.0	-0.4	18.6	0.813	4.515	11.936	0.190	0.703	0.550
210.0	-0.2	387.7	0.797	3.358	11.762	0.197	0.714	0.570
225.0	0.5	314.2	0.735	2.995	11.628	0.199	0.702	0.574
240.0	1.5	291.9	0.770	5.965	13.364	0.200	1.075	0.783
255.0	1.0	293.6	0.783	4.513	13.156	0.205	1.092	0.771
270.0	0.5	299.3	0.727	4.317	12.550	0.209	1.031	0.718
285.0	0.2	304.9	0.859	4.285	12.732	0.208	0.936	0.662
300.0	0.0	309.2	0.847	3.794	12.061	0.207	0.848	0.627
315.0	-0.1	312.9	0.830	3.524	11.726	0.205	0.781	0.599
330.0	-0.2	315.9	0.772	3.255	11.444	0.202	0.718	0.579
345.0	-0.3	321.4	0.768	2.759	11.346	0.196	0.608	0.546

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.2:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	4.7	-1.1	0.691	0.660	11.263	0.192	0.104	0.534
15.0	4.7	13.8	0.818	0.899	11.327	0.195	0.214	0.539
30.0	4.7	28.6	0.762	1.810	11.563	0.212	0.386	0.588
45.0	4.6	43.0	0.921	2.137	11.738	0.227	0.620	0.648
60.0	4.4	55.1	0.830	3.557	12.258	0.231	0.857	0.706
75.0	4.0	56.2	0.817	3.531	12.506	0.226	0.893	0.695
90.0	3.6	57.8	0.799	4.473	12.320	0.222	0.928	0.684
105.0	3.6	60.6	0.861	4.525	12.992	0.219	0.970	0.706
120.0	3.8	61.1	0.844	3.776	12.503	0.221	0.967	0.721
135.0	3.9	61.5	0.805	4.684	12.577	0.222	0.964	0.728
150.0	4.4	145.5	0.393	1.781	10.903	0.112	0.467	0.246
165.0	4.8	163.8	0.396	1.088	10.699	0.097	0.241	0.190
180.0	4.8	179.2	0.344	0.499	10.746	0.090	0.097	0.174
195.0	4.8	194.7	0.359	1.047	10.723	0.094	0.249	0.192
210.0	4.7	211.2	0.385	1.704	10.925	0.107	0.460	0.243
225.0	4.7	284.5	0.835	6.099	13.725	0.192	1.081	0.879
240.0	4.5	286.4	1.201	5.315	13.681	0.194	1.101	0.877
255.0	4.4	289.9	0.787	4.647	13.874	0.208	1.081	0.846
270.0	4.3	293.3	0.971	5.838	13.395	0.218	1.057	0.819
285.0	4.4	295.0	0.851	3.962	13.224	0.222	1.027	0.803
300.0	4.7	302.5	0.828	3.988	12.467	0.235	0.921	0.754
315.0	4.7	315.1	0.898	2.675	11.742	0.232	0.665	0.675
330.0	4.7	329.4	0.796	1.848	11.596	0.216	0.417	0.609
345.0	4.7	344.1	0.852	1.094	11.382	0.199	0.228	0.551

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.3:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	9.7	-0.4	0.807	0.678	11.708	0.214	0.079	0.623
15.0	9.7	14.5	0.787	0.877	11.646	0.220	0.160	0.630
30.0	9.7	29.5	0.900	1.513	11.744	0.238	0.351	0.673
45.0	9.7	44.5	1.014	2.774	11.873	0.255	0.600	0.726
60.0	9.7	59.2	0.925	3.679	12.384	0.253	0.869	0.817
75.0	9.7	72.9	0.888	4.819	13.976	0.214	1.018	0.942
90.0	9.3	85.2	0.404	5.364	13.008	0.098	0.978	0.883
105.0	9.0	99.8	0.928	8.921	15.171	0.110	1.105	0.585
120.0	9.2	115.7	0.471	5.037	11.867	0.101	1.040	0.367
135.0	9.6	133.2	0.280	2.926	10.498	0.090	0.993	0.191
150.0	9.7	148.9	0.231	2.941	10.233	0.078	1.011	0.128
165.0	9.8	164.3	0.235	2.795	10.258	0.068	0.822	0.102
180.0	9.8	179.4	0.236	1.853	10.202	0.066	0.468	0.081
195.0	9.8	194.9	0.271	1.756	10.485	0.069	0.540	0.102
210.0	9.8	210.4	0.257	2.481	10.378	0.075	0.862	0.137
225.0	9.7	226.1	0.355	2.917	10.665	0.089	0.957	0.214
240.0	9.3	243.5	0.779	6.639	12.775	0.105	1.051	0.385
255.0	9.1	260.3	0.675	7.663	13.867	0.116	1.133	0.616
270.0	9.4	274.3	0.462	6.053	13.238	0.085	1.023	0.909
285.0	9.8	286.8	0.883	6.199	13.982	0.215	1.072	0.998
300.0	9.7	300.3	0.943	3.203	12.751	0.256	0.916	0.853
315.0	9.7	314.8	0.969	2.370	11.886	0.258	0.633	0.739
330.0	9.7	329.8	0.903	1.631	11.706	0.241	0.379	0.681
345.0	9.7	344.7	0.814	0.923	11.637	0.222	0.185	0.636

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table V.4:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	14.7	-0.3	0.812	1.049	11.875	0.236	0.106	0.662
15.0	14.7	14.7	0.876	1.206	11.676	0.243	0.168	0.670
30.0	14.6	29.8	0.952	1.773	12.055	0.262	0.335	0.726
45.0	14.6	44.8	1.046	2.829	12.072	0.278	0.569	0.803
60.0	14.7	59.6	0.961	3.839	12.759	0.270	0.839	0.928
75.0	14.7	74.0	0.772	5.471	13.717	0.215	0.971	1.044
90.0	14.6	88.3	0.301	5.121	12.891	0.050	0.922	0.802
105.0	14.4	103.1	0.564	6.595	12.722	0.089	1.077	0.479
120.0	14.5	118.1	0.391	5.466	11.947	0.069	1.378	0.274
135.0	14.6	133.9	0.208	4.486	10.372	0.058	1.592	0.237
150.0	14.7	149.6	0.180	2.961	10.240	0.061	0.927	0.132
165.0	14.7	164.6	0.298	2.181	10.172	0.060	0.475	0.073
180.0	14.7	179.6	0.245	2.085	10.113	0.069	0.317	0.067
195.0	14.8	194.7	0.214	2.927	10.188	0.061	0.414	0.046
210.0	14.7	209.9	0.195	3.426	9.977	0.061	0.922	0.066
225.0	14.7	225.6	0.256	3.858	10.701	0.058	1.453	0.157
240.0	14.6	241.2	0.304	4.110	10.907	0.075	1.406	0.268
255.0	14.5	256.8	0.445	7.706	12.583	0.097	1.134	0.498
270.0	14.6	271.6	0.318	4.686	13.208	0.044	1.047	0.872
285.0	14.8	285.9	0.863	4.329	14.000	0.214	1.095	1.122
300.0	14.7	300.1	1.005	3.502	12.944	0.272	0.902	0.974
315.0	14.6	314.8	0.949	2.411	12.378	0.281	0.609	0.825
330.0	14.6	329.8	0.969	1.611	11.930	0.264	0.363	0.739
345.0	14.7	344.8	0.894	1.273	11.767	0.245	0.191	0.678

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.5:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.2	0.847	1.499	12.052	0.254	0.147	0.760
15.0	19.6	14.8	0.869	1.544	12.086	0.262	0.181	0.779
30.0	19.6	29.8	0.999	1.952	12.120	0.282	0.322	0.861
45.0	19.6	44.8	1.002	2.588	12.644	0.297	0.535	0.957
60.0	19.6	59.8	0.994	3.571	13.029	0.285	0.796	1.079
75.0	19.6	74.4	0.756	4.841	13.965	0.218	0.926	1.143
90.0	19.6	89.0	0.247	5.224	12.821	0.042	0.890	0.789
105.0	19.6	104.0	0.361	5.168	11.760	0.070	1.073	0.416
120.0	19.6	119.1	0.204	5.514	11.001	0.048	1.983	0.355
135.0	19.6	134.8	0.207	4.190	10.295	0.053	1.259	0.180
150.0	19.8	149.7	0.513	2.770	10.087	0.064	0.627	0.086
165.0	19.9	164.7	0.226	2.319	9.934	0.067	0.314	0.059
180.0	19.6	179.6	0.506	3.290	9.944	0.071	0.423	0.083
195.0	19.7	194.8	0.325	3.695	9.915	0.069	0.531	0.092
210.0	19.7	209.9	0.291	4.142	9.910	0.063	0.777	0.105
225.0	19.6	225.1	0.207	5.184	10.226	0.052	1.464	0.153
240.0	19.6	240.7	0.215	6.213	10.708	0.051	1.907	0.225
255.0	19.6	255.9	0.402	5.123	12.146	0.080	1.200	0.417
270.0	19.6	270.9	0.269	6.792	13.406	0.039	1.117	0.877
285.0	19.7	285.5	0.799	4.497	14.141	0.213	1.138	1.230
300.0	19.6	300.1	0.964	3.842	13.551	0.282	0.913	1.127
315.0	19.6	314.9	1.040	2.520	12.827	0.297	0.611	0.982
330.0	19.6	329.9	0.963	1.858	12.379	0.282	0.373	0.874
345.0	19.6	344.9	0.848	1.470	11.998	0.261	0.214	0.788

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.6:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.7	-0.1	0.933	1.515	12.621	0.262	0.166	0.944
15.0	24.7	14.9	0.877	1.614	12.621	0.271	0.182	0.974
30.0	24.7	29.9	0.923	1.978	12.937	0.293	0.295	1.073
45.0	24.7	44.9	1.004	2.798	13.200	0.311	0.498	1.181
60.0	24.7	59.8	0.942	4.037	13.817	0.296	0.769	1.264
75.0	24.7	74.6	0.710	4.338	14.184	0.220	0.914	1.256
90.0	24.6	89.4	0.198	5.267	13.343	0.040	0.883	0.793
105.0	24.6	104.4	0.307	6.248	11.806	0.056	1.210	0.376
120.0	24.6	119.9	0.238	5.566	10.297	0.048	1.969	0.295
135.0	24.6	134.8	0.643	3.891	10.005	0.069	1.095	0.136
150.0	24.6	149.8	0.641	2.561	10.065	0.082	0.485	0.085
165.0	24.6	164.8	0.710	3.010	10.068	0.101	0.448	0.115
180.0	24.7	179.9	0.676	3.302	10.158	0.083	0.424	0.122
195.0	24.7	194.7	0.652	3.635	10.109	0.091	0.602	0.135
210.0	24.4	209.7	0.652	3.947	9.987	0.080	0.749	0.126
225.0	24.6	225.1	0.243	5.600	9.916	0.063	1.237	0.177
240.0	24.6	240.3	0.214	6.546	10.462	0.053	2.367	0.298
255.0	24.6	255.6	0.397	6.120	11.658	0.068	1.334	0.350
270.0	24.6	270.6	0.284	7.873	13.293	0.044	1.133	0.869
285.0	24.7	285.4	0.752	5.245	14.355	0.210	1.156	1.320
300.0	24.7	300.1	0.969	3.983	13.801	0.289	0.924	1.298
315.0	24.7	315.1	0.933	2.552	13.247	0.306	0.619	1.195
330.0	24.7	330.0	0.919	1.932	13.078	0.291	0.384	1.081
345.0	24.7	345.0	0.888	1.530	12.725	0.270	0.234	0.977

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.7: Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 8.2$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.7	-0.1	0.846	1.369	13.264	0.262	0.163	1.116
15.0	29.8	14.9	0.874	1.518	13.332	0.271	0.163	1.157
30.0	29.8	29.9	0.936	1.988	13.683	0.295	0.264	1.285
45.0	29.7	44.9	1.029	2.585	14.034	0.316	0.466	1.415
60.0	29.7	59.8	1.042	3.659	14.299	0.302	0.747	1.459
75.0	29.7	74.7	0.797	4.645	15.037	0.220	0.914	1.364
90.0	29.7	89.5	0.200	5.582	13.021	0.041	0.922	0.797
105.0	29.7	104.6	0.327	7.075	11.664	0.054	1.475	0.355
120.0	29.6	119.9	0.430	6.101	10.146	0.072	2.031	0.277
135.0	29.7	134.6	0.312	3.484	9.998	0.074	0.926	0.102
150.0	29.6	150.0	0.320	2.552	10.161	0.082	0.566	0.131
165.0	29.8	164.8	0.361	2.720	10.234	0.084	0.445	0.152
180.0	29.7	179.9	0.747	2.816	10.316	0.085	0.481	0.170
195.0	29.9	195.0	0.739	3.643	10.244	0.086	0.632	0.163
210.0	29.4	209.5	0.828	3.751	10.147	0.097	0.873	0.180
225.0	29.5	224.8	0.813	4.155	9.948	0.072	1.014	0.138
240.0	29.6	240.2	0.464	7.295	10.220	0.070	2.107	0.297
255.0	29.7	255.3	0.428	7.076	12.175	0.060	1.493	0.297
270.0	29.7	270.4	0.300	5.576	13.314	0.048	1.107	0.855
285.0	29.7	285.3	0.794	4.982	14.878	0.209	1.174	1.402
300.0	29.7	300.2	0.918	3.575	14.527	0.293	0.937	1.477
315.0	29.7	315.1	0.958	2.731	14.373	0.310	0.624	1.421
330.0	29.7	330.1	0.882	1.954	13.642	0.292	0.386	1.287
345.0	29.7	345.0	0.830	1.471	13.079	0.270	0.235	1.157

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.8:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	0.0	-7.5	0.577	2.171	10.771	0.136	0.338	0.326
15.0	-0.1	-2.3	0.483	1.579	10.767	0.135	0.217	0.316
30.0	-0.4	4.2	0.572	1.641	10.642	0.135	0.297	0.312
45.0	-0.4	19.7	0.502	2.523	10.660	0.132	0.620	0.318
60.0	-0.4	35.8	0.441	3.132	10.915	0.124	0.849	0.335
75.0	-0.4	50.0	0.405	3.095	11.187	0.111	0.973	0.352
90.0	-0.4	63.9	0.320	3.226	11.223	0.088	1.024	0.358
105.0	-0.4	78.6	0.197	3.059	11.136	0.044	1.022	0.340
120.0	-0.6	93.4	0.163	3.203	11.125	0.023	1.031	0.326
135.0	-1.1	103.6	0.269	3.422	11.251	0.052	1.058	0.345
150.0	-1.6	110.3	0.294	3.680	11.158	0.072	1.048	0.357
165.0	-0.3	14.7	0.466	3.582	10.756	0.130	0.383	0.318
180.0	0.3	269.3	0.488	2.877	11.009	0.117	0.632	0.320
195.0	0.2	357.0	0.605	3.851	11.010	0.129	0.577	0.334
210.0	0.3	363.7	0.511	3.824	10.934	0.125	0.695	0.340
225.0	0.8	262.8	0.229	3.785	11.387	0.039	1.036	0.376
240.0	0.8	273.9	0.217	4.054	11.156	0.033	1.026	0.380
255.0	0.8	286.8	0.312	4.251	11.713	0.069	1.024	0.402
270.0	0.6	298.1	0.448	4.070	11.704	0.096	1.008	0.403
285.0	0.3	307.8	0.427	3.722	11.274	0.111	0.945	0.388
300.0	0.2	317.8	0.549	3.743	11.197	0.120	0.887	0.370
315.0	0.1	328.1	0.540	3.662	11.019	0.126	0.777	0.352
330.0	0.1	338.9	0.523	3.054	10.857	0.131	0.631	0.338
345.0	0.1	347.1	0.579	2.360	10.782	0.135	0.463	0.331

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.9: Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 5.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	4.8	-1.2	0.654	0.623	11.063	0.158	0.096	0.385
15.0	4.8	13.1	0.618	1.348	10.845	0.156	0.359	0.385
30.0	4.7	27.5	0.738	2.156	11.174	0.151	0.635	0.394
45.0	4.7	42.0	0.639	2.810	11.416	0.140	0.818	0.406
60.0	4.6	55.9	0.494	3.420	11.712	0.122	0.949	0.420
75.0	4.6	69.8	0.327	3.673	11.535	0.081	0.988	0.409
90.0	4.5	83.1	0.134	3.409	11.406	0.026	0.981	0.369
105.0	4.3	93.7	0.150	3.104	11.263	0.019	0.994	0.347
120.0	4.0	99.6	0.196	3.366	11.361	0.031	0.993	0.337
135.0	3.9	108.3	0.262	4.103	11.291	0.050	0.983	0.329
150.0	4.3	141.5	0.320	2.542	10.946	0.082	0.667	0.251
165.0	4.6	161.8	0.397	1.446	10.901	0.086	0.370	0.215
180.0	4.8	178.8	0.366	0.961	10.742	0.088	0.179	0.205
195.0	4.8	195.3	0.410	1.450	10.891	0.086	0.407	0.211
210.0	4.7	212.6	0.352	2.319	10.829	0.082	0.655	0.236
225.0	4.5	231.0	0.336	3.318	11.103	0.075	0.869	0.283
240.0	4.5	247.6	0.275	3.134	11.267	0.058	0.979	0.332
255.0	4.6	260.4	0.162	3.464	11.386	0.032	0.988	0.352
270.0	4.7	274.3	0.137	3.423	11.201	0.019	0.978	0.379
285.0	4.8	288.1	0.344	3.754	11.989	0.074	0.981	0.425
300.0	4.8	302.1	0.450	3.363	11.431	0.119	0.970	0.436
315.0	4.8	316.0	0.665	3.238	11.561	0.140	0.821	0.417
330.0	4.8	330.2	0.610	2.442	10.998	0.150	0.633	0.399
345.0	4.8	344.5	0.633	1.816	11.013	0.156	0.390	0.389

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.10:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.7	-0.4	0.726	0.557	11.217	0.179	0.059	0.444
15.0	9.7	14.6	0.804	1.117	11.264	0.176	0.271	0.440
30.0	9.7	29.6	0.651	2.094	11.134	0.169	0.517	0.441
45.0	9.8	44.5	0.619	2.407	11.437	0.155	0.716	0.448
60.0	9.8	59.3	0.552	2.956	12.086	0.128	0.866	0.464
75.0	9.8	74.0	0.359	3.455	12.164	0.070	0.878	0.429
90.0	9.8	88.8	0.056	3.287	11.184	0.014	0.881	0.365
105.0	9.8	103.6	0.159	3.700	11.342	0.032	0.915	0.320
120.0	9.7	118.2	0.194	3.731	10.953	0.049	0.968	0.274
135.0	9.7	133.4	0.262	3.768	10.998	0.055	0.856	0.224
150.0	9.7	148.9	0.209	2.744	10.423	0.060	0.782	0.183
165.0	9.7	164.2	0.197	2.076	10.333	0.062	0.567	0.158
180.0	9.8	179.4	0.228	1.510	10.447	0.063	0.316	0.144
195.0	9.8	194.7	0.226	1.532	10.399	0.063	0.404	0.142
210.0	9.8	210.3	0.255	2.173	10.512	0.060	0.730	0.158
225.0	9.7	225.9	0.258	3.128	10.908	0.057	0.886	0.204
240.0	9.7	241.3	0.226	3.895	11.162	0.050	1.005	0.257
255.0	9.8	256.1	0.167	3.312	11.173	0.035	0.966	0.314
270.0	9.8	270.9	0.063	3.611	11.349	0.015	0.937	0.374
285.0	9.9	285.5	0.287	3.790	11.761	0.068	0.928	0.444
300.0	9.8	300.1	0.476	3.457	12.071	0.127	0.895	0.476
315.0	9.8	314.9	0.605	2.951	11.417	0.155	0.738	0.456
330.0	9.8	329.7	0.655	2.159	11.122	0.168	0.525	0.444
345.0	9.8	344.6	0.654	1.334	11.133	0.176	0.288	0.444

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.11: Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 15.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	14.7	-0.3	0.738	0.877	11.030	0.199	0.080	0.488
15.0	14.7	14.8	0.727	1.342	11.230	0.196	0.253	0.482
30.0	14.7	29.8	0.774	2.212	11.307	0.186	0.471	0.482
45.0	14.7	44.8	0.628	2.707	11.584	0.170	0.665	0.494
60.0	14.7	59.7	0.492	3.240	11.805	0.138	0.837	0.511
75.0	14.8	74.6	0.379	3.239	12.531	0.072	0.808	0.453
90.0	14.8	89.4	0.069	3.251	11.186	0.020	0.809	0.367
105.0	14.7	104.3	0.175	3.865	11.362	0.031	0.847	0.304
120.0	14.7	119.1	0.187	3.985	10.808	0.040	1.117	0.261
135.0	14.7	134.4	0.222	4.019	10.610	0.041	1.077	0.218
150.0	14.7	149.6	0.162	2.558	10.278	0.046	0.717	0.161
165.0	14.7	164.7	0.191	1.699	10.249	0.045	0.363	0.125
180.0	14.7	179.7	0.184	1.407	10.153	0.047	0.221	0.110
195.0	14.7	194.7	0.204	2.060	10.068	0.048	0.342	0.097
210.0	14.7	209.8	0.193	3.388	10.048	0.045	0.683	0.094
225.0	14.7	225.3	0.281	3.694	10.655	0.044	1.136	0.140
240.0	14.7	240.6	0.241	4.245	11.075	0.042	1.175	0.212
255.0	14.8	255.4	0.199	4.054	11.064	0.035	0.996	0.275
270.0	14.8	270.3	0.100	3.822	11.166	0.023	0.943	0.373
285.0	14.8	285.1	0.261	3.623	11.604	0.069	0.902	0.473
300.0	14.7	299.9	0.475	3.788	11.847	0.137	0.865	0.534
315.0	14.7	314.7	0.614	2.869	11.570	0.170	0.675	0.505
330.0	14.7	329.7	0.766	2.123	11.262	0.187	0.462	0.487
345.0	14.7	344.7	0.700	1.450	11.172	0.195	0.238	0.483

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.



**Table V.12:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.2	0.840	1.329	11.434	0.217	0.128	0.552
15.0	19.6	14.9	0.953	1.710	11.475	0.214	0.273	0.550
30.0	19.6	29.9	0.806	2.483	11.591	0.203	0.467	0.558
45.0	19.6	44.9	0.638	2.727	11.725	0.183	0.656	0.574
60.0	19.6	59.9	0.554	3.684	12.164	0.148	0.833	0.583
75.0	19.7	74.8	0.353	3.597	12.474	0.076	0.736	0.480
90.0	19.7	89.7	0.088	3.145	11.205	0.026	0.730	0.369
105.0	19.7	104.7	0.151	3.405	11.028	0.034	0.773	0.290
120.0	19.6	119.6	0.152	4.412	10.499	0.039	1.315	0.276
135.0	19.7	134.8	0.150	3.351	10.251	0.037	0.786	0.167
150.0	19.7	149.8	0.145	2.288	10.150	0.044	0.533	0.129
165.0	19.7	164.8	0.168	1.986	10.005	0.044	0.268	0.083
180.0	19.6	179.8	0.156	2.539	9.970	0.044	0.240	0.073
195.0	19.7	194.9	0.164	2.607	9.936	0.047	0.339	0.066
210.0	19.7	209.9	0.152	3.596	9.952	0.039	0.557	0.073
225.0	19.6	225.0	0.178	5.033	9.947	0.042	1.155	0.111
240.0	19.7	240.3	0.212	4.833	10.467	0.040	1.447	0.152
255.0	19.7	255.2	0.171	4.550	10.722	0.037	1.013	0.233
270.0	19.7	270.1	0.133	3.961	11.094	0.030	0.932	0.365
285.0	19.7	285.0	0.244	3.918	11.747	0.072	0.860	0.505
300.0	19.7	299.9	0.487	3.815	11.969	0.145	0.808	0.610
315.0	19.6	314.8	0.646	2.917	11.644	0.182	0.603	0.587
330.0	19.6	329.8	0.811	2.317	11.625	0.202	0.398	0.564
345.0	19.6	344.8	0.794	1.629	11.452	0.213	0.208	0.553

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.13:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.7	-0.1	0.955	1.489	11.781	0.232	0.149	0.675
15.0	24.7	15.0	0.867	1.844	12.224	0.229	0.275	0.673
30.0	24.7	30.0	0.872	2.526	12.045	0.217	0.452	0.681
45.0	24.7	45.0	0.718	2.996	12.150	0.195	0.632	0.691
60.0	24.7	60.0	0.622	3.807	12.564	0.157	0.820	0.682
75.0	24.7	74.9	0.278	3.279	11.994	0.080	0.695	0.521
90.0	24.7	89.8	0.112	3.039	11.194	0.031	0.687	0.361
105.0	24.7	104.8	0.185	3.573	11.053	0.040	0.746	0.264
120.0	24.7	119.9	0.166	3.923	10.181	0.043	1.150	0.212
135.0	24.7	134.9	0.166	2.696	10.064	0.047	0.785	0.132
150.0	24.7	149.9	0.213	2.278	10.003	0.066	0.598	0.110
165.0	24.7	164.9	0.237	1.833	10.043	0.067	0.274	0.075
180.0	24.8	179.9	0.225	1.807	9.968	0.066	0.173	0.056
195.0	24.7	194.9	0.174	2.557	9.930	0.057	0.310	0.053
210.0	24.7	210.0	0.218	3.603	9.967	0.053	0.631	0.084
225.0	24.7	225.0	0.141	4.555	9.906	0.046	1.007	0.114
240.0	24.7	240.1	0.170	5.896	9.912	0.043	1.458	0.131
255.0	24.7	255.1	0.202	4.581	10.689	0.042	0.948	0.203
270.0	24.7	270.1	0.142	3.784	11.297	0.037	0.877	0.353
285.0	24.7	285.0	0.277	3.844	11.905	0.075	0.799	0.545
300.0	24.7	299.9	0.544	3.919	12.336	0.151	0.761	0.701
315.0	24.7	314.9	0.707	3.222	12.093	0.192	0.559	0.701
330.0	24.7	329.9	0.856	2.267	12.254	0.215	0.363	0.687
345.0	24.7	344.9	0.868	1.624	12.036	0.228	0.196	0.676

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.14:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 4.0$  m and  $T_p = 13.6$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.7	-0.0	0.964	1.359	12.829	0.245	0.151	0.845
15.0	29.7	15.0	0.869	1.663	12.801	0.241	0.262	0.842
30.0	29.7	30.0	0.888	2.434	12.535	0.228	0.426	0.840
45.0	29.7	45.0	0.844	3.079	12.466	0.204	0.607	0.829
60.0	29.7	60.0	0.581	3.266	12.339	0.162	0.817	0.790
75.0	29.7	74.9	0.264	3.141	11.802	0.083	0.675	0.568
90.0	29.7	89.9	0.135	3.182	11.107	0.037	0.696	0.352
105.0	29.7	104.9	0.177	3.088	10.683	0.047	0.800	0.240
120.0	29.7	119.9	0.284	5.999	10.016	0.060	1.467	0.216
135.0	29.7	134.9	0.242	3.538	9.949	0.062	0.895	0.110
150.0	29.8	149.9	0.271	2.412	9.951	0.083	0.551	0.079
165.0	29.6	164.9	0.315	1.749	9.936	0.091	0.312	0.052
180.0	30.1	179.9	0.329	1.942	9.879	0.092	0.210	0.036
195.0	29.7	194.9	0.322	2.523	9.919	0.090	0.400	0.054
210.0	29.8	210.0	0.233	2.975	9.913	0.074	0.620	0.074
225.0	29.8	225.2	0.156	3.650	9.897	0.049	0.801	0.084
240.0	29.7	240.1	0.221	6.088	9.865	0.051	1.430	0.144
255.0	29.7	255.1	0.189	3.900	10.505	0.049	0.860	0.180
270.0	29.7	270.0	0.161	3.619	11.171	0.042	0.783	0.346
285.0	29.7	285.0	0.265	3.777	12.033	0.079	0.726	0.594
300.0	29.7	299.9	0.557	3.453	12.432	0.157	0.739	0.803
315.0	29.7	314.9	0.743	2.790	12.454	0.200	0.532	0.835
330.0	29.7	329.9	0.818	2.096	12.565	0.226	0.351	0.846
345.0	29.7	344.9	0.946	1.448	12.650	0.240	0.201	0.843

Wind at 20.8 knots (10.7 m/s) is from the starboard beam in all cases.

**Table V.15:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-0.1	-14.8	1.336	3.260	11.437	0.279	0.530	0.707
15.0	-0.3	-8.0	1.160	1.942	11.327	0.277	0.331	0.684
30.0	-0.8	2.9	1.164	1.782	11.361	0.274	0.320	0.656
45.0	-1.2	14.5	1.353	3.131	11.482	0.273	0.672	0.645
60.0	-2.4	-38.4	1.288	11.201	13.589	0.237	1.639	0.794
75.0	-2.0	-24.4	1.320	10.877	14.515	0.250	1.714	0.775
90.0	-2.7	-27.4	1.285	8.174	14.493	0.258	1.674	0.742
105.0	-2.5	-4.7	1.362	8.889	15.847	0.255	1.615	0.737
120.0	-1.5	23.5	1.422	10.658	14.542	0.224	1.618	0.754
135.0	-3.6	104.8	2.446	11.661	14.367	0.222	1.910	0.928
150.0	-4.6	112.2	1.936	10.286	13.785	0.241	1.786	0.921
165.0	-2.6	39.5	1.184	8.141	13.364	0.248	1.345	0.786
180.0	-0.3	358.6	1.246	9.412	13.274	0.271	0.731	0.706
195.0	-0.1	372.2	1.191	4.750	12.038	0.277	0.766	0.724
210.0	-0.3	378.0	1.267	4.218	12.267	0.275	0.932	0.744
225.0	-0.3	382.0	1.197	5.604	13.111	0.272	1.136	0.769
240.0	0.1	385.1	1.080	7.900	13.938	0.278	1.273	0.831
255.0	0.7	332.4	1.892	6.041	15.569	0.279	1.558	0.951
270.0	0.8	335.1	1.311	6.434	13.591	0.285	1.512	0.927
285.0	0.3	309.4	1.224	6.311	13.447	0.286	1.368	0.875
300.0	0.1	316.4	1.271	6.087	13.070	0.284	1.203	0.815
315.0	-0.2	324.7	1.254	5.320	12.037	0.282	1.047	0.773
330.0	-0.1	331.9	1.207	5.143	11.705	0.281	0.851	0.741
345.0	-0.0	338.4	1.332	4.490	12.010	0.281	0.664	0.726

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.16:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	4.5	-2.4	1.197	1.216	11.753	0.312	0.196	0.808
15.0	4.4	11.9	1.300	1.329	11.934	0.315	0.330	0.808
30.0	4.2	24.6	1.443	2.398	12.213	0.317	0.620	0.825
45.0	3.8	29.7	1.431	3.496	12.533	0.316	0.783	0.821
60.0	3.3	30.9	1.386	3.667	11.862	0.310	0.827	0.795
75.0	3.0	37.8	1.262	4.560	12.119	0.305	1.030	0.795
90.0	3.1	40.6	1.182	5.573	12.699	0.302	1.128	0.818
105.0	3.4	42.5	1.235	6.248	13.634	0.305	1.132	0.852
120.0	3.6	43.3	1.385	5.346	12.482	0.307	1.132	0.866
135.0	3.6	43.1	1.395	5.766	12.590	0.307	1.100	0.863
150.0	3.5	41.8	1.333	5.080	12.166	0.308	1.059	0.859
165.0	3.3	51.9	1.289	5.338	12.590	0.301	1.056	0.838
180.0	4.6	179.4	0.612	1.167	11.353	0.154	0.251	0.323
195.0	4.3	199.3	0.665	2.288	11.647	0.161	0.574	0.372
210.0	4.1	353.6	1.407	3.964	12.145	0.308	0.500	0.803
225.0	4.3	308.0	1.142	6.029	14.316	0.302	1.277	0.924
240.0	4.2	360.6	1.558	8.149	16.127	0.306	1.088	0.911
255.0	4.5	292.7	1.234	6.315	14.262	0.279	1.597	1.061
270.0	4.3	298.9	1.309	6.512	14.892	0.295	1.510	1.013
285.0	4.2	303.3	1.350	7.073	15.174	0.304	1.454	0.982
300.0	4.3	306.9	1.217	5.988	13.354	0.310	1.336	0.955
315.0	4.4	316.9	1.201	5.439	12.332	0.320	1.084	0.913
330.0	4.5	329.6	1.375	4.053	12.625	0.324	0.784	0.872
345.0	4.5	343.5	1.284	2.294	11.804	0.318	0.440	0.834

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.17:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.5	-0.7	1.460	1.425	12.223	0.349	0.198	0.929
15.0	9.5	14.2	1.518	1.465	12.241	0.351	0.320	0.930
30.0	9.4	29.1	1.306	2.347	12.513	0.355	0.629	0.958
45.0	9.4	44.0	1.515	4.635	12.646	0.350	1.001	0.986
60.0	9.4	58.3	1.095	6.515	13.196	0.325	1.321	1.043
75.0	9.2	70.1	3.412	6.991	15.732	0.282	1.528	1.139
90.0	8.3	76.0	1.139	8.331	14.736	0.230	1.600	1.135
105.0	8.0	77.5	0.989	10.026	15.658	0.217	1.583	1.108
120.0	8.0	82.5	1.058	10.604	15.961	0.174	1.655	1.069
135.0	8.1	83.6	1.007	12.913	15.010	0.189	1.698	1.075
150.0	9.2	146.2	0.433	3.716	10.975	0.119	1.349	0.268
165.0	9.5	162.8	0.371	3.602	10.644	0.114	1.130	0.208
180.0	9.7	178.8	0.412	3.068	10.637	0.112	0.723	0.177
195.0	9.7	195.2	0.427	2.453	10.925	0.114	0.760	0.196
210.0	9.4	212.2	0.417	3.636	10.981	0.120	1.219	0.264
225.0	8.4	264.4	0.816	13.830	14.946	0.122	1.788	0.918
240.0	8.5	275.7	1.732	10.571	17.096	0.160	1.713	1.106
255.0	8.5	278.2	1.498	12.019	15.901	0.174	1.713	1.135
270.0	8.7	281.1	1.318	19.934	15.649	0.202	1.713	1.202
285.0	9.5	288.1	1.647	9.011	17.501	0.274	1.614	1.222
300.0	9.6	300.8	1.237	6.431	13.750	0.328	1.370	1.090
315.0	9.5	314.8	1.475	5.640	12.619	0.353	1.043	1.007
330.0	9.5	329.6	1.347	2.942	12.160	0.359	0.697	0.978
345.0	9.5	344.4	1.401	2.349	12.539	0.353	0.391	0.934

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.18:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.5	-0.4	1.383	1.403	12.467	0.382	0.214	1.006
15.0	14.5	14.6	1.456	1.782	12.349	0.383	0.318	1.012
30.0	14.5	29.7	1.438	2.481	12.371	0.388	0.606	1.048
45.0	14.5	44.7	1.555	3.851	12.848	0.378	0.927	1.089
60.0	14.6	59.4	1.202	5.829	13.755	0.343	1.280	1.175
75.0	14.6	73.5	1.352	9.837	16.555	0.267	1.451	1.283
90.0	14.3	87.1	0.645	8.759	15.310	0.092	1.491	1.034
105.0	14.0	100.9	1.443	15.218	15.566	0.112	1.778	0.770
120.0	14.1	116.3	0.470	7.228	12.292	0.103	1.962	0.521
135.0	14.4	132.7	0.371	6.712	12.063	0.082	1.827	0.369
150.0	14.5	148.8	0.390	4.513	10.958	0.095	1.382	0.255
165.0	14.6	164.3	0.401	3.282	10.617	0.095	0.753	0.162
180.0	14.7	179.4	0.347	2.528	10.490	0.104	0.465	0.135
195.0	14.7	194.5	0.349	3.401	10.208	0.090	0.645	0.092
210.0	14.6	209.8	0.361	4.796	10.312	0.091	1.263	0.120
225.0	14.4	227.3	0.448	5.645	11.899	0.088	1.901	0.296
240.0	14.2	243.7	0.506	6.564	12.396	0.109	1.956	0.479
255.0	14.0	259.3	0.845	13.651	14.838	0.124	1.913	0.771
270.0	14.2	273.5	1.415	10.473	15.861	0.107	1.698	1.121
285.0	14.7	286.4	1.374	7.285	15.128	0.267	1.604	1.358
300.0	14.6	300.1	1.207	4.957	13.767	0.344	1.343	1.228
315.0	14.5	314.7	1.461	3.540	12.769	0.380	0.985	1.116
330.0	14.5	329.6	1.444	2.686	12.493	0.390	0.646	1.063
345.0	14.5	344.6	1.442	1.729	12.444	0.386	0.349	1.020

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.19:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.6	-0.3	1.468	2.061	13.144	0.411	0.287	1.164
15.0	19.6	14.8	1.548	2.259	13.157	0.413	0.361	1.172
30.0	19.6	29.8	1.517	3.418	13.110	0.416	0.601	1.219
45.0	19.5	44.9	1.445	4.371	13.628	0.403	0.900	1.265
60.0	19.6	59.6	1.412	6.437	14.395	0.361	1.227	1.346
75.0	19.6	74.1	1.174	7.523	16.109	0.270	1.365	1.400
90.0	19.4	88.4	0.781	9.181	16.006	0.079	1.424	1.019
105.0	19.4	103.2	0.505	12.235	13.868	0.095	1.766	0.680
120.0	19.5	118.4	0.335	6.908	12.300	0.071	2.247	0.526
135.0	19.3	134.2	0.467	6.414	11.116	0.091	2.066	0.377
150.0	19.6	149.3	0.546	4.235	10.731	0.107	1.161	0.195
165.0	19.8	164.5	0.597	3.210	10.466	0.108	0.579	0.122
180.0	19.6	179.3	0.848	3.549	10.532	0.116	0.557	0.125
195.0	19.8	194.9	0.573	3.855	10.277	0.094	0.669	0.112
210.0	19.6	210.1	0.583	6.136	10.210	0.094	1.298	0.183
225.0	19.4	225.5	0.582	7.226	10.751	0.085	2.164	0.280
240.0	19.5	241.9	0.438	11.331	13.192	0.080	2.456	0.401
255.0	19.3	257.1	0.872	16.827	15.616	0.111	2.004	0.656
270.0	19.4	271.8	1.385	11.690	16.725	0.084	1.787	1.109
285.0	19.6	285.9	1.039	6.535	15.748	0.263	1.666	1.494
300.0	19.6	300.0	1.239	5.674	14.458	0.357	1.349	1.417
315.0	19.6	314.8	1.367	3.516	13.538	0.400	0.957	1.298
330.0	19.6	329.8	1.557	2.957	13.460	0.415	0.634	1.238
345.0	19.6	344.8	1.551	1.893	13.081	0.413	0.368	1.186

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table V.20:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.6	-0.1	1.460	2.660	13.798	0.433	0.390	1.426
15.0	24.6	14.8	1.494	3.060	13.992	0.434	0.439	1.433
30.0	24.6	29.9	1.483	3.821	13.941	0.438	0.630	1.475
45.0	24.5	44.9	1.584	5.272	14.259	0.425	0.893	1.510
60.0	24.5	59.7	1.360	6.179	14.610	0.378	1.175	1.545
75.0	24.5	74.3	1.025	8.219	15.849	0.273	1.293	1.501
90.0	24.4	88.9	0.485	8.982	15.176	0.074	1.387	1.010
105.0	24.5	104.1	0.457	8.663	12.685	0.082	1.867	0.613
120.0	24.4	119.5	0.624	7.481	11.542	0.080	2.522	0.513
135.0	24.3	134.5	0.674	5.845	10.411	0.119	1.710	0.283
150.0	24.2	149.6	0.812	3.977	10.221	0.149	0.972	0.190
165.0	24.5	164.4	0.999	3.802	10.480	0.147	0.653	0.162
180.0	24.8	179.7	0.743	4.244	10.071	0.125	0.553	0.138
195.0	24.6	194.6	0.812	4.448	10.227	0.130	0.806	0.188
210.0	24.2	209.4	0.752	5.016	9.989	0.145	1.121	0.222
225.0	24.4	225.6	0.688	6.866	10.343	0.107	1.935	0.326
240.0	24.3	241.1	0.637	13.366	13.380	0.087	2.961	0.472
255.0	24.4	256.3	0.624	14.283	13.860	0.102	2.192	0.556
270.0	24.4	271.2	1.807	10.194	15.606	0.081	1.859	1.105
285.0	24.6	285.6	1.100	7.657	16.241	0.259	1.760	1.606
300.0	24.6	300.1	1.289	5.266	15.009	0.364	1.404	1.608
315.0	24.6	314.9	1.459	4.116	14.580	0.417	1.010	1.546
330.0	24.6	329.9	1.436	3.082	14.127	0.433	0.695	1.498
345.0	24.6	344.9	1.435	2.568	13.986	0.433	0.482	1.442

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.21:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 9.3$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.1	1.341	3.198	14.962	0.443	0.481	1.738
15.0	29.6	14.9	1.348	3.721	14.751	0.448	0.489	1.748
30.0	29.6	29.9	1.450	4.178	15.138	0.451	0.641	1.779
45.0	29.6	44.9	1.433	5.962	14.969	0.439	0.879	1.778
60.0	29.5	59.8	1.378	6.031	15.102	0.390	1.152	1.756
75.0	29.5	74.5	0.950	6.810	15.748	0.277	1.235	1.625
90.0	29.5	89.2	0.621	10.377	14.805	0.072	1.363	1.000
105.0	29.5	104.5	0.994	8.633	11.957	0.092	2.347	0.583
120.0	29.2	119.5	0.941	9.144	11.443	0.131	2.644	0.503
135.0	29.3	134.5	0.902	5.265	10.547	0.133	1.455	0.233
150.0	29.4	149.7	1.003	4.243	10.208	0.152	0.921	0.198
165.0	29.7	164.1	1.083	4.871	10.375	0.157	0.783	0.232
180.0	29.2	179.5	1.081	4.891	10.257	0.181	0.832	0.250
195.0	29.8	194.6	1.071	5.174	10.416	0.157	0.980	0.260
210.0	29.5	209.8	0.936	4.920	10.064	0.148	1.129	0.245
225.0	29.3	224.9	0.819	5.858	10.510	0.125	1.511	0.275
240.0	29.3	240.8	0.770	9.106	11.871	0.107	2.648	0.454
255.0	29.4	255.7	0.841	11.904	13.454	0.103	2.498	0.480
270.0	29.5	270.8	1.290	13.700	14.732	0.085	1.880	1.088
285.0	29.6	285.5	1.102	8.475	16.819	0.256	1.863	1.709
300.0	29.6	300.2	1.222	5.532	15.657	0.369	1.450	1.811
315.0	29.6	315.1	1.373	3.997	15.139	0.425	1.064	1.812
330.0	29.6	330.1	1.464	3.737	15.094	0.442	0.766	1.799
345.0	29.6	345.0	1.425	2.907	15.020	0.442	0.570	1.753

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.22:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	0.0	-11.0	0.986	3.594	11.313	0.206	0.594	0.505
15.0	-0.4	-7.0	0.799	3.026	11.202	0.203	0.509	0.486
30.0	-1.1	-0.7	0.808	2.293	11.133	0.202	0.510	0.470
45.0	-1.6	-77.7	0.584	5.946	12.441	0.117	1.437	0.534
60.0	-0.6	35.0	0.849	4.128	11.762	0.186	1.117	0.502
75.0	-0.5	50.5	0.673	4.023	11.704	0.166	1.275	0.523
90.0	-0.4	65.8	0.673	4.506	12.636	0.127	1.371	0.532
105.0	-0.4	80.4	0.336	4.868	12.138	0.063	1.385	0.507
120.0	-1.0	95.1	0.368	4.719	12.158	0.044	1.408	0.495
135.0	-2.0	104.1	0.409	5.828	11.977	0.083	1.448	0.531
150.0	-1.2	15.5	0.798	4.797	11.705	0.184	0.911	0.484
165.0	-0.6	9.6	0.878	3.979	11.309	0.199	0.619	0.487
180.0	-0.2	354.8	0.765	4.788	11.309	0.196	0.742	0.495
195.0	0.1	367.9	0.928	4.231	11.694	0.198	0.838	0.512
210.0	0.0	382.4	0.795	5.013	11.909	0.192	1.017	0.533
225.0	1.6	270.7	0.428	5.931	12.090	0.064	1.421	0.553
240.0	1.4	276.8	0.390	6.439	12.197	0.060	1.395	0.565
255.0	1.3	287.6	0.565	6.782	13.272	0.111	1.382	0.595
270.0	1.0	297.2	0.707	6.361	13.018	0.146	1.332	0.597
285.0	0.7	305.8	0.758	5.892	12.521	0.165	1.273	0.583
300.0	0.4	314.7	0.757	5.476	12.143	0.178	1.177	0.563
315.0	0.1	322.5	0.816	5.492	12.061	0.186	1.095	0.546
330.0	-0.1	331.8	0.801	5.218	11.990	0.193	0.969	0.527
345.0	0.0	343.1	0.964	4.459	11.395	0.201	0.786	0.512

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.23:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	4.6	-2.9	0.990	1.810	11.419	0.236	0.286	0.576
15.0	4.2	5.5	1.161	2.160	11.566	0.236	0.480	0.569
30.0	3.5	0.1	1.270	3.455	11.911	0.233	0.582	0.546
45.0	3.4	10.1	1.078	3.784	11.949	0.228	0.780	0.554
60.0	3.5	24.4	0.985	4.623	12.603	0.218	0.995	0.571
75.0	3.8	50.0	0.742	5.554	12.610	0.188	1.263	0.606
90.0	3.7	61.7	0.698	5.527	12.545	0.156	1.334	0.604
105.0	3.7	75.0	0.433	4.849	11.958	0.091	1.345	0.572
120.0	3.6	89.8	0.216	5.025	12.208	0.027	1.354	0.522
135.0	3.4	101.4	0.332	6.076	12.217	0.055	1.374	0.517
150.0	3.6	48.6	0.818	5.459	12.466	0.191	1.194	0.583
165.0	3.4	49.4	0.944	5.818	12.561	0.195	1.157	0.576
180.0	4.5	177.6	0.731	1.925	11.730	0.133	0.336	0.313
195.0	4.5	197.9	0.657	2.419	11.963	0.129	0.608	0.329
210.0	4.4	244.0	0.679	5.739	12.134	0.095	1.309	0.485
225.0	4.4	257.1	0.583	5.071	12.043	0.067	1.383	0.518
240.0	4.4	267.8	0.285	5.321	11.929	0.042	1.371	0.542
255.0	4.4	278.7	0.359	7.541	12.395	0.069	1.392	0.583
270.0	4.4	287.7	0.483	6.565	12.491	0.111	1.404	0.619
285.0	4.5	295.5	0.685	5.581	12.836	0.151	1.375	0.639
300.0	4.6	305.1	0.842	5.112	12.669	0.187	1.291	0.641
315.0	4.6	317.5	1.036	4.743	12.429	0.210	1.108	0.616
330.0	4.7	330.5	0.968	4.394	11.660	0.224	0.897	0.597
345.0	4.7	343.9	0.963	2.596	11.403	0.233	0.600	0.585

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.24:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	9.6	-0.8	1.202	1.033	11.788	0.267	0.143	0.660
15.0	9.6	14.1	1.228	1.825	11.813	0.262	0.417	0.656
30.0	9.6	29.1	1.103	2.650	11.818	0.250	0.758	0.655
45.0	9.6	44.0	0.956	3.369	12.167	0.231	1.032	0.669
60.0	9.7	58.7	0.924	4.830	13.276	0.193	1.231	0.688
75.0	9.7	73.1	0.675	5.907	13.771	0.112	1.255	0.646
90.0	9.6	87.5	0.168	5.469	12.077	0.027	1.257	0.561
105.0	9.5	102.1	0.319	6.058	12.099	0.048	1.286	0.500
120.0	9.2	115.8	0.428	6.183	12.255	0.073	1.309	0.448
135.0	9.2	130.7	0.476	5.474	11.976	0.083	1.165	0.365
150.0	9.4	147.3	0.417	3.404	11.144	0.092	1.080	0.293
165.0	9.5	163.2	0.380	3.057	10.955	0.095	0.838	0.250
180.0	9.6	178.9	0.378	2.485	10.653	0.095	0.546	0.215
195.0	9.7	194.8	0.409	2.094	10.804	0.095	0.596	0.214
210.0	9.6	211.2	0.404	3.001	10.977	0.093	1.036	0.248
225.0	9.4	228.3	0.494	4.632	11.800	0.086	1.230	0.329
240.0	9.3	243.9	0.462	4.912	12.120	0.077	1.391	0.418
255.0	9.5	258.0	0.385	5.127	12.252	0.054	1.381	0.485
270.0	9.7	272.3	0.211	6.030	12.462	0.028	1.345	0.569
285.0	9.8	286.5	0.560	6.436	12.932	0.108	1.342	0.664
300.0	9.7	300.6	0.764	5.362	13.313	0.190	1.270	0.700
315.0	9.7	314.9	0.885	3.969	12.209	0.231	1.037	0.674
330.0	9.7	329.6	1.156	3.287	12.177	0.251	0.761	0.661
345.0	9.6	344.4	1.264	2.021	11.861	0.262	0.424	0.659

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.25:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.6	-0.4	1.306	1.124	11.817	0.295	0.144	0.726
15.0	14.6	14.7	1.126	1.702	11.765	0.289	0.386	0.723
30.0	14.6	29.8	1.204	2.664	12.209	0.275	0.696	0.721
45.0	14.6	44.8	0.951	3.373	12.394	0.250	0.961	0.734
60.0	14.7	59.5	0.729	4.433	12.956	0.204	1.190	0.760
75.0	14.7	74.2	0.672	5.506	14.247	0.111	1.183	0.687
90.0	14.7	88.9	0.130	4.849	12.129	0.032	1.169	0.563
105.0	14.7	103.8	0.291	5.081	11.868	0.049	1.200	0.472
120.0	14.5	118.1	0.456	6.469	12.452	0.064	1.465	0.432
135.0	14.5	133.7	0.431	5.274	11.666	0.066	1.436	0.346
150.0	14.6	149.1	0.393	3.976	11.030	0.072	1.063	0.259
165.0	14.7	164.4	0.356	2.811	10.653	0.068	0.541	0.192
180.0	14.7	179.5	0.345	2.318	10.389	0.071	0.377	0.165
195.0	14.7	194.6	0.312	3.067	10.168	0.073	0.547	0.139
210.0	14.7	209.9	0.385	4.223	10.542	0.071	1.022	0.142
225.0	14.6	226.0	0.343	4.463	10.820	0.070	1.580	0.234
240.0	14.5	241.7	0.438	5.859	11.937	0.067	1.620	0.351
255.0	14.7	256.2	0.399	6.390	11.997	0.055	1.439	0.428
270.0	14.7	270.9	0.192	5.675	12.328	0.035	1.365	0.562
285.0	14.8	285.5	0.481	6.198	12.831	0.106	1.338	0.704
300.0	14.7	300.0	0.766	4.810	12.924	0.202	1.249	0.782
315.0	14.6	314.6	0.882	3.937	12.203	0.249	0.972	0.744
330.0	14.6	329.5	1.183	2.958	12.165	0.276	0.663	0.726
345.0	14.6	344.5	1.153	1.797	11.685	0.289	0.358	0.723
Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.								

**Table V.26:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.6	-0.3	1.350	1.711	12.466	0.320	0.220	0.825
15.0	19.6	14.8	1.198	2.255	12.100	0.314	0.412	0.822
30.0	19.6	29.9	1.263	3.011	12.310	0.298	0.687	0.830
45.0	19.6	44.9	1.019	3.732	12.364	0.267	0.959	0.840
60.0	19.6	59.8	0.816	4.703	13.372	0.218	1.185	0.861
75.0	19.6	74.6	0.616	6.040	14.135	0.115	1.100	0.724
90.0	19.7	89.4	0.144	4.630	12.151	0.040	1.072	0.562
105.0	19.7	104.4	0.270	5.250	11.681	0.053	1.155	0.452
120.0	19.6	119.1	0.325	6.722	11.491	0.065	1.776	0.448
135.0	19.6	134.6	0.393	5.413	11.165	0.068	1.433	0.301
150.0	19.6	149.5	0.337	3.679	10.778	0.078	0.950	0.226
165.0	19.7	164.6	0.499	2.801	10.250	0.071	0.479	0.139
180.0	19.5	179.5	0.406	3.009	10.074	0.067	0.442	0.117
195.0	19.7	194.8	0.272	3.967	10.024	0.071	0.591	0.111
210.0	19.6	210.0	0.249	5.322	9.957	0.065	0.975	0.127
225.0	19.5	225.3	0.479	6.490	10.322	0.065	1.635	0.174
240.0	19.6	240.8	0.337	6.264	11.239	0.066	2.013	0.269
255.0	19.7	255.6	0.396	6.449	11.318	0.058	1.489	0.358
270.0	19.7	270.5	0.209	6.786	12.454	0.045	1.405	0.550
285.0	19.7	285.2	0.432	6.137	12.799	0.107	1.334	0.745
300.0	19.6	299.9	0.740	5.424	13.137	0.212	1.225	0.890
315.0	19.6	314.6	0.963	3.911	12.355	0.266	0.915	0.862
330.0	19.6	329.6	1.203	3.266	12.364	0.297	0.616	0.837
345.0	19.6	344.6	1.328	2.239	12.037	0.314	0.336	0.825

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.27:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.5	-0.2	1.246	2.637	13.027	0.342	0.335	0.993
15.0	24.5	14.9	1.377	2.937	12.761	0.336	0.475	0.987
30.0	24.5	30.0	1.369	3.738	13.100	0.318	0.710	0.993
45.0	24.5	45.0	1.105	4.111	13.078	0.286	0.946	1.000
60.0	24.5	59.9	0.851	5.144	13.106	0.230	1.183	0.984
75.0	24.6	74.7	0.454	5.416	13.091	0.122	1.029	0.773
90.0	24.6	89.6	0.174	4.749	11.980	0.049	1.005	0.563
105.0	24.6	104.6	0.327	5.365	11.865	0.064	1.116	0.423
120.0	24.6	119.8	0.259	5.386	10.495	0.073	1.795	0.394
135.0	24.5	134.7	0.377	4.982	10.339	0.086	1.285	0.256
150.0	24.5	149.7	0.330	2.988	10.257	0.099	0.857	0.191
165.0	24.6	164.7	0.409	3.194	10.168	0.101	0.513	0.142
180.0	24.9	179.8	0.372	3.138	10.111	0.099	0.359	0.113
195.0	24.6	194.6	0.300	3.735	9.987	0.087	0.534	0.127
210.0	24.6	209.9	0.397	5.089	10.027	0.075	0.872	0.174
225.0	24.5	225.1	0.532	7.413	9.985	0.075	1.474	0.242
240.0	24.5	240.3	0.267	7.645	10.092	0.071	2.227	0.284
255.0	24.6	255.3	0.367	8.352	11.130	0.065	1.515	0.303
270.0	24.6	270.3	0.261	6.788	12.379	0.055	1.407	0.530
285.0	24.6	285.1	0.392	6.830	12.700	0.111	1.323	0.798
300.0	24.6	299.9	0.832	6.096	13.408	0.220	1.197	1.011
315.0	24.5	314.7	1.066	4.482	13.029	0.278	0.872	1.008
330.0	24.5	329.7	1.218	3.251	13.158	0.314	0.595	0.997
345.0	24.5	344.8	1.306	2.732	13.430	0.334	0.376	0.988

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.



**Table V.28:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 6.0$  m and  $T_p = 13.6$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.1	1.497	2.976	14.097	0.358	0.418	1.205
15.0	29.6	15.0	1.430	3.166	13.720	0.353	0.527	1.205
30.0	29.6	30.0	1.369	4.035	13.570	0.335	0.721	1.196
45.0	29.6	45.0	1.240	4.171	13.855	0.300	0.938	1.184
60.0	29.6	60.0	0.788	4.985	13.371	0.242	1.176	1.129
75.0	29.6	74.8	0.425	5.173	13.232	0.129	1.005	0.837
90.0	29.6	89.7	0.217	4.758	11.938	0.057	1.009	0.555
105.0	29.6	104.8	0.294	4.331	11.238	0.075	1.157	0.399
120.0	29.5	119.8	0.366	5.968	10.202	0.093	1.892	0.367
135.0	29.5	134.7	0.351	3.914	10.025	0.093	1.170	0.190
150.0	29.6	149.7	0.424	3.482	10.086	0.127	0.779	0.155
165.0	29.6	164.5	0.533	3.516	10.017	0.146	0.601	0.135
180.0	30.4	179.8	0.523	4.043	9.972	0.138	0.487	0.109
195.0	29.7	194.8	0.524	4.175	9.963	0.141	0.670	0.145
210.0	29.7	210.0	0.363	4.361	9.901	0.113	0.843	0.162
225.0	29.5	225.0	0.300	6.069	9.979	0.089	1.281	0.254
240.0	29.6	240.1	0.280	6.610	9.929	0.073	1.722	0.269
255.0	29.6	255.1	0.302	7.024	10.844	0.075	1.450	0.265
270.0	29.6	270.1	0.299	6.925	11.820	0.065	1.366	0.512
285.0	29.6	285.1	0.486	6.584	12.835	0.116	1.287	0.858
300.0	29.6	299.9	0.837	5.797	13.519	0.226	1.136	1.137
315.0	29.6	314.9	1.132	4.540	13.583	0.288	0.847	1.181
330.0	29.6	329.9	1.295	3.721	13.953	0.328	0.615	1.199
345.0	29.6	344.9	1.331	2.986	13.907	0.350	0.469	1.204

Wind at 28.0 knots (14.4 m/s) is from the starboard beam in all cases.

**Table V.29:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-1.0	-23.1	1.890	11.688	14.656	0.377	1.428	0.986
15.0	-1.9	-121.3	1.809	9.728	14.906	0.354	1.698	0.983
30.0	-2.9	-77.1	2.569	17.241	16.930	0.349	2.294	1.162
45.0	-4.3	97.6	2.305	16.106	15.380	0.299	2.524	1.248
60.0	-2.8	-80.0	1.939	15.056	14.359	0.270	2.645	1.217
75.0	-0.7	-40.2	2.069	13.259	16.762	0.289	2.528	1.161
90.0	-0.7	-18.6	2.265	14.382	17.202	0.338	2.498	1.110
105.0	-1.4	-40.0	2.209	17.655	15.186	0.339	2.207	1.029
120.0	-1.2	95.7	1.622	13.478	14.657	0.167	2.702	1.114
135.0	-4.2	105.0	2.238	13.546	14.866	0.272	2.737	1.224
150.0	-5.4	58.8	2.414	13.512	16.617	0.324	2.453	1.144
165.0	-8.0	-10.4	1.597	13.862	16.152	0.341	2.553	1.259
180.0	-0.7	10.3	1.700	8.102	14.083	0.376	1.371	0.982
195.0	-1.0	20.6	1.974	9.527	15.332	0.372	1.552	0.981
210.0	-0.3	382.9	2.638	10.777	17.493	0.372	1.669	1.030
225.0	0.2	395.2	1.708	12.584	15.664	0.368	1.804	1.062
240.0	2.7	283.8	1.534	13.902	17.222	0.271	2.451	1.276
255.0	1.1	287.6	2.960	12.489	16.366	0.327	2.361	1.257
270.0	1.5	295.8	2.337	13.232	18.870	0.358	2.287	1.232
285.0	1.3	304.0	1.721	11.320	17.313	0.372	2.054	1.167
300.0	0.9	312.0	3.185	20.081	17.373	0.384	1.874	1.109
315.0	0.3	320.4	1.862	8.678	15.288	0.379	1.660	1.056
330.0	-0.1	327.4	1.770	8.170	14.407	0.379	1.504	1.023
345.0	-0.5	332.8	1.853	8.889	15.083	0.380	1.410	1.003

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.30:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	3.6	-17.0	1.934	7.459	14.307	0.433	1.062	1.088
15.0	2.6	-23.9	2.125	6.636	13.602	0.427	1.306	1.087
30.0	2.4	-17.3	1.834	6.567	14.083	0.418	1.304	1.059
45.0	2.2	-6.9	2.058	5.944	12.989	0.414	1.239	1.028
60.0	2.3	-9.1	1.886	11.751	14.481	0.396	1.597	1.044
75.0	2.4	-1.8	1.781	7.533	16.435	0.401	1.606	1.049
90.0	2.5	21.5	1.814	9.582	15.919	0.390	1.749	1.084
105.0	2.7	26.4	1.807	12.622	16.516	0.382	1.787	1.107
120.0	2.6	17.6	1.996	8.514	13.475	0.406	1.390	1.056
135.0	2.3	22.0	1.831	7.744	14.772	0.391	1.531	1.043
150.0	2.4	27.5	1.984	7.733	14.022	0.401	1.428	1.057
165.0	2.4	32.1	1.732	7.735	14.010	0.405	1.502	1.076
180.0	2.8	71.0	1.507	9.626	14.210	0.373	1.692	1.006
195.0	3.7	365.9	2.026	8.029	13.878	0.427	1.097	1.078
210.0	3.8	372.1	1.856	8.405	13.685	0.423	1.259	1.090
225.0	4.2	351.2	1.995	12.535	16.064	0.393	1.707	1.149
240.0	4.5	295.7	3.212	13.189	17.625	0.312	2.492	1.332
255.0	4.7	289.5	1.923	12.754	17.186	0.327	2.398	1.342
270.0	4.5	296.2	2.648	23.620	17.109	0.369	2.252	1.273
285.0	4.3	303.0	2.280	11.652	16.706	0.382	1.985	1.220
300.0	4.3	309.2	1.779	8.714	16.970	0.395	1.929	1.188
315.0	4.2	316.8	1.921	7.183	15.983	0.411	1.657	1.159
330.0	4.1	329.9	1.776	6.100	13.764	0.425	1.305	1.117
345.0	4.0	340.0	1.952	6.908	13.636	0.434	1.082	1.099

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.31:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.2	-1.8	1.988	3.774	12.646	0.486	0.449	1.217
15.0	9.0	12.4	2.136	2.661	13.106	0.482	0.646	1.214
30.0	8.8	26.9	2.120	4.490	13.535	0.468	1.095	1.219
45.0	8.8	41.8	1.862	6.006	13.746	0.440	1.538	1.228
60.0	8.8	55.5	1.582	8.725	15.743	0.400	1.908	1.269
75.0	8.4	64.2	2.414	13.375	16.786	0.371	2.132	1.354
90.0	7.9	68.6	1.919	14.167	18.608	0.330	2.164	1.366
105.0	7.8	77.0	1.447	12.133	17.168	0.256	2.265	1.355
120.0	7.7	90.7	1.826	19.305	15.892	0.118	2.485	1.185
135.0	7.5	91.3	1.484	20.489	16.267	0.213	2.472	1.207
150.0	7.8	72.5	1.636	14.034	18.118	0.328	2.304	1.298
165.0	7.7	71.5	2.065	14.036	17.511	0.346	2.252	1.284
180.0	9.2	177.7	0.901	3.928	11.629	0.165	1.007	0.327
195.0	9.2	197.6	0.896	6.263	11.980	0.166	1.107	0.352
210.0	8.4	299.8	3.103	16.967	17.695	0.349	2.134	1.279
225.0	8.3	271.4	2.311	22.072	16.194	0.175	2.868	1.264
240.0	8.3	280.0	2.801	22.149	16.895	0.243	2.614	1.351
255.0	8.4	283.0	1.859	16.497	16.956	0.266	2.511	1.401
270.0	8.5	285.7	3.217	25.369	17.620	0.303	2.497	1.447
285.0	9.1	290.5	2.382	13.615	19.581	0.344	2.328	1.440
300.0	9.3	301.6	3.017	8.450	15.639	0.405	2.001	1.320
315.0	9.2	314.7	1.729	6.617	14.406	0.443	1.658	1.257
330.0	9.2	329.1	2.058	5.933	13.522	0.469	1.195	1.244
345.0	9.2	343.7	2.131	4.661	13.241	0.483	0.778	1.232

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.32:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.4	-0.8	2.208	2.048	13.104	0.527	0.392	1.346
15.0	14.3	14.3	2.144	2.956	12.992	0.523	0.619	1.340
30.0	14.3	29.4	2.027	4.431	13.573	0.506	1.028	1.354
45.0	14.3	44.5	1.844	6.936	13.641	0.467	1.472	1.355
60.0	14.4	59.1	1.628	9.714	15.120	0.410	1.911	1.423
75.0	14.3	72.3	3.576	14.260	17.094	0.328	2.170	1.535
90.0	13.7	85.3	1.596	13.910	16.854	0.153	2.409	1.341
105.0	13.5	99.1	1.378	23.620	15.342	0.124	2.552	1.079
120.0	13.2	110.4	2.156	17.860	18.810	0.150	2.519	0.955
135.0	13.5	127.8	0.853	15.519	14.619	0.127	2.267	0.687
150.0	14.4	148.3	0.623	5.794	11.937	0.114	1.474	0.383
165.0	14.3	163.2	0.733	4.275	11.628	0.149	1.060	0.324
180.0	14.4	178.6	0.680	4.247	11.259	0.135	0.688	0.238
195.0	14.3	193.9	0.748	4.988	11.139	0.151	0.984	0.199
210.0	14.6	209.8	0.713	5.737	11.556	0.127	1.513	0.214
225.0	13.6	236.2	1.130	15.722	13.569	0.151	2.591	0.669
240.0	13.1	253.2	1.437	19.973	15.072	0.159	2.807	0.944
255.0	13.1	265.1	1.468	25.016	16.643	0.133	2.794	1.124
270.0	13.6	275.9	1.422	16.398	18.146	0.166	2.632	1.379
285.0	14.4	287.3	1.900	10.698	19.238	0.317	2.374	1.562
300.0	14.5	300.2	1.625	7.425	16.612	0.409	1.973	1.462
315.0	14.4	314.4	1.882	6.002	14.719	0.470	1.498	1.379
330.0	14.4	329.2	1.950	4.821	13.106	0.506	1.067	1.366
345.0	14.3	344.2	2.012	3.403	13.453	0.521	0.671	1.343

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.33:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	19.5	-0.4	2.058	2.388	13.952	0.559	0.446	1.541
15.0	19.5	14.7	1.987	3.328	13.803	0.552	0.644	1.545
30.0	19.4	29.8	1.959	4.967	13.677	0.536	1.030	1.550
45.0	19.4	44.9	1.979	6.308	14.193	0.497	1.417	1.550
60.0	19.5	59.5	1.578	8.538	15.854	0.429	1.847	1.615
75.0	19.4	73.7	2.400	15.097	17.961	0.316	2.087	1.646
90.0	19.2	87.7	1.250	13.961	16.038	0.119	2.322	1.286
105.0	19.2	102.7	0.768	17.896	14.764	0.124	2.487	0.952
120.0	19.1	117.2	0.945	11.245	13.221	0.122	2.713	0.778
135.0	19.2	134.2	0.901	9.883	11.704	0.132	2.311	0.470
150.0	19.1	149.0	0.653	5.770	11.268	0.160	1.749	0.337
165.0	19.5	164.0	0.921	3.850	10.995	0.167	0.908	0.234
180.0	19.6	179.5	0.842	3.926	11.675	0.177	0.663	0.213
195.0	19.6	194.8	0.874	4.926	10.644	0.156	1.033	0.179
210.0	19.2	210.4	0.658	7.273	10.961	0.147	1.828	0.260
225.0	19.1	227.3	1.664	14.767	13.675	0.131	2.599	0.472
240.0	18.9	244.4	0.754	16.902	13.657	0.133	3.026	0.667
255.0	18.8	259.5	1.019	20.464	14.675	0.139	2.911	0.945
270.0	19.0	273.1	1.158	16.363	17.561	0.131	2.716	1.336
285.0	19.5	286.3	1.544	12.328	17.752	0.306	2.428	1.685
300.0	19.6	300.0	1.611	9.073	16.363	0.425	1.946	1.673
315.0	19.5	314.5	2.136	5.528	14.631	0.493	1.434	1.589
330.0	19.5	329.4	2.225	4.429	14.021	0.534	1.002	1.566
345.0	19.5	344.5	2.120	3.059	13.963	0.551	0.631	1.542

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.34:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 25.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.5	-0.2	2.040	3.329	15.188	0.583	0.600	1.841
15.0	24.5	14.9	2.119	4.333	15.097	0.579	0.760	1.828
30.0	24.5	29.9	2.015	6.526	14.819	0.562	1.078	1.821
45.0	24.4	44.9	1.986	6.884	14.871	0.521	1.410	1.807
60.0	24.4	59.7	1.564	8.602	15.435	0.448	1.751	1.826
75.0	24.4	74.0	1.993	10.886	18.111	0.313	1.953	1.744
90.0	24.3	88.5	1.422	15.714	16.457	0.116	2.280	1.271
105.0	24.3	104.1	1.183	15.874	13.403	0.131	2.734	0.854
120.0	24.1	119.0	0.698	9.263	13.466	0.145	3.296	0.748
135.0	23.7	132.6	0.977	9.924	13.372	0.200	2.695	0.617
150.0	24.2	148.8	0.970	6.820	11.379	0.190	1.619	0.316
165.0	24.8	164.3	0.798	5.499	10.412	0.184	0.938	0.226
180.0	25.3	179.6	0.721	4.412	10.397	0.172	0.695	0.191
195.0	25.2	195.3	0.885	5.243	10.035	0.167	0.883	0.178
210.0	24.2	210.8	0.772	6.370	11.436	0.179	1.677	0.297
225.0	23.7	228.7	1.015	14.908	14.499	0.159	2.800	0.542
240.0	24.1	241.3	0.764	12.017	12.618	0.131	3.368	0.571
255.0	24.0	257.4	1.337	23.658	15.117	0.144	3.040	0.778
270.0	24.2	271.9	1.189	17.073	16.657	0.127	2.831	1.294
285.0	24.5	286.0	1.839	11.908	16.995	0.301	2.586	1.791
300.0	24.5	300.1	1.499	8.119	15.709	0.433	2.003	1.879
315.0	24.5	314.7	2.104	5.505	15.450	0.509	1.481	1.844
330.0	24.5	329.7	2.039	4.077	15.275	0.554	1.037	1.856
345.0	24.5	344.7	2.111	3.187	15.403	0.574	0.724	1.844

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.35:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 11.0$  s; Ship's speed is 30.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.6	-0.0	2.004	5.421	16.448	0.599	0.846	2.183
15.0	29.5	15.0	1.971	5.591	16.294	0.598	0.945	2.161
30.0	29.5	30.1	2.098	7.155	15.696	0.582	1.192	2.131
45.0	29.5	45.0	1.977	8.506	16.079	0.542	1.449	2.083
60.0	29.4	59.7	1.658	9.304	17.114	0.463	1.720	2.035
75.0	29.4	74.2	2.656	11.803	18.788	0.322	1.904	1.870
90.0	29.3	88.9	0.867	15.604	15.856	0.118	2.286	1.257
105.0	29.3	104.4	1.081	15.289	14.157	0.132	2.685	0.776
120.0	28.7	118.1	0.963	11.906	14.864	0.183	3.177	0.778
135.0	28.8	133.9	1.173	8.072	12.113	0.257	2.450	0.460
150.0	29.6	148.2	1.061	6.873	11.471	0.238	1.526	0.366
165.0	29.7	163.3	1.121	6.908	10.338	0.283	1.103	0.343
180.0	30.2	178.7	2.427	6.526	10.484	0.312	1.028	0.326
195.0	30.7	194.8	1.212	6.038	10.919	0.252	1.136	0.314
210.0	30.0	210.9	1.056	5.937	10.794	0.217	1.567	0.310
225.0	28.8	227.5	0.974	12.093	13.184	0.229	2.695	0.544
240.0	28.9	241.6	1.165	21.662	13.751	0.155	3.216	0.685
255.0	29.2	256.1	1.020	13.550	14.514	0.142	3.193	0.639
270.0	29.2	271.3	1.111	16.972	16.907	0.132	2.938	1.262
285.0	29.5	285.8	1.346	12.243	18.158	0.300	2.708	1.914
300.0	29.5	300.1	1.629	8.812	17.094	0.440	2.120	2.088
315.0	29.5	314.9	1.852	6.307	16.616	0.522	1.595	2.133
330.0	29.5	329.9	1.902	4.911	16.422	0.566	1.193	2.168
345.0	29.5	345.0	1.889	4.414	16.563	0.589	0.938	2.183

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.



**Table V.36:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 0.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	-1.0	-20.7	0.753	4.598	11.421	0.205	0.852	0.533
15.0	-2.2	-124.4	0.967	5.258	12.344	0.184	1.184	0.575
30.0	-2.3	-110.4	0.831	5.603	12.362	0.164	1.340	0.578
45.0	-1.8	-91.3	0.630	5.458	12.188	0.122	1.486	0.561
60.0	0.1	49.7	0.580	4.635	12.092	0.153	1.307	0.541
75.0	0.2	66.2	0.518	4.386	12.072	0.102	1.383	0.529
90.0	-0.1	84.2	0.338	5.038	12.092	0.046	1.391	0.509
105.0	-0.6	96.0	0.309	4.839	11.900	0.044	1.408	0.513
120.0	-1.4	105.3	0.372	5.588	12.199	0.067	1.448	0.533
135.0	-2.2	114.0	0.440	5.110	11.805	0.094	1.431	0.556
150.0	-3.1	123.7	0.600	5.597	12.316	0.129	1.356	0.580
165.0	-2.9	87.6	0.821	5.510	12.120	0.174	1.349	0.568
180.0	-1.0	25.0	0.791	4.750	11.536	0.202	0.878	0.536
195.0	1.0	225.4	0.822	5.600	12.445	0.144	1.298	0.529
210.0	1.1	242.1	0.692	6.268	12.088	0.106	1.452	0.540
225.0	0.8	253.0	0.570	6.130	12.635	0.074	1.462	0.538
240.0	0.4	263.2	0.482	6.404	12.155	0.045	1.433	0.526
255.0	0.3	274.2	0.321	6.090	12.353	0.037	1.399	0.520
270.0	0.2	284.7	0.411	5.976	12.702	0.067	1.366	0.531
285.0	0.0	294.0	0.554	5.976	12.789	0.101	1.319	0.543
300.0	-0.2	302.6	0.663	6.213	12.212	0.132	1.266	0.552
315.0	-0.2	311.4	0.799	6.612	12.723	0.158	1.195	0.553
330.0	-0.3	319.8	0.830	6.360	12.140	0.176	1.103	0.552
345.0	-0.5	329.1	0.785	5.476	12.162	0.193	0.971	0.548

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.37:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 5.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	3.2	-27.7	1.306	6.020	12.080	0.229	1.034	0.589
15.0	2.8	-20.8	1.321	5.221	11.878	0.234	0.970	0.583
30.0	2.7	-13.3	1.283	3.907	11.565	0.236	0.975	0.588
45.0	2.9	3.4	1.051	3.750	12.591	0.234	1.028	0.599
60.0	3.9	41.9	0.778	4.716	12.434	0.195	1.203	0.616
75.0	4.1	60.1	0.569	4.689	12.392	0.129	1.332	0.591
90.0	4.2	76.0	0.394	5.183	12.362	0.061	1.348	0.557
105.0	4.0	89.6	0.241	4.927	12.292	0.026	1.363	0.534
120.0	3.7	101.3	0.237	5.924	12.445	0.040	1.382	0.538
135.0	3.4	111.1	0.407	6.669	12.481	0.062	1.389	0.551
150.0	2.9	120.9	0.587	6.421	12.604	0.087	1.358	0.550
165.0	2.6	131.7	0.690	6.482	12.517	0.112	1.290	0.527
180.0	2.8	56.5	0.847	5.171	12.848	0.195	1.395	0.562
195.0	4.2	194.8	1.071	3.968	12.220	0.145	0.727	0.391
210.0	4.2	227.1	0.895	5.392	12.342	0.116	1.201	0.454
225.0	4.3	244.3	0.530	5.152	12.143	0.081	1.363	0.491
240.0	4.3	255.9	0.370	5.547	11.733	0.054	1.412	0.499
255.0	4.4	265.5	0.281	6.431	12.096	0.033	1.399	0.511
270.0	4.5	278.2	0.366	5.932	12.450	0.036	1.397	0.531
285.0	4.6	290.8	0.427	6.798	12.531	0.087	1.394	0.567
300.0	4.7	302.8	0.775	5.823	13.453	0.143	1.332	0.597
315.0	4.6	313.9	0.804	5.720	12.964	0.189	1.211	0.613
330.0	4.4	324.5	0.891	7.313	12.425	0.217	1.080	0.615
345.0	4.0	331.6	1.234	6.104	12.200	0.230	0.979	0.608

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.38:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 10.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	9.5	-1.7	1.183	1.983	11.679	0.284	0.300	0.694
15.0	9.5	13.5	1.126	2.569	11.901	0.279	0.586	0.702
30.0	9.5	28.7	1.157	3.205	12.109	0.258	0.936	0.707
45.0	9.6	43.7	0.936	4.118	13.044	0.216	1.172	0.690
60.0	9.6	58.1	0.876	4.953	13.856	0.154	1.330	0.659
75.0	9.7	73.0	0.346	5.296	12.619	0.076	1.278	0.604
90.0	9.7	87.7	0.140	4.746	12.092	0.030	1.262	0.557
105.0	9.6	102.6	0.260	5.182	12.150	0.043	1.270	0.525
120.0	9.1	115.8	0.569	4.910	12.177	0.064	1.304	0.505
135.0	9.0	130.1	0.533	5.860	12.223	0.083	1.201	0.455
150.0	9.0	145.5	0.600	4.350	12.055	0.099	1.038	0.389
165.0	9.0	160.9	0.738	4.052	11.856	0.109	0.935	0.339
180.0	9.3	177.8	0.544	2.940	11.097	0.111	0.734	0.287
195.0	9.5	194.7	0.634	3.176	11.442	0.110	0.705	0.267
210.0	9.4	211.9	0.612	5.115	11.571	0.103	1.098	0.308
225.0	9.2	229.1	0.601	5.520	11.850	0.088	1.373	0.379
240.0	9.3	244.0	0.481	5.780	11.873	0.071	1.503	0.439
255.0	9.6	257.5	0.345	5.299	12.456	0.050	1.471	0.470
270.0	9.7	271.9	0.226	6.274	12.495	0.032	1.464	0.519
285.0	9.7	286.3	0.485	8.171	13.023	0.070	1.456	0.576
300.0	9.7	300.8	0.626	6.429	12.712	0.147	1.426	0.633
315.0	9.6	314.6	0.771	5.107	12.640	0.210	1.211	0.660
330.0	9.6	328.9	1.131	3.661	12.206	0.252	0.924	0.678
345.0	9.5	343.5	1.063	2.740	12.000	0.276	0.604	0.689

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.39:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 15.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	14.5	-0.7	1.283	1.784	12.133	0.314	0.273	0.762
15.0	14.5	14.5	1.208	2.776	11.964	0.307	0.595	0.770
30.0	14.6	29.6	1.182	3.701	12.590	0.282	0.967	0.774
45.0	14.6	44.5	0.927	4.474	12.629	0.234	1.223	0.753
60.0	14.6	59.2	0.541	5.333	12.542	0.160	1.419	0.713
75.0	14.7	74.1	0.411	6.286	13.096	0.078	1.239	0.636
90.0	14.7	89.0	0.154	4.568	12.181	0.043	1.183	0.563
105.0	14.7	103.9	0.468	4.998	12.261	0.056	1.195	0.509
120.0	14.4	118.1	0.664	5.988	12.306	0.073	1.522	0.508
135.0	14.4	133.3	0.416	5.156	11.549	0.084	1.430	0.439
150.0	14.4	148.6	0.470	4.139	11.255	0.092	1.056	0.349
165.0	14.6	163.9	0.461	3.219	10.916	0.092	0.686	0.279
180.0	14.6	179.2	0.556	2.375	10.819	0.103	0.555	0.243
195.0	14.6	194.6	0.530	3.820	10.623	0.091	0.692	0.187
210.0	14.6	210.2	0.454	4.490	10.638	0.088	1.182	0.180
225.0	14.5	226.3	0.385	4.778	11.006	0.086	1.671	0.262
240.0	14.5	241.9	0.591	6.531	11.741	0.077	1.796	0.369
255.0	14.7	256.1	0.400	7.155	11.517	0.062	1.588	0.420
270.0	14.7	270.9	0.257	7.284	11.846	0.046	1.552	0.505
285.0	14.8	285.5	0.481	8.407	13.002	0.069	1.513	0.586
300.0	14.7	300.2	0.655	5.707	12.778	0.153	1.541	0.672
315.0	14.6	314.6	0.936	4.887	13.120	0.229	1.275	0.713
330.0	14.5	329.3	1.137	3.668	12.315	0.278	0.928	0.739
345.0	14.5	344.2	1.363	2.526	12.282	0.306	0.545	0.752

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.40:** Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 20.0 Knots

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	$\psi_{MHP}$ deg	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$
0.0	19.5	-0.4	1.460	2.215	12.166	0.341	0.354	0.866
15.0	19.6	14.8	1.369	2.867	12.213	0.333	0.665	0.874
30.0	19.6	29.9	1.274	3.880	12.547	0.307	1.022	0.872
45.0	19.6	44.9	0.893	4.713	12.853	0.254	1.321	0.845
60.0	19.6	59.7	0.731	5.670	13.460	0.173	1.523	0.791
75.0	19.7	74.5	0.520	5.554	13.780	0.083	1.196	0.662
90.0	19.7	89.4	0.204	4.398	12.199	0.056	1.106	0.566
105.0	19.7	104.4	0.473	4.560	12.479	0.073	1.112	0.487
120.0	19.6	119.0	0.370	5.665	11.514	0.091	1.798	0.518
135.0	19.6	134.3	0.612	5.552	11.477	0.097	1.412	0.378
150.0	19.5	149.3	0.647	4.773	10.899	0.115	1.144	0.315
165.0	19.6	164.4	0.421	2.746	10.615	0.108	0.656	0.246
180.0	19.6	179.5	0.611	3.067	10.646	0.113	0.549	0.211
195.0	19.7	194.7	0.405	4.922	10.179	0.095	0.781	0.177
210.0	19.6	210.0	0.543	7.300	10.011	0.102	1.330	0.203
225.0	19.6	225.3	0.711	7.304	10.930	0.092	1.708	0.213
240.0	19.6	240.9	0.581	7.189	11.306	0.088	2.056	0.294
255.0	19.7	255.5	0.388	7.488	11.325	0.073	1.653	0.365
270.0	19.7	270.4	0.255	8.264	11.847	0.058	1.603	0.489
285.0	19.7	285.3	0.330	7.249	12.568	0.072	1.581	0.595
300.0	19.6	300.0	0.707	7.637	12.996	0.162	1.629	0.725
315.0	19.6	314.6	0.881	5.391	12.533	0.246	1.294	0.787
330.0	19.6	329.4	1.153	4.128	12.558	0.301	0.916	0.833
345.0	19.5	344.5	1.491	2.754	12.304	0.332	0.510	0.853

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.41: Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 25.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	24.5	-0.2	1.474	3.136	12.966	0.367	0.497	1.038
15.0	24.5	14.9	1.495	3.836	12.906	0.359	0.763	1.043
30.0	24.5	30.0	1.377	5.015	12.904	0.331	1.091	1.036
45.0	24.5	45.0	1.069	5.277	13.137	0.272	1.384	0.966
60.0	24.5	59.9	0.720	6.217	13.759	0.185	1.614	0.872
75.0	24.6	74.6	0.542	5.540	14.227	0.091	1.161	0.690
90.0	24.6	89.5	0.247	4.518	11.976	0.069	1.044	0.568
105.0	24.6	104.6	0.404	4.649	11.900	0.091	1.047	0.465
120.0	24.5	119.5	0.463	6.817	10.996	0.111	1.932	0.490
135.0	24.5	134.5	0.659	6.353	11.351	0.133	1.767	0.371
150.0	24.5	149.4	0.684	5.083	11.032	0.144	1.260	0.294
165.0	24.8	164.5	0.481	3.223	10.276	0.111	0.555	0.182
180.0	24.8	179.7	0.514	3.547	10.382	0.145	0.449	0.204
195.0	24.8	194.9	0.413	3.633	10.115	0.104	0.485	0.145
210.0	24.6	210.1	0.565	5.953	10.160	0.120	1.242	0.284
225.0	24.5	225.2	0.611	8.560	9.970	0.111	1.728	0.338
240.0	24.6	240.3	0.380	8.608	10.014	0.097	2.124	0.282
255.0	24.6	255.2	0.458	7.502	11.456	0.086	1.669	0.335
270.0	24.6	270.2	0.310	8.552	11.772	0.070	1.623	0.478
285.0	24.6	285.1	0.422	8.485	12.276	0.076	1.637	0.614
300.0	24.6	299.9	0.721	8.054	12.999	0.170	1.644	0.780
315.0	24.6	314.7	0.980	5.780	12.876	0.263	1.244	0.906
330.0	24.5	329.6	1.417	4.878	12.832	0.325	0.855	0.985
345.0	24.5	344.7	1.446	3.433	12.669	0.355	0.545	1.020

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

**Table V.42: Accelerations at Flight Deck: JONSWAP Spectrum with  $H_s = 9.0$  m and  $T_p = 17.1$  s; Ship's speed is 30.0 Knots**

Cmd Heading	Actual Mean		Absolute Maximum			Standard Deviation		
	Speed kts	$\psi_{MHP}$ deg	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$	Long $m/s^2$	Lat $m/s^2$	Vert $m/s^2$
0.0	29.5	-0.1	1.906	4.526	13.678	0.387	0.706	1.248
15.0	29.5	15.0	1.590	5.190	13.528	0.381	0.908	1.258
30.0	29.5	30.1	1.601	5.729	13.692	0.353	1.188	1.238
45.0	29.5	45.0	1.124	6.146	13.695	0.296	1.422	1.154
60.0	29.5	59.9	0.715	7.353	13.742	0.201	1.652	0.980
75.0	29.5	74.7	0.372	5.048	12.834	0.100	1.194	0.719
90.0	29.5	89.6	0.340	4.800	11.847	0.084	1.113	0.562
105.0	29.5	104.6	0.533	5.958	11.935	0.112	1.004	0.428
120.0	29.4	119.7	0.451	6.660	10.647	0.139	2.136	0.507
135.0	29.4	134.5	0.485	5.083	10.260	0.153	1.541	0.342
150.0	29.6	149.4	0.561	4.487	10.162	0.178	1.050	0.291
165.0	29.8	164.5	0.635	3.870	10.130	0.181	0.618	0.213
180.0	29.7	179.3	0.735	4.182	10.058	0.185	0.497	0.185
195.0	30.1	194.8	0.522	4.239	10.070	0.166	0.576	0.183
210.0	29.8	210.1	0.528	4.471	10.123	0.148	0.875	0.230
225.0	29.5	225.0	0.463	6.813	9.991	0.123	1.426	0.366
240.0	29.5	240.1	0.445	8.942	9.890	0.114	2.023	0.410
255.0	29.5	255.1	0.475	7.608	11.062	0.102	1.623	0.345
270.0	29.5	270.1	0.369	8.238	11.603	0.082	1.625	0.491
285.0	29.6	285.1	0.391	8.432	11.944	0.083	1.694	0.651
300.0	29.5	299.9	0.684	8.402	12.966	0.181	1.631	0.853
315.0	29.5	314.8	1.164	6.861	13.629	0.281	1.228	1.063
330.0	29.5	329.8	1.418	5.619	13.759	0.342	0.907	1.184
345.0	29.5	344.8	1.639	4.655	13.761	0.376	0.687	1.228

Wind at 38.7 knots (19.9 m/s) is from the starboard beam in all cases.

This page intentionally left blank.



# Annex W

## NATO Sea State Table

*Table W.1: NATO Sea State Table (After Table D-1 in NATO STANAG 4194)*

Sea State Number	Significant Wave Height (m)		Sustained Wind Speed (Knots)*		% Prob. of Sea State	Wave Period (s)	
	Range	Mean	Range	Mean		Range†	Most Prob.‡
0 - 1	0.00 - 0.10	0.05	0 - 6	3.0	0.70	—	—
2	0.10 - 0.50	0.30	7 - 10	8.5	6.80	3.3 - 12.8	7.5
3	0.50 - 1.25	0.88	11 - 16	13.5	23.70	5.0 - 14.8	7.5
4	1.25 - 2.50	1.88	17 - 21	19.0	27.80	6.1 - 15.2	8.8
5	2.50 - 4.00	3.25	22 - 27	24.5	20.64	8.3 - 15.5	9.7
6	4.00 - 6.00	5.00	28 - 47	37.5	13.15	9.8 - 16.2	12.4
7	6.00 - 9.00	7.50	48 - 55	51.5	6.05	11.8 - 18.5	15.0
8	9.00 - 14.00	11.50	56 - 63	59.5	1.11	14.2 - 18.6	16.4
> 8	> 14.00	> 14.00	> 63	> 63.0	0.05	15.7 - 23.7	20.0

\*Ambient wind sustained at 19.5 m above surface to generate fully-developed seas.  
 To convert to another altitude,  $H_2$ , apply  $V_2 = V_1 (H_2/19.5)^{1/7}$   
 †Min. is 5 percentile and max. is 95 percentile for periods give wave height range.  
 ‡Based on periods associated with central frequencies incl. in Hindcast Climatology.

This page intentionally left blank.

**DOCUMENT CONTROL DATA**

(Security classification of title, body of abstract and indexing annotation must be entered when document is classified)

1. ORIGINATOR (the name and address of the organization preparing the document. Organizations for whom the document was prepared, e.g. Centre sponsoring a contractor's report, or tasking agency, are entered in section 8.)  Defence R&D Canada – Atlantic P. O. Box 1012, Dartmouth, NS, Canada B2Y 3Z7		2. SECURITY CLASSIFICATION (overall security classification of the document including special warning terms if applicable).  UNCLASSIFIED	
3. TITLE (the complete document title as indicated on the title page. Its classification should be indicated by the appropriate abbreviation (S,C,R or U) in parentheses after the title).  Tabulated Data for FREDYN Simulations of HALIFAX for Determining Helicopter Securing Loads			
4. AUTHORS (Last name, first name, middle initial. If military, show rank, e.g. Doe, Maj. John E.)  Perrault, Doug ; McTaggart, Kevin			
5. DATE OF PUBLICATION (month and year of publication of document)  March 2004	6a. NO. OF PAGES (total containing information. Include Annexes, Appendices, etc).  489	6b. NO. OF REFS (total cited in document)  1	
7. DESCRIPTIVE NOTES (the category of the document, e.g. technical report, technical note or memorandum. If appropriate, enter the type of report, e.g. interim, progress, summary, annual or final. Give the inclusive dates when a specific reporting period is covered).  Technical Memorandum			
8. SPONSORING ACTIVITY (the name of the department project office or laboratory sponsoring the research and development. Include address).  Defence R&D Canada– Atlantic P. O. Box 1012, Dartmouth, NS, Canada B2Y 3Z7			
9a. PROJECT OR GRANT NO. (if appropriate, the applicable research and development project or grant number under which the document was written. Specify whether project or grant).  11GK12		9b. CONTRACT NO. (if appropriate, the applicable number under which the document was written).	
10a. ORIGINATOR'S DOCUMENT NUMBER (the official document number by which the document is identified by the originating activity. This number must be unique.)  DRDC Atlantic TM 2004-044		10b. OTHER DOCUMENT NOS. (Any other numbers which may be assigned this document either by the originator or by the sponsor.)	
11. DOCUMENT AVAILABILITY (any limitations on further dissemination of the document, other than those imposed by security classification) ( X ) Unlimited distribution ( ) Defence departments and defence contractors; further distribution only as approved ( ) Defence departments and Canadian defence contractors; further distribution only as approved ( ) Government departments and agencies; further distribution only as approved ( ) Defence departments; further distribution only as approved ( ) Other (please specify):			
12. DOCUMENT ANNOUNCEMENT (any limitation to the bibliographic announcement of this document. This will normally correspond to the Document Availability (11). However, where further distribution beyond the audience specified in (11) is possible, a wider announcement audience may be selected).			

13. ABSTRACT (a brief and factual summary of the document. It may also appear elsewhere in the body of the document itself. It is highly desirable that the abstract of classified documents be unclassified. Each paragraph of the abstract shall begin with an indication of the security classification of the information in the paragraph (unless the document itself is unclassified) represented as (S), (C), (R), or (U). It is not necessary to include here abstracts in both official languages unless the text is bilingual).

In support of procurement of new maritime helicopters, DRDC Atlantic was tasked to simulate motions of the HALIFAX class in seaways. The data produced will aid in the determination of helicopter securing loads, which are highly dependent upon the motions of the ship. The present work reports a systematic series of simulations modelling a HALIFAX class frigate with nominally steady speed and heading (course-keeping) in a variety of seaway conditions. This memorandum provides the data in a tabulated format for quick reference. A companion report (DRDC TM 2004-043) describes the simulation conditions and key results.

14. KEYWORDS, DESCRIPTORS or IDENTIFIERS (technically meaningful terms or short phrases that characterize a document and could be helpful in cataloguing the document. They should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location may also be included. If possible keywords should be selected from a published thesaurus. e.g. Thesaurus of Engineering and Scientific Terms (TEST) and that thesaurus-identified. If it not possible to select indexing terms which are Unclassified, the classification of each should be indicated as with the title).

Ship motions  
Helicopter securing loads  
Open waters  
Coastal waters  
Heave  
Roll angles  
Pitch angles  
Longitudinal force estimator  
Lateral force estimator  
Vertical force estimator

This page intentionally left blank.

## **Defence R&D Canada**

Canada's leader in defence  
and national security R&D

## **R & D pour la défense Canada**

Chef de file au Canada en R & D  
pour la défense et la sécurité nationale



[www.drdc-rddc.gc.ca](http://www.drdc-rddc.gc.ca)