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**DAVID W. TAYLOR NAVAL SHIP
RESEARCH AND DEVELOPMENT CENTER**

Bethesda, Md. 20084



LEVEL III

ASR-14 SHIP AND TOW POINT MOTION PREDICTIONS

by

T. R. Applebee

and

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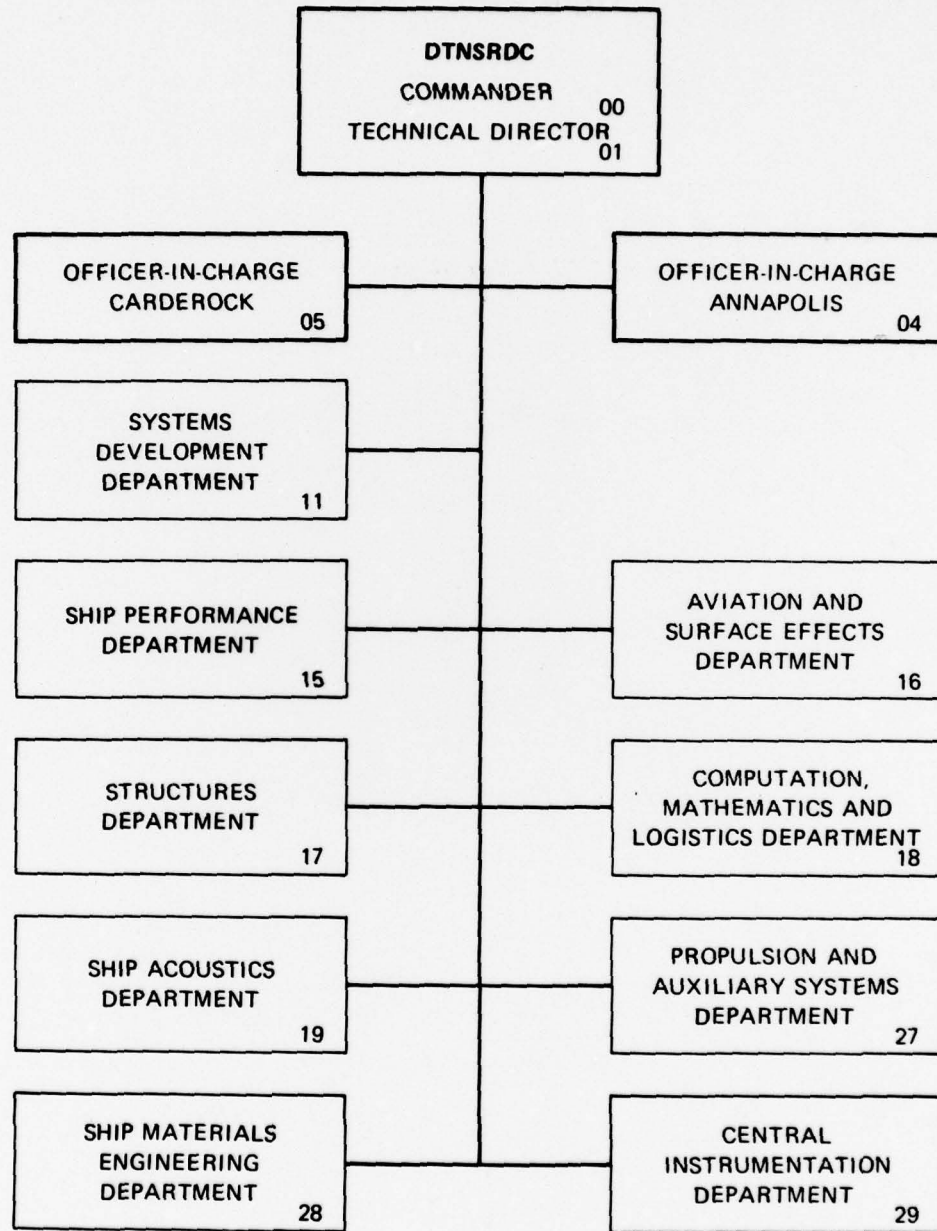
ASR-14 SHIP AND TOW POINT MOTION PREDICTIONS

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ABSTRACT

Surge and longitudinal displacement at a cable tow position are predicted for a Submarine Rescue Ship (ASR) in long- and short-crested seas. Results are presented in the form of speed polars, but interpretation must be approached with caution in light of highly restrictive assumptions.

ADMINISTRATIVE INFORMATION

This investigation was funded by the Naval Ship Engineering Center (NAVSEC) under Work Request N6519779WR91556. The work is identified at the David W. Taylor Naval Ship Research and Development Center (DTNSRDC) as Work Unit Number 1-1568-820.

INTRODUCTION

In an effort to determine the excursion of a Submarine Rescue Ship (ASR) at an aft tow position, DTNSRDC implemented its Ship-Motion and Sea-Load Program^{1*} (SMSL) and the SHREDS² program to obtain a root mean square (RMS) ship motion data base for all headings and speeds. Both long-crested and short-crested seaways were investigated for significant wave heights of 10, 15, and 20 feet and a modal period of 9 seconds.

The predicted results are presented in the form of speed polar plots of longitudinal tow point motion and RMS tables of the ship motion data base. It is noted that the assumptions relating limiting longitudinal tow point motions to the calculated RMS longitudinal motions are of questionable validity. These assumptions are particularly questionable in seas aft of the beam at the higher sea states. Inadequacies in the present ship motion theory do not permit more accurate longitudinal ship motion predictions to be made. Similarly, the measurement accuracies of transducers for longitudinal ship motions have made typical full-scale data unavailable.

The use of the longitudinal displacement speed polar plots for determining operating limits in speed or heading for cable tension loads is subject to the above-mentioned assumptions. Furthermore, it should be pointed out that for the case of "impact" cable loading, the longitudinal

*A complete listing of references is given on page 5.

velocity and acceleration needs to be considered because the ship tow point does not move instantaneously.

Caution in the interpretation of tow point motions in the horizontal plane is therefore recommended.

CALCULATION CONDITIONS

Because of the inability to obtain the most recent modifications to the hull of the ASR-14, an earlier version of the hull lines was used. Table 1 presents the computed ship particulars and Figure 1 the computed ship lines for this version of the ASR.

Three long-crested and short-crested Bretschneider³ seaways based on worldwide heavy weather operations (Reference 4) were selected. These seaways, identified as Sea States 5, 6, and high 6, correspond to significant wave heights of 10, 15, and 20 feet, respectively, and a modal period of 9 seconds. Short-crested was represented by a cosine square spreading function as recommended in Reference 5.

The RMS data base calculated by SHREDS includes surge and the longitudinal displacement at a tow location 8 feet aft of the aft perpendicular, on centerline, and 26.07 feet above the keel.

ASSUMPTIONS

It is understood that tow point motions affect the tension in the cable, although the individual x,y,z components of these motions do not equally influence cable tension. In fact, based on a discussion with NAVSEC personnel, it is understood that the x-component or longitudinal tow point motion is the only significant component of ship motion that affects cable tension. As a result, only this component is presented in polar plot form.

Motions were calculated for a ship traveling on a fixed course without rudder activity. Thus a critical assumption affecting the interpretation of the results is that the ship's horizontal excursions are isolated from and independent of helm control. Thus, the ship is assumed to travel without yaw or course correction on the selected heading relative to the

sea. Clearly, this assumption becomes unrealistic* once seas of sufficient height are encountered at headings other than head or following seas.

Operator control of the rudder in trying to maintain a base ship course, particularly for the seaways investigated, produces significant yaw motion. Figure 2 illustrates such operator control on a 3000-ton USCG cutter of typical destroyer hull form in mild 5 to 7-foot, 7-second modal period beam seas. Such operator-induced yaw motion in turn modifies the ship's forward speed and longitudinal motion response as well as the other ship responses. Rudder or helm control thus results in yaw-surge motion coupling, the importance of which increases as sea state increases, particularly when ship heading is aft of the beam.

It has been assumed that the operator steering activity represents one-half of the total longitudinal tow point motions for the very large response amplitudes of interest. These large motion amplitudes, in turn, represent limiting motion levels. Furthermore, it has been assumed that the limiting motion level of concern is statistically related to the calculated RMS motion. The highest expected value in 1000 successive motion amplitudes is this assumed limiting design motion level.

The limiting longitudinal motions presented in the speed polar plots represent a value twice the highest expected value in 1000 successive longitudinal motion amplitudes, i.e., $2 \times 3.72 \times \text{RMS}$.

RESULTS

Figures 3 through 8 present the speed polar plots for the aft tow position, while Figures 9 through 14 present the surge speed polars. Long-crested results for each point are presented first, followed by the short-crested polar plots. Note that all speed polar contours are dimensioned in feet.

The appendix contains the ship motion data base in the form of RMS/TOE tables for unit significant wave height and modal periods of 7, 9, 11, . . . , 21 seconds. The tables present the displacements, velocities, and accelerations for the six-degrees-of-freedom at the origin and for longitudinal, lateral, and vertical motions at the aft tow position.

*See Figure 2 time between 650 and 725 seconds.

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3. Bretschneider, C.L., "Wave Variability and Wave Spectra for Wind Generated Gravity Waves," Department of the Army, Corps of Engineers Technical Memorandum 118 (1959).
4. Bales, Susan L. and Edward W. Foley, "Development of A Heavy Weather Operator Guidance Catalog for FF-1052 Class Ships," David W. Taylor Naval Ship Research and Development Center, Ship Performance Department Report DTNSRDC/SPD-0773-02 (Feb 1979).
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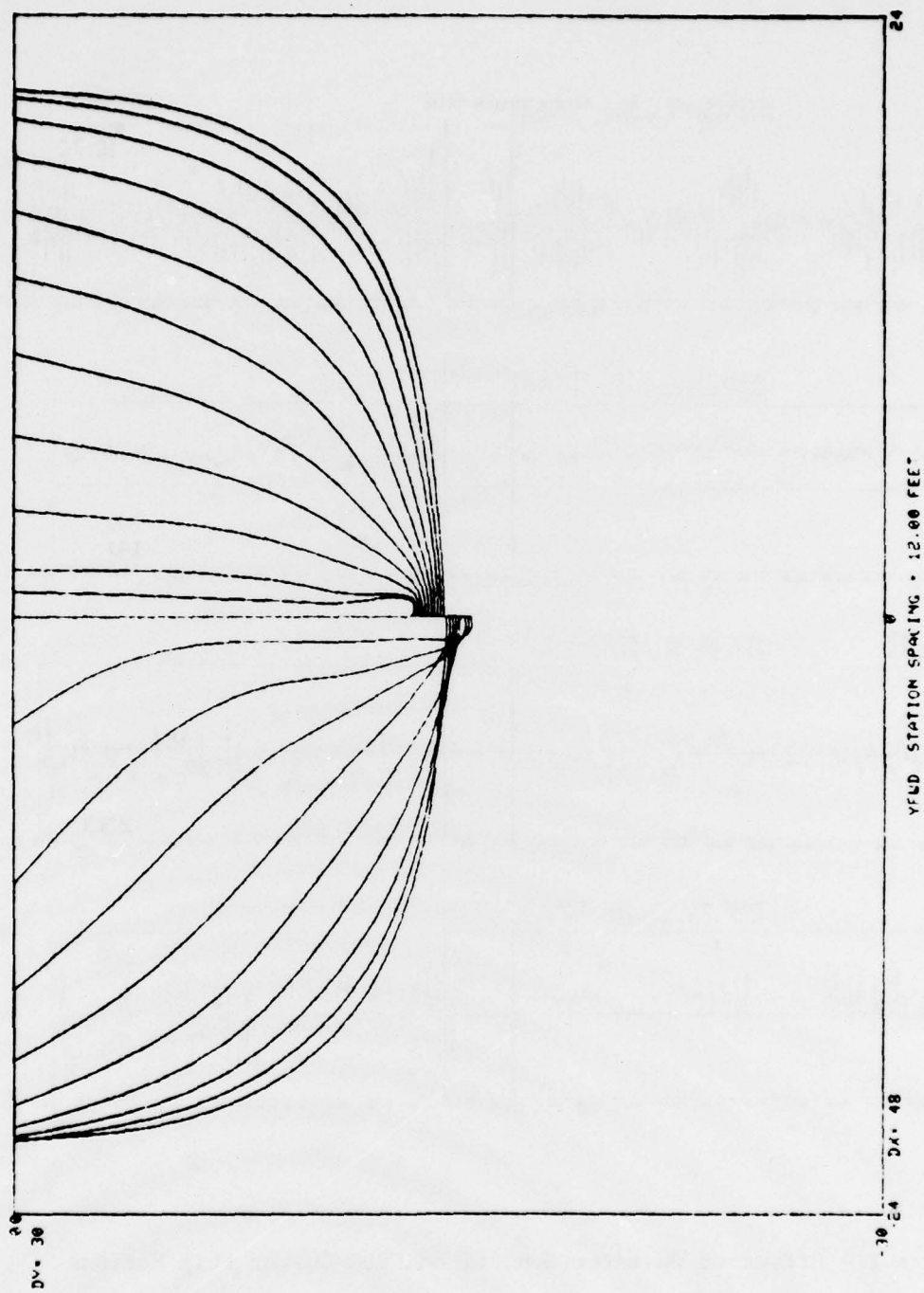


Figure 1 - Computed Ship Lines for the ASR

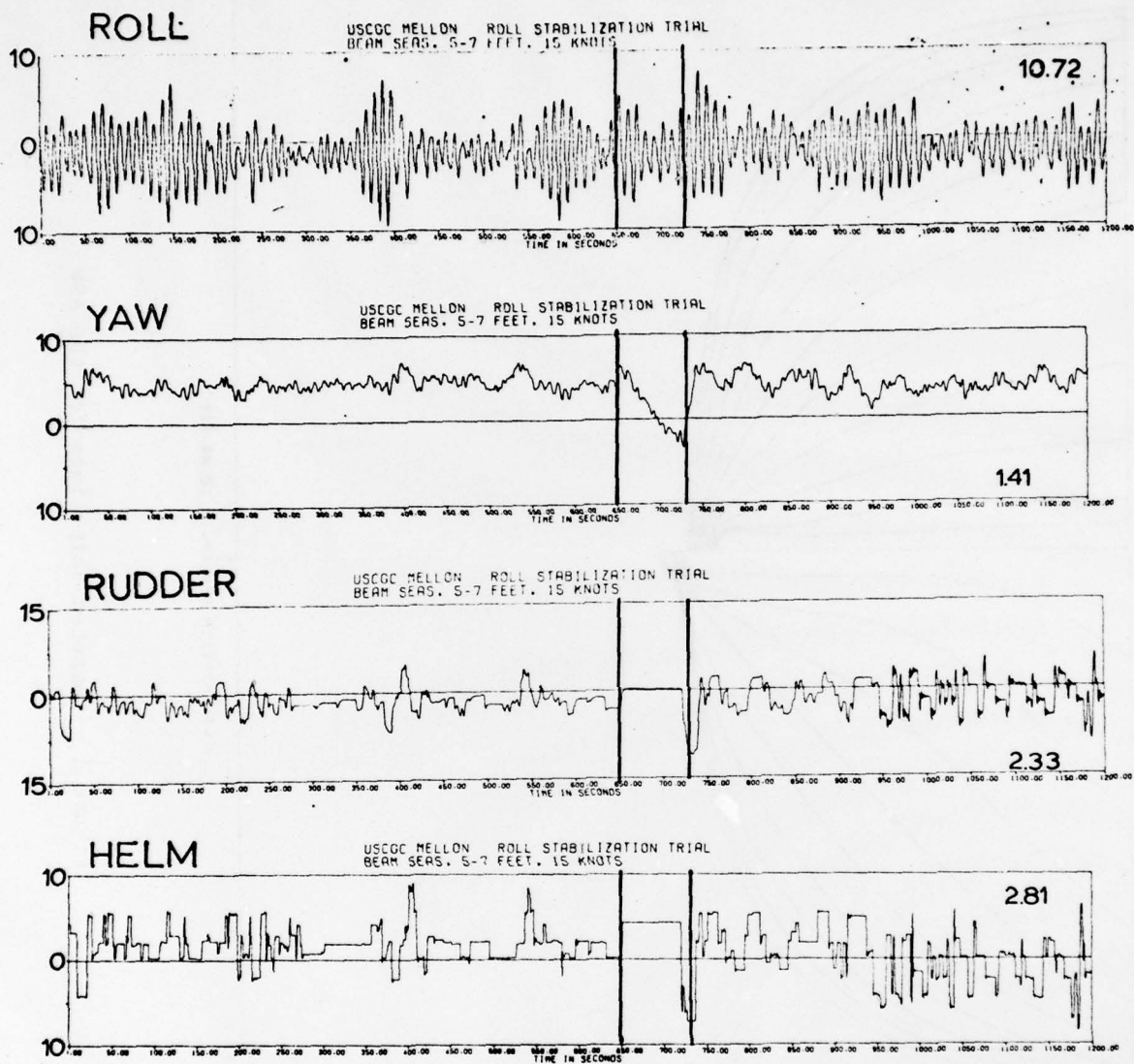


Figure 2 - Effect of Operator Control on USCG Cutter Ship Motions

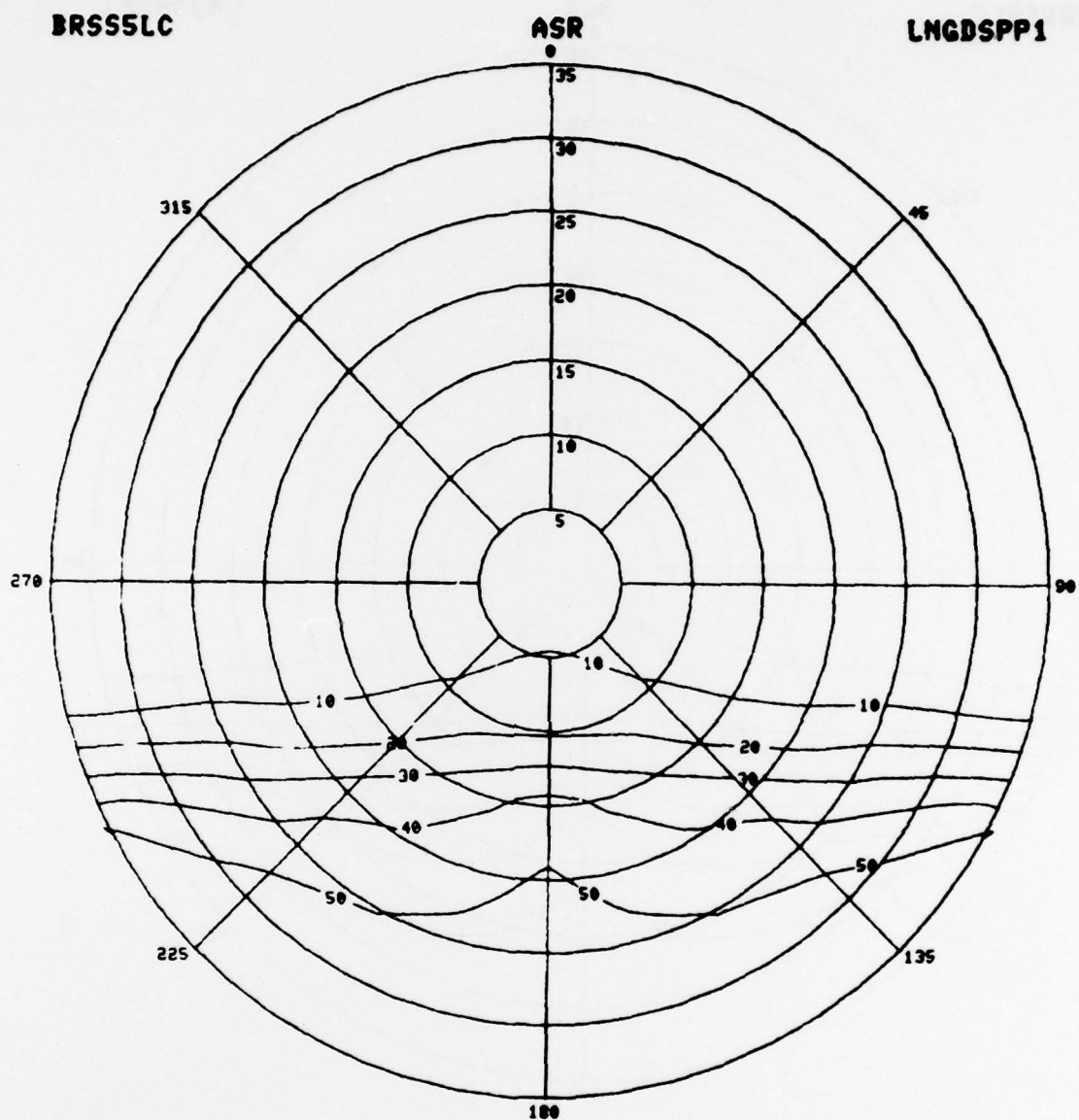


Figure 3 - Speed Polar Plot of Longitudinal Displacement at the Aft Tow Position in a Sea State 5, Long-Crested

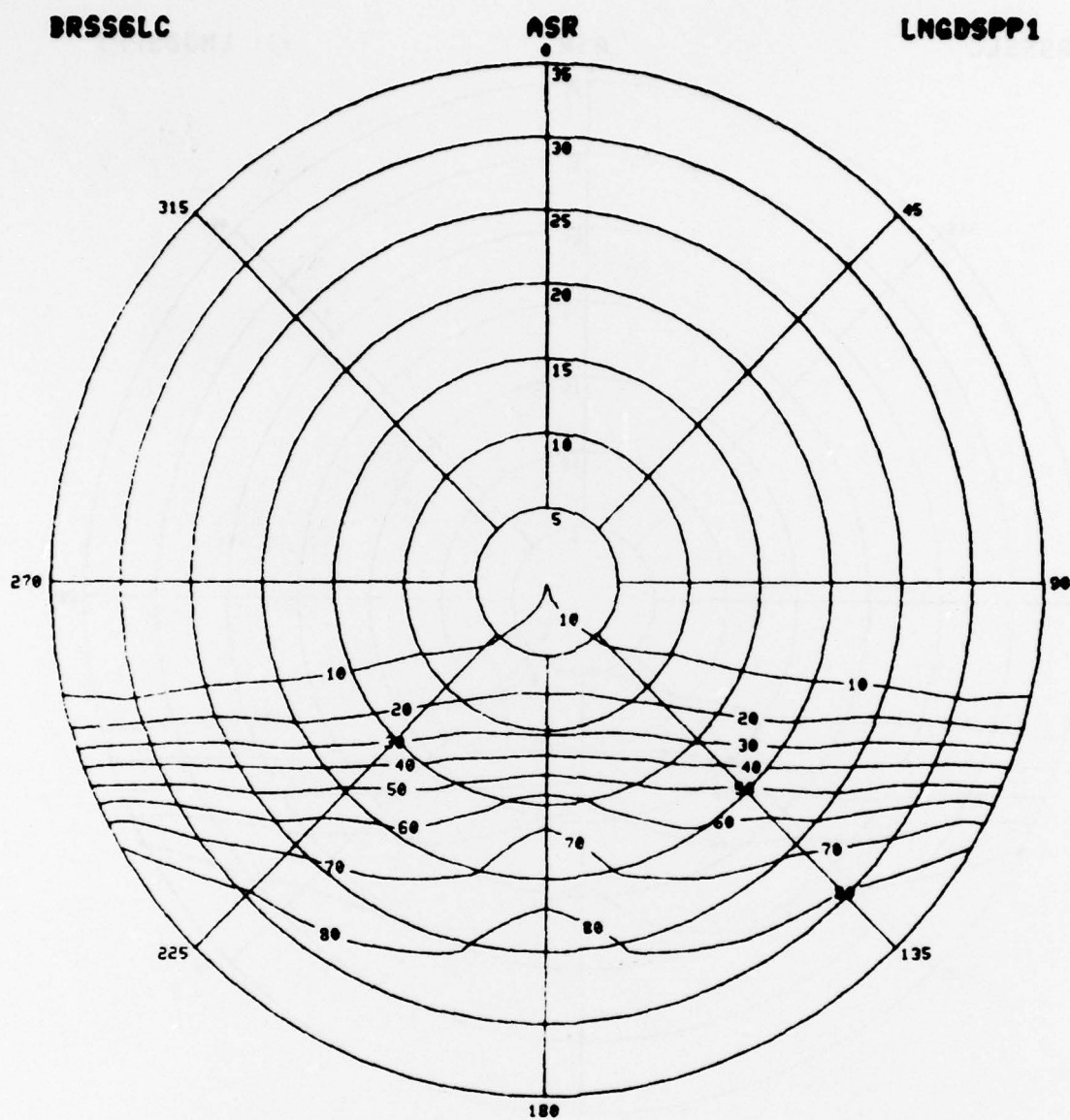


Figure 4 - Speed Polar Plot of Longitudinal Displacement at the Aft Tow Position in a Sea State 6, Long-Crested

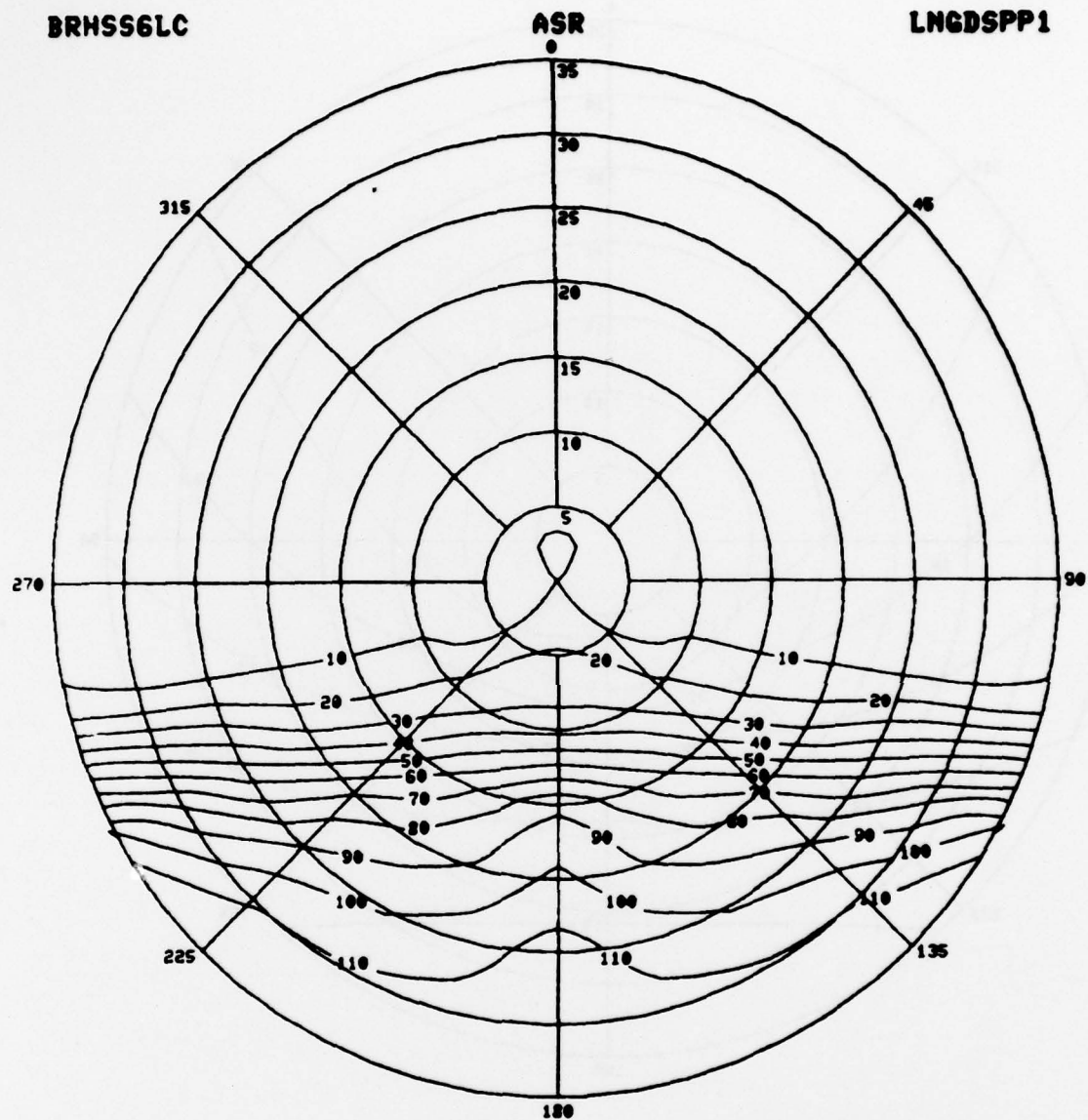


Figure 5 - Speed Polar Plot of Longitudinal Displacement at the Aft Tow Position in a High Sea State 6, Long-Crested

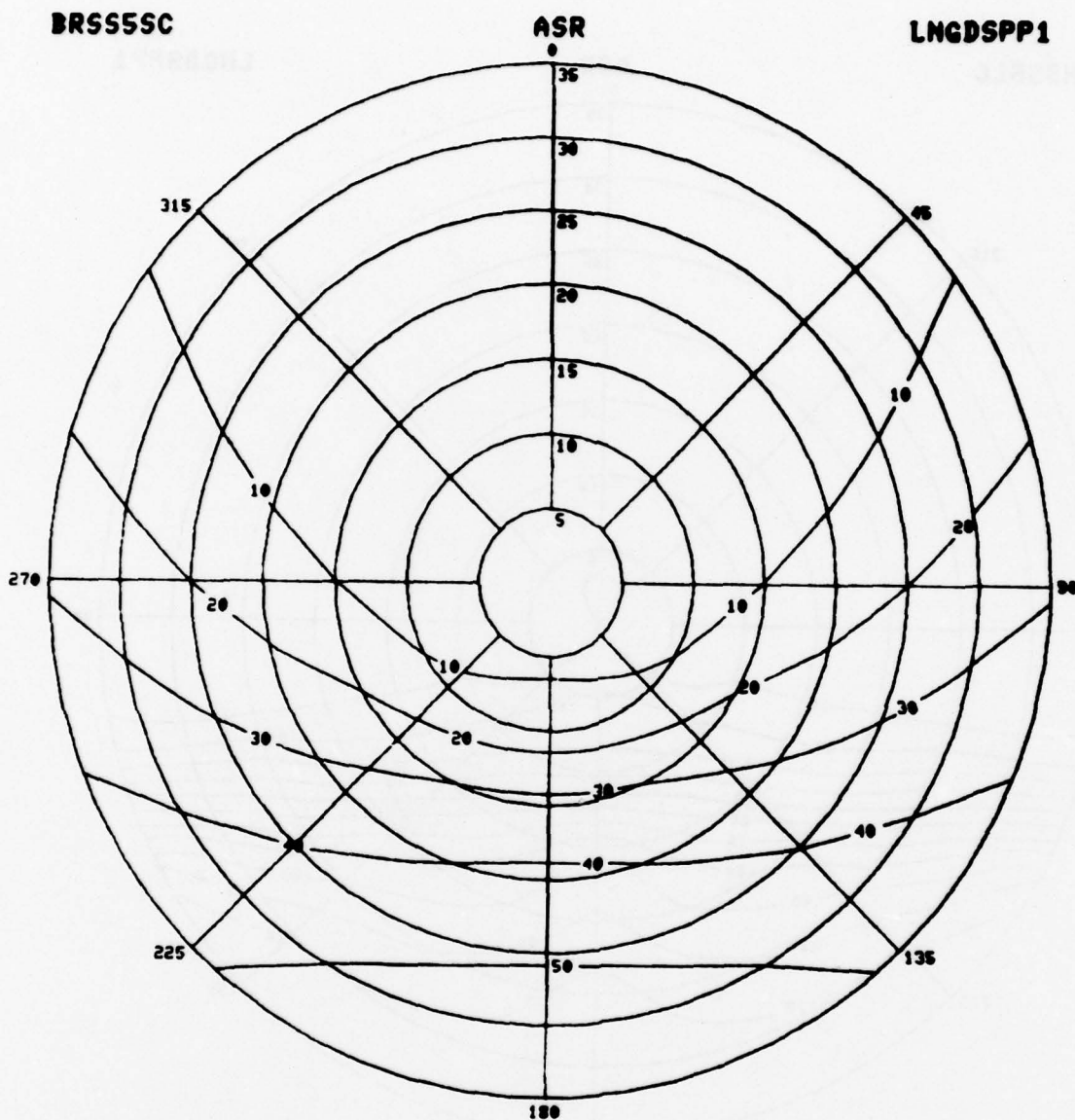


Figure 6 - Speed Polar Plot of Longitudinal Displacement at the Aft Tow Position in a Sea State 5, Short-Crested

BRSS6SC

ASR

LNGDSPP1

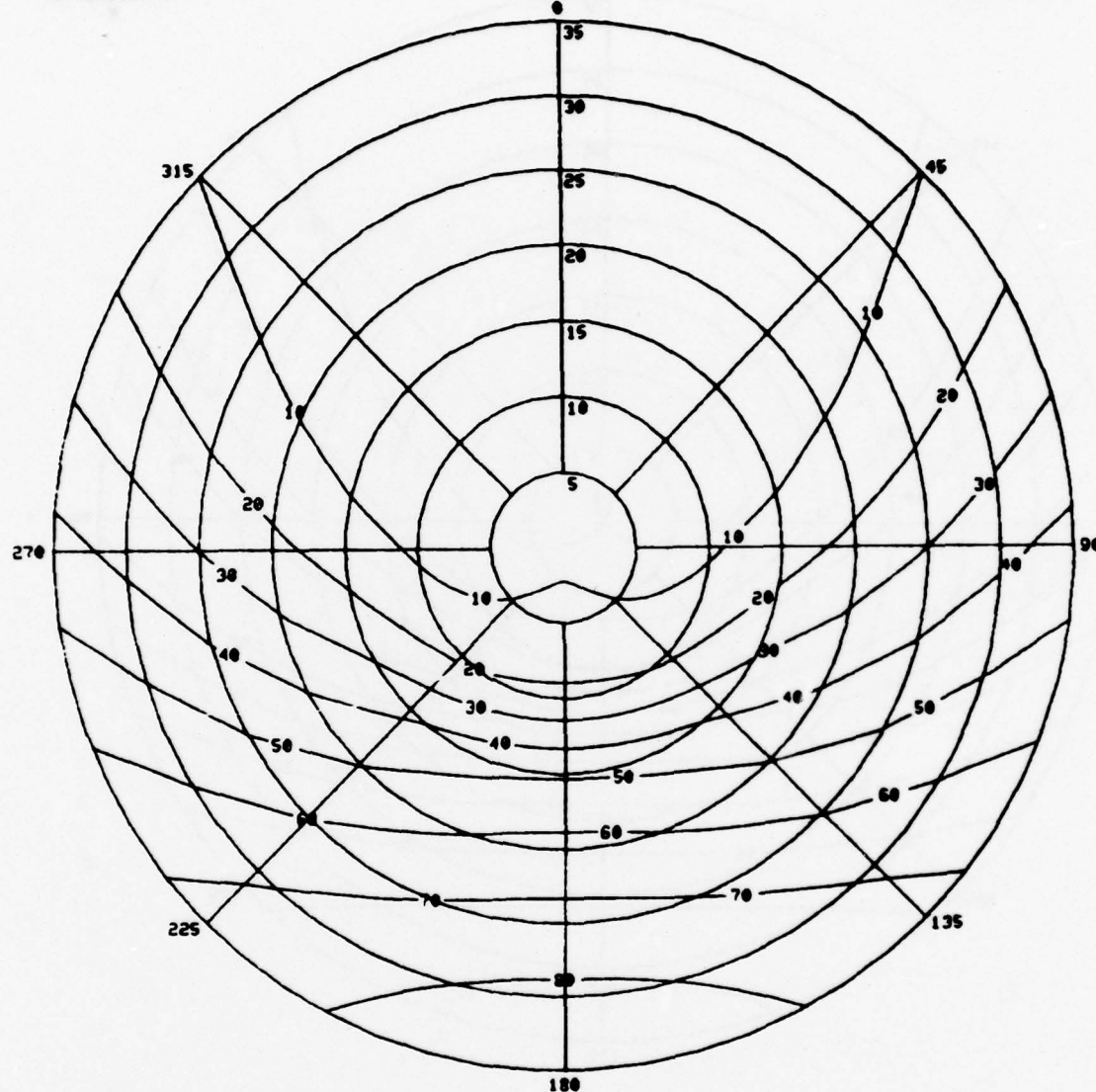


Figure 7 - Speed Polar Plot of Longitudinal Displacement at the Aft Tow Position in a Sea State 6, Short-Crested

BRHSS6SC

ASR

LNGDSPP1

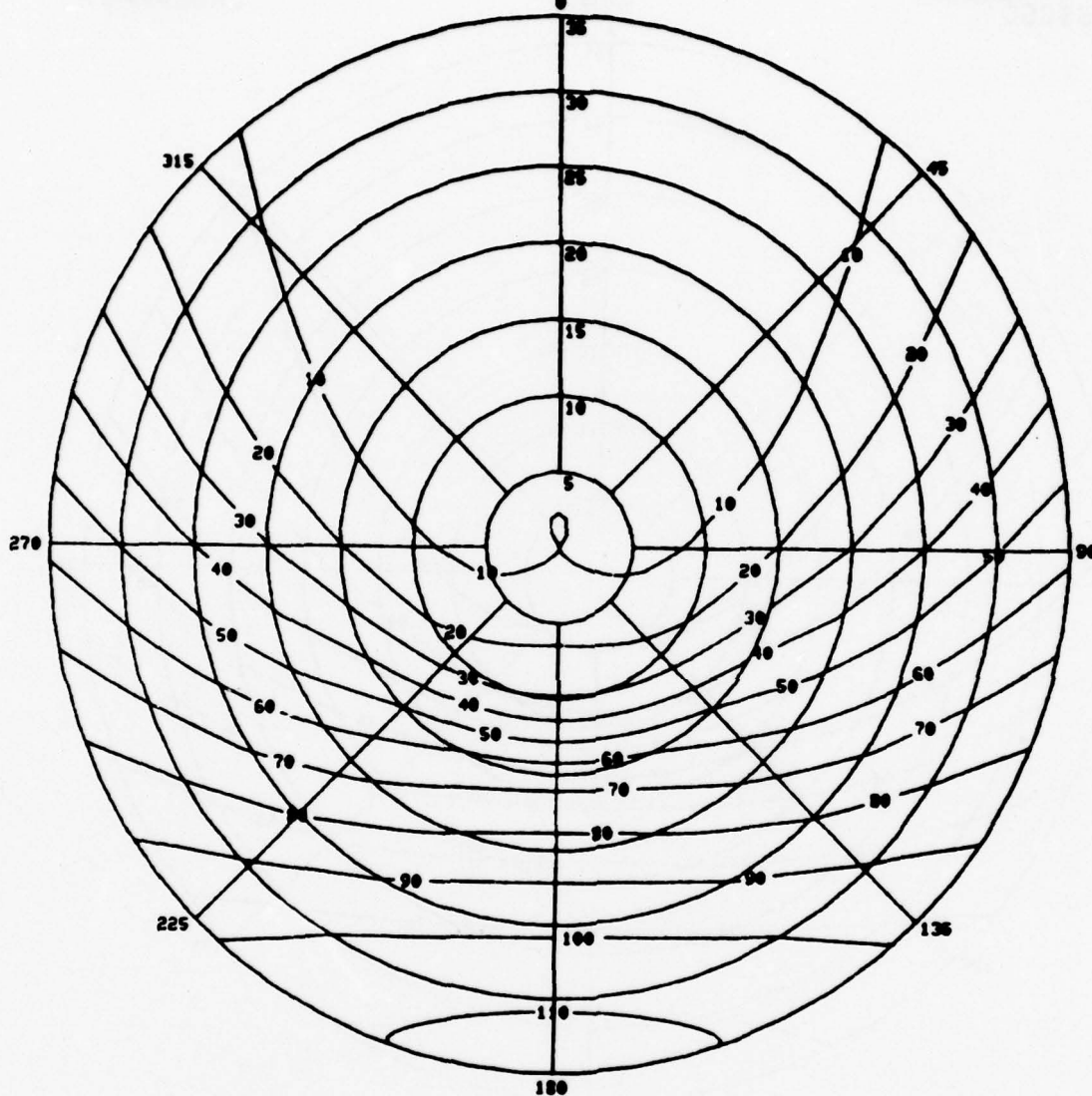


Figure 8 - Speed Polar Plot of Longitudinal Displacement at the Aft Tow Position in a High Sea State 6, Short-Crested

BRSS5LC

ASR

LNGDSPP2

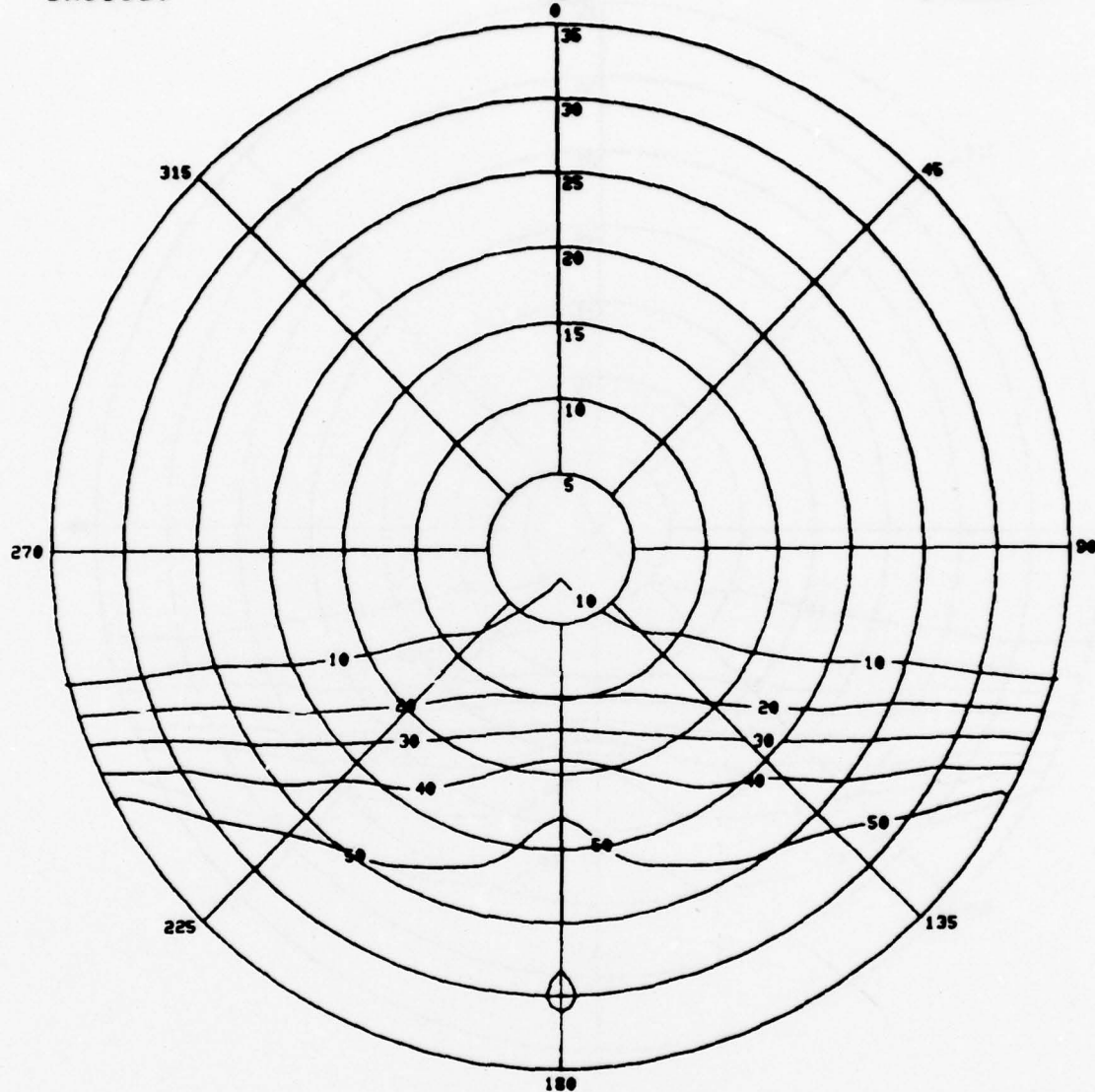


Figure 9 - Speed Polar Plot of Surge in a Sea State 5, Long-Crested

BRSS6LC

ASR

LNQDSPP2

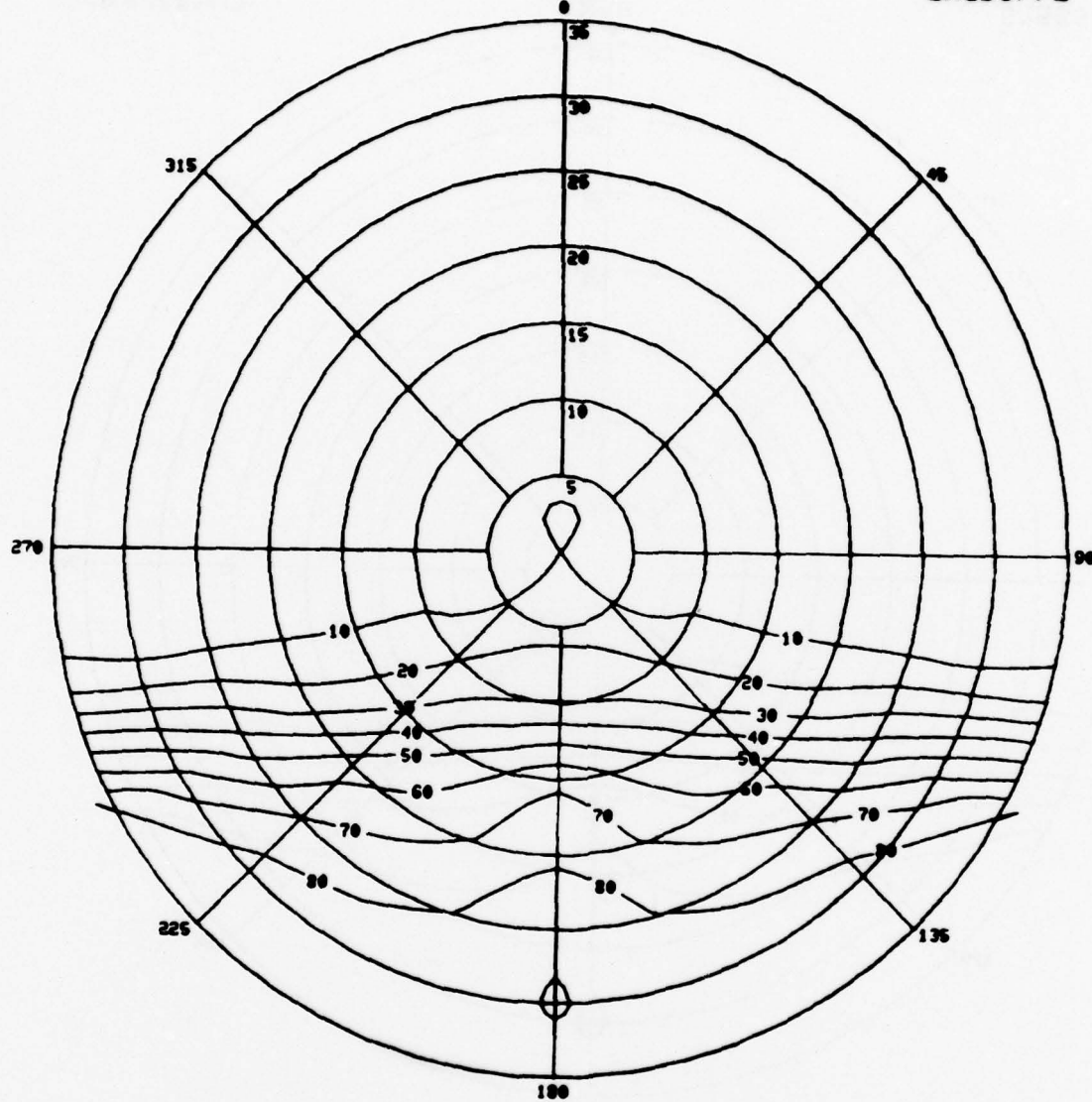


Figure 10 - Speed Polar Plot of Surge in a Sea State 6, Long-Crested

BRH556LC

ASR

LNGDSPP2

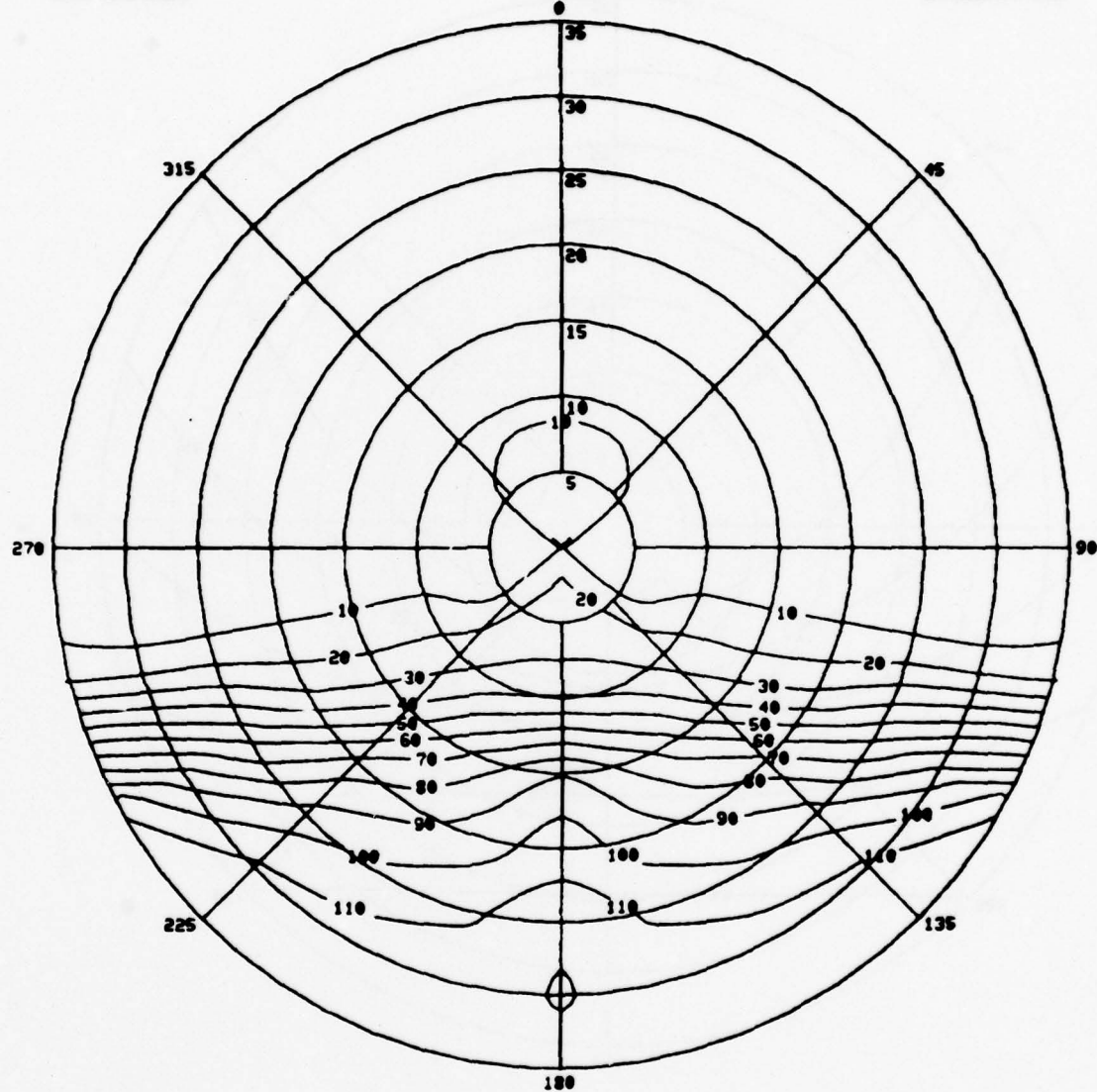


Figure 11 - Speed Polar Plot of Surge in a High Sea State 6, Long-Crested

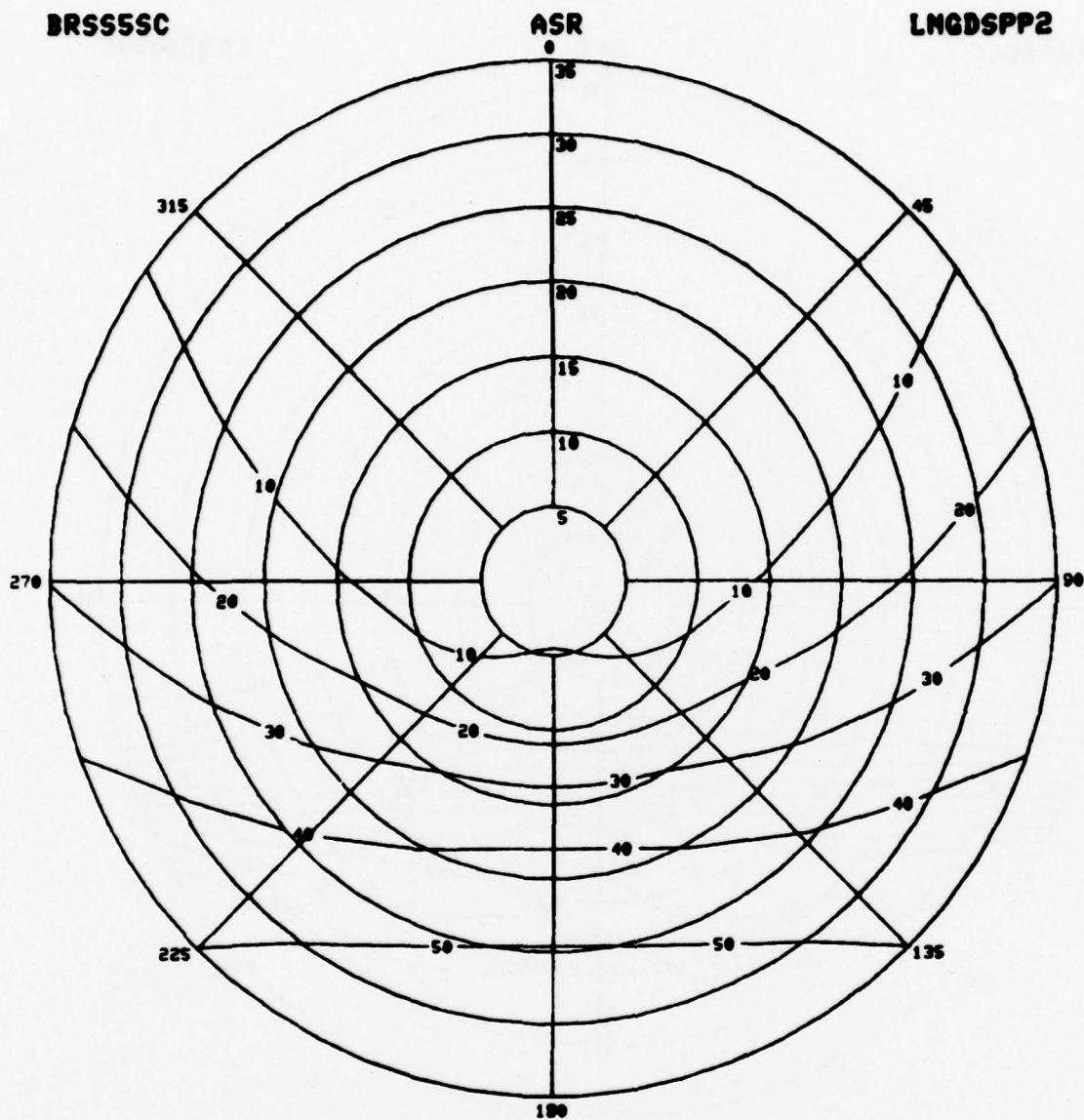


Figure 12 - Speed Polar Plot of Surge in a Sea State 5, Short-Crested

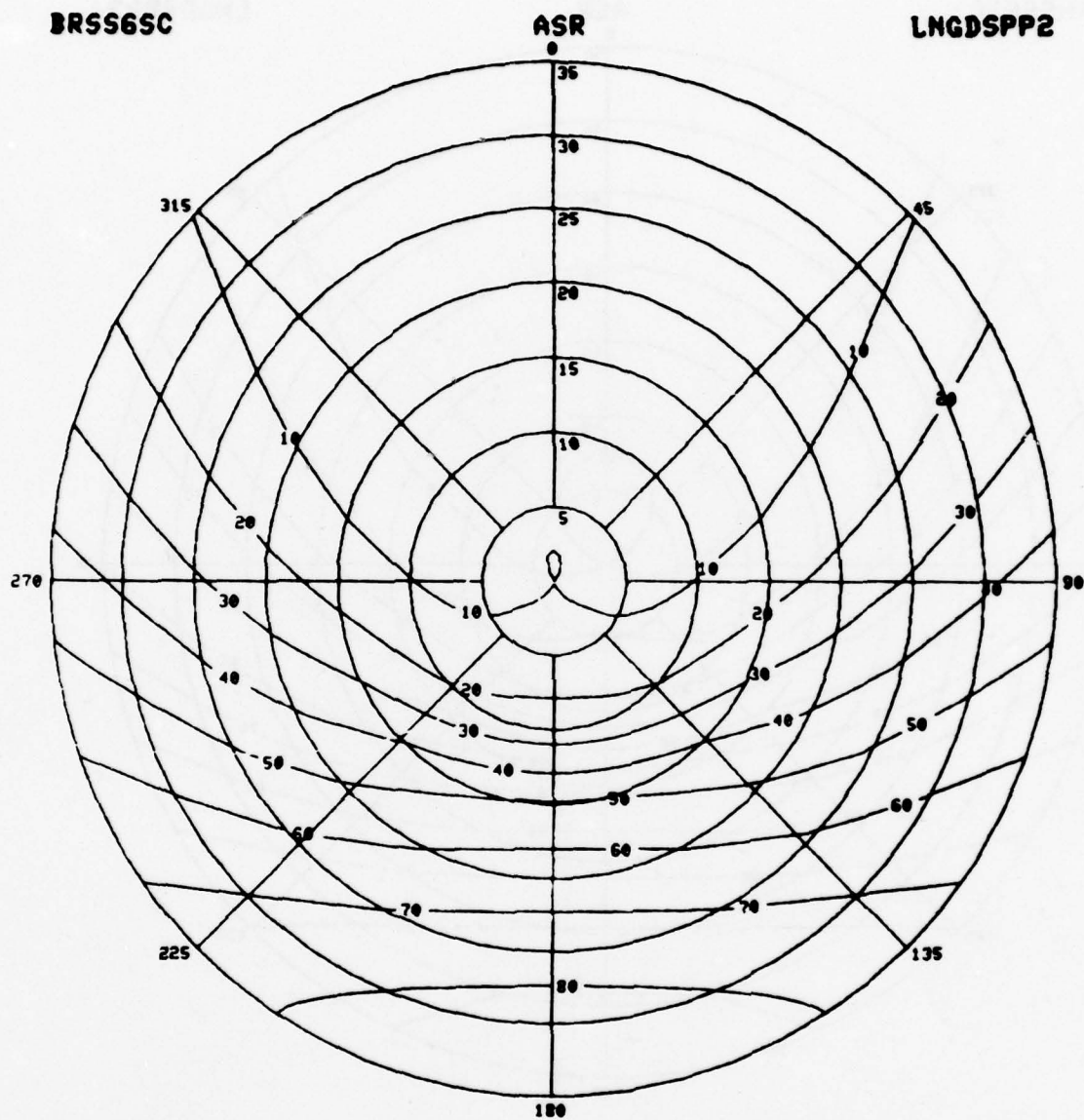


Figure 13 - Speed Polar Plot of Surge in a Sea State 6, Short-Crested

BRHSS65C

ASR

LNGDSPP2

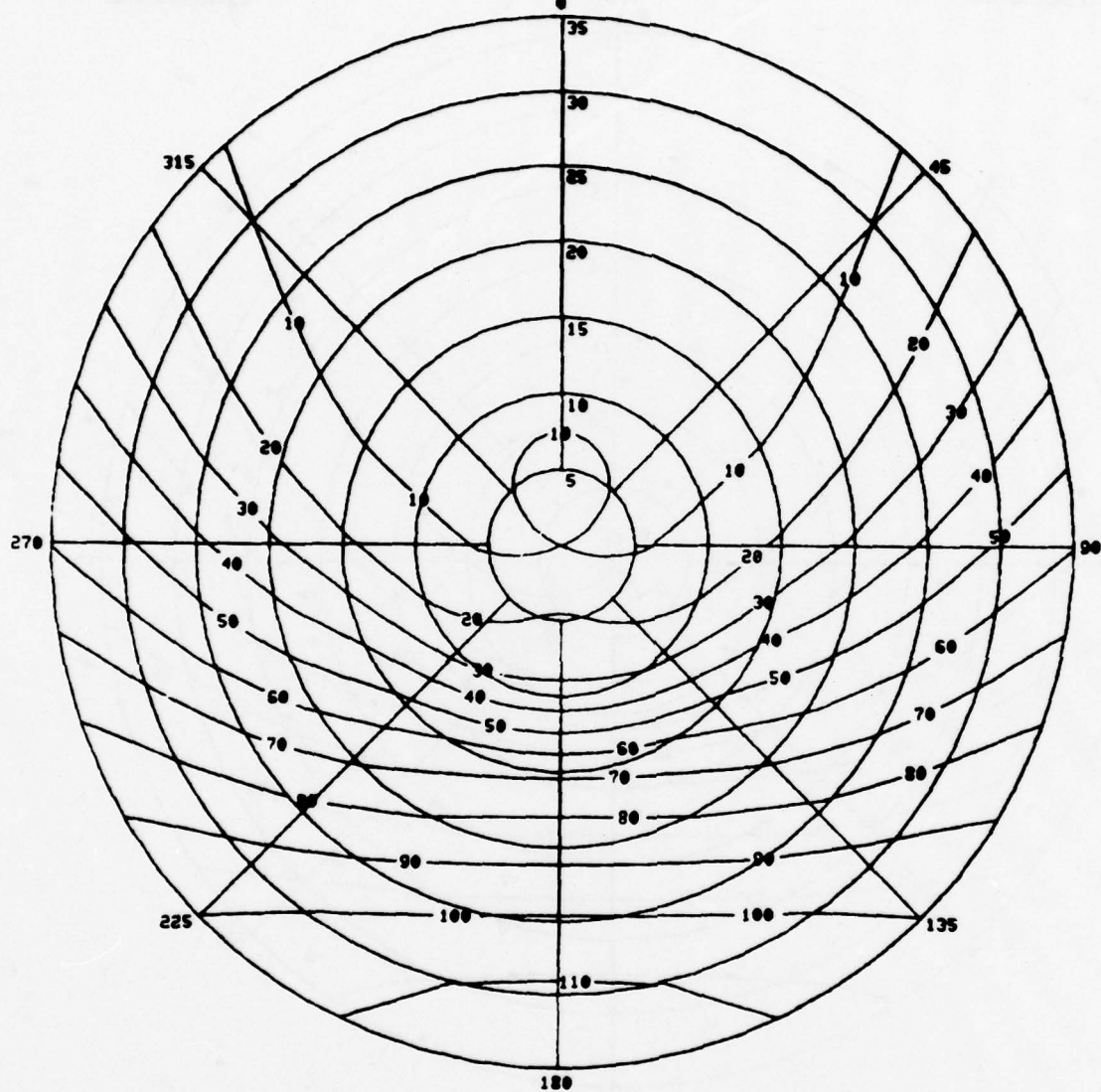


Figure 14 - Speed Polar Plot of Surge in a High Sea State 6, Short-Crested

TABLE 1 - COMPUTED SHIP PARTICULARS

Displacement, Δ	2118 Long Tons (2085 Metric Tons)
Length Between Perpendiculars, L_{pp}	240.00 feet (73.15 meters)
Beam, B	42.00 feet (12.80 meters)
Draft at Midships, T_{M}	14.71 feet (4.48 meters)
Metacentric Height, GM	3.19 feet (0.97 meters)
Vertical Center of Gravity, KG	15.60 feet (4.75 meters)
Longitudinal Center of Gravity, LCG*	5.81 feet (1.77 meters)
Trim (by the stern)	2.10 feet (0.64 meters)
Block Coefficient	.50

*Aft of Midships

APPENDIX
RMS/TOE TABLES

ASR
LONGCRESTED
RMS LON DISP IN FEET/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
DE

V	T	SHIP HEADING ANGLE IN DEGREES											180
		0	15	30	45	60	75	90	105	120	135	150	165
0	7	.07/ 8	.07/ 8	.07/ 8	.07/ 8	.06/ 7	.03/ 7	.00/ 7	.04/ 7	.06/ 7	.07/ 8	.04/ 7	.07/ 8
	9	.11/10	.11/10	.10/10	.09/10	.07/ 9	.04/ 9	.01/10	.05/ 9	.08/10	.09/10	.04/ 9	.10/ 9
	11	.14/11	.14/11	.13/11	.11/11	.08/11	.04/11	.01/11	.05/11	.09/11	.11/11	.05/11	.11/11
	13	.16/14	.15/14	.14/14	.12/13	.08/13	.04/13	.01/14	.05/13	.09/13	.12/14	.05/13	.12/13
	15	.17/16	.16/16	.15/16	.12/16	.09/16	.04/16	.01/16	.05/16	.10/16	.13/16	.05/16	.12/16
	17	.17/18	.17/18	.15/18	.13/18	.09/18	.04/18	.01/18	.05/18	.10/18	.14/18	.05/18	.12/18
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	13	.10/14	.10/14	.09/14	.08/14	.06/14	.04/14	.01/14	.06/14	.13/15	.19/15	.25/16	.30/16
	15	.11/16	.11/16	.10/16	.09/16	.07/16	.04/16	.01/16	.06/17	.13/16	.19/17	.26/17	.30/18
	17	.12/18	.12/18	.11/18	.09/18	.07/18	.04/18	.01/18	.06/18	.13/18	.19/18	.26/19	.29/20
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	13	.07/14	.07/14	.07/14	.06/14	.05/14	.03/14	.01/14	.07/15	.21/13	.44/19	.58/23	.66/26
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	11	.05/13	.05/13	.05/13	.05/13	.05/13	.03/12	.01/11	.08/13	.21/13	.44/19	.58/23	.66/26
	13	.06/14	.06/14	.06/14	.05/14	.05/14	.03/14	.01/14	.08/15	.28/17	.50/24	.71/30	.80/33
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	17	.08/18	.07/18	.07/18	.06/18	.05/18	.03/18	.01/18	.08/18	.22/17	.44/24	.62/30	.74/33
	19	.08/21	.08/21	.08/21	.07/21	.06/21	.03/21	.01/18	.07/20	.21/17	.40/24	.57/30	.69/33
	21	.09/21	.09/21	.08/21	.08/21	.06/21	.04/21	.01/21	.07/23	.19/17	.37/24	.53/30	.64/33

LONGCRESTED
RMS LON VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
OE

26

ASR
LONGCRESTED
RMS LON ACC IN G'S/ENCOUNTERED MODAL PERIOD, T_{OE}, IN SECONDS
(ACC. X 100)

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	15/7	15/7	16/7	15/7	11/6	01/6	12/6	15/7	16/7	10/6	14/7	14/7
9	9	18/8	17/8	17/8	14/8	09/7	01/7	10/7	15/8	17/8	09/6	16/8	18/8
11	11	17/10	17/10	15/9	12/9	07/8	01/9	08/9	13/9	15/9	08/7	15/8	18/10
13	13	16/10	16/10	13/10	10/10	06/10	01/10	07/10	11/10	14/10	06/9	13/9	16/10
15	15	14/12	14/12	11/11	09/11	05/10	01/12	06/11	09/11	12/11	05/10	12/10	14/12
17	17	12/13	12/13	10/13	07/13	04/13	01/13	05/13	08/13	10/13	04/11	10/11	13/13
19	19	11/14	11/14	08/14	06/14	03/14	00/14	04/14	07/14	09/14	04/13	09/13	11/14
21	21	10/16	09/16	07/16	05/16	03/16	00/16	03/16	06/16	08/16	03/14	07/14	10/16
8	7	15/7	15/7	16/7	15/7	11/6	01/6	12/6	09/6	14/8	14/9	14/10	14/10
9	9	18/8	18/8	17/8	14/8	09/7	01/7	10/7	07/7	14/8	17/10	17/10	17/10
11	11	16/10	16/10	13/10	10/10	06/10	01/10	07/10	05/10	11/10	16/11	17/12	16/12
13	13	14/12	14/12	11/11	09/11	05/10	01/12	06/11	09/11	14/12	14/13	16/12	16/13
15	15	13/13	13/13	10/13	07/13	04/13	01/13	05/13	03/13	08/13	11/13	14/13	13/15
17	17	11/14	11/14	08/14	06/14	03/14	00/14	04/14	03/14	07/14	10/15	11/16	11/16
19	19	10/16	09/16	07/16	05/16	03/16	00/16	03/16	02/16	06/16	09/16	10/16	10/16
21	21	14/8	14/8	15/7	15/7	10/6	01/6	12/7	15/8	15/10	14/12	13/13	13/13
10	7	18/8	17/8	16/8	14/8	09/7	01/7	10/8	14/10	16/11	17/12	17/13	17/13
9	9	17/10	17/10	15/9	12/9	07/8	01/9	08/9	12/10	15/12	16/13	17/13	16/13
11	11	16/10	16/10	13/10	10/10	06/10	01/10	07/10	11/12	13/13	15/14	15/13	16/13
13	13	14/13	14/13	11/12	09/11	05/10	01/12	06/12	09/13	11/13	13/14	14/15	14/15
15	15	13/13	13/13	10/13	07/13	04/13	01/13	05/13	08/13	10/14	11/15	12/16	12/16
17	17	11/14	11/14	08/14	06/14	03/14	00/14	04/14	07/15	09/15	10/16	11/17	11/17
19	19	10/16	09/16	07/16	05/16	03/16	00/16	03/16	06/16	09/17	09/17	09/18	10/17
21	21	13/8	14/8	15/7	14/7	10/6	01/6	12/7	14/10	14/14	13/17	11/20	11/20
15	7	17/9	17/9	16/8	14/8	09/7	01/7	10/8	15/14	15/14	16/17	14/20	15/20
9	9	18/10	17/10	15/9	12/9	07/8	01/9	08/10	12/11	14/14	16/17	15/20	15/20
11	11	16/10	16/10	13/10	10/10	06/10	01/10	07/10	10/12	13/14	14/17	14/20	15/20
13	13	14/13	14/13	11/12	09/11	05/11	01/12	06/12	09/13	11/14	13/17	13/20	13/20
15	15	13/14	12/14	10/13	07/13	04/13	01/13	05/13	08/14	10/14	11/17	12/20	12/20
17	17	11/14	10/14	08/14	06/14	03/14	00/14	04/14	07/15	09/14	10/17	10/20	11/20
19	19	10/16	09/16	07/16	05/16	03/16	00/16	03/16	06/17	07/14	09/17	09/20	09/20
21	21	13/8	14/8	15/7	14/7	10/6	01/6	12/7	14/13	11/19	06/25	04/31	04/33
20	7	17/9	17/9	16/8	14/8	08/7	01/7	10/9	14/13	14/19	09/23	07/26	07/27
9	9	18/10	17/10	15/9	12/9	07/8	01/9	08/10	12/13	13/19	11/23	09/26	09/27
11	11	16/10	16/10	13/10	10/10	06/10	01/10	07/11	10/13	12/19	10/26	10/26	10/27
13	13	14/13	13/12	11/12	09/11	05/11	01/12	06/13	09/13	11/19	11/23	10/26	10/27
15	15	13/14	12/14	10/13	07/13	04/13	01/13	05/13	08/13	09/19	10/23	10/26	10/27
17	17	11/14	10/14	08/14	06/14	03/14	00/14	04/14	07/15	09/19	09/23	09/26	09/27
19	19	10/16	09/16	07/16	05/16	03/16	00/16	03/16	06/13	07/19	08/23	08/26	08/27
21	21	12/8	12/7	13/7	14/8	13/7	01/7	11/9	13/17	06/26	05/6	06/6	07/7
25	7	16/9	16/9	15/8	13/8	08/7	01/7	10/9	13/17	09/24	06/31	05/37	06/7
9	9	17/10	16/10	15/9	12/9	07/8	01/9	08/9	12/17	10/24	07/30	06/35	06/35
11	11	16/10	16/10	13/10	10/10	06/10	01/10	07/10	10/17	10/24	08/30	07/33	08/33
13	13	14/13	13/12	11/12	09/11	05/11	01/12	06/13	09/17	09/24	08/30	08/33	08/33
15	15	13/14	12/14	10/13	07/13	04/13	01/13	05/14	06/17	08/24	08/30	08/33	08/33
17	17	11/14	10/14	08/14	06/14	03/14	00/14	04/15	06/17	08/24	07/30	07/33	08/33
19	19	10/16	09/16	07/16	05/16	03/16	00/16	03/17	06/17	07/24	07/30	07/33	07/33
21	21	12/8	12/7	13/7	14/8	13/7	01/7	11/9	13/17	06/26	05/6	06/6	07/7

LONGCRESTED
RMS LAT DISP IN FEET/ENCOUNTERED MODAL PERIOD, T_{OE} , IN SECONDS

28

ASR
LONGCRESTED
RMS LAT VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	0	15	30	45	60	SHIP HEADING ANGLE IN DEGREES					135	150	165	180
						75	90	105	120					
0	7	0.00/..	.01/ 8	.02/ 8	.04/ 8	.08/ 7	.12/ 7	.15/ 7	.12/ 7	.07/ 7	.04/ 8	.02/ 8	.01/ 8	.00/ 8
	9	0.00/..	.02/ 9	.04/ 9	.07/ 9	.10/ 9	.13/ 9	.15/ 8	.13/ 9	.10/ 9	.07/ 9	.04/ 10	.02/ 10	.00/ 10
	11	0.00/..	.02/ 12	.05/ 12	.08/ 11	.10/ 11	.13/ 11	.14/ 11	.13/ 11	.11/ 11	.08/ 11	.05/ 11	.02/ 11	.00/ 11
	13	0.00/..	.03/ 13	.05/ 13	.08/ 13	.10/ 12	.13/ 12	.14/ 12	.13/ 12	.11/ 12	.08/ 12	.05/ 12	.03/ 12	.00/ 12
	15	0.00/..	.03/ 14	.05/ 14	.08/ 14	.10/ 14	.13/ 13	.13/ 13	.12/ 13	.10/ 13	.08/ 14	.05/ 14	.03/ 14	.00/ 14
	17	0.00/..	.03/ 14	.05/ 14	.07/ 14	.09/ 14	.11/ 14	.12/ 14	.11/ 14	.09/ 14	.07/ 14	.05/ 14	.03/ 14	.00/ 14
5	7	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.11/ 16	.10/ 16	.09/ 16	.07/ 16	.05/ 16	.02/ 16	.00/ 16
	9	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.09/ 18	.08/ 18	.06/ 18	.04/ 18	.02/ 18	.00/ 18
	11	0.00/..	.01/ 8	.02/ 8	.04/ 8	.08/ 7	.12/ 7	.15/ 7	.12/ 7	.08/ 8	.04/ 9	.02/ 10	.01/ 11	.00/ 10
	13	0.00/..	.02/ 10	.04/ 10	.06/ 10	.10/ 9	.13/ 9	.15/ 8	.13/ 9	.10/ 10	.07/ 11	.05/ 12	.03/ 12	.00/ 11
	15	0.00/..	.02/ 13	.05/ 13	.07/ 13	.10/ 11	.13/ 11	.14/ 11	.13/ 11	.11/ 11	.08/ 11	.05/ 12	.03/ 13	.00/ 13
	17	0.00/..	.03/ 14	.05/ 14	.08/ 14	.10/ 14	.13/ 12	.14/ 12	.13/ 12	.11/ 12	.08/ 13	.05/ 14	.03/ 15	.00/ 15
10	7	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.11/ 14	.12/ 14	.11/ 14	.09/ 15	.07/ 15	.05/ 16	.03/ 16	.00/ 16
	9	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.11/ 16	.10/ 16	.09/ 17	.07/ 19	.05/ 19	.02/ 20	.00/ 20
	11	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.09/ 18	.08/ 19	.06/ 19	.04/ 20	.02/ 20	.00/ 20
	13	0.00/..	.01/ 8	.02/ 8	.04/ 8	.08/ 7	.12/ 7	.15/ 7	.12/ 8	.08/ 10	.06/ 11	.03/ 12	.01/ 13	.00/ 13
	15	0.00/..	.02/ 10	.04/ 10	.06/ 10	.10/ 9	.13/ 9	.15/ 9	.13/ 10	.10/ 11	.08/ 12	.05/ 13	.02/ 14	.00/ 14
	17	0.00/..	.02/ 11	.05/ 11	.07/ 11	.10/ 10	.13/ 10	.14/ 10	.13/ 11	.11/ 12	.08/ 13	.05/ 14	.03/ 15	.00/ 15
15	7	0.00/..	.02/ 14	.05/ 14	.08/ 13	.10/ 13	.13/ 13	.14/ 12	.13/ 13	.11/ 13	.08/ 14	.05/ 15	.03/ 16	.00/ 16
	9	0.00/..	.03/ 14	.05/ 14	.08/ 14	.10/ 14	.13/ 14	.13/ 13	.12/ 14	.10/ 15	.08/ 15	.05/ 16	.03/ 17	.00/ 17
	11	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.11/ 14	.12/ 14	.11/ 15	.09/ 16	.07/ 17	.05/ 19	.02/ 20	.00/ 18
	13	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.11/ 16	.10/ 17	.09/ 18	.07/ 18	.05/ 20	.02/ 20	.00/ 20
	15	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.09/ 19	.08/ 20	.06/ 21	.04/ 22	.02/ 22	.00/ 22
	17	0.00/..	.01/ 8	.02/ 8	.04/ 8	.08/ 7	.12/ 7	.15/ 7	.12/ 9	.09/ 11	.06/ 14	.04/ 17	.02/ 20	.00/ 20
20	7	0.00/..	.02/ 10	.04/ 10	.06/ 10	.10/ 9	.13/ 9	.15/ 9	.14/ 10	.11/ 12	.08/ 14	.05/ 17	.03/ 20	.00/ 20
	9	0.00/..	.02/ 11	.05/ 11	.07/ 11	.10/ 10	.13/ 10	.14/ 10	.14/ 11	.12/ 13	.09/ 14	.06/ 17	.03/ 20	.00/ 20
	11	0.00/..	.02/ 13	.05/ 14	.07/ 14	.10/ 13	.12/ 13	.14/ 12	.13/ 13	.11/ 15	.08/ 14	.06/ 17	.03/ 20	.00/ 20
	13	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.11/ 14	.12/ 14	.13/ 13	.12/ 14	.10/ 16	.08/ 17	.03/ 20	.00/ 20
	15	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.11/ 14	.12/ 14	.11/ 15	.10/ 17	.08/ 18	.05/ 17	.03/ 20	.00/ 20
	17	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.11/ 16	.10/ 17	.09/ 19	.07/ 20	.05/ 23	.02/ 20	.00/ 20
25	7	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.09/ 20	.08/ 21	.07/ 22	.05/ 23	.02/ 20	.00/ 20
	9	0.00/..	.01/ 8	.02/ 8	.04/ 8	.08/ 7	.12/ 7	.15/ 7	.13/ 9	.11/ 13	.08/ 19	.04/ 26	.02/ 35	.00/ 20
	11	0.00/..	.02/ 10	.04/ 10	.06/ 10	.09/ 9	.13/ 9	.15/ 9	.14/ 11	.12/ 13	.10/ 19	.05/ 23	.03/ 26	.00/ 20
	13	0.00/..	.02/ 11	.04/ 11	.07/ 11	.10/ 11	.13/ 10	.14/ 10	.14/ 12	.12/ 13	.10/ 19	.06/ 23	.03/ 26	.00/ 20
	15	0.00/..	.02/ 13	.05/ 13	.07/ 13	.10/ 13	.12/ 13	.14/ 12	.13/ 13	.12/ 13	.10/ 19	.06/ 23	.03/ 26	.00/ 20
	17	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.11/ 14	.12/ 14	.12/ 13	.11/ 13	.09/ 19	.06/ 23	.03/ 26	.00/ 20
30	7	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.11/ 16	.11/ 14	.11/ 16	.10/ 18	.09/ 19	.06/ 23	.03/ 26	.00/ 20
	9	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.10/ 16	.10/ 16	.10/ 18	.09/ 19	.06/ 23	.03/ 26	.00/ 20
	11	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.09/ 20	.08/ 21	.07/ 22	.05/ 23	.02/ 20	.00/ 20
	13	0.00/..	.01/ 8	.02/ 8	.04/ 8	.08/ 7	.12/ 7	.15/ 7	.13/ 9	.11/ 13	.08/ 19	.04/ 26	.02/ 35	.00/ 20
	15	0.00/..	.02/ 10	.04/ 10	.06/ 9	.09/ 9	.13/ 9	.15/ 9	.14/ 11	.12/ 13	.10/ 19	.05/ 23	.03/ 26	.00/ 20
	17	0.00/..	.02/ 11	.04/ 11	.07/ 11	.10/ 11	.13/ 10	.14/ 10	.14/ 12	.12/ 13	.10/ 19	.06/ 23	.03/ 26	.00/ 20
35	7	0.00/..	.02/ 13	.05/ 13	.07/ 13	.10/ 13	.12/ 13	.14/ 12	.13/ 13	.12/ 13	.10/ 19	.06/ 23	.03/ 26	.00/ 20
	9	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.11/ 14	.12/ 14	.12/ 13	.11/ 13	.09/ 19	.06/ 23	.03/ 26	.00/ 20
	11	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.11/ 16	.11/ 16	.10/ 18	.09/ 19	.06/ 23	.03/ 26	.00/ 20
	13	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.10/ 16	.10/ 16	.10/ 18	.09/ 19	.06/ 23	.03/ 26	.00/ 20
	15	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.09/ 20	.08/ 21	.07/ 22	.05/ 23	.02/ 20	.00/ 20
	17	0.00/..	.01/ 8	.02/ 8	.04/ 8	.08/ 7	.12/ 7	.15/ 7	.14/ 10	.14/ 17	.07/ 24	.02/ 45	.01/ 7	.00/ 20
40	7	0.00/..	.02/ 10	.04/ 10	.06/ 9	.09/ 9	.13/ 9	.15/ 9	.15/ 11	.15/ 17	.07/ 24	.03/ 31	.02/ 39	.00/ 20
	9	0.00/..	.02/ 11	.04/ 11	.07/ 11	.10/ 11	.13/ 10	.14/ 10	.15/ 12	.14/ 17	.08/ 24	.04/ 30	.02/ 33	.00/ 20
	11	0.00/..	.02/ 13	.05/ 13	.07/ 13	.10/ 13	.12/ 13	.14/ 12	.14/ 14	.13/ 17	.09/ 24	.05/ 30	.03/ 33	.00/ 20
	13	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.11/ 14	.12/ 14	.13/ 15	.12/ 17	.09/ 24	.05/ 30	.03/ 33	.00/ 20
	15	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.11/ 14	.12/ 17	.11/ 17	.09/ 24	.05/ 30	.03/ 33	.00/ 20
	17	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.11/ 18	.10/ 20	.08/ 24	.05/ 30	.03/ 33	.00/ 20
45	7	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.11/ 18	.10/ 20	.08/ 24	.05/ 30	.03/ 33	.00/ 20
	9	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.11/ 18	.10/ 20	.08/ 24	.05/ 30	.03/ 33	.00/ 20
	11	0.00/..	.01/ 8	.02/ 8	.04/ 8	.08/ 7	.12/ 7	.15/ 7	.14/ 10	.14/ 17	.07/ 24	.02/ 45	.01/ 7	.00/ 20
	13	0.00/..	.02/ 10	.04/ 10	.06/ 9	.09/ 9	.13/ 9	.15/ 9	.15/ 11	.15/ 17	.07/ 24	.03/ 31	.02/ 39	.00/ 20
	15	0.00/..	.02/ 11	.04/ 11	.07/ 11	.10/ 11	.13/ 10	.14/ 10	.15/ 12	.14/ 17	.08/ 24	.04/ 30	.02/ 33	.00/ 20
	17	0.00/..	.02/ 13	.05/ 13	.07/ 13	.10/ 13	.12/ 13	.14/ 12	.14/ 14	.13/ 17	.09/ 24	.05/ 30	.03/ 33	.00/ 20
50	7	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.11/ 16	.12/ 17	.11/ 17	.09/ 24	.05/ 30	.03/ 33	.00/ 20
	9	0.00/..	.02/ 16	.05/ 16	.07/ 16	.09/ 16	.10/ 16	.11/ 16	.11/ 16	.11/ 17	.09/ 24	.05/ 30	.03/ 33	.00/ 20
	11	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.11/ 18	.10/ 20	.08/ 24	.05/ 30	.03/ 33	.00/ 20
	13	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.11/ 18	.10/ 20	.08/ 24	.05/ 30	.03/ 33	.00/ 20
	15	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.11/ 18	.10/ 20	.08/ 24	.05/ 30	.03/ 33	.00/ 20
	17	0.00/..	.02/ 18	.04/ 18	.06/ 18	.08/ 18	.09/ 18	.10/ 18	.11/ 18	.10/ 20	.08/ 24	.05/ 30	.03/ 33	.00/ 20

ASR

RMS LAT ACC IN G'S/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
(ACC. X 100)

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	0.00/00	0.03/08	0.06/08	0.12/07	0.22/07	0.38/06	0.49/06	0.36/07	0.21/07	0.12/08	0.06/08	0.00/08
9	9	0.00/00	0.04/09	0.09/09	0.15/08	0.23/08	0.35/08	0.43/07	0.33/08	0.23/08	0.15/09	0.04/10	0.00/10
11	11	0.00/00	0.04/11	0.09/11	0.15/11	0.22/09	0.30/09	0.35/09	0.29/09	0.22/10	0.15/10	0.05/10	0.00/10
13	13	0.00/00	0.04/12	0.09/12	0.14/12	0.20/11	0.26/11	0.29/11	0.25/11	0.20/11	0.14/11	0.09/11	0.00/10
15	15	0.00/00	0.04/12	0.08/12	0.13/12	0.17/12	0.22/12	0.24/12	0.22/12	0.18/12	0.13/12	0.09/12	0.00/10
17	17	0.00/00	0.04/13	0.08/13	0.11/13	0.15/13	0.19/12	0.21/12	0.19/12	0.15/12	0.12/13	0.08/13	0.00/10
19	19	0.00/00	0.04/13	0.07/14	0.10/14	0.13/13	0.16/13	0.16/13	0.16/13	0.13/13	0.10/13	0.07/14	0.00/10
21	21	0.00/00	0.03/14	0.08/14	0.09/14	0.12/14	0.14/14	0.15/14	0.14/14	0.12/14	0.09/14	0.06/14	0.00/10
7	7	0.00/00	0.03/08	0.07/08	0.14/07	0.25/07	0.41/06	0.49/06	0.33/07	0.18/08	0.10/09	0.05/10	0.00/10
9	9	0.00/00	0.05/09	0.10/09	0.17/09	0.26/08	0.37/08	0.41/08	0.31/08	0.21/09	0.13/11	0.08/11	0.00/10
11	11	0.00/00	0.05/10	0.10/10	0.17/10	0.24/10	0.32/09	0.35/09	0.28/11	0.20/11	0.14/11	0.09/11	0.00/10
13	13	0.00/00	0.05/13	0.10/13	0.16/13	0.22/12	0.27/12	0.29/11	0.24/11	0.19/11	0.13/11	0.08/12	0.00/10
15	15	0.00/00	0.05/13	0.09/13	0.14/13	0.19/13	0.23/12	0.24/12	0.21/11	0.16/12	0.12/13	0.08/13	0.00/10
17	17	0.00/00	0.04/13	0.08/13	0.12/13	0.16/13	0.20/12	0.21/12	0.18/12	0.14/13	0.10/14	0.07/14	0.00/10
19	19	0.00/00	0.04/13	0.07/14	0.11/14	0.14/13	0.17/13	0.18/13	0.15/13	0.12/13	0.09/14	0.06/14	0.00/16
21	21	0.00/00	0.03/14	0.07/14	0.10/14	0.12/14	0.15/14	0.15/14	0.13/14	0.11/15	0.08/15	0.05/15	0.00/16
10	7	0.00/00	0.04/08	0.08/08	0.16/07	0.27/07	0.44/06	0.49/06	0.30/08	0.16/09	0.10/11	0.05/12	0.00/13
9	9	0.00/00	0.05/09	0.11/09	0.19/08	0.28/08	0.39/08	0.41/08	0.30/09	0.19/11	0.13/11	0.07/13	0.00/14
11	11	0.00/00	0.06/10	0.12/10	0.18/10	0.26/10	0.33/09	0.35/09	0.27/10	0.19/11	0.13/12	0.07/14	0.00/15
13	13	0.00/00	0.06/11	0.11/11	0.17/11	0.23/13	0.28/11	0.29/11	0.23/11	0.17/12	0.12/13	0.07/14	0.00/15
15	15	0.00/00	0.05/14	0.10/14	0.15/13	0.20/13	0.24/13	0.24/12	0.20/12	0.15/13	0.11/14	0.06/15	0.00/16
17	17	0.00/00	0.05/14	0.09/14	0.13/14	0.17/13	0.20/13	0.21/12	0.17/13	0.13/13	0.09/15	0.06/16	0.00/17
19	19	0.00/00	0.04/14	0.08/14	0.12/14	0.15/14	0.18/13	0.18/13	0.15/13	0.12/15	0.08/15	0.05/17	0.00/18
21	21	0.00/00	0.04/14	0.07/14	0.10/14	0.13/14	0.15/14	0.15/14	0.13/15	0.10/15	0.07/16	0.05/19	0.00/20
15	7	0.00/00	0.04/08	0.09/08	0.17/07	0.30/07	0.46/06	0.49/06	0.29/08	0.16/11	0.08/14	0.04/17	0.00/20
9	9	0.00/00	0.06/09	0.12/09	0.21/08	0.31/08	0.41/08	0.42/08	0.29/10	0.19/11	0.10/14	0.06/17	0.00/20
11	11	0.00/00	0.06/10	0.13/10	0.20/10	0.28/10	0.35/10	0.35/09	0.26/11	0.18/12	0.11/14	0.06/17	0.00/20
13	13	0.00/00	0.06/11	0.12/11	0.18/11	0.24/11	0.29/10	0.29/10	0.22/11	0.16/13	0.10/14	0.06/17	0.00/20
15	15	0.00/00	0.05/13	0.11/14	0.16/13	0.21/13	0.25/13	0.24/12	0.19/12	0.14/14	0.09/14	0.06/17	0.00/20
17	17	0.00/00	0.05/16	0.10/14	0.14/14	0.18/14	0.21/13	0.21/13	0.17/13	0.12/15	0.08/17	0.05/17	0.00/20
19	19	0.00/00	0.04/16	0.09/16	0.13/14	0.16/14	0.18/14	0.18/13	0.14/14	0.11/16	0.07/18	0.05/17	0.00/20
21	21	0.00/00	0.04/16	0.08/16	0.11/16	0.14/14	0.16/14	0.15/14	0.13/14	0.10/16	0.07/19	0.04/17	0.00/20
20	7	0.00/00	0.04/08	0.10/08	0.19/08	0.32/07	0.48/06	0.49/06	0.27/09	0.15/13	0.08/19	0.03/25	0.00/20
9	9	0.00/00	0.06/09	0.14/09	0.22/08	0.33/08	0.43/07	0.42/08	0.28/10	0.17/13	0.10/19	0.04/23	0.00/20
11	11	0.00/00	0.07/10	0.14/10	0.22/10	0.29/09	0.36/10	0.35/09	0.25/11	0.17/13	0.10/19	0.03/26	0.00/27
13	13	0.00/00	0.06/11	0.13/11	0.20/11	0.26/11	0.30/10	0.29/10	0.22/12	0.15/13	0.10/19	0.05/23	0.00/27
15	15	0.00/00	0.06/13	0.12/13	0.17/13	0.22/13	0.26/13	0.24/11	0.19/13	0.13/13	0.09/19	0.05/23	0.00/27
17	17	0.00/00	0.05/16	0.10/16	0.15/14	0.19/14	0.22/13	0.21/13	0.16/13	0.12/13	0.08/19	0.05/23	0.00/27
19	19	0.00/00	0.04/16	0.09/16	0.13/16	0.17/14	0.19/14	0.19/13	0.14/14	0.10/15	0.07/19	0.04/23	0.00/27
21	21	0.00/00	0.04/16	0.08/16	0.12/16	0.14/14	0.16/14	0.15/14	0.12/15	0.09/13	0.07/19	0.04/23	0.00/27
25	7	0.00/00	0.05/08	0.11/08	0.20/07	0.34/07	0.50/07	0.49/06	0.28/10	0.15/17	0.03/26	0.02/37	0.00/08
9	9	0.00/00	0.07/09	0.15/09	0.24/08	0.34/08	0.44/07	0.42/08	0.28/10	0.17/17	0.05/24	0.02/31	0.00/00
11	11	0.00/00	0.07/10	0.15/10	0.23/10	0.31/09	0.37/09	0.35/09	0.25/11	0.16/17	0.07/24	0.03/30	0.00/48
13	13	0.00/00	0.06/11	0.14/11	0.21/10	0.27/10	0.31/10	0.29/10	0.22/12	0.15/17	0.07/24	0.03/30	0.00/33
15	15	0.00/00	0.06/13	0.12/13	0.18/13	0.23/13	0.26/13	0.24/11	0.19/13	0.13/17	0.07/24	0.03/30	0.00/33
17	17	0.00/00	0.06/14	0.11/14	0.16/14	0.20/14	0.22/13	0.21/13	0.16/14	0.12/17	0.07/24	0.03/30	0.00/33
19	19	0.00/00	0.05/16	0.10/16	0.14/16	0.17/14	0.19/14	0.18/13	0.14/15	0.10/17	0.06/24	0.03/30	0.00/33
21	21	0.00/00	0.04/16	0.08/16	0.12/16	0.15/16	0.16/14	0.15/14	0.12/15	0.09/17	0.06/24	0.03/30	0.00/33

ASR

RMS VER DISP IN FEET/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
 ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.0 FT ABOVE KEEL

V TO	SHIP HEADING ANGLE IN DEGREES															
	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225
0	7 .36/7 .42/8 .41/10 .38/11 .35/14 .33/16 .31/18 .30/21	7 .37/7 .42/8 .40/10 .37/12 .34/14 .32/16 .31/18 .29/21	7 .39/7 .42/8 .40/10 .37/12 .34/14 .32/16 .31/18 .29/21	7 .42/7 .42/8 .39/10 .35/12 .33/14 .31/16 .29/18 .28/21	7 .42/6 .39/8 .35/10 .32/13 .29/16 .27/18 .25/18 .23/21	7 .42/6 .39/8 .35/10 .32/13 .29/16 .27/18 .25/18 .23/21	7 .31/6 .30/9 .29/10 .28/13 .27/14 .26/16 .25/18 .24/21	7 .23/7 .25/9 .25/10 .25/13 .25/16 .25/18 .25/18 .25/21	7 .39/6 .35/8 .31/10 .28/13 .25/16 .22/18 .19/17 .16/21	7 .45/6 .41/8 .37/10 .33/13 .30/16 .27/18 .24/21 .21/22	7 .43/7 .42/8 .39/10 .35/12 .32/15 .29/17 .26/20 .23/22	7 .39/7 .41/8 .40/10 .37/12 .34/14 .32/16 .30/18 .28/22	7 .37/7 .41/8 .40/10 .37/12 .34/14 .32/16 .30/18 .28/22	7 .36/7 .41/8 .40/10 .38/11 .35/14 .33/16 .31/18 .30/21	7 .36/7 .41/8 .40/10 .38/11 .35/14 .33/16 .31/18 .30/21	7 .36/7 .41/8 .40/10 .38/11 .35/14 .33/16 .31/18 .30/21
8	7 .40/7 .46/8 .44/10 .40/11 .37/14 .34/16 .32/18 .30/21	7 .41/7 .46/8 .44/10 .40/11 .37/14 .34/16 .32/18 .30/21	7 .42/7 .46/8 .44/10 .40/11 .37/14 .34/16 .32/18 .30/21	7 .43/7 .44/7 .40/10 .36/12 .33/14 .30/16 .27/18 .25/21	7 .41/6 .39/7 .35/10 .32/13 .29/16 .27/18 .25/18 .23/21	7 .41/6 .39/7 .35/10 .32/13 .29/16 .27/18 .25/18 .23/21	7 .32/6 .31/9 .28/10 .26/13 .24/14 .22/16 .20/18 .18/21	7 .24/7 .26/9 .26/10 .26/13 .26/16 .26/18 .26/18 .26/21	7 .37/6 .33/9 .31/11 .29/13 .27/15 .25/17 .23/19 .21/22	7 .39/7 .37/9 .34/11 .31/13 .28/15 .25/17 .22/19 .19/22	7 .35/8 .37/10 .35/11 .33/13 .31/15 .29/17 .26/20 .23/22	7 .31/9 .35/10 .35/11 .34/13 .32/15 .30/17 .28/20 .25/22	7 .29/9 .35/10 .35/11 .34/13 .32/15 .30/17 .28/20 .25/22	7 .28/10 .35/12 .35/12 .34/13 .32/15 .30/17 .28/20 .25/22	7 .28/10 .35/12 .35/12 .34/13 .32/15 .30/17 .28/20 .25/22	7 .28/10 .35/12 .35/12 .34/13 .32/15 .30/17 .28/20 .25/22
10	7 .39/7 .48/8 .46/9 .42/12 .38/14 .35/16 .33/18 .31/21	7 .40/7 .47/8 .45/9 .41/12 .38/14 .35/16 .33/18 .31/21	7 .41/7 .47/8 .45/9 .41/12 .38/14 .35/16 .33/18 .31/21	7 .42/7 .45/7 .43/9 .39/13 .36/14 .33/16 .30/18 .27/21	7 .41/7 .40/7 .37/10 .33/13 .30/14 .27/16 .24/18 .21/21	7 .41/7 .40/7 .37/10 .33/13 .30/14 .27/16 .24/18 .21/21	7 .33/5 .32/9 .30/10 .28/13 .26/14 .24/16 .22/18 .20/21	7 .26/7 .27/9 .26/10 .26/13 .26/16 .26/18 .26/18 .26/21	7 .35/7 .32/10 .28/11 .25/13 .22/15 .19/17 .16/20 .13/23	7 .34/8 .32/12 .30/14 .28/16 .26/18 .24/20 .22/22 .20/25	7 .30/10 .33/11 .32/13 .31/15 .30/17 .28/20 .25/22 .22/25	7 .26/12 .31/13 .32/13 .31/15 .30/17 .28/20 .25/22 .22/25	7 .24/13 .31/13 .32/13 .31/15 .30/17 .28/20 .25/22 .22/25	7 .24/13 .31/13 .32/13 .31/15 .30/17 .28/20 .25/22 .22/25	7 .24/13 .31/13 .32/13 .31/15 .30/17 .28/20 .25/22 .22/25	7 .24/13 .31/13 .32/13 .31/15 .30/17 .28/20 .25/22 .22/25
15	7 .38/8 .49/8 .47/8 .43/12 .39/14 .36/16 .34/18 .32/21	7 .39/8 .49/8 .47/8 .43/12 .39/14 .36/16 .34/18 .32/21	7 .41/7 .49/8 .47/8 .43/12 .39/14 .36/16 .34/18 .32/21	7 .43/7 .47/7 .43/9 .39/13 .36/14 .33/16 .30/18 .27/21	7 .42/7 .42/7 .39/10 .35/13 .32/14 .29/16 .26/18 .23/21	7 .42/7 .42/7 .39/10 .35/13 .32/14 .29/16 .26/18 .23/21	7 .36/6 .35/8 .32/10 .29/13 .26/14 .24/16 .22/18 .20/21	7 .27/6 .27/9 .27/10 .27/13 .27/16 .27/18 .27/18 .27/21	7 .33/8 .31/10 .29/12 .28/14 .27/15 .26/17 .25/19 .23/22	7 .32/10 .32/10 .30/13 .28/15 .26/17 .24/20 .22/22 .20/25	7 .26/14 .29/14 .29/14 .29/15 .28/17 .26/20 .24/23 .22/25	7 .21/17 .27/20 .29/20 .29/20 .28/21 .26/24 .24/27 .22/30	7 .21/20 .27/20 .29/20 .29/20 .28/21 .26/24 .24/27 .22/30	7 .20/20 .27/20 .29/20 .29/20 .28/21 .26/24 .24/27 .22/30	7 .20/20 .27/20 .29/20 .29/20 .28/21 .26/24 .24/27 .22/30	7 .20/20 .27/20 .29/20 .29/20 .28/21 .26/24 .24/27 .22/30
20	7 .37/8 .53/8 .52/8 .47/8 .42/14 .39/16 .36/18 .34/21	7 .38/8 .52/8 .50/8 .47/8 .42/14 .39/16 .36/18 .34/21	7 .40/8 .52/8 .50/8 .47/8 .42/14 .39/16 .36/18 .34/21	7 .44/7 .50/7 .48/8 .44/8 .40/14 .37/16 .34/18 .32/21	7 .45/7 .46/7 .43/9 .39/13 .36/14 .33/16 .30/18 .27/21	7 .45/7 .46/7 .43/9 .39/13 .36/14 .33/16 .30/18 .27/21	7 .39/6 .38/8 .35/10 .32/13 .29/16 .27/18 .25/18 .23/21	7 .27/6 .28/9 .27/10 .27/13 .27/16 .27/18 .27/18 .27/21	7 .32/8 .31/10 .29/12 .28/14 .27/15 .26/17 .25/19 .23/22	7 .30/13 .29/13 .28/15 .26/17 .24/20 .22/22 .20/25	7 .24/19 .26/23 .28/26 .28/26 .27/23 .25/26 .23/29 .21/32	7 .21/27 .26/26 .28/26 .28/26 .27/23 .25/26 .23/29 .21/32	7 .20/29 .26/29 .28/27 .28/27 .27/23 .25/26 .23/29 .21/32	7 .20/29 .26/29 .28/27 .28/27 .27/23 .25/26 .23/29 .21/32	7 .20/29 .26/29 .28/27 .28/27 .27/23 .25/26 .23/29 .21/32	7 .20/29 .26/29 .28/27 .28/27 .27/23 .25/26 .23/29 .21/32
25	7 .35/8 .56/9 .56/9 .51/9 .46/9 .41/16 .38/18 .35/21	7 .36/8 .56/8 .55/8 .51/8 .46/8 .41/16 .38/18 .35/21	7 .40/8 .57/8 .55/8 .51/8 .46/8 .41/16 .38/18 .35/21	7 .44/8 .55/8 .53/8 .49/8 .44/8 .40/16 .37/18 .34/21	7 .43/7 .47/7 .43/9 .39/13 .36/14 .33/16 .30/18 .27/21	7 .43/7 .47/7 .43/9 .39/13 .36/14 .33/16 .30/18 .27/21	7 .36/6 .35/8 .32/10 .29/13 .26/14 .24/16 .22/18 .20/21	7 .27/6 .28/9 .27/10 .27/13 .27/16 .27/18 .27/18 .27/21	7 .32/8 .31/10 .29/12 .28/14 .27/15 .26/17 .25/19 .23/22	7 .30/13 .29/13 .28/15 .26/17 .24/20 .22/22 .20/25	7 .24/19 .26/23 .28/26 .28/26 .27/23 .25/26 .23/29 .21/32	7 .21/27 .26/26 .28/26 .28/26 .27/23 .25/26 .23/29 .21/32	7 .20/29 .26/29 .28/27 .28/27 .27/23 .25/26 .23/29 .21/32	7 .20/29 .26/29 .28/27 .28/27 .27/23 .25/26 .23/29 .21/32	7 .20/29 .26/29 .28/27 .28/27 .27/23 .25/26 .23/29 .21/32	7 .20/29 .26/29 .28/27 .28/27 .27/23 .25/26 .23/29 .21/32

ASR

LONGCRESTED
RMS VER VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
OE
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	34/ 7	37/ 7	42/ 6	44/ 6	33/ 6	24/ 6	34/ 5	47/ 6	42/ 6	37/ 7	34/ 7	33/ 7
9	9	34/ 8	35/ 7	37/ 7	36/ 6	28/ 6	22/ 8	34/ 5	39/ 6	37/ 7	35/ 7	34/ 7	33/ 8
11	10	30/ 8	30/ 8	30/ 7	29/ 6	23/ 9	19/ 10	21/ 5	31/ 6	31/ 7	30/ 8	29/ 8	29/ 8
13	13	25/ 9	25/ 9	25/ 9	24/ 10	19/ 10	16/ 11	22/ 10	25/ 9	25/ 9	25/ 9	25/ 9	25/ 9
15	15	21/ 10	21/ 10	21/ 10	20/ 12	16/ 13	14/ 13	18/ 13	20/ 12	21/ 10	21/ 10	21/ 10	21/ 10
17	17	18/ 11	18/ 11	18/ 13	17/ 14	14/ 14	13/ 14	15/ 14	17/ 14	18/ 13	18/ 13	18/ 12	18/ 12
19	19	16/ 14	16/ 14	15/ 16	14/ 16	12/ 16	11/ 16	13/ 16	15/ 16	15/ 16	16/ 16	16/ 14	16/ 14
21	21	14/ 18	14/ 18	13/ 18	13/ 18	11/ 18	10/ 18	12/ 18	13/ 18	13/ 18	14/ 18	14/ 18	14/ 18
8	7	44/ 7	47/ 7	48/ 6	46/ 6	35/ 6	25/ 6	39/ 6	35/ 7	28/ 8	23/ 9	20/ 9	19/ 9
9	9	45/ 7	45/ 7	44/ 7	39/ 6	30/ 6	22/ 8	31/ 6	30/ 7	26/ 9	23/ 10	22/ 10	21/ 10
11	11	39/ 8	38/ 7	36/ 7	32/ 7	24/ 9	19/ 10	24/ 10	24/ 9	22/ 10	21/ 10	20/ 11	20/ 11
13	13	33/ 8	32/ 8	29/ 7	26/ 7	20/ 10	17/ 11	20/ 11	20/ 10	19/ 11	18/ 11	18/ 12	18/ 12
15	15	27/ 8	26/ 8	24/ 7	21/ 12	17/ 13	15/ 13	17/ 13	17/ 13	16/ 13	16/ 12	16/ 13	16/ 13
17	17	23/ 10	22/ 11	20/ 13	18/ 14	15/ 14	13/ 14	14/ 15	15/ 15	14/ 15	14/ 14	14/ 14	14/ 14
19	19	20/ 14	19/ 14	18/ 16	16/ 16	13/ 16	12/ 16	13/ 16	13/ 17	12/ 17	12/ 17	12/ 17	12/ 17
21	21	17/ 16	17/ 18	15/ 18	14/ 18	12/ 18	10/ 18	11/ 18	11/ 19	11/ 19	11/ 20	11/ 20	11/ 20
10	7	49/ 7	51/ 7	52/ 7	49/ 6	39/ 6	26/ 6	34/ 6	25/ 8	18/ 10	14/ 12	12/ 13	11/ 13
9	9	53/ 7	53/ 7	52/ 7	43/ 6	33/ 6	23/ 8	27/ 8	22/ 9	18/ 11	16/ 12	14/ 13	14/ 13
11	11	46/ 8	46/ 8	44/ 7	35/ 7	27/ 6	20/ 10	22/ 10	19/ 10	17/ 12	15/ 13	14/ 13	14/ 13
13	13	39/ 8	38/ 8	36/ 8	33/ 7	27/ 10	17/ 11	18/ 12	16/ 12	15/ 13	14/ 13	13/ 13	13/ 13
15	15	32/ 8	32/ 8	30/ 8	28/ 7	19/ 13	15/ 13	15/ 13	14/ 13	13/ 14	12/ 15	12/ 15	12/ 15
17	17	27/ 8	26/ 8	25/ 8	23/ 7	16/ 14	13/ 14	13/ 15	12/ 16	12/ 17	11/ 17	11/ 17	11/ 17
19	19	23/ 8	22/ 8	21/ 8	20/ 16	17/ 16	14/ 16	12/ 16	11/ 17	10/ 18	10/ 20	10/ 20	10/ 20
21	21	20/ 16	19/ 16	17/ 18	15/ 18	12/ 18	11/ 18	11/ 19	10/ 20	09/ 20	09/ 22	09/ 22	09/ 22
15	7	52/ 8	53/ 7	56/ 7	54/ 7	44/ 6	27/ 6	28/ 7	19/ 10	11/ 14	08/ 17	06/ 20	06/ 20
9	9	60/ 8	60/ 8	59/ 7	49/ 7	37/ 6	24/ 8	23/ 9	18/ 10	13/ 14	10/ 17	08/ 20	08/ 20
11	11	54/ 8	51/ 7	47/ 7	40/ 7	30/ 6	20/ 10	19/ 10	16/ 10	12/ 14	10/ 17	09/ 20	09/ 20
13	13	45/ 8	42/ 7	38/ 7	32/ 7	24/ 10	18/ 11	16/ 12	14/ 12	11/ 14	10/ 17	09/ 20	09/ 20
15	15	37/ 8	35/ 8	31/ 7	27/ 7	20/ 13	15/ 13	14/ 14	12/ 15	10/ 14	09/ 17	08/ 20	08/ 20
17	17	31/ 8	29/ 8	26/ 7	22/ 7	17/ 14	13/ 14	12/ 15	11/ 17	09/ 14	08/ 17	08/ 20	08/ 20
19	19	26/ 8	25/ 8	22/ 7	19/ 16	15/ 16	12/ 16	11/ 17	10/ 19	09/ 14	08/ 17	08/ 20	08/ 20
21	21	23/ 8	21/ 8	19/ 18	16/ 18	13/ 18	11/ 18	10/ 20	09/ 21	08/ 22	07/ 20	07/ 20	07/ 20
20	7	53/ 8	57/ 8	60/ 7	60/ 7	50/ 6	28/ 6	24/ 7	14/ 13	07/ 19	04/ 26	03/ 31	03/ 35
9	9	69/ 8	67/ 8	64/ 7	57/ 7	42/ 6	25/ 8	21/ 10	14/ 13	08/ 19	06/ 23	05/ 26	05/ 27
11	11	63/ 8	59/ 8	55/ 7	46/ 7	34/ 6	21/ 10	18/ 11	13/ 13	09/ 19	07/ 23	06/ 26	06/ 27
13	13	53/ 8	49/ 8	45/ 7	37/ 7	27/ 6	18/ 11	15/ 13	11/ 13	09/ 19	07/ 23	06/ 26	06/ 27
15	15	44/ 8	43/ 8	41/ 8	30/ 7	23/ 13	16/ 13	13/ 14	10/ 13	08/ 19	07/ 23	06/ 26	06/ 27
17	17	37/ 8	36/ 8	34/ 8	25/ 7	19/ 14	14/ 14	12/ 16	09/ 13	08/ 19	07/ 23	06/ 26	06/ 27
19	19	31/ 8	30/ 8	28/ 8	21/ 7	17/ 16	12/ 16	10/ 18	09/ 13	07/ 19	06/ 23	06/ 26	06/ 27
21	21	26/ 8	24/ 8	22/ 7	19/ 7	14/ 18	11/ 18	09/ 20	08/ 22	07/ 19	06/ 23	06/ 26	06/ 27
25	7	52/ 8	54/ 8	63/ 8	66/ 7	56/ 6	29/ 6	22/ 9	10/ 17	05/ 27	05/ 52	05/ 6	05/ 6
9	9	77/ 9	78/ 8	73/ 8	65/ 7	48/ 6	25/ 8	19/ 9	10/ 17	06/ 24	05/ 33	04/ 39	04/ 48
11	11	73/ 9	70/ 8	63/ 8	53/ 7	38/ 6	21/ 10	16/ 10	10/ 17	07/ 24	05/ 30	04/ 33	04/ 35
13	13	62/ 9	62/ 8	59/ 8	43/ 7	31/ 6	18/ 11	14/ 13	09/ 17	07/ 24	05/ 30	05/ 33	05/ 33
15	15	52/ 9	51/ 9	48/ 8	35/ 7	25/ 6	16/ 13	12/ 15	09/ 17	07/ 24	05/ 30	05/ 33	05/ 33
17	17	43/ 9	42/ 9	40/ 8	29/ 7	21/ 6	14/ 14	11/ 17	08/ 17	06/ 24	05/ 30	05/ 33	05/ 33
19	19	36/ 9	36/ 9	34/ 8	24/ 7	18/ 16	12/ 16	10/ 18	07/ 17	06/ 24	05/ 30	05/ 33	05/ 33
21	21	31/ 9	30/ 9	29/ 8	25/ 8	16/ 18	11/ 18	09/ 20	07/ 17	06/ 24	05/ 30	05/ 33	05/ 33

ASR

LONGCRESTED
RMS VER ACC IN G'S/ENCOUNTERED MODAL PERIOD, T_{DE} IN SECONDS
(ACC. X 100)
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL. AND 26.07 FT ABOVE KEEL

SHIP HEADING ANGLE IN DEGREES														
V TO	0	15	30	45	60	75	90	105	120	135	150	165	180	
0	7 .95/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .99/ 7 .91/ 7 .74/ 7 .59/ 7 .47/ 8 .39/ 8 .32/ 8 .27/ 8	7 1.11/ 6 .97/ 7 .78/ 7 .61/ 7 .49/ 7 .40/ 7 .33/ 7 .27/ 7	7 1.33/ 6 1.09/ 6 .84/ 6 .65/ 6 .51/ 6 .41/ 6 .34/ 6 .28/ 6	7 1.51/ 5 1.15/ 6 .86/ 6 .65/ 6 .51/ 6 .41/ 6 .34/ 6 .28/ 6	7 1.18/ 5 .89/ 6 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.06/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.02/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.64/ 5 1.23/ 6 1.16/ 5 .92/ 6 .70/ 6 .54/ 6 .43/ 6 .36/ 6 .30/ 6	7 1.36/ 6 1.10/ 6 .85/ 6 .65/ 6 .52/ 6 .42/ 6 .34/ 6 .28/ 6	7 1.13/ 6 .98/ 7 .78/ 7 .61/ 7 .49/ 7 .38/ 8 .32/ 8 .27/ 8	7 1.02/ 7 .91/ 7 .74/ 7 .59/ 7 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8	
5	7 1.56/ 7 1.46/ 7 1.19/ 7 .94/ 7 .74/ 7 .60/ 7 .49/ 7 .41/ 7	7 1.59/ 7 1.47/ 7 1.18/ 7 .93/ 7 .72/ 7 .60/ 7 .49/ 7 .41/ 7	7 1.66/ 7 1.48/ 7 1.17/ 7 .92/ 7 .72/ 7 .56/ 7 .48/ 7 .40/ 7	7 1.74/ 6 1.47/ 6 1.14/ 7 .88/ 7 .69/ 7 .55/ 7 .45/ 7 .38/ 7	7 1.71/ 6 1.35/ 6 1.02/ 6 .78/ 6 .57/ 6 .45/ 6 .36/ 6 .30/ 6 .25/ 6	7 1.29/ 6 .99/ 6 .74/ 6 .52/ 6 .41/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.38/ 5 .87/ 5 .68/ 6 .52/ 6 .41/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.06/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.02/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.38/ 6 1.10/ 6 .85/ 6 .65/ 6 .52/ 6 .42/ 6 .34/ 6 .28/ 6	7 1.13/ 6 .98/ 7 .78/ 7 .61/ 7 .49/ 7 .38/ 8 .32/ 8 .27/ 8	7 1.02/ 7 .91/ 7 .74/ 7 .59/ 7 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8
10	7 1.94/ 7 1.60/ 7 1.27/ 7 1.01/ 7 .81/ 7 .67/ 7 .55/ 7	7 1.97/ 7 1.58/ 7 1.23/ 7 1.01/ 7 .80/ 7 .67/ 7 .55/ 7 .47/ 7	7 2.02/ 7 1.53/ 7 1.20/ 7 1.00/ 7 .76/ 7 .62/ 7 .52/ 7	7 2.06/ 7 1.42/ 7 1.10/ 7 .86/ 6 .66/ 6 .42/ 6 .34/ 10 .28/ 10 .23/ 11 .20/ 12	7 1.95/ 6 1.59/ 6 1.21/ 6 .93/ 6 .73/ 6 .54/ 6 .44/ 6 .35/ 10 .28/ 10 .23/ 11 .20/ 12	7 1.48/ 6 .86/ 6 .66/ 6 .42/ 6 .34/ 10 .28/ 10 .23/ 11 .20/ 12	7 1.10/ 6 .79/ 6 .58/ 6 .44/ 6 .35/ 10 .28/ 10 .23/ 11 .20/ 12	7 1.06/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.02/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.38/ 6 1.10/ 6 .85/ 6 .65/ 6 .52/ 6 .42/ 6 .34/ 6 .28/ 6	7 1.13/ 6 .98/ 7 .78/ 7 .61/ 7 .49/ 7 .38/ 8 .32/ 8 .27/ 8	7 1.02/ 7 .91/ 7 .74/ 7 .59/ 7 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8
15	7 2.25/ 7 2.44/ 8 2.05/ 8 1.64/ 8 1.30/ 8 1.05/ 8 .86/ 8 .72/ 8	7 2.28/ 7 2.42/ 8 2.02/ 8 1.61/ 8 1.28/ 8 1.03/ 8 .84/ 8 .70/ 8	7 2.34/ 7 2.36/ 8 1.94/ 8 1.53/ 8 1.21/ 8 1.03/ 8 .84/ 8 .70/ 8	7 2.38/ 7 2.22/ 7 1.76/ 7 1.37/ 7 1.08/ 7 .86/ 7 .71/ 7 .58/ 7	7 2.27/ 6 1.92/ 7 1.47/ 7 1.13/ 7 .88/ 7 .61/ 6 .40/ 6 .34/ 6 .29/ 10 .24/ 10 .19/ 12 .16/ 14	7 1.74/ 6 1.36/ 6 1.02/ 6 .78/ 6 .57/ 6 .45/ 6 .36/ 6 .30/ 6 .25/ 6	7 1.48/ 6 .89/ 5 .70/ 6 .54/ 6 .44/ 6 .35/ 10 .28/ 10 .23/ 11 .20/ 12	7 1.10/ 6 .79/ 6 .58/ 6 .44/ 6 .35/ 10 .28/ 10 .23/ 11 .20/ 12	7 1.06/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.38/ 6 1.10/ 6 .85/ 6 .65/ 6 .52/ 6 .42/ 6 .34/ 6 .28/ 6	7 1.13/ 6 .98/ 7 .78/ 7 .61/ 7 .49/ 7 .38/ 8 .32/ 8 .27/ 8	7 1.02/ 7 .91/ 7 .74/ 7 .59/ 7 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8
20	7 2.43/ 8 2.95/ 8 2.58/ 8 2.08/ 8 1.67/ 8 1.35/ 8 1.10/ 8 .92/ 8	7 2.46/ 8 2.92/ 8 2.53/ 8 2.04/ 8 1.63/ 8 1.31/ 8 1.07/ 8 .89/ 8	7 2.58/ 8 2.85/ 8 2.40/ 8 1.91/ 8 1.52/ 8 1.22/ 8 1.00/ 8 .83/ 8	7 2.69/ 7 2.68/ 7 2.18/ 7 1.79/ 7 1.34/ 7 1.08/ 7 .86/ 7 .73/ 7	7 2.61/ 7 2.30/ 7 1.79/ 7 1.38/ 7 1.08/ 7 .86/ 7 .73/ 7 .58/ 7	7 2.04/ 6 1.61/ 6 1.21/ 6 .92/ 6 .72/ 6 .58/ 6 .47/ 6 .39/ 6	7 1.59/ 7 .75/ 5 .58/ 6 .45/ 6 .36/ 10 .23/ 11 .20/ 12	7 1.20/ 5 .79/ 5 .56/ 6 .44/ 6 .35/ 10 .28/ 10 .23/ 11 .20/ 12	7 1.06/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.38/ 6 1.10/ 6 .85/ 6 .65/ 6 .52/ 6 .42/ 6 .34/ 6 .28/ 6	7 1.13/ 6 .98/ 7 .78/ 7 .61/ 7 .49/ 7 .38/ 8 .32/ 8 .27/ 8	7 1.02/ 7 .91/ 7 .74/ 7 .59/ 7 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8
25	7 2.50/ 8 3.44/ 8 3.13/ 8 2.57/ 9 2.07/ 9 1.68/ 9 1.37/ 9	7 2.58/ 8 3.46/ 8 3.11/ 8 2.54/ 8 2.04/ 8 1.65/ 8 1.35/ 8	7 2.73/ 8 3.40/ 8 2.97/ 8 2.39/ 8 1.91/ 8 1.54/ 8 1.26/ 8	7 2.91/ 8 3.16/ 8 2.63/ 8 2.08/ 8 1.67/ 7 1.34/ 7 1.08/ 7 .85/ 7	7 2.95/ 7 2.74/ 7 2.16/ 7 1.67/ 7 1.30/ 7 1.04/ 7 .85/ 7 .55/ 7	7 2.38/ 6 1.91/ 6 1.43/ 6 1.09/ 6 .85/ 6 .71/ 6 .55/ 6 .25/ 11	7 1.01/ 5 .78/ 5 .60/ 5 .47/ 5 .37/ 10 .20/ 9 .30/ 10 .25/ 11	7 1.20/ 5 .79/ 5 .56/ 6 .44/ 6 .35/ 10 .28/ 10 .23/ 11 .20/ 12	7 1.06/ 5 .86/ 5 .67/ 6 .51/ 7 .40/ 9 .33/ 10 .27/ 10 .22/ 12 .19/ 13	7 1.38/ 6 1.10/ 6 .85/ 6 .65/ 6 .52/ 6 .42/ 6 .34/ 6 .28/ 6	7 1.13/ 6 .98/ 7 .78/ 7 .61/ 7 .49/ 7 .38/ 8 .32/ 8 .27/ 8	7 1.02/ 7 .91/ 7 .74/ 7 .59/ 7 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8	7 .98/ 7 .89/ 7 .73/ 7 .58/ 8 .47/ 8 .38/ 8 .32/ 8 .27/ 8

ASR

LONGCRESTED
RMS ROLL IN DEGREES/ENCOUNTERED MODAL PERIOD, T_{DE}, IN SECONDS

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	0.00/00	.10/10	.18/10	.23/10	.23/10	.20/10	.18/10	.20/10	.22/10	.21/10	.17/10	.09/10
9	0.00/00	.24/10	.37/10	.44/10	.45/10	.43/10	.43/10	.44/10	.45/10	.43/10	.36/10	.23/10	.00/10
11	0.00/00	.26/10	.40/10	.47/10	.49/10	.52/10	.52/10	.53/10	.53/10	.50/10	.46/10	.28/10	.00/10
13	0.00/00	.28/10	.43/10	.51/10	.51/10	.52/10	.49/10	.49/10	.49/10	.46/10	.39/10	.25/10	.00/10
15	0.00/00	.22/10	.34/10	.40/10	.42/10	.42/10	.42/10	.42/10	.42/10	.39/10	.33/10	.22/10	.00/10
17	0.00/00	.18/10	.28/10	.33/10	.35/10	.35/10	.35/10	.35/10	.35/10	.33/10	.28/10	.18/10	.00/10
19	0.00/00	.15/10	.23/10	.28/10	.29/10	.30/10	.30/10	.30/10	.29/10	.27/10	.23/10	.15/10	.00/10
21	0.00/00	.13/10	.20/10	.23/10	.25/10	.25/10	.25/10	.25/10	.25/10	.23/10	.19/10	.12/10	.00/10
5	7	0.00/00	.09/08	.13/08	.15/08	.15/08	.16/10	.18/10	.28/10	.39/10	.49/10	.39/10	.00/10
9	0.00/00	.12/11	.23/11	.31/11	.35/11	.39/10	.43/10	.57/10	.67/10	.73/10	.70/10	.51/10	.00/10
11	0.00/00	.19/12	.35/12	.45/11	.50/11	.53/10	.52/10	.63/11	.69/10	.70/10	.63/10	.45/10	.00/10
13	0.00/00	.19/12	.36/12	.46/12	.50/11	.51/11	.49/10	.56/10	.60/10	.58/10	.51/10	.36/10	.00/10
15	0.00/00	.17/12	.32/12	.41/12	.44/11	.45/11	.42/10	.47/11	.49/10	.47/10	.41/10	.29/10	.00/10
17	0.00/00	.15/12	.27/12	.35/12	.38/11	.38/11	.35/10	.39/11	.40/10	.39/10	.33/10	.23/10	.00/10
19	0.00/00	.13/12	.23/12	.29/12	.32/11	.32/11	.30/10	.33/11	.33/10	.32/10	.27/10	.19/10	.00/10
21	0.00/00	.11/12	.20/12	.25/12	.27/11	.27/11	.25/10	.27/11	.28/10	.26/10	.23/10	.16/10	.00/10
10	7	0.00/00	.06/07	.09/07	.11/08	.12/08	.17/10	.32/10	.66/10	1.17/10	.73/12	.20/13	.00/13
9	0.00/00	.06/13	.11/13	.16/12	.22/11	.26/11	.34/10	.51/10	.76/10	1.04/10	.62/12	.19/13	.00/13
11	0.00/00	.11/13	.19/13	.24/13	.32/12	.37/11	.41/10	.52/10	.66/10	.81/10	.47/12	.15/13	.00/13
13	0.00/00	.13/13	.22/13	.27/13	.34/13	.37/11	.39/10	.46/10	.54/10	.62/10	.36/12	.12/13	.00/13
15	0.00/00	.13/13	.21/13	.25/13	.31/13	.33/12	.34/10	.38/10	.43/10	.48/10	.28/12	.10/13	.00/13
17	0.00/00	.11/13	.19/13	.23/13	.27/13	.29/12	.29/10	.32/10	.35/10	.38/10	.22/12	.08/13	.00/13
19	0.00/00	.10/13	.17/13	.20/13	.23/13	.24/12	.24/10	.26/10	.29/10	.31/10	.18/12	.06/13	.00/13
21	0.00/00	.09/13	.14/13	.17/13	.20/13	.21/12	.21/10	.22/10	.24/10	.26/10	.15/12	.05/13	.00/13
15	7	0.00/00	.04/08	.06/07	.08/07	.09/08	.15/09	.36/10	1.09/10	.43/14	.17/17	.07/20	.00/21
9	0.00/00	.04/11	.07/11	.10/11	.13/11	.18/11	.27/10	.46/10	.69/10	.39/14	.17/17	.08/20	.00/20
11	0.00/00	.08/14	.12/14	.16/13	.19/13	.25/12	.30/10	.43/10	.68/10	.32/14	.15/17	.07/20	.00/20
13	0.00/00	.12/14	.15/14	.19/14	.21/13	.26/12	.30/10	.37/10	.53/10	.25/14	.13/17	.06/20	.00/20
15	0.00/00	.13/14	.16/14	.19/14	.21/13	.24/12	.27/10	.31/11	.41/10	.25/14	.10/17	.05/20	.00/20
17	0.00/00	.12/14	.15/14	.18/14	.19/13	.21/13	.23/10	.26/11	.33/10	.17/14	.09/17	.04/20	.00/20
19	0.00/00	.11/14	.13/14	.16/14	.17/13	.18/13	.20/10	.21/11	.27/10	.14/14	.07/17	.03/20	.00/20
21	0.00/00	.09/14	.12/14	.14/14	.14/13	.16/13	.17/11	.18/11	.22/10	.12/14	.06/17	.03/20	.00/20
20	7	0.00/00	.03/08	.05/08	.06/07	.08/08	.14/08	.47/10	.66/13	.32/19	.14/31	.27/04	.00/04
9	0.00/00	.03/10	.05/11	.07/11	.10/11	.15/11	.25/10	.52/10	.56/13	.26/19	.13/23	.18/04	.00/04
11	0.00/00	.05/14	.09/14	.12/14	.16/13	.21/12	.30/10	.46/10	.46/13	.21/19	.12/23	.13/04	.00/27
13	0.00/00	.07/16	.13/14	.16/14	.19/13	.22/13	.29/10	.38/11	.34/13	.17/19	.10/23	.10/26	.00/27
15	0.00/00	.08/16	.15/14	.16/14	.19/14	.21/13	.25/10	.31/11	.27/13	.14/19	.08/23	.08/26	.00/27
17	0.00/00	.08/16	.14/14	.15/14	.17/14	.19/13	.22/11	.26/11	.22/13	.12/19	.07/23	.06/26	.00/27
19	0.00/00	.07/16	.13/14	.14/14	.15/14	.16/13	.19/11	.21/11	.18/13	.10/19	.06/23	.05/26	.00/27
21	0.00/00	.07/16	.11/14	.12/14	.14/14	.14/13	.16/11	.18/11	.15/13	.09/19	.05/23	.04/26	.00/27
25	7	0.00/00	.02/08	.04/08	.05/08	.07/08	.14/08	.68/09	.37/17	.21/35	.14/07	.11/05	.00/06
9	0.00/00	.02/10	.04/10	.06/11	.08/11	.12/11	.23/10	.63/10	.33/17	.19/24	.13/45	.08/05	.00/06
11	0.00/00	.03/16	.06/14	.09/14	.12/13	.18/13	.28/10	.52/11	.28/17	.17/24	.11/30	.07/42	.00/48
13	0.00/00	.06/16	.09/16	.13/14	.16/14	.20/13	.26/10	.41/11	.23/17	.14/24	.09/30	.05/33	.00/33
15	0.00/00	.07/16	.10/16	.14/14	.16/14	.19/13	.23/11	.33/11	.18/17	.12/24	.08/30	.04/33	.00/33
17	0.00/00	.07/16	.10/16	.14/16	.15/14	.17/13	.20/11	.27/11	.15/17	.10/24	.06/30	.04/33	.00/33
19	0.00/00	.07/16	.09/16	.12/16	.14/14	.15/13	.17/11	.22/11	.13/17	.08/24	.06/30	.03/33	.00/33
21	0.00/00	.06/16	.09/16	.11/16	.12/14	.13/13	.15/11	.19/11	.11/17	.07/24	.05/30	.03/33	.00/33

ASR
LONGCRESTED
RMS ROLL VEL IN DPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	0.00/00	.14/8	.19/7	.20/8	.16/10	.15/10	.17/10	.19/8	.17/8	.13/8	.07/10	.00/10
9	9	.08/10	.24/10	.29/10	.30/10	.28/10	.28/10	.29/10	.30/10	.28/10	.24/10	.15/10	.00/10
11	11	.15/10	.17/10	.32/10	.33/10	.32/10	.32/10	.33/10	.33/10	.32/10	.27/10	.17/10	.00/10
13	13	.16/10	.24/10	.29/10	.30/10	.29/10	.30/10	.30/10	.30/10	.28/10	.24/10	.15/10	.00/10
15	15	.13/10	.20/10	.24/10	.25/10	.25/10	.25/10	.25/10	.25/10	.24/10	.20/10	.13/10	.00/10
17	17	.11/10	.17/10	.20/10	.21/10	.21/10	.21/10	.21/10	.21/10	.20/10	.17/10	.11/10	.00/10
19	19	.09/10	.14/10	.17/10	.17/10	.17/10	.17/10	.17/10	.17/10	.16/10	.14/10	.09/10	.00/10
21	21	.08/10	.12/10	.14/10	.15/10	.15/10	.14/10	.15/10	.15/10	.14/10	.12/10	.07/10	.00/10
8	7	.05/7	.10/7	.14/7	.10/7	.15/10	.15/10	.22/10	.29/10	.34/10	.33/10	.25/10	.00/10
9	9	.09/11	.16/11	.22/11	.24/11	.26/10	.28/10	.37/10	.43/10	.46/10	.43/10	.31/10	.00/10
11	11	.12/12	.23/12	.29/11	.31/11	.32/10	.32/10	.39/10	.42/10	.43/10	.38/10	.27/10	.00/10
13	13	.12/12	.23/12	.29/11	.31/11	.31/10	.29/10	.34/11	.36/10	.35/10	.31/10	.22/10	.00/10
15	15	.11/12	.20/12	.25/12	.27/11	.27/10	.25/10	.28/11	.29/10	.28/10	.25/10	.17/10	.00/10
17	17	.09/12	.17/12	.21/12	.23/11	.22/11	.23/11	.23/10	.24/10	.23/10	.20/10	.14/10	.00/10
19	19	.08/12	.14/12	.18/12	.19/11	.19/11	.17/10	.19/11	.20/10	.19/10	.16/10	.11/10	.00/10
21	21	.07/12	.12/12	.15/12	.16/11	.16/11	.14/10	.16/11	.16/10	.16/10	.13/10	.09/10	.00/10
10	7	.04/7	.07/7	.11/7	.13/6	.12/8	.14/8	.24/10	.44/10	.72/10	.40/12	.10/13	.00/13
9	9	.05/13	.10/13	.13/11	.17/11	.18/10	.23/10	.32/10	.48/10	.62/10	.33/12	.09/13	.00/13
11	11	.07/13	.13/13	.17/13	.21/12	.23/11	.26/10	.33/10	.41/10	.48/10	.25/12	.07/13	.00/13
13	13	.08/13	.14/13	.17/13	.22/12	.23/11	.23/10	.28/10	.32/10	.36/10	.19/12	.06/13	.00/13
15	15	.08/13	.13/13	.16/13	.19/12	.20/11	.20/10	.23/10	.26/10	.28/10	.15/12	.04/13	.00/13
17	17	.07/13	.12/13	.14/13	.17/13	.17/11	.17/10	.18/10	.21/10	.22/10	.12/12	.04/13	.00/13
19	19	.06/13	.10/13	.12/13	.14/13	.14/11	.14/10	.15/10	.17/10	.18/10	.09/12	.03/13	.00/13
21	21	.05/13	.09/13	.10/13	.12/13	.12/11	.12/10	.13/10	.14/10	.15/10	.08/12	.02/13	.00/13
15	7	.03/8	.06/7	.08/7	.10/7	.10/8	.13/8	.26/10	.66/10	.19/14	.06/17	.02/20	.00/20
9	9	.04/8	.07/8	.10/10	.12/10	.14/10	.18/10	.30/10	.53/10	.17/14	.06/17	.02/20	.00/20
11	11	.06/14	.09/14	.12/13	.14/13	.17/11	.20/10	.27/10	.40/10	.14/14	.05/17	.02/20	.00/20
13	13	.08/14	.10/14	.13/13	.14/13	.16/12	.18/10	.22/10	.30/10	.11/14	.04/17	.02/20	.00/20
15	15	.08/14	.10/14	.12/14	.13/13	.15/12	.16/10	.18/10	.23/10	.09/14	.04/17	.01/20	.00/20
17	17	.07/14	.09/14	.11/14	.11/13	.13/12	.13/10	.15/10	.19/10	.07/14	.03/17	.01/20	.00/20
19	19	.06/14	.08/14	.09/14	.10/13	.11/12	.11/10	.12/10	.15/10	.06/14	.02/17	.01/20	.00/20
21	21	.06/14	.07/14	.08/14	.08/13	.09/12	.09/10	.10/10	.12/10	.05/14	.02/17	.01/20	.00/20
20	7	.02/8	.05/7	.07/7	.09/7	.09/8	.13/8	.33/10	.30/13	.14/3	.06/4	.16/4	.00/4
9	9	.03/9	.06/8	.08/8	.10/10	.12/10	.17/10	.33/10	.26/13	.10/19	.04/23	.10/4	.00/4
11	11	.04/14	.08/14	.10/13	.12/13	.14/12	.19/10	.28/10	.20/13	.08/19	.03/23	.07/4	.00/4
13	13	.05/14	.09/14	.11/14	.12/13	.14/13	.17/10	.23/10	.15/13	.06/19	.03/23	.05/4	.00/4
15	15	.05/16	.10/14	.11/14	.12/13	.13/13	.15/10	.18/10	.12/13	.05/19	.02/23	.04/4	.00/27
17	17	.05/16	.09/14	.10/14	.11/14	.11/13	.12/10	.15/11	.10/13	.04/19	.02/23	.03/4	.00/27
19	19	.05/16	.08/14	.09/14	.09/14	.09/13	.10/10	.12/11	.08/13	.03/19	.02/23	.02/4	.00/27
21	21	.04/16	.07/14	.07/14	.08/14	.08/13	.09/10	.10/11	.07/13	.03/19	.01/23	.02/4	.00/27
25	7	.02/7	.04/7	.06/7	.07/7	.08/7	.12/8	.45/9	.12/17	.07/4	.05/5	.05/5	.00/6
9	9	.02/9	.05/9	.07/8	.08/10	.10/10	.16/10	.39/10	.11/17	.05/24	.03/5	.04/5	.00/6
11	11	.03/16	.06/14	.08/14	.10/13	.12/12	.17/10	.31/10	.10/17	.04/24	.03/30	.02/5	.00/6
13	13	.04/16	.06/16	.09/14	.11/14	.13/13	.16/10	.24/10	.08/17	.04/24	.02/30	.02/5	.00/6
15	15	.05/16	.07/16	.09/14	.10/14	.12/13	.14/10	.19/11	.06/17	.03/24	.02/30	.02/5	.00/33
17	17	.05/16	.07/16	.08/14	.10/14	.10/13	.12/10	.15/11	.05/17	.03/24	.01/30	.01/33	.00/33
19	19	.04/16	.06/16	.08/14	.08/14	.09/13	.10/10	.12/11	.04/17	.02/24	.01/30	.01/33	.00/33
21	21	.04/16	.05/15	.07/16	.07/14	.08/13	.08/10	.10/11	.04/17	.02/24	.01/30	.01/33	.00/33

ASR
LONGCRESTED
RMS ROLL ACC IN DS2/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	SHIP HEADING ANGLE IN DEGREES											180
	0	15	30	45	60	75	90	105	120	135	150	165
0	7	0.00/..	.07/ 7	.13/ 7	.18/ 6	.20/ 6	.16/ 8	.14/ 8	.17/ 7	.15/ 7	.11/ 7	.06/ 7
	9	0.00/..	.10/10	.17/10	.21/10	.22/10	.20/10	.19/10	.21/10	.20/10	.16/10	.10/10
	11	0.00/..	.11/10	.18/10	.21/10	.22/10	.20/10	.19/10	.21/10	.20/10	.16/10	.10/10
	13	0.00/..	.10/10	.15/10	.18/10	.19/10	.18/10	.17/10	.19/10	.18/10	.15/10	.10/10
	15	0.00/..	.08/10	.13/10	.15/10	.16/10	.15/10	.14/10	.16/10	.15/10	.13/10	.08/10
	17	0.00/..	.07/10	.11/10	.13/10	.13/10	.13/10	.13/10	.13/10	.12/10	.10/10	.07/10
	19	0.00/..	.06/10	.09/10	.10/10	.11/10	.11/10	.11/10	.11/10	.10/10	.09/10	.05/10
	21	0.00/..	.05/10	.07/10	.09/10	.09/10	.09/10	.09/10	.11/10	.08/10	.07/10	.05/10
5	7	0.00/..	.05/ 7	.11/ 7	.15/ 6	.18/ 6	.15/ 7	.14/ 8	.22/10	.24/10	.22/10	.16/10
	9	0.00/..	.07/11	.13/11	.17/11	.19/11	.19/10	.19/10	.28/10	.30/10	.27/10	.19/10
	11	0.00/..	.08/12	.15/11	.20/11	.21/11	.21/10	.20/10	.27/10	.27/10	.24/10	.17/10
	13	0.00/..	.08/12	.15/12	.19/11	.20/11	.19/10	.18/10	.22/10	.22/10	.19/10	.13/10
	15	0.00/..	.07/12	.13/12	.16/11	.17/11	.16/10	.15/10	.17/10	.17/10	.15/10	.10/10
	17	0.00/..	.06/12	.11/12	.13/11	.14/11	.14/10	.13/10	.15/10	.14/10	.12/10	.08/10
	19	0.00/..	.05/12	.09/12	.11/11	.12/11	.11/10	.10/10	.12/10	.11/10	.10/10	.07/10
	21	0.00/..	.04/12	.08/12	.09/11	.10/11	.10/10	.09/10	.10/10	.09/10	.08/10	.06/10
10	7	0.00/..	.05/ 7	.10/ 7	.14/ 7	.16/ 6	.13/ 6	.13/ 8	.31/10	.45/10	.21/12	.05/13
	9	0.00/..	.05/ 7	.10/ 7	.14/ 7	.16/11	.15/10	.16/10	.31/10	.38/10	.18/12	.04/13
	11	0.00/..	.06/13	.10/13	.13/13	.15/12	.16/11	.17/10	.26/10	.29/10	.13/12	.03/13
	13	0.00/..	.06/13	.10/13	.13/13	.15/12	.15/11	.15/10	.20/10	.22/10	.10/12	.03/13
	15	0.00/..	.05/13	.09/13	.11/13	.13/12	.13/11	.12/10	.14/10	.17/10	.08/12	.02/13
	17	0.00/..	.05/13	.08/13	.09/13	.11/12	.11/11	.10/10	.13/10	.13/10	.06/12	.02/13
	19	0.00/..	.04/13	.07/13	.08/13	.09/12	.09/11	.08/10	.10/10	.11/10	.05/12	.01/13
	21	0.00/..	.03/13	.06/13	.07/13	.08/12	.07/11	.07/10	.08/10	.09/10	.04/12	.01/13
15	7	0.00/..	.04/ 7	.09/ 7	.13/ 7	.15/ 6	.12/ 6	.13/ 8	.40/10	.08/14	.02/17	.01/20
	9	0.00/..	.05/ 8	.09/ 8	.12/ 7	.13/ 7	.12/10	.14/10	.32/10	.07/14	.02/17	.01/20
	11	0.00/..	.05/14	.08/13	.11/13	.12/12	.12/11	.13/10	.23/10	.06/14	.02/17	.01/20
	13	0.00/..	.05/14	.08/14	.10/13	.11/13	.11/11	.12/10	.18/10	.05/14	.02/17	.01/20
	15	0.00/..	.05/14	.07/14	.09/13	.09/13	.10/12	.10/10	.14/10	.04/14	.01/17	.00/20
	17	0.00/..	.05/14	.06/14	.08/13	.08/13	.08/12	.08/10	.11/10	.03/14	.01/17	.00/20
	19	0.00/..	.04/14	.06/14	.06/13	.07/13	.07/12	.07/10	.09/10	.02/14	.01/17	.00/20
	21	0.00/..	.04/14	.05/14	.05/13	.06/13	.06/12	.06/10	.07/10	.02/14	.01/17	.00/20
20	7	0.00/..	.04/ 7	.08/ 7	.12/ 6	.14/ 6	.12/ 6	.13/ 7	.14/13	.08/ 3	.04/ 4	.09/ 4
	9	0.00/..	.04/ 8	.08/ 8	.11/ 8	.12/ 7	.11/10	.13/10	.12/13	.05/ 3	.03/ 4	.06/ 4
	11	0.00/..	.04/14	.08/14	.10/13	.11/13	.11/11	.13/10	.09/13	.04/19	.02/23	.04/ 4
	13	0.00/..	.04/14	.08/14	.09/14	.10/13	.10/12	.11/10	.07/13	.03/19	.01/23	.03/ 4
	15	0.00/..	.04/14	.07/14	.09/13	.09/13	.09/12	.09/10	.06/13	.02/19	.01/23	.02/ 4
	17	0.00/..	.04/16	.06/14	.07/14	.07/13	.07/13	.08/10	.04/13	.02/19	.01/23	.02/ 4
	19	0.00/..	.03/16	.06/14	.06/14	.06/13	.06/13	.06/10	.07/10	.01/19	.01/23	.02/ 4
	21	0.00/..	.03/16	.05/14	.05/14	.05/13	.05/10	.05/10	.03/13	.01/19	.01/23	.01/ 4
25	7	0.00/..	.04/ 7	.08/ 7	.11/ 7	.13/ 6	.11/ 6	.12/ 7	.04/17	.03/ 4	.03/ 4	.03/ 5
	9	0.00/..	.04/ 8	.07/ 8	.10/ 8	.11/ 7	.10/10	.13/10	.04/17	.05/ 4	.02/ 4	.02/ 5
	11	0.00/..	.04/ 9	.07/ 9	.09/12	.10/12	.10/11	.12/10	.03/17	.02/24	.01/ 4	.02/ 5
	13	0.00/..	.04/16	.06/14	.08/14	.09/13	.09/13	.10/10	.02/24	.01/ 4	.01/ 4	.01/ 5
	15	0.00/..	.04/16	.06/16	.07/14	.08/14	.08/13	.09/10	.02/17	.01/24	.01/30	.01/ 5
	17	0.00/..	.03/16	.05/16	.07/14	.07/14	.07/13	.07/10	.02/17	.01/24	.01/30	.01/ 5
	19	0.00/..	.03/16	.04/16	.06/14	.06/14	.06/13	.06/10	.02/17	.01/24	.01/30	.01/ 5
	21	0.00/..	.03/16	.04/16	.05/14	.05/14	.05/13	.05/10	.01/17	.01/24	.00/30	.00/ 5

ASR
LONGCRESTED
RMS PITCH IN DEGREES/ENCOUNTERED MODAL PERIOD, T_{OE}, IN SECONDS

V	T ₀	SHIP HEADING ANGLE IN DEGREES											180
		0	15	30	45	60	75	90	105	120	135	150	165
0	7	.17/ 7	.18/ 7	.19/ 7	.20/ 6	.20/ 6	.14/ 6	.02/ 5	.15/ 5	.19/ 6	.19/ 7	.17/ 7	.16/ 7
	9	.19/ 8	.19/ 8	.19/ 8	.19/ 7	.17/ 6	.11/ 6	.02/ 5	.11/ 6	.16/ 7	.18/ 7	.18/ 8	.18/ 8
	11	.17/ 9	.17/ 9	.17/ 9	.16/ 8	.14/ 7	.08/ 6	.01/ 5	.09/ 6	.13/ 7	.15/ 8	.16/ 9	.17/ 9
	13	.15/10	.15/10	.14/10	.13/ 9	.11/ 9	.07/ 6	.01/ 5	.07/ 6	.11/ 9	.13/10	.14/10	.15/10
	15	.13/10	.13/10	.12/10	.11/10	.09/10	.05/ 6	.01/ 5	.05/ 6	.09/10	.11/10	.12/10	.12/10
	17	.11/12	.11/12	.10/11	.09/11	.07/10	.04/10	.01/ 5	.04/10	.07/10	.09/11	.10/12	.11/12
5	7	.10/13	.09/13	.09/13	.08/13	.06/12	.04/10	.00/ 5	.04/11	.06/12	.08/13	.09/13	.09/13
	9	.08/14	.08/14	.08/14	.07/14	.05/13	.03/13	.00/ 5	.03/13	.05/13	.07/14	.07/14	.08/14
	11	.21/ 7	.21/ 7	.22/ 7	.22/ 7	.21/ 6	.14/ 6	.01/ 5	.14/ 6	.17/ 7	.16/ 8	.14/ 9	.13/ 9
	13	.23/ 8	.23/ 8	.22/ 7	.21/ 7	.18/ 6	.11/ 6	.01/ 5	.11/ 6	.15/ 8	.15/ 9	.15/10	.15/10
	15	.20/ 8	.20/ 8	.19/ 8	.18/ 7	.14/ 7	.08/ 6	.01/ 5	.09/ 6	.12/ 9	.14/10	.14/10	.15/11
	17	.17/10	.17/10	.16/10	.15/ 8	.11/ 7	.07/ 6	.01/ 5	.07/10	.10/10	.12/11	.13/11	.13/12
10	7	.15/10	.14/10	.14/10	.12/10	.09/ 7	.05/ 6	.00/12	.05/10	.08/11	.10/12	.11/12	.12/13
	9	.12/11	.12/11	.11/10	.10/10	.08/10	.04/ 6	.00/13	.05/11	.07/12	.08/13	.09/13	.10/13
	11	.10/13	.10/13	.10/13	.08/11	.06/10	.04/ 6	.00/13	.04/12	.06/13	.07/14	.08/14	.09/15
	13	.09/14	.09/14	.08/13	.07/13	.05/12	.03/ 6	.00/13	.03/13	.05/13	.06/14	.07/14	.08/16
	15	.21/ 7	.21/ 7	.22/ 7	.22/ 7	.20/ 6	.14/ 6	.01/ 4	.14/ 6	.15/ 8	.14/10	.12/12	.11/13
	17	.24/ 8	.24/ 8	.24/ 7	.22/ 7	.18/ 7	.11/ 6	.01/10	.11/ 7	.13/ 8	.14/11	.14/12	.13/13
15	7	.22/ 8	.21/ 8	.19/ 8	.15/ 8	.12/ 7	.07/ 6	.01/11	.09/ 9	.11/10	.12/12	.13/13	.13/13
	9	.19/ 8	.17/ 8	.14/ 8	.13/ 8	.10/ 7	.05/ 6	.01/12	.05/11	.08/12	.09/13	.10/14	.10/13
	11	.16/ 9	.16/ 9	.14/ 8	.13/ 8	.10/ 7	.04/ 6	.01/12	.05/12	.08/13	.09/14	.09/13	.09/13
	13	.13/10	.13/10	.12/ 9	.10/ 8	.08/ 7	.04/ 6	.01/12	.05/12	.06/13	.07/14	.08/15	.08/13
	15	.11/11	.11/11	.10/10	.09/ 8	.07/ 7	.04/ 6	.00/13	.03/13	.05/13	.06/15	.07/15	.07/16
	17	.10/12	.09/12	.09/11	.07/10	.06/ 7	.03/ 6	.00/13	.03/13	.05/13	.06/15	.07/15	.07/16
20	7	.19/ 8	.20/ 8	.20/ 7	.21/ 7	.20/ 7	.15/ 6	.02/ 4	.13/ 7	.14/10	.12/14	.10/17	.09/20
	9	.25/ 8	.25/ 8	.24/ 8	.22/ 7	.19/ 7	.12/ 6	.02/10	.11/ 8	.13/10	.13/14	.12/17	.12/20
	11	.23/ 8	.23/ 8	.22/ 8	.19/ 7	.15/ 7	.09/ 6	.01/10	.08/10	.11/10	.11/14	.11/17	.12/20
	13	.20/ 8	.19/ 8	.18/ 8	.16/ 8	.12/ 7	.07/ 6	.01/11	.07/10	.09/10	.10/14	.10/17	.11/20
	15	.17/ 8	.16/ 8	.15/ 8	.13/ 8	.10/ 7	.06/ 6	.01/12	.05/11	.08/10	.09/14	.09/17	.10/20
	17	.14/ 9	.14/ 8	.13/ 8	.11/ 8	.08/ 7	.04/ 6	.01/12	.05/12	.06/10	.07/14	.08/17	.09/20
25	7	.12/ 9	.12/ 9	.11/ 8	.09/ 8	.07/ 7	.04/ 6	.01/13	.04/13	.05/10	.06/14	.07/17	.08/20
	9	.10/ 9	.10/ 9	.09/ 8	.08/ 8	.06/ 7	.03/ 6	.01/13	.03/13	.05/13	.06/14	.06/17	.07/20
	11	.17/ 8	.18/ 8	.19/ 8	.20/ 7	.20/ 7	.16/ 6	.03/ 4	.13/ 7	.14/13	.11/19	.10/30	.09/33
	13	.25/ 8	.25/ 8	.24/ 8	.23/ 8	.20/ 7	.13/ 6	.02/ 4	.11/ 8	.13/13	.12/19	.11/23	.11/27
	15	.24/ 8	.24/ 8	.22/ 8	.20/ 8	.16/ 7	.10/ 6	.02/10	.09/10	.11/13	.11/19	.11/23	.11/26
	17	.21/ 8	.20/ 8	.19/ 8	.17/ 8	.13/ 7	.08/ 6	.02/11	.07/11	.09/13	.10/19	.10/23	.10/26
30	7	.18/ 8	.17/ 8	.16/ 8	.14/ 8	.10/ 7	.05/ 6	.01/12	.05/12	.08/13	.08/19	.09/23	.09/26
	9	.15/ 8	.14/ 8	.13/ 8	.11/ 8	.08/ 7	.05/ 6	.01/13	.05/13	.06/13	.07/19	.08/23	.08/26
	11	.12/ 8	.12/ 8	.11/ 8	.09/ 8	.07/ 7	.04/ 6	.01/13	.04/13	.05/13	.06/19	.07/23	.07/26
	13	.09/ 8	.09/ 8	.08/ 8	.08/ 8	.06/ 7	.03/ 6	.01/13	.03/13	.05/13	.06/19	.06/23	.07/26
	15	.16/ 8	.16/ 8	.15/ 8	.14/ 8	.11/ 7	.08/ 6	.03/ 4	.14/ 9	.15/17	.14/35	.11/33	.10/36
	17	.25/ 9	.25/ 9	.25/ 8	.24/ 8	.21/ 7	.14/ 6	.03/ 4	.11/ 9	.13/17	.14/24	.13/33	.12/36
35	7	.25/ 9	.25/ 9	.24/ 8	.21/ 8	.17/ 7	.11/ 6	.02/10	.09/ 9	.11/17	.12/24	.12/30	.12/33
	9	.22/ 9	.21/ 9	.20/ 8	.18/ 8	.14/ 7	.08/ 6	.02/11	.07/ 9	.09/17	.10/24	.11/30	.12/33
	11	.18/ 9	.18/ 9	.17/ 8	.15/ 8	.11/ 7	.07/ 6	.01/12	.06/ 9	.07/17	.09/24	.10/30	.10/33
	13	.15/ 9	.15/ 9	.14/ 8	.12/ 8	.09/ 7	.05/ 6	.01/13	.05/ 9	.06/17	.08/24	.09/30	.09/33
	15	.13/ 9	.13/ 9	.12/ 8	.10/ 8	.08/ 7	.04/ 6	.01/13	.04/ 9	.05/17	.07/24	.08/30	.08/33
	17	.11/ 9	.11/ 9	.10/ 8	.08/ 8	.06/ 7	.04/ 6	.01/13	.03/ 9	.05/17	.06/24	.06/30	.07/33

ASR
LONGCRESTED
RMS PITCH VEL IN DPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	SHIP HEADING ANGLE IN DEGREES										
	0	15	30	45	60	75	90	105	120	135	150
0	.16/ 7	.16/ 7	.18/ 6	.21/ 6	.23/ 6	.16/ 5	.03/ 5	.17/ 5	.21/ 6	.19/ 6	.16/ 7
9	.16/ 7	.16/ 7	.16/ 7	.17/ 6	.17/ 6	.12/ 5	.02/ 5	.12/ 5	.16/ 6	.16/ 7	.15/ 7
11	.13/ 8	.13/ 8	.13/ 7	.14/ 7	.13/ 6	.08/ 5	.02/ 5	.09/ 5	.12/ 6	.13/ 7	.13/ 8
13	.11/ 8	.11/ 8	.11/ 8	.11/ 7	.10/ 6	.06/ 6	.01/ 5	.09/ 5	.09/ 6	.10/ 7	.10/ 8
15	.09/ 9	.09/ 8	.09/ 8	.08/ 7	.08/ 6	.05/ 6	.01/ 5	.05/ 5	.07/ 6	.08/ 7	.08/ 9
17	.07/ 9	.07/ 9	.07/ 8	.07/ 7	.05/ 6	.04/ 6	.01/ 5	.04/ 5	.06/ 6	.06/ 7	.07/ 9
19	.06/ 9	.06/ 9	.06/ 8	.06/ 7	.05/ 6	.03/ 6	.01/ 5	.03/ 5	.05/ 6	.05/ 9	.06/ 9
21	.05/ 9	.05/ 9	.05/ 8	.05/ 7	.04/ 6	.03/ 6	.00/ 5	.03/ 5	.04/ 6	.04/ 8	.05/ 10
8	.23/ 7	.23/ 7	.24/ 7	.25/ 6	.24/ 6	.16/ 6	.02/ 4	.16/ 5	.16/ 6	.12/ 8	.10/ 8
9	.23/ 7	.23/ 7	.23/ 7	.22/ 7	.19/ 6	.12/ 6	.01/ 4	.11/ 5	.13/ 7	.11/ 8	.10/ 10
11	.19/ 7	.19/ 7	.18/ 7	.17/ 7	.15/ 6	.09/ 6	.01/ 4	.08/ 6	.10/ 7	.09/ 9	.09/ 10
13	.15/ 7	.15/ 7	.15/ 7	.13/ 7	.11/ 6	.07/ 6	.01/ 4	.06/ 6	.07/ 8	.07/ 10	.07/ 11
15	.12/ 8	.12/ 7	.12/ 7	.11/ 7	.09/ 6	.05/ 6	.01/ 4	.05/ 6	.06/ 8	.06/ 10	.06/ 11
17	.10/ 8	.10/ 7	.09/ 7	.09/ 7	.07/ 6	.04/ 6	.00/ 4	.04/ 6	.05/ 8	.05/ 10	.05/ 11
19	.08/ 8	.08/ 8	.08/ 7	.07/ 7	.06/ 6	.03/ 6	.00/ 4	.03/ 6	.04/ 8	.04/ 10	.04/ 12
21	.07/ 8	.07/ 8	.06/ 7	.06/ 7	.05/ 6	.03/ 6	.00/ 4	.03/ 6	.03/ 8	.03/ 10	.04/ 12
10	.26/ 7	.26/ 7	.27/ 7	.27/ 7	.25/ 6	.17/ 6	.02/ 4	.15/ 6	.11/ 8	.08/ 10	.06/ 12
9	.28/ 7	.27/ 7	.27/ 7	.25/ 7	.21/ 6	.13/ 6	.01/ 4	.10/ 6	.09/ 8	.08/ 10	.06/ 13
11	.23/ 8	.23/ 8	.22/ 7	.20/ 7	.16/ 7	.10/ 6	.01/ 4	.08/ 6	.07/ 9	.07/ 11	.06/ 13
13	.19/ 8	.19/ 8	.18/ 7	.16/ 7	.12/ 7	.07/ 6	.01/ 4	.06/ 6	.06/ 9	.05/ 13	.05/ 13
15	.15/ 8	.15/ 8	.14/ 7	.12/ 7	.10/ 7	.06/ 6	.01/ 4	.05/ 10	.05/ 11	.04/ 13	.04/ 13
17	.12/ 8	.12/ 8	.11/ 7	.10/ 7	.08/ 7	.04/ 6	.00/ 10	.04/ 6	.04/ 10	.04/ 12	.04/ 13
19	.10/ 8	.10/ 8	.09/ 7	.08/ 7	.06/ 7	.04/ 6	.00/ 11	.03/ 6	.03/ 10	.03/ 12	.03/ 13
21	.08/ 8	.08/ 8	.08/ 7	.07/ 7	.05/ 7	.03/ 6	.00/ 11	.02/ 6	.03/ 10	.03/ 12	.03/ 13
15	.26/ 8	.26/ 8	.27/ 7	.28/ 7	.26/ 7	.19/ 6	.02/ 4	.12/ 6	.09/ 10	.05/ 14	.03/ 20
9	.30/ 8	.30/ 8	.29/ 7	.27/ 7	.23/ 7	.14/ 6	.02/ 4	.09/ 7	.07/ 10	.05/ 14	.04/ 20
11	.27/ 8	.26/ 8	.25/ 8	.22/ 7	.18/ 7	.11/ 6	.01/ 4	.07/ 7	.06/ 10	.05/ 14	.04/ 20
13	.22/ 8	.21/ 8	.20/ 8	.17/ 7	.14/ 7	.08/ 6	.01/ 4	.05/ 7	.05/ 10	.04/ 14	.03/ 20
15	.18/ 8	.17/ 8	.16/ 8	.14/ 7	.11/ 7	.05/ 6	.01/ 10	.04/ 7	.04/ 10	.03/ 14	.03/ 20
17	.14/ 8	.14/ 8	.13/ 8	.11/ 7	.08/ 7	.05/ 6	.01/ 10	.03/ 7	.03/ 10	.03/ 14	.03/ 20
19	.12/ 8	.11/ 8	.11/ 8	.09/ 7	.07/ 7	.04/ 6	.01/ 11	.03/ 7	.03/ 10	.02/ 14	.02/ 20
21	.10/ 8	.10/ 8	.09/ 8	.08/ 7	.06/ 7	.03/ 6	.00/ 11	.02/ 7	.02/ 10	.02/ 14	.02/ 20
20	.25/ 8	.25/ 8	.27/ 8	.28/ 7	.27/ 7	.21/ 6	.03/ 4	.10/ 7	.06/ 13	.03/ 19	.02/ 26
9	.33/ 8	.32/ 8	.32/ 8	.30/ 7	.25/ 7	.16/ 6	.02/ 4	.08/ 7	.06/ 13	.04/ 19	.03/ 26
11	.30/ 8	.29/ 8	.28/ 8	.25/ 7	.20/ 7	.12/ 6	.02/ 4	.06/ 7	.05/ 13	.03/ 19	.02/ 26
13	.25/ 8	.24/ 8	.22/ 8	.20/ 7	.15/ 7	.09/ 6	.01/ 4	.05/ 7	.04/ 13	.03/ 19	.02/ 26
15	.20/ 8	.19/ 8	.18/ 8	.16/ 7	.12/ 7	.07/ 6	.01/ 4	.04/ 7	.03/ 13	.02/ 19	.02/ 26
17	.16/ 8	.16/ 8	.15/ 8	.12/ 8	.09/ 7	.05/ 6	.01/ 11	.03/ 7	.03/ 13	.02/ 19	.02/ 26
19	.13/ 8	.13/ 8	.12/ 8	.10/ 8	.08/ 7	.04/ 6	.01/ 11	.02/ 7	.02/ 13	.02/ 19	.02/ 26
21	.11/ 8	.11/ 8	.10/ 8	.08/ 8	.06/ 7	.04/ 6	.01/ 11	.02/ 7	.02/ 13	.02/ 19	.01/ 27
25	.23/ 8	.24/ 8	.26/ 8	.28/ 8	.29/ 7	.23/ 6	.04/ 4	.09/ 9	.05/ 17	.02/ 30	.02/ 35
9	.34/ 9	.35/ 8	.34/ 8	.32/ 8	.28/ 7	.18/ 6	.03/ 4	.07/ 9	.04/ 17	.03/ 24	.02/ 48
11	.33/ 9	.32/ 9	.31/ 8	.27/ 8	.22/ 7	.14/ 6	.02/ 4	.05/ 9	.02/ 35	.02/ 30	.02/ 37
13	.27/ 9	.27/ 9	.25/ 8	.22/ 8	.17/ 7	.10/ 6	.02/ 4	.04/ 9	.03/ 17	.02/ 24	.02/ 33
15	.22/ 9	.22/ 9	.21/ 8	.17/ 8	.13/ 7	.08/ 6	.01/ 4	.03/ 9	.02/ 30	.02/ 24	.02/ 33
17	.18/ 9	.18/ 9	.17/ 8	.14/ 8	.11/ 7	.06/ 6	.01/ 4	.03/ 9	.02/ 30	.02/ 24	.02/ 33
19	.15/ 9	.15/ 9	.14/ 8	.11/ 8	.09/ 7	.05/ 6	.01/ 4	.02/ 9	.02/ 30	.02/ 24	.01/ 33
21	.12/ 9	.12/ 9	.11/ 8	.09/ 8	.07/ 7	.04/ 6	.01/ 4	.02/ 9	.02/ 30	.01/ 30	.01/ 33

ASR
LONGCRESTED
RMS PITCH ACC IN DS2/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
OE

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180	
0	7 .15/7 .13/7 .11/7 .08/7 .07/7 .05/7 .04/7	7 .15/6 .14/7 .11/7 .09/7 .07/7 .05/7 .04/7	7 .17/6 .15/7 .12/7 .09/7 .07/7 .05/7 .04/7	7 .21/6 .17/6 .13/6 .10/6 .07/6 .05/6 .04/6	7 .25/5 .18/5 .13/6 .10/6 .07/5 .05/5 .04/6	7 .19/5 .13/5 .09/5 .07/5 .05/5 .04/5 .03/5	7 .04/5 .03/5 .02/5 .01/5 .01/5 .01/5 .01/5	7 .21/5 .15/5 .10/5 .08/5 .06/5 .04/5 .03/5	7 .23/5 .17/6 .12/6 .09/6 .07/6 .06/6 .04/6	7 .19/6 .15/6 .12/6 .09/6 .07/6 .05/6 .04/6	7 .16/6 .14/7 .11/7 .08/7 .07/7 .05/7 .04/7	7 .13/7 .10/7 .08/7 .06/7 .05/7 .04/7 .03/7	7 .14/7 .13/7 .10/7 .08/7 .06/8 .05/8 .04/8	
8	7 .26/7 .24/7 .19/7 .15/7 .12/7 .09/7 .06/7	7 .24/7 .21/7 .17/7 .14/7 .11/7 .08/7 .06/7	7 .28/6 .25/7 .21/7 .18/7 .15/7 .12/7 .09/7	7 .30/6 .26/6 .22/6 .18/6 .14/6 .11/6 .08/6	7 .29/5 .22/6 .16/6 .12/6 .09/6 .06/6 .05/6	7 .20/5 .14/5 .10/6 .08/6 .06/6 .05/6 .04/6	7 .03/4 .02/4 .01/4 .01/4 .01/4 .01/4 .01/4	7 .19/5 .13/5 .09/5 .07/5 .05/5 .04/5 .03/5	7 .15/6 .11/6 .08/6 .06/7 .05/7 .04/7 .03/7	7 .10/7 .08/8 .06/9 .05/10 .04/10 .03/10 .02/10	7 .08/8 .07/9 .06/9 .05/9 .04/10 .03/10 .02/10	7 .06/9 .05/10 .04/10 .03/10 .02/10 .02/10 .02/10	7 .06/9 .05/10 .04/10 .03/10 .02/10 .02/10 .02/10	
10	7 .33/7 .31/7 .27/7 .21/7 .16/7 .13/7 .11/7	7 .33/7 .31/7 .27/7 .21/7 .16/7 .13/7 .11/7	7 .34/7 .32/7 .29/7 .25/7 .21/7 .17/7 .14/7	7 .34/7 .32/7 .29/7 .25/7 .21/7 .17/7 .14/7	7 .32/6 .25/6 .19/6 .14/6 .11/6 .08/6 .06/6	7 .22/6 .16/6 .12/6 .09/6 .06/6 .05/6 .04/6	7 .02/4 .02/4 .01/4 .01/4 .01/4 .01/4 .01/4	7 .16/5 .09/8 .05/10 .03/12 .02/13 .02/13 .02/13	7 .09/8 .07/8 .05/10 .03/12 .02/13 .02/13 .02/13	7 .05/10 .03/12 .02/13 .02/13 .02/13 .02/13 .02/13	7 .03/12 .02/13 .02/13 .02/13 .02/13 .02/13 .02/13	7 .03/13 .02/13 .02/13 .02/13 .02/13 .02/13 .02/13	7 .03/13 .02/13 .02/13 .02/13 .02/13 .02/13 .02/13	
15	7 .36/8 .33/8 .29/8 .26/8 .21/8 .17/8 .13/8	7 .36/7 .33/8 .29/8 .26/8 .21/8 .17/8 .13/8	7 .37/7 .34/7 .31/7 .27/7 .23/7 .19/7 .15/7	7 .38/7 .35/7 .31/7 .27/7 .23/7 .19/7 .15/7	7 .35/6 .28/7 .22/7 .17/7 .13/7 .09/7 .06/7	7 .25/6 .18/7 .12/7 .07/7 .03/7 .00/7 .00/7	7 .03/4 .02/4 .01/4 .01/4 .01/4 .01/4 .01/4	7 .12/6 .08/6 .06/6 .04/6 .03/6 .02/6 .02/6	7 .05/10 .04/10 .03/10 .02/10 .01/10 .01/10 .01/10	7 .02/14 .01/17 .01/20 .01/20 .01/20 .01/20 .01/20	7 .01/17 .01/20 .01/20 .01/20 .01/20 .01/20 .01/20	7 .01/20 .01/20 .01/20 .01/20 .01/20 .01/20 .01/20	7 .01/20 .01/20 .01/20 .01/20 .01/20 .01/20 .01/20	7 .01/20 .01/20 .01/20 .01/20 .01/20 .01/20 .01/20
20	7 .36/8 .34/8 .31/8 .28/8 .24/8 .20/8 .16/8	7 .37/8 .34/8 .31/8 .28/8 .24/8 .20/8 .16/8	7 .38/8 .35/8 .32/8 .29/8 .25/8 .21/8 .17/8	7 .40/7 .37/8 .34/8 .31/8 .28/8 .24/8 .20/8	7 .38/7 .35/7 .32/7 .29/7 .26/7 .22/7 .18/7	7 .28/6 .25/6 .21/6 .17/6 .13/6 .09/6 .06/6	7 .05/4 .03/4 .02/4 .01/4 .01/4 .01/4 .01/4	7 .08/7 .06/7 .04/7 .03/7 .02/7 .01/7 .01/7	7 .03/13 .03/13 .02/13 .01/19 .01/19 .01/19 .01/19	7 .01/26 .01/26 .01/26 .01/26 .01/26 .01/26 .01/26	7 .01/3 .01/3 .01/3 .01/3 .01/3 .01/3 .01/3	7 .01/3 .01/3 .01/3 .01/3 .01/3 .01/3 .01/3	7 .01/3 .01/3 .01/3 .01/3 .01/3 .01/3 .01/3	7 .01/3 .01/3 .01/3 .01/3 .01/3 .01/3 .01/3
25	7 .36/8 .34/8 .31/8 .28/8 .24/8 .20/8 .16/8	7 .37/8 .34/8 .31/8 .28/8 .24/8 .20/8 .16/8	7 .39/8 .36/8 .33/8 .30/8 .26/8 .22/8 .18/8	7 .42/8 .39/8 .36/8 .33/8 .29/8 .25/8 .21/8	7 .42/7 .39/7 .36/7 .33/7 .29/7 .25/7 .21/7	7 .32/6 .25/6 .21/6 .17/6 .13/6 .09/6 .06/6	7 .06/4 .04/4 .03/4 .02/4 .01/4 .01/4 .01/4	7 .07/9 .05/9 .04/9 .03/9 .02/9 .01/9 .01/9	7 .02/17 .02/17 .01/24 .01/24 .01/24 .01/24 .01/24	7 .02/4 .01/4 .01/4 .01/4 .01/4 .01/4 .01/4	7 .02/4 .01/4 .01/4 .01/4 .01/4 .01/4 .01/4	7 .02/4 .01/4 .01/4 .01/4 .01/4 .01/4 .01/4	7 .02/4 .01/4 .01/4 .01/4 .01/4 .01/4 .01/4	7 .02/4 .01/4 .01/4 .01/4 .01/4 .01/4 .01/4

ASR
LONGCRESTED
RMS YAW IN DEGREES/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	0.00/0.00	0.02/8	0.04/7	0.06/7	0.07/7	0.06/6	0.01/6	0.06/6	0.07/7	0.06/7	0.02/8	0.00/9
9	9	0.00/0.00	0.03/10	0.05/10	0.07/8	0.07/8	0.05/10	0.01/10	0.05/7	0.07/8	0.05/9	0.02/9	0.00/10
11	11	0.00/0.00	0.03/10	0.05/10	0.07/10	0.07/10	0.05/10	0.01/10	0.04/9	0.06/9	0.05/10	0.03/10	0.00/12
13	13	0.00/0.00	0.03/10	0.05/10	0.06/10	0.06/10	0.04/10	0.01/10	0.04/9	0.05/12	0.04/12	0.02/12	0.00/12
15	15	0.00/0.00	0.02/10	0.04/10	0.05/10	0.05/10	0.03/10	0.01/10	0.03/13	0.05/13	0.04/13	0.02/13	0.00/13
17	17	0.00/0.00	0.02/10	0.04/10	0.05/10	0.04/10	0.03/10	0.01/10	0.03/13	0.04/13	0.04/13	0.02/13	0.00/13
19	19	0.00/0.00	0.03/10	0.03/10	0.04/10	0.04/10	0.02/10	0.01/10	0.02/14	0.03/14	0.03/14	0.02/14	0.00/14
21	21	0.00/0.00	0.02/10	0.03/10	0.04/10	0.03/10	0.02/10	0.00/10	0.02/14	0.03/14	0.03/14	0.02/14	0.00/14
5	7	0.00/0.00	0.02/8	0.03/7	0.05/7	0.06/7	0.05/6	0.01/6	0.06/6	0.08/7	0.07/8	0.03/9	0.00/10
9	9	0.00/0.00	0.02/9	0.04/9	0.06/8	0.06/8	0.05/8	0.01/10	0.05/8	0.08/9	0.06/10	0.03/11	0.00/11
11	11	0.00/0.00	0.02/11	0.04/11	0.06/11	0.06/11	0.04/10	0.01/10	0.05/9	0.07/9	0.06/12	0.03/12	0.00/12
13	13	0.00/0.00	0.02/13	0.04/12	0.05/12	0.05/12	0.04/12	0.01/10	0.04/12	0.06/12	0.05/13	0.03/13	0.00/13
15	15	0.00/0.00	0.02/13	0.04/12	0.05/12	0.05/12	0.03/11	0.01/10	0.03/13	0.05/13	0.05/13	0.03/13	0.00/13
17	17	0.00/0.00	0.02/13	0.03/13	0.04/12	0.04/12	0.03/11	0.01/10	0.03/13	0.04/13	0.04/13	0.02/13	0.00/13
19	19	0.00/0.00	0.02/13	0.03/13	0.03/12	0.03/12	0.02/11	0.00/10	0.02/13	0.04/13	0.04/13	0.02/13	0.00/13
21	21	0.00/0.00	0.01/13	0.02/13	0.03/12	0.03/12	0.02/11	0.00/10	0.02/14	0.03/13	0.03/14	0.02/14	0.00/14
10	7	0.00/0.00	0.01/8	0.03/7	0.04/7	0.05/7	0.05/6	0.01/8	0.07/7	0.09/10	0.08/12	0.04/13	0.00/13
9	9	0.00/0.00	0.02/9	0.03/9	0.05/8	0.05/8	0.04/8	0.01/10	0.06/8	0.09/11	0.09/12	0.05/13	0.00/13
11	11	0.00/0.00	0.02/10	0.03/10	0.05/10	0.05/10	0.04/10	0.01/10	0.05/9	0.08/12	0.08/12	0.04/13	0.00/13
13	13	0.00/0.00	0.02/13	0.03/13	0.04/13	0.04/12	0.03/11	0.01/10	0.04/12	0.07/12	0.07/13	0.04/13	0.00/13
15	15	0.00/0.00	0.02/13	0.03/13	0.04/13	0.04/13	0.03/11	0.01/10	0.03/13	0.06/13	0.06/13	0.03/13	0.00/13
17	17	0.00/0.00	0.01/14	0.03/13	0.03/13	0.03/13	0.02/11	0.01/10	0.03/13	0.05/13	0.05/13	0.03/13	0.00/13
19	19	0.00/0.00	0.01/14	0.02/13	0.03/13	0.03/13	0.02/11	0.00/10	0.02/13	0.04/13	0.04/13	0.02/13	0.00/13
21	21	0.00/0.00	0.01/14	0.02/13	0.02/13	0.02/13	0.02/11	0.00/10	0.02/14	0.03/13	0.03/13	0.02/13	0.00/13
15	7	0.00/0.00	0.01/8	0.02/8	0.04/7	0.05/7	0.05/6	0.01/8	0.07/7	0.11/10	0.12/17	0.07/20	0.00/00
9	9	0.00/0.00	0.01/9	0.03/9	0.04/8	0.05/8	0.04/8	0.01/9	0.06/8	0.13/14	0.10/17	0.06/20	0.00/00
11	11	0.00/0.00	0.01/10	0.03/10	0.04/10	0.04/10	0.03/10	0.01/10	0.05/9	0.09/10	0.08/17	0.05/20	0.00/00
13	13	0.00/0.00	0.01/14	0.03/12	0.03/12	0.04/11	0.03/11	0.01/14	0.04/12	0.07/10	0.06/17	0.04/20	0.00/20
15	15	0.00/0.00	0.01/14	0.02/14	0.03/13	0.03/13	0.02/11	0.01/14	0.03/13	0.06/10	0.05/17	0.03/20	0.00/20
17	17	0.00/0.00	0.01/14	0.02/14	0.03/13	0.03/13	0.02/11	0.01/14	0.03/13	0.05/12	0.04/17	0.02/20	0.00/20
19	19	0.00/0.00	0.01/14	0.02/14	0.02/14	0.02/13	0.02/11	0.00/14	0.02/14	0.04/12	0.03/17	0.02/20	0.00/20
21	21	0.00/0.00	0.01/14	0.02/14	0.02/14	0.02/13	0.01/11	0.00/14	0.02/14	0.03/12	0.03/17	0.02/20	0.00/20
20	7	0.00/0.00	0.01/8	0.02/8	0.03/7	0.04/7	0.04/6	0.01/8	0.06/8	0.11/13	0.13/70	0.09/63	0.00/00
9	9	0.00/0.00	0.01/9	0.02/9	0.03/8	0.04/8	0.04/7	0.01/8	0.05/8	0.09/19	0.10/70	0.08/63	0.00/00
11	11	0.00/0.00	0.01/10	0.02/10	0.03/10	0.04/10	0.03/9	0.01/9	0.04/9	0.06/19	0.07/70	0.06/63	0.00/00
13	13	0.00/0.00	0.01/11	0.02/11	0.03/11	0.03/10	0.02/10	0.01/14	0.03/13	0.05/19	0.05/70	0.04/63	0.00/00
15	15	0.00/0.00	0.01/13	0.02/14	0.02/13	0.03/12	0.02/10	0.01/14	0.03/13	0.04/19	0.04/70	0.03/63	0.00/00
17	17	0.00/0.00	0.01/14	0.02/14	0.02/13	0.02/13	0.02/11	0.01/14	0.02/13	0.03/19	0.03/70	0.03/63	0.00/00
19	19	0.00/0.00	0.01/16	0.01/14	0.02/14	0.02/13	0.01/11	0.00/14	0.02/13	0.02/19	0.03/70	0.02/63	0.00/00
21	21	0.00/0.00	0.01/16	0.01/14	0.01/14	0.01/13	0.01/11	0.00/14	0.02/13	0.02/19	0.02/70	0.02/63	0.00/00
25	7	0.00/0.00	0.01/8	0.02/7	0.03/7	0.04/7	0.04/7	0.01/8	0.06/9	0.08/17	0.14/00	0.08/8	0.00/00
9	9	0.00/0.00	0.01/9	0.02/9	0.03/8	0.04/8	0.03/7	0.01/8	0.05/9	0.06/17	0.16/45	0.11/57	0.00/00
11	11	0.00/0.00	0.01/10	0.02/10	0.03/10	0.03/9	0.02/10	0.01/13	0.04/9	0.04/17	0.12/39	0.10/57	0.00/00
13	13	0.00/0.00	0.01/10	0.02/10	0.02/11	0.03/10	0.02/10	0.01/14	0.03/9	0.03/17	0.09/39	0.11/45	0.00/00
15	15	0.00/0.00	0.01/13	0.02/13	0.02/12	0.02/11	0.02/10	0.01/14	0.02/9	0.02/17	0.07/39	0.09/45	0.00/00
17	17	0.00/0.00	0.01/16	0.01/13	0.02/13	0.02/12	0.01/10	0.01/14	0.02/9	0.05/39	0.07/45	0.05/57	0.00/00
19	19	0.00/0.00	0.01/16	0.01/14	0.01/13	0.01/12	0.01/10	0.01/14	0.02/9	0.04/39	0.06/45	0.05/57	0.00/00
21	21	0.00/0.00	0.01/16	0.01/14	0.01/14	0.01/12	0.01/10	0.00/14	0.01/9	0.01/17	0.04/39	0.05/45	0.00/00

ASB

41

ASR

LONGCRESTED
RMS YAW ACC IN DS2/ENCOUNTERED MODAL PERIOD, T_{DE}, IN SECONDS

		SHIP HEADING ANGLE IN DEGREES													
		0	15	30	45	60	75	90	105	120	135	150	165	180	
0	7	0.00/..	.02/ 7	.03/ 7	.05/ 6	.08/ 6	.08/ 5	.02/ 4	.08/ 5	.07/ 6	.05/ 7	.03/ 7	.01/ 7	.00/ 7	
	9	0.00/..	.02/ 8	.03/ 7	.05/ 7	.06/ 6	.06/ 5	.01/ 5	.06/ 5	.06/ 6	.05/ 7	.03/ 7	.02/ 8	.00/ 8	
	11	0.00/..	.01/10	.03/ 8	.04/ 7	.05/ 6	.04/ 5	.01/10	.04/ 5	.04/ 7	.04/ 7	.03/ 8	.01/ 8	.00/ 8	
	13	0.00/..	.01/10	.02/10	.03/10	.04/ 7	.03/ 5	.01/10	.03/ 6	.03/ 7	.03/ 8	.02/ 8	.01/ 9	.00/ 9	
	15	0.00/..	.01/10	.02/10	.03/10	.03/ 7	.02/ 5	.01/10	.02/ 6	.03/ 7	.03/ 7	.02/ 8	.01/ 9	.00/ 9	
	17	0.00/..	.01/10	.01/10	.02/10	.02/10	.02/ 5	.00/10	.02/ 6	.02/ 7	.02/ 7	.02/ 8	.01/ 9	.00/ 9	
	19	0.00/..	.01/10	.01/10	.02/10	.02/10	.02/ 5	.00/10	.01/ 6	.02/ 7	.02/ 8	.01/ 9	.01/ 9	.00/ 9	
5	7	0.00/..	.01/10	.01/10	.01/10	.02/10	.01/10	.00/10	.01/ 6	.01/ 7	.01/ 8	.01/ 9	.01/ 9	.00/ 9	
	9	0.00/..	.02/ 7	.04/ 7	.06/ 6	.09/ 6	.09/ 5	.02/ 4	.07/ 6	.06/ 7	.04/ 8	.03/ 9	.01/10	.00/ 9	
	11	0.00/..	.02/ 8	.04/ 7	.05/ 7	.07/ 6	.06/ 5	.01/ 5	.05/ 6	.05/ 7	.04/ 8	.03/ 9	.01/10	.00/11	
	13	0.00/..	.02/ 8	.03/ 8	.04/ 7	.05/ 6	.05/ 5	.01/10	.04/ 6	.04/ 7	.03/ 8	.02/ 9	.01/11	.00/11	
	15	0.00/..	.01/ 8	.02/ 8	.03/ 7	.04/ 7	.03/ 5	.01/10	.03/ 6	.03/ 7	.03/ 8	.02/ 9	.01/12	.00/11	
	17	0.00/..	.01/ 8	.02/ 8	.03/ 7	.03/ 7	.03/ 5	.00/10	.02/ 6	.02/ 7	.02/ 8	.02/ 9	.01/12	.00/11	
	19	0.00/..	.01/10	.02/ 8	.02/ 7	.02/ 7	.02/ 6	.00/10	.02/ 6	.02/ 7	.02/ 8	.01/12	.01/12	.00/11	
10	7	0.00/..	.01/10	.01/11	.02/11	.02/ 7	.02/ 6	.00/10	.01/ 6	.01/ 8	.01/ 9	.01/12	.00/12	.00/11	
	9	0.00/..	.02/ 7	.04/ 7	.06/ 7	.07/ 6	.09/ 5	.02/ 5	.06/ 6	.05/ 8	.03/10	.02/12	.01/13	.00/13	
	11	0.00/..	.02/ 8	.04/ 7	.06/ 7	.07/ 6	.07/ 5	.01/ 5	.05/ 6	.04/ 8	.03/11	.02/12	.01/13	.00/13	
	13	0.00/..	.02/ 8	.03/ 8	.05/ 7	.06/ 6	.05/ 6	.01/10	.03/ 6	.03/ 8	.03/11	.02/12	.01/13	.00/13	
	15	0.00/..	.01/ 8	.02/ 8	.04/ 7	.04/ 6	.04/ 6	.01/10	.02/ 6	.03/ 9	.02/11	.02/12	.01/13	.00/13	
	17	0.00/..	.01/ 8	.02/ 8	.03/ 7	.03/ 7	.03/ 6	.00/10	.02/ 6	.02/ 9	.02/11	.01/12	.01/13	.00/13	
	19	0.00/..	.01/ 8	.02/ 8	.02/ 7	.03/ 7	.03/ 7	.00/10	.01/ 6	.02/ 9	.01/11	.01/12	.00/13	.00/13	
15	7	0.00/..	.01/ 8	.01/ 8	.02/ 7	.02/ 7	.02/ 6	.00/10	.01/ 6	.01/ 9	.01/11	.01/12	.00/13	.00/13	
	9	0.00/..	.01/ 8	.01/ 8	.02/ 7	.02/ 7	.02/ 6	.00/10	.01/ 6	.01/ 9	.01/11	.01/12	.00/13	.00/13	
	11	0.00/..	.02/ 7	.05/ 7	.08/ 6	.10/ 6	.10/ 5	.02/ 5	.05/ 7	.04/10	.03/14	.01/17	.00/20	.00/20	
	13	0.00/..	.02/ 8	.04/ 8	.05/ 7	.06/ 7	.05/ 6	.01/ 5	.04/ 7	.03/10	.02/14	.01/17	.00/20	.00/20	
	15	0.00/..	.01/ 8	.03/ 8	.04/ 7	.04/ 7	.04/ 6	.01/ 9	.02/ 7	.02/10	.01/14	.01/17	.00/20	.00/20	
	17	0.00/..	.01/ 8	.02/ 8	.03/ 7	.03/ 7	.03/ 6	.00/ 9	.02/ 7	.02/10	.01/14	.01/17	.00/20	.00/20	
	19	0.00/..	.01/ 8	.02/ 8	.02/ 7	.03/ 7	.02/ 6	.00/ 9	.01/ 7	.01/10	.01/14	.00/17	.00/20	.00/20	
20	7	0.00/..	.01/ 8	.01/ 8	.02/ 7	.02/ 7	.02/ 6	.00/10	.01/ 7	.01/10	.01/14	.00/17	.00/20	.00/20	
	9	0.00/..	.02/ 7	.05/ 7	.08/ 6	.10/ 6	.10/ 5	.02/ 5	.05/ 7	.04/10	.03/14	.01/17	.00/20	.00/20	
	11	0.00/..	.02/ 8	.04/ 8	.05/ 7	.06/ 7	.05/ 6	.01/ 5	.04/ 7	.03/10	.02/14	.01/17	.00/20	.00/20	
	13	0.00/..	.02/ 8	.04/ 8	.05/ 8	.06/ 7	.05/ 5	.01/ 5	.03/ 7	.02/13	.00/19	.00/23	.00/42	.00/39	
	15	0.00/..	.02/ 8	.03/ 8	.04/ 8	.05/ 7	.04/ 6	.01/ 8	.02/ 7	.01/13	.00/19	.00/23	.00/26	.00/27	
	17	0.00/..	.01/ 8	.02/ 8	.03/ 8	.04/ 7	.03/ 6	.00/ 8	.01/ 7	.01/13	.00/19	.00/23	.00/26	.00/27	
	19	0.00/..	.01/ 8	.02/ 8	.03/ 8	.03/ 7	.02/ 6	.00/ 8	.01/ 7	.01/13	.00/19	.00/23	.00/26	.00/27	
25	7	0.00/..	.01/ 9	.01/ 9	.02/ 8	.02/ 8	.02/ 7	.00/14	.01/ 7	.01/13	.00/19	.00/23	.00/26	.00/27	
	9	0.00/..	.01/ 9	.01/ 8	.02/ 8	.02/ 7	.02/ 6	.00/14	.01/ 7	.01/13	.00/19	.00/23	.00/26	.00/27	
	11	0.00/..	.03/ 7	.05/ 7	.08/ 6	.11/ 6	.10/ 5	.02/ 5	.03/ 9	.00/17	.01/37	.01/ 4	.00/ 4	.00/ 4	
	13	0.00/..	.02/ 7	.05/ 7	.07/ 7	.08/ 6	.07/ 5	.01/ 5	.02/ 9	.00/17	.00/31	.00/42	.00/52	.00/63	
	15	0.00/..	.02/ 8	.04/ 7	.05/ 7	.06/ 6	.05/ 5	.01/ 5	.02/ 9	.00/17	.00/24	.00/37	.00/45	.00/42	
	17	0.00/..	.02/ 8	.03/ 7	.04/ 7	.05/ 6	.04/ 5	.01/ 8	.01/ 9	.00/17	.00/24	.00/30	.00/42	.00/42	
	19	0.00/..	.01/ 9	.02/ 8	.03/ 7	.04/ 6	.03/ 5	.00/ 8	.01/ 9	.00/17	.00/24	.00/30	.00/42	.00/42	

ASR

RMS LONG DISP IN FEET/ENCOUNTERED MODAL PERIOD, T_{DE}, IN SECONDS
 ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL

V TO	SHIP HEADING ANGLE IN DEGREES										
	0	15	30	45	60	75	90	105	120	135	150
0	7 05/ 8 09/10 11/12 13/14 15/16 17/18 19/21 21/21	8 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	9 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	10 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	11 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	12 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	13 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	14 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	15 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	16 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21	17 05/ 8 08/10 11/12 13/14 15/16 17/18 19/21 21/21
5	7 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	8 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	9 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	10 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	11 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	12 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	13 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	14 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	15 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	16 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21	17 04/ 7 06/10 08/13 10/14 12/16 14/18 16/21 18/21
10	7 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	8 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	9 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	10 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	11 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	12 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	13 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	14 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	15 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	16 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21	17 04/ 7 05/10 07/13 08/14 09/16 10/18 11/21 12/21
15	7 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	8 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	9 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	10 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	11 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	12 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	13 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	14 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	15 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	16 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21	17 04/ 7 05/ 8 06/13 07/14 08/16 09/18 10/21 11/21
20	7 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	8 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	9 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	10 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	11 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	12 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	13 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	14 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	15 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	16 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21	17 04/ 8 05/ 8 06/14 07/16 08/18 09/21 10/21 11/21
25	7 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	8 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	9 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	10 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	11 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	12 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	13 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	14 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	15 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	16 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21	17 03/ 8 05/ 8 06/14 07/18 08/21 09/21 10/21 11/21

ASR

LONGCRESTED
RMS LON VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
DE
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL

V TO	SHIP HEADING ANGLE IN DEGREES										150	165	180
	0	15	30	45	60	75	90	105	120	135			
0	7	04/8	04/8	04/8	04/8	04/5	01/4	04/5	04/5	04/8	02/6	04/8	04/8
9	06/10	06/10	06/10	05/9	04/9	03/5	00/4	03/9	05/9	06/9	02/11	05/8	06/10
11	07/11	07/11	06/10	05/10	04/10	02/10	00/10	03/10	05/10	06/10	02/11	06/10	07/11
13	07/13	07/13	06/13	05/13	04/13	02/13	00/13	03/13	04/13	06/13	02/13	05/13	07/13
15	07/14	07/14	06/14	05/14	04/14	02/14	00/14	03/14	04/14	06/14	02/14	05/14	07/14
17	07/16	07/16	06/16	05/16	04/16	02/16	00/16	03/16	04/16	06/16	02/16	05/16	07/16
19	07/18	06/18	06/18	05/18	04/18	02/18	00/18	03/18	04/18	06/18	02/18	05/18	07/18
21	08/18	08/18	08/18	08/18	03/18	02/18	00/18	02/18	04/18	05/18	01/18	04/18	07/18
8	7	04/7	05/7	05/8	05/6	04/5	00/4	04/5	02/6	04/8	05/10	05/10	05/10
9	05/10	05/10	05/10	04/10	03/10	02/10	00/10	03/10	02/11	05/12	07/11	08/11	08/11
11	06/11	06/11	06/11	05/11	04/11	02/11	00/11	03/11	01/12	05/13	08/12	09/13	09/13
13	06/13	06/13	06/13	05/13	04/13	02/13	00/13	03/13	01/13	05/15	08/13	09/14	09/14
15	06/14	06/14	06/14	05/14	04/14	02/14	00/14	03/14	01/15	05/17	07/15	09/16	09/16
17	06/16	06/16	05/16	04/16	03/16	02/16	00/16	02/16	01/17	04/17	07/17	08/17	08/17
19	06/18	06/18	05/18	04/18	03/18	02/18	00/18	02/18	01/19	04/19	07/19	08/18	08/18
21	06/21	05/21	05/21	04/21	03/18	02/18	00/18	02/19	04/20	06/20	07/21	08/22	08/22
10	7	05/7	06/7	06/7	05/6	04/5	00/6	03/8	05/9	07/10	08/12	08/13	08/13
9	06/7	06/7	06/7	05/7	04/6	03/5	00/5	03/10	06/10	08/12	10/13	11/13	11/13
11	06/12	06/12	05/12	04/11	03/10	02/10	00/10	03/11	06/12	08/13	10/14	11/13	12/13
13	06/13	06/13	05/13	04/13	03/13	02/13	00/13	03/13	05/13	08/14	10/15	11/15	11/15
15	06/14	05/14	05/14	04/14	03/14	02/14	00/14	03/15	05/16	07/16	09/16	10/17	11/17
17	05/16	05/16	05/16	04/16	03/16	02/16	00/16	02/17	05/17	07/17	09/17	10/18	10/18
19	05/18	05/18	04/18	04/18	03/18	02/18	00/18	02/18	04/18	06/19	08/19	09/20	09/20
21	05/21	05/21	05/21	04/21	03/18	02/18	00/18	02/19	04/20	06/20	07/21	08/22	09/22
15	7	06/7	06/7	06/7	06/6	04/6	01/6	03/8	06/10	10/14	12/17	12/20	12/20
9	06/8	06/7	06/7	05/7	04/6	03/6	00/6	03/10	07/11	11/14	14/17	14/20	15/20
11	06/8	06/8	06/8	05/7	04/6	03/6	00/10	03/12	07/13	10/14	14/17	15/20	16/20
13	05/14	05/14	05/14	05/13	04/13	02/13	00/11	03/13	06/14	10/14	13/17	14/20	15/20
15	05/16	05/16	05/16	04/16	03/16	02/16	00/14	03/15	06/16	09/14	12/17	13/20	14/20
17	05/16	05/16	05/16	04/16	03/16	02/16	00/16	03/17	05/17	08/14	11/17	12/20	13/20
19	05/18	05/18	04/18	04/18	03/18	02/18	00/18	02/17	05/18	07/20	10/17	11/20	12/20
21	05/21	05/21	04/21	04/21	03/21	02/18	00/18	02/20	04/21	07/22	09/17	10/20	11/20
20	7	06/6	06/8	06/7	06/7	04/6	01/6	04/9	09/13	12/19	08/26	07/35	07/35
9	07/8	07/8	07/8	06/7	05/7	03/6	00/6	04/10	09/13	13/19	12/23	11/26	11/27
11	06/8	06/8	06/8	05/7	04/7	03/6	00/10	03/12	08/13	13/19	13/23	13/26	14/27
13	06/8	05/8	05/8	05/7	04/7	02/13	00/11	03/13	07/13	12/19	13/23	14/26	15/27
15	05/16	05/16	05/16	04/16	03/16	02/14	00/13	03/16	06/13	11/19	13/23	14/26	14/27
17	05/18	05/18	04/18	04/18	03/16	02/16	00/16	03/17	06/13	09/19	12/23	13/26	13/27
19	05/18	05/18	04/18	04/18	03/18	02/18	00/18	02/18	05/13	08/19	11/23	12/26	12/27
21	04/21	04/21	04/21	04/21	03/21	01/18	00/18	02/20	05/22	08/19	10/23	11/26	12/27
25	7	06/8	06/8	06/8	06/7	04/6	01/5	04/9	12/17	09/27	07/45	07/7	07/7
9	07/8	07/8	07/8	06/8	05/7	03/6	00/6	04/11	11/17	12/24	09/31	09/39	09/42
11	07/8	07/8	06/8	05/8	04/7	03/6	00/10	04/12	10/17	13/24	12/30	11/33	11/33
13	06/8	06/8	05/8	05/8	04/7	02/6	00/11	03/14	09/17	13/24	13/30	12/33	13/33
15	05/8	05/8	05/8	04/8	03/16	02/14	00/13	03/15	08/17	12/24	13/30	13/33	13/33
17	05/18	05/18	04/18	04/18	03/16	02/16	00/14	03/17	07/17	10/24	12/30	13/33	13/33
19	04/18	04/18	04/18	04/18	03/18	02/18	00/16	03/18	06/17	09/24	11/30	12/33	13/33
21	04/21	04/21	04/21	03/21	03/21	01/18	00/18	02/20	05/17	09/24	10/30	11/33	12/33

ASR
LONGCRESTED
RMS LON ACC IN G'S/ENCOUNTERED MODAL PERIOD, T_{OE}, IN SECONDS
(ACC. X 100)
ROLLER CHOCK - 8.0 FT AFT OF AP ON CL, AND 26.07 FT ABOVE KEEL

LONGCRESTED

LONGCRESTED
RMS LON ACC IN G'S/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

 $(ACC. \times 100)$

ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL
(ALL. A 100)

V	T0	SHIP HEADING ANGLE IN DEGREES												180
		0	15	30	45	60	75	90	105	120	135	150	165	
0	7	.10/ 8	.11/ 8	.11/ 7	.13/ 6	.16/ 5	.14/ 5	.03/ 4	.14/ 5	.15/ 5	.13/ 7	.08/ 6	.11/ 8	.11/ 8
	9	.13/ 9	.13/ 9	.13/ 9	.13/ 8	.13/ 5	.10/ 5	.02/ 4	.10/ 5	.12/ 8	.13/ 8	.06/ 6	.12/ 9	.13/ 9
	11	.13/10	.13/10	.12/10	.12/10	.10/10	.07/ 5	.01/ 4	.08/ 5	.11/10	.12/10	.05/ 6	.12/ 9	.14/10
	13	.13/11	.12/11	.10/11	.09/11	.09/10	.06/ 5	.01/ 4	.06/10	.09/10	.11/11	.04/ 6	.10/10	.13/11
	15	.12/13	.11/13	.09/13	.09/13	.07/13	.05/ 5	.01/ 4	.05/12	.08/13	.10/13	.03/13	.08/12	.12/13
	17	.10/14	.09/14	.08/14	.08/14	.06/13	.04/13	.01/ 4	.04/13	.07/13	.09/14	.03/14	.08/13	.11/14
	19	.08/14	.07/14	.07/14	.07/14	.06/13	.03/14	.01/ 4	.04/14	.06/14	.08/14	.02/16	.07/14	.10/14
	21	.08/16	.08/16	.07/16	.06/16	.05/16	.03/16	.00/14	.03/16	.05/16	.07/16	.02/16	.06/16	.09/16
5	7	.16/ 6	.16/ 6	.17/ 6	.19/ 6	.20/ 6	.15/ 5	.02/ 4	.12/ 5	.07/ 6	.10/ 8	.11/ 9	.11/10	.11/10
	9	.16/ 7	.16/ 7	.16/ 6	.16/ 6	.15/ 6	.11/ 5	.01/ 4	.09/ 5	.05/ 6	.11/ 8	.14/10	.14/10	.14/10
	11	.15/10	.15/10	.14/10	.14/ 6	.12/ 6	.08/ 5	.01/ 4	.07/10	.04/ 6	.10/10	.13/11	.14/12	.15/12
	13	.13/12	.13/12	.12/11	.10/13	.10/ 6	.06/ 5	.01/10	.06/11	.02/13	.08/12	.12/12	.12/13	.14/13
	15	.12/13	.12/13	.11/13	.10/13	.08/13	.05/ 5	.01/12	.05/12	.02/16	.07/13	.12/13	.13/13	.13/13
	17	.11/14	.10/14	.09/14	.09/14	.07/14	.04/ 5	.01/13	.04/13	.02/15	.06/14	.10/14	.11/15	.11/15
	19	.09/16	.09/16	.08/16	.07/16	.06/14	.03/14	.00/14	.04/14	.02/17	.06/15	.09/16	.10/16	.10/16
	21	.08/16	.08/16	.08/16	.07/16	.05/16	.03/16	.00/16	.03/16	.02/17	.06/15	.08/17	.09/17	.09/17
10	7	.22/ 7	.23/ 7	.23/ 7	.24/ 6	.23/ 6	.16/ 5	.02/ 4	.10/ 5	.11/ 9	.12/10	.12/12	.12/13	.12/13
	9	.21/ 7	.21/ 7	.21/ 7	.20/ 6	.18/ 6	.11/ 5	.01/ 6	.08/ 9	.11/10	.14/11	.15/12	.15/13	.15/13
	11	.18/ 7	.18/ 7	.17/ 7	.16/ 6	.14/ 6	.08/ 5	.01/ 6	.07/10	.10/11	.13/12	.14/13	.15/13	.15/13
	13	.15/ 7	.15/ 7	.15/ 7	.13/ 7	.11/ 6	.06/ 5	.01/10	.06/11	.09/12	.12/13	.13/14	.14/13	.14/13
	15	.13/13	.13/13	.12/ 7	.11/ 7	.09/ 6	.05/ 5	.01/11	.05/13	.08/13	.10/14	.12/15	.13/15	.13/15
	17	.11/14	.11/14	.11/14	.09/14	.07/14	.04/ 5	.01/13	.04/14	.07/14	.09/15	.10/15	.11/16	.12/16
	19	.10/16	.10/16	.09/16	.08/16	.06/16	.03/16	.00/14	.03/15	.06/16	.08/17	.09/17	.10/17	.10/17
	21	.09/16	.09/16	.08/16	.07/16	.05/16	.03/16	.00/16	.03/17	.05/17	.07/17	.08/17	.09/18	.09/18
15	7	.26/ 7	.26/ 7	.27/ 7	.27/ 7	.25/ 6	.17/ 6	.02/ 6	.08/ 8	.12/10	.13/14	.12/17	.10/20	.10/20
	9	.26/ 7	.26/ 7	.26/ 7	.24/ 7	.20/ 6	.12/ 6	.02/ 6	.07/ 9	.12/10	.14/14	.15/17	.14/20	.14/20
	11	.22/ 7	.22/ 7	.21/ 7	.19/ 7	.15/ 6	.09/ 6	.01/ 6	.06/10	.11/12	.13/14	.15/17	.15/20	.15/20
	13	.18/ 8	.18/ 7	.17/ 7	.15/ 7	.12/ 6	.07/ 6	.01/ 6	.05/12	.09/13	.12/14	.13/17	.14/20	.14/20
	15	.15/ 8	.15/ 7	.12/ 7	.12/ 7	.10/ 6	.06/ 6	.01/ 6	.05/13	.08/14	.10/14	.12/17	.12/20	.13/20
	17	.13/ 8	.13/ 7	.12/ 7	.10/ 7	.08/ 6	.04/ 6	.01/11	.04/14	.07/15	.09/14	.11/17	.11/20	.11/20
	19	.11/ 8	.11/ 7	.10/ 7	.09/ 7	.07/ 6	.04/ 6	.01/14	.03/15	.06/16	.08/14	.09/17	.10/20	.10/20
	21	.10/18	.09/18	.09/18	.07/16	.06/ 6	.03/ 6	.00/16	.03/17	.05/17	.07/14	.08/17	.09/20	.09/20
20	7	.28/ 8	.28/ 8	.29/ 7	.30/ 7	.28/ 7	.19/ 6	.03/ 5	.08/ 8	.12/13	.11/19	.05/25	.04/31	.04/33
	9	.31/ 8	.30/ 8	.29/ 8	.27/ 7	.22/ 7	.14/ 6	.02/ 5	.07/10	.12/13	.13/19	.09/23	.07/26	.07/27
	11	.25/ 8	.25/ 8	.24/ 8	.21/ 7	.17/ 7	.10/ 6	.02/ 6	.06/10	.11/13	.13/19	.11/23	.09/26	.09/27
	13	.21/ 8	.21/ 8	.19/ 8	.17/ 7	.13/ 7	.08/ 6	.01/ 6	.05/12	.09/13	.12/19	.11/23	.10/26	.10/27
	15	.17/ 8	.17/ 8	.16/ 8	.14/ 7	.11/ 7	.06/ 6	.01/ 6	.05/13	.08/13	.10/19	.10/23	.10/26	.10/27
	17	.14/ 8	.14/ 8	.13/ 8	.11/ 7	.09/ 7	.05/ 6	.01/10	.04/15	.07/13	.09/19	.09/23	.09/26	.09/27
	19	.12/ 8	.12/ 8	.11/ 8	.09/ 7	.07/ 7	.04/ 6	.01/11	.03/16	.06/13	.08/19	.08/23	.09/26	.09/27
	21	.11/ 8	.10/ 8	.09/ 8	.08/ 7	.06/ 7	.03/ 6	.01/12	.03/17	.05/13	.07/19	.08/23	.08/26	.08/27
25	7	.28/ 8	.29/ 8	.30/ 8	.31/ 7	.29/ 7	.21/ 6	.03/ 4	.08/ 9	.12/17	.06/26	.05/ 6	.06/ 7	.06/ 7
	9	.34/ 8	.34/ 8	.33/ 8	.30/ 8	.25/ 7	.15/ 6	.02/ 5	.07/ 9	.12/17	.09/24	.05/31	.05/37	.06/ 7
	11	.30/ 8	.29/ 8	.27/ 8	.24/ 8	.19/ 7	.11/ 6	.02/ 5	.06/11	.11/17	.10/24	.07/30	.06/33	.06/35
	13	.24/ 8	.24/ 8	.22/ 8	.19/ 8	.15/ 7	.08/ 6	.01/ 5	.05/12	.09/17	.10/24	.08/30	.07/33	.07/33
	15	.20/ 8	.19/ 8	.18/ 8	.15/ 8	.12/ 7	.07/ 6	.01/ 5	.05/13	.08/17	.09/24	.08/30	.07/33	.07/33
	17	.16/ 8	.16/ 8	.15/ 8	.13/ 8	.09/ 7	.05/ 6	.01/10	.04/15	.07/13	.08/24	.08/30	.07/33	.07/33
	19	.14/ 8	.13/ 8	.12/ 8	.10/ 8	.08/ 7	.04/ 6	.01/11	.03/16	.06/17	.07/24	.07/30	.07/33	.07/33
	21	.13/ 8	.13/ 8	.12/ 8	.10/ 8	.08/ 7	.04/ 6	.01/11	.03/16	.06/17	.07/24	.07/30	.07/33	.07/33

ASR

LONGCRESTED
RMS LAT DISP IN FEET/ENCOUNTERED MODAL PERIOD, T^{DE}, IN SECONDS
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL

V TO	SHIP HEADING ANGLE IN DEGREES										180
	0	15	30	45	60	75	90	105	120	135	
0	7	0.00/00	.05/8	.11/8	.16/7	.20/7	.18/7	.16/8	.21/7	.17/7	180
9	0.00/00	.07/10	.14/10	.19/10	.22/10	.22/10	.21/10	.24/10	.25/10	.22/10	.05/8
11	0.00/00	.08/10	.14/10	.19/10	.22/10	.22/10	.21/10	.24/10	.25/10	.22/10	.08/10
13	0.00/00	.07/10	.14/10	.19/10	.22/10	.22/10	.21/10	.24/10	.25/10	.22/10	.09/10
15	0.00/00	.07/14	.13/14	.18/14	.21/15	.22/15	.22/16	.23/16	.22/16	.20/10	.09/10
17	0.00/00	.07/16	.13/16	.18/16	.21/15	.22/15	.22/16	.23/16	.22/16	.19/15	.08/10
19	0.00/00	.07/18	.13/18	.18/18	.21/18	.22/18	.22/18	.23/18	.22/18	.18/18	.08/10
21	0.06/00	.07/21	.13/21	.17/21	.20/18	.22/21	.22/21	.23/21	.21/21	.18/21	.07/21
8	7	0.00/00	.04/8	.08/8	.13/7	.17/7	.16/7	.16/8	.23/8	.24/9	180
9	0.00/00	.06/10	.12/10	.17/10	.20/10	.20/10	.20/10	.26/10	.26/10	.28/10	.11/10
11	0.00/00	.07/11	.13/11	.18/11	.20/10	.21/10	.21/10	.26/10	.26/10	.26/10	.13/10
13	0.00/00	.07/11	.13/11	.18/11	.20/10	.21/10	.21/10	.26/10	.26/10	.26/10	.11/10
15	0.00/00	.07/11	.13/11	.18/11	.20/10	.21/10	.21/10	.26/10	.26/10	.26/10	.10/10
17	0.00/00	.06/16	.12/16	.16/16	.19/16	.21/16	.21/16	.24/16	.24/17	.21/17	.09/10
19	0.00/00	.06/18	.12/18	.16/18	.19/21	.21/21	.21/21	.23/18	.23/19	.20/19	.08/20
21	0.00/00	.06/21	.12/21	.16/21	.19/21	.22/21	.22/21	.23/21	.23/22	.20/22	.08/22
10	7	0.00/00	.03/8	.07/8	.11/7	.15/7	.16/7	.16/8	.25/8	.37/10	180
9	0.00/00	.05/10	.09/10	.14/10	.17/10	.19/10	.19/10	.26/10	.27/10	.34/10	.09/13
11	0.00/00	.06/13	.11/12	.15/11	.19/11	.20/10	.20/10	.26/10	.26/10	.31/10	.11/13
13	0.00/00	.06/13	.11/13	.15/12	.19/11	.20/10	.20/10	.26/10	.26/10	.31/10	.10/13
15	0.00/00	.06/13	.11/13	.15/12	.19/11	.20/10	.20/10	.26/10	.26/10	.31/10	.10/13
17	0.00/00	.05/13	.10/18	.15/18	.18/18	.21/16	.21/16	.24/18	.24/20	.23/18	.09/20
19	0.00/00	.05/18	.10/18	.15/18	.18/18	.21/16	.21/16	.24/18	.24/20	.23/18	.09/20
21	0.00/00	.05/21	.10/21	.15/21	.19/21	.21/21	.21/21	.23/21	.24/22	.21/23	.08/24
15	7	0.00/00	.03/8	.06/8	.09/7	.13/7	.14/7	.16/8	.27/9	.34/14	180
9	0.00/00	.04/10	.08/10	.12/10	.15/10	.17/10	.17/10	.20/10	.28/10	.38/10	.21/20
11	0.00/00	.05/13	.09/13	.13/12	.16/11	.19/11	.19/11	.21/10	.27/10	.33/10	.18/20
13	0.00/00	.05/14	.09/13	.13/13	.17/13	.20/12	.20/12	.26/14	.26/14	.30/10	.15/20
15	0.00/00	.05/14	.09/13	.13/13	.17/13	.20/12	.20/12	.26/14	.26/14	.30/10	.13/20
17	0.00/00	.05/14	.09/18	.13/18	.17/18	.20/16	.20/16	.23/16	.25/19	.27/19	.12/20
19	0.00/00	.05/18	.09/18	.13/18	.17/18	.20/16	.20/16	.23/16	.25/20	.27/19	.11/20
21	0.00/00	.05/21	.09/21	.14/21	.17/21	.21/21	.21/21	.23/21	.25/22	.26/23	.10/20
20	7	0.00/00	.02/8	.05/8	.08/8	.11/7	.13/7	.16/8	.29/9	.36/13	180
9	0.00/00	.03/10	.07/9	.10/10	.13/10	.16/10	.16/10	.20/10	.29/10	.36/13	.25/63
11	0.00/00	.04/13	.08/13	.11/12	.15/12	.18/11	.18/11	.21/10	.28/13	.34/13	.24/63
13	0.00/00	.04/14	.09/14	.12/13	.16/13	.19/13	.19/13	.22/14	.27/15	.31/13	.22/26
15	0.00/00	.04/14	.09/14	.12/14	.16/16	.19/16	.19/16	.23/16	.27/16	.32/13	.19/26
17	0.00/00	.04/14	.09/14	.12/18	.16/18	.19/18	.19/18	.23/16	.26/20	.30/19	.18/26
19	0.00/00	.04/21	.09/18	.13/18	.16/18	.20/18	.20/18	.23/18	.26/20	.29/19	.16/26
21	0.00/00	.04/21	.09/21	.13/21	.16/21	.20/21	.20/21	.23/21	.26/22	.29/19	.15/26
25	7	0.00/00	.02/8	.04/8	.07/8	.10/8	.12/7	.16/8	.32/9	.45/19	180
9	0.00/00	.03/10	.06/9	.09/9	.12/10	.15/10	.15/10	.20/10	.29/10	.36/13	.21/7
11	0.00/00	.03/12	.07/13	.10/13	.13/12	.16/11	.16/11	.21/10	.30/13	.37/19	.43/45
13	0.00/00	.04/14	.07/14	.11/14	.14/13	.18/13	.18/13	.22/14	.29/15	.38/17	.27/57
15	0.00/00	.04/16	.08/14	.11/14	.15/14	.19/16	.19/16	.23/16	.28/17	.36/24	.24/33
17	0.00/00	.04/16	.08/16	.12/18	.15/18	.19/18	.19/18	.23/16	.28/18	.35/17	.22/33
19	0.00/00	.04/16	.08/21	.12/21	.15/18	.19/18	.19/18	.23/18	.28/20	.37/24	.21/33
21	0.00/00	.04/21	.08/21	.12/21	.15/21	.19/21	.19/21	.23/21	.28/23	.35/24	.19/33

ASR

LONGCRESTED
RMS LAT VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	0.00/00	0.05/7	0.09/7	0.14/7	0.19/7	0.24/7	0.29/7	0.34/7	0.39/7	0.44/7	0.49/7	0.54/7
9	9	0.00/00	0.06/9	0.11/9	0.16/9	0.21/9	0.26/9	0.31/9	0.36/9	0.41/9	0.46/9	0.51/9	0.56/9
11	11	0.00/00	0.05/10	0.10/10	0.15/10	0.20/10	0.25/10	0.30/10	0.35/10	0.40/10	0.45/10	0.50/10	0.55/10
13	13	0.00/00	0.05/10	0.09/10	0.14/10	0.19/10	0.24/10	0.29/10	0.34/10	0.39/10	0.44/10	0.49/10	0.54/10
15	15	0.00/00	0.04/10	0.08/10	0.13/10	0.18/10	0.23/10	0.28/10	0.33/10	0.38/10	0.43/10	0.48/10	0.53/10
17	17	0.00/00	0.04/10	0.07/10	0.11/10	0.16/10	0.21/10	0.26/10	0.31/10	0.36/10	0.41/10	0.46/10	0.51/10
19	19	0.00/00	0.03/16	0.06/16	0.10/16	0.15/16	0.20/16	0.25/16	0.30/16	0.35/16	0.40/16	0.45/16	0.50/16
21	21	0.00/00	0.03/18	0.05/18	0.09/18	0.13/18	0.17/18	0.21/18	0.25/18	0.29/18	0.33/18	0.37/18	0.41/18
8	7	0.00/00	0.04/7	0.09/7	0.14/7	0.19/7	0.24/7	0.29/7	0.34/7	0.39/7	0.44/7	0.49/7	0.54/7
9	9	0.00/00	0.05/9	0.10/9	0.15/9	0.20/9	0.25/9	0.30/9	0.35/9	0.40/9	0.45/9	0.50/9	0.55/9
11	11	0.00/00	0.05/11	0.10/11	0.15/11	0.20/11	0.25/11	0.30/11	0.35/11	0.40/11	0.45/11	0.50/11	0.55/11
13	13	0.00/00	0.05/11	0.09/11	0.14/11	0.19/11	0.24/11	0.29/11	0.34/11	0.39/11	0.44/11	0.49/11	0.54/11
15	15	0.00/00	0.04/11	0.08/11	0.13/11	0.18/11	0.23/11	0.28/11	0.33/11	0.38/11	0.43/11	0.48/11	0.53/11
17	17	0.00/00	0.04/11	0.07/11	0.11/11	0.16/11	0.21/11	0.26/11	0.31/11	0.36/11	0.41/11	0.46/11	0.51/11
19	19	0.00/00	0.03/11	0.06/11	0.10/11	0.15/11	0.20/11	0.25/11	0.30/11	0.35/11	0.40/11	0.45/11	0.50/11
21	21	0.00/00	0.03/11	0.05/11	0.09/11	0.13/11	0.17/11	0.21/11	0.25/11	0.29/11	0.33/11	0.37/11	0.41/11
10	7	0.00/00	0.04/7	0.08/7	0.13/7	0.17/7	0.22/7	0.27/7	0.32/7	0.37/7	0.42/7	0.47/7	0.52/7
9	9	0.00/00	0.05/8	0.09/8	0.14/8	0.18/8	0.23/8	0.28/8	0.33/8	0.38/8	0.43/8	0.48/8	0.53/8
11	11	0.00/00	0.05/13	0.09/13	0.13/13	0.17/13	0.21/13	0.25/13	0.29/13	0.33/13	0.37/13	0.41/13	0.45/13
13	13	0.00/00	0.04/13	0.08/13	0.12/13	0.16/13	0.20/13	0.24/13	0.28/13	0.32/13	0.36/13	0.40/13	0.44/13
15	15	0.00/00	0.04/13	0.07/13	0.11/13	0.15/13	0.19/13	0.23/13	0.27/13	0.31/13	0.35/13	0.39/13	0.43/13
17	17	0.00/00	0.03/13	0.06/13	0.10/13	0.14/13	0.18/13	0.22/13	0.26/13	0.30/13	0.34/13	0.38/13	0.42/13
19	19	0.00/00	0.03/13	0.06/13	0.09/13	0.13/13	0.17/13	0.21/13	0.25/13	0.29/13	0.33/13	0.37/13	0.41/13
21	21	0.00/00	0.03/13	0.05/13	0.09/13	0.13/13	0.17/13	0.21/13	0.25/13	0.29/13	0.33/13	0.37/13	0.41/13
15	7	0.00/00	0.04/8	0.08/8	0.12/8	0.16/8	0.20/8	0.24/8	0.28/8	0.32/8	0.36/8	0.40/8	0.44/8
9	9	0.00/00	0.04/8	0.09/8	0.13/8	0.17/8	0.21/8	0.25/8	0.29/8	0.33/8	0.37/8	0.41/8	0.45/8
11	11	0.00/00	0.04/10	0.09/10	0.12/10	0.16/10	0.20/10	0.24/10	0.28/10	0.32/10	0.36/10	0.40/10	0.44/10
13	13	0.00/00	0.04/10	0.08/10	0.11/10	0.15/10	0.19/10	0.23/10	0.27/10	0.31/10	0.35/10	0.39/10	0.43/10
15	15	0.00/00	0.04/10	0.07/10	0.11/10	0.14/10	0.18/10	0.22/10	0.26/10	0.30/10	0.34/10	0.38/10	0.42/10
17	17	0.00/00	0.03/14	0.06/14	0.10/14	0.14/14	0.18/14	0.22/14	0.26/14	0.30/14	0.34/14	0.38/14	0.42/14
19	19	0.00/00	0.03/14	0.06/14	0.09/14	0.13/14	0.17/14	0.21/14	0.25/14	0.29/14	0.33/14	0.37/14	0.41/14
21	21	0.00/00	0.03/14	0.05/14	0.09/14	0.13/14	0.17/14	0.21/14	0.25/14	0.29/14	0.33/14	0.37/14	0.41/14
20	7	0.00/00	0.03/7	0.07/7	0.12/7	0.16/7	0.21/7	0.26/7	0.31/7	0.36/7	0.41/7	0.46/7	0.51/7
9	9	0.00/00	0.04/8	0.08/8	0.12/8	0.16/8	0.20/8	0.24/8	0.28/8	0.32/8	0.36/8	0.40/8	0.44/8
11	11	0.00/00	0.04/10	0.08/10	0.11/10	0.15/10	0.19/10	0.23/10	0.27/10	0.31/10	0.35/10	0.39/10	0.43/10
13	13	0.00/00	0.04/10	0.07/10	0.11/10	0.14/10	0.18/10	0.22/10	0.26/10	0.30/10	0.34/10	0.38/10	0.42/10
15	15	0.00/00	0.04/10	0.07/10	0.11/10	0.14/10	0.18/10	0.22/10	0.26/10	0.30/10	0.34/10	0.38/10	0.42/10
17	17	0.00/00	0.03/14	0.06/14	0.10/14	0.14/14	0.18/14	0.22/14	0.26/14	0.30/14	0.34/14	0.38/14	0.42/14
19	19	0.00/00	0.03/14	0.06/14	0.09/14	0.13/14	0.17/14	0.21/14	0.25/14	0.29/14	0.33/14	0.37/14	0.41/14
21	21	0.00/00	0.03/14	0.05/14	0.09/14	0.13/14	0.17/14	0.21/14	0.25/14	0.29/14	0.33/14	0.37/14	0.41/14
25	7	0.00/00	0.03/7	0.07/7	0.11/7	0.15/7	0.20/7	0.25/7	0.30/7	0.35/7	0.40/7	0.45/7	0.50/7
9	9	0.00/00	0.04/9	0.08/9	0.11/9	0.15/9	0.19/9	0.23/9	0.27/9	0.31/9	0.35/9	0.39/9	0.43/9
11	11	0.00/00	0.04/10	0.08/10	0.11/10	0.15/10	0.19/10	0.23/10	0.27/10	0.31/10	0.35/10	0.39/10	0.43/10
13	13	0.00/00	0.04/10	0.07/10	0.11/10	0.14/10	0.18/10	0.22/10	0.26/10	0.30/10	0.34/10	0.38/10	0.42/10
15	15	0.00/00	0.04/10	0.07/10	0.11/10	0.14/10	0.18/10	0.22/10	0.26/10	0.30/10	0.34/10	0.38/10	0.42/10
17	17	0.00/00	0.03/16	0.06/16	0.10/16	0.14/16	0.18/16	0.22/16	0.26/16	0.30/16	0.34/16	0.38/16	0.42/16
19	19	0.00/00	0.03/16	0.06/16	0.09/16	0.13/16	0.17/16	0.21/16	0.25/16	0.29/16	0.33/16	0.37/16	0.41/16
21	21	0.00/00	0.03/16	0.05/16	0.09/16	0.13/16	0.17/16	0.21/16	0.25/16	0.29/16	0.33/16	0.37/16	0.41/16

ASR

RMS LAT ACC IN G'S/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
 LONGCRESTED
 (ACC. X 100)

ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL

V	T0	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	0.00/00	.12/7	.26/7	.43/7	.60/6	.63/6	.49/6	.75/5	.62/6	.42/7	.26/7	.12/7	.00/7
	9	0.00/00	.13/8	.27/8	.40/7	.51/7	.51/8	.43/8	.59/6	.54/7	.42/7	.28/8	.14/8	.00/10
	11	0.00/00	.12/10	.23/9	.33/9	.41/9	.41/10	.36/10	.47/10	.44/10	.36/10	.25/10	.13/10	.00/10
	13	0.00/00	.10/10	.19/10	.27/10	.33/10	.33/10	.30/10	.37/10	.35/10	.29/10	.17/10	.11/10	.00/10
	15	0.00/00	.08/10	.16/10	.22/10	.26/10	.26/10	.24/10	.30/10	.29/10	.24/10	.17/10	.09/10	.00/10
	17	0.00/00	.07/10	.13/10	.18/10	.22/10	.22/10	.20/10	.24/10	.24/10	.20/10	.14/10	.08/10	.00/10
	19	0.00/00	.06/10	.11/10	.15/10	.18/10	.18/10	.17/10	.20/10	.20/10	.17/10	.12/10	.06/10	.00/10
	21	0.00/00	.05/10	.09/10	.13/10	.15/10	.16/10	.15/10	.17/10	.17/10	.14/10	.10/10	.05/10	.00/10
5	7	0.00/00	.14/7	.30/7	.48/7	.66/6	.68/6	.48/6	.70/6	.57/7	.41/8	.27/9	.14/10	.00/10
	9	0.00/00	.15/8	.30/7	.45/7	.56/7	.55/7	.43/8	.56/7	.51/8	.34/10	.25/10	.16/10	.00/10
	11	0.00/00	.14/9	.26/8	.37/8	.45/9	.43/10	.36/10	.45/10	.42/10	.34/10	.25/10	.14/10	.00/10
	13	0.00/00	.12/11	.22/11	.30/10	.36/10	.34/10	.30/10	.36/10	.33/10	.28/10	.20/10	.11/10	.00/10
	15	0.00/00	.10/11	.18/11	.25/10	.29/10	.28/10	.24/10	.29/10	.27/10	.22/10	.16/10	.09/10	.00/10
	17	0.00/00	.08/11	.15/11	.20/10	.24/10	.23/10	.20/10	.24/10	.22/10	.18/10	.13/10	.07/10	.00/10
	19	0.00/00	.07/11	.13/11	.17/10	.20/10	.19/10	.17/10	.20/10	.18/10	.15/10	.11/10	.06/10	.00/10
	21	0.00/00	.06/11	.11/11	.14/10	.17/10	.16/10	.15/10	.17/10	.16/10	.13/10	.09/10	.05/10	.00/10
10	7	0.00/00	.16/7	.33/7	.53/7	.72/6	.71/6	.48/6	.64/6	.54/8	.43/10	.16/12	.07/13	.00/13
	9	0.00/00	.16/8	.33/7	.48/7	.60/7	.56/7	.42/8	.52/9	.47/10	.38/10	.16/12	.07/13	.00/13
	11	0.00/00	.15/8	.28/8	.40/8	.48/7	.45/10	.35/10	.41/10	.38/10	.30/10	.14/12	.07/13	.00/13
	13	0.00/00	.12/13	.23/10	.33/10	.38/10	.36/10	.29/10	.32/10	.30/10	.24/10	.12/12	.06/13	.00/13
	15	0.00/00	.10/13	.19/11	.26/11	.31/11	.29/10	.24/10	.26/10	.24/10	.19/10	.10/12	.05/13	.00/13
	17	0.00/00	.08/13	.16/12	.22/11	.25/11	.24/10	.20/10	.22/10	.20/10	.16/10	.09/12	.05/13	.00/13
	19	0.00/00	.07/13	.13/13	.18/11	.21/11	.20/10	.17/10	.18/10	.17/10	.13/10	.07/12	.04/13	.00/13
	21	0.00/00	.06/13	.11/13	.15/11	.18/11	.17/10	.15/10	.15/10	.14/10	.11/10	.06/12	.03/13	.00/13
15	7	0.00/00	.17/7	.35/7	.56/7	.75/6	.73/6	.47/6	.57/7	.48/10	.18/14	.08/17	.03/20	.00/20
	9	0.00/00	.18/8	.35/8	.53/8	.64/7	.58/7	.41/8	.46/9	.40/10	.18/14	.09/17	.04/20	.00/20
	11	0.00/00	.16/8	.30/8	.42/7	.49/7	.46/9	.35/9	.37/10	.31/10	.16/14	.09/17	.04/20	.00/20
	13	0.00/00	.13/8	.25/8	.34/8	.39/10	.37/10	.29/10	.29/10	.25/10	.14/14	.08/17	.04/20	.00/20
	15	0.00/00	.11/13	.20/11	.28/11	.32/11	.30/10	.24/10	.24/10	.20/10	.12/14	.07/17	.03/20	.00/20
	17	0.00/00	.09/13	.17/13	.23/12	.26/11	.25/10	.20/10	.20/10	.17/10	.10/14	.06/17	.03/20	.00/20
	19	0.00/00	.08/13	.14/13	.19/13	.22/11	.21/11	.17/10	.17/10	.14/10	.09/14	.05/17	.03/20	.00/20
	21	0.00/00	.06/13	.12/13	.16/13	.18/12	.17/11	.15/14	.14/10	.12/10	.08/14	.05/17	.02/20	.00/20
20	7	0.00/00	.18/7	.37/7	.59/6	.77/6	.75/6	.47/6	.50/8	.21/13	.09/19	.03/25	.04/4	.00/70
	9	0.00/00	.19/8	.37/8	.53/8	.64/7	.59/7	.41/8	.41/9	.21/13	.11/19	.05/23	.03/26	.00/30
	11	0.00/00	.16/8	.32/8	.44/8	.51/7	.47/9	.35/9	.33/10	.18/13	.11/19	.05/23	.03/26	.00/27
	13	0.00/00	.14/9	.26/8	.36/8	.40/7	.37/10	.29/10	.27/10	.16/13	.10/19	.05/23	.03/26	.00/27
	15	0.00/00	.11/9	.22/8	.29/8	.33/11	.30/11	.24/10	.22/10	.14/13	.09/19	.05/23	.03/26	.00/27
	17	0.00/00	.09/14	.18/14	.24/13	.27/12	.25/11	.20/10	.18/10	.12/13	.08/19	.05/23	.03/26	.00/27
	19	0.00/00	.08/14	.15/14	.20/13	.22/13	.21/11	.17/10	.16/15	.11/13	.07/19	.05/23	.03/26	.00/27
	21	0.00/00	.07/14	.13/14	.17/13	.19/13	.18/11	.15/14	.13/16	.09/13	.07/19	.04/23	.03/26	.00/27
25	7	0.00/00	.19/7	.38/7	.60/7	.78/6	.76/6	.47/6	.45/9	.15/17	.06/27	.05/4	.03/4	.00/8
	9	0.00/00	.19/8	.38/7	.54/7	.65/7	.60/7	.41/8	.37/9	.17/17	.07/24	.04/33	.03/42	.00/30
	11	0.00/00	.17/9	.32/9	.45/8	.52/8	.47/9	.35/9	.30/9	.16/17	.07/24	.04/30	.02/33	.00/48
	13	0.00/00	.14/9	.26/9	.36/8	.41/8	.38/10	.29/10	.24/9	.14/17	.07/24	.04/30	.02/33	.00/33
	15	0.00/00	.12/10	.22/9	.30/8	.33/12	.31/11	.24/10	.20/9	.13/17	.07/24	.04/30	.02/33	.00/33
	17	0.00/00	.10/10	.18/9	.25/13	.27/13	.26/11	.20/10	.17/9	.11/17	.07/24	.04/30	.02/33	.00/33
	19	0.00/00	.08/16	.15/14	.20/14	.23/13	.21/12	.17/10	.15/15	.10/17	.06/24	.04/30	.02/33	.00/33

ASR

LONGCRESTED
RMS VER DISP IN FEET/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
OE

V TO		SHIP HEADING ANGLE IN DEGREES											180
		0	15	30	45	60	75	90	105	120	135	150	165
0	7	.09/ 8	.09/ 8	.10/ 8	.13/ 8	.18/ 7	.23/ 7	.26/ 7	.22/ 7	.17/ 7	.13/ 8	.10/ 8	.09/ 8
	9	.15/10	.15/10	.16/10	.18/10	.21/ 9	.25/ 9	.26/ 9	.24/ 9	.21/ 9	.18/10	.16/10	.15/10
	11	.19/11	.19/11	.20/11	.21/11	.23/11	.25/10	.26/10	.25/10	.23/11	.21/11	.20/11	.19/11
	13	.21/13	.21/13	.22/13	.23/13	.24/13	.25/13	.26/13	.25/13	.24/13	.23/13	.22/13	.21/13
	15	.22/16	.23/16	.23/16	.24/16	.25/16	.25/16	.26/16	.25/16	.25/16	.24/16	.23/16	.23/16
	17	.23/18	.23/18	.24/18	.24/18	.25/18	.25/18	.26/18	.25/18	.25/18	.24/18	.24/18	.23/18
	21	.24/21	.24/21	.24/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.24/21	.24/21
5	7	.11/ 8	.12/ 8	.14/ 7	.17/ 7	.21/ 7	.25/ 7	.25/ 7	.21/ 7	.16/ 8	.12/ 9	.10/10	.08/10
	9	.17/10	.17/10	.19/10	.21/10	.24/ 9	.26/ 9	.26/ 9	.23/10	.20/10	.17/11	.15/11	.14/12
	11	.20/11	.20/11	.21/11	.23/11	.25/11	.26/10	.26/10	.25/11	.22/12	.20/13	.19/13	.18/13
	13	.22/13	.22/13	.23/13	.24/13	.25/13	.26/13	.26/13	.25/13	.23/13	.22/14	.21/14	.20/15
	15	.23/16	.23/16	.24/16	.24/16	.25/16	.26/16	.26/16	.25/16	.24/17	.23/17	.22/17	.22/17
	17	.24/18	.24/18	.24/18	.25/18	.25/18	.26/18	.26/18	.25/18	.24/18	.24/19	.23/19	.23/20
	21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/22	.24/22	.24/22	.24/22
10	7	.16/ 7	.17/ 7	.18/ 7	.21/ 7	.24/ 7	.27/ 6	.25/ 7	.20/ 8	.15/10	.11/11	.09/12	.08/13
	9	.22/ 8	.22/ 8	.23/ 8	.25/ 9	.26/ 9	.27/ 9	.26/ 9	.23/10	.20/11	.17/12	.15/13	.13/14
	11	.24/11	.24/11	.24/11	.25/11	.26/11	.27/11	.26/10	.24/12	.22/13	.20/14	.18/15	.17/15
	13	.24/13	.25/13	.25/13	.26/13	.26/13	.27/13	.26/13	.25/13	.23/15	.22/15	.20/16	.20/17
	15	.25/16	.25/16	.25/16	.26/16	.26/16	.26/16	.26/16	.25/15	.24/16	.23/17	.22/18	.21/18
	17	.25/18	.25/18	.25/18	.26/18	.26/18	.26/18	.26/18	.25/18	.24/20	.23/18	.23/20	.22/20
	21	.25/21	.25/21	.25/21	.25/21	.26/21	.26/21	.25/21	.25/22	.25/22	.24/23	.24/24	.23/25
15	7	.19/ 8	.20/ 8	.21/ 7	.24/ 7	.27/ 7	.28/ 6	.25/ 7	.20/ 9	.15/11	.11/14	.08/17	.07/20
	9	.27/ 8	.27/ 8	.28/ 8	.29/ 7	.29/ 7	.29/ 9	.26/ 9	.23/10	.19/12	.16/14	.14/17	.13/20
	11	.28/ 8	.28/ 8	.28/11	.28/11	.28/11	.28/11	.26/10	.24/12	.21/14	.19/16	.17/17	.17/20
	13	.27/13	.28/13	.28/13	.28/13	.28/13	.27/13	.26/13	.24/14	.23/16	.21/17	.20/17	.19/20
	15	.27/16	.27/16	.27/16	.27/16	.27/16	.27/16	.26/16	.25/16	.23/17	.22/19	.21/20	.21/20
	17	.27/18	.27/18	.27/18	.27/18	.26/18	.26/18	.26/18	.25/19	.24/19	.23/20	.22/22	.22/22
	21	.26/21	.26/21	.26/21	.26/21	.26/21	.26/21	.25/18	.25/20	.24/21	.23/22	.23/23	.23/24
20	7	.20/ 8	.21/ 8	.23/ 8	.26/ 7	.29/ 7	.30/ 6	.25/ 7	.19/ 9	.14/13	.10/19	.08/25	.07/31
	9	.31/ 8	.31/ 8	.31/ 8	.32/ 8	.32/ 7	.30/ 8	.26/ 9	.22/11	.18/13	.15/19	.12/23	.12/26
	11	.32/ 8	.32/ 8	.32/ 8	.32/ 8	.31/11	.29/11	.26/10	.23/13	.21/13	.19/19	.17/23	.16/26
	13	.31/13	.31/13	.30/13	.30/13	.29/13	.28/13	.26/13	.24/15	.23/17	.21/19	.20/23	.19/26
	15	.30/16	.29/16	.29/16	.29/16	.28/16	.27/16	.26/16	.24/16	.23/18	.22/19	.21/23	.21/26
	17	.28/18	.28/18	.28/18	.28/18	.27/18	.26/18	.25/18	.25/18	.24/20	.23/22	.22/23	.22/26
	21	.28/18	.27/18	.27/18	.27/18	.26/18	.26/18	.25/18	.25/20	.24/22	.23/24	.23/26	.23/27
25	7	.19/ 9	.20/ 8	.23/ 8	.26/ 8	.29/ 7	.32/ 6	.25/ 7	.19/10	.14/17	.10/27	.08/57	.06/57
	9	.33/ 9	.34/ 9	.35/ 8	.35/ 8	.35/ 7	.32/ 8	.26/ 9	.22/12	.18/17	.15/24	.13/33	.12/45
	11	.36/ 9	.36/ 9	.36/ 8	.35/ 8	.33/ 7	.30/11	.26/11	.23/13	.20/17	.18/24	.17/30	.16/35
	13	.34/ 9	.34/ 9	.34/ 8	.32/ 8	.31/13	.28/13	.26/13	.24/15	.22/17	.21/24	.19/30	.19/33
	15	.32/16	.32/16	.32/16	.30/16	.29/16	.27/16	.26/16	.24/17	.23/17	.22/24	.21/30	.21/33
	17	.30/18	.30/18	.29/18	.29/18	.28/18	.27/18	.25/18	.24/18	.23/17	.23/24	.23/30	.22/33
	21	.28/21	.28/21	.28/21	.28/21	.27/21	.26/21	.25/21	.25/23	.24/26	.23/27	.23/30	.23/33

ASR

LONGCRESTED
RMS VER VEL IN FPS/ENCOUNTERED MODAL PERIOD, T_{OE}, IN SECONDS

V TO	SHIP HEADING ANGLE IN DEGREES											180
	0	15	30	45	60	75	90	105	120	135	150	165
0	07/ 8	08/ 8	09/ 8	11/ 7	17/ 7	24/ 6	27/ 6	21/ 6	15/ 7	11/ 7	08/ 8	07/ 8
	10/ 9	11/ 9	12/ 9	14/ 9	16/ 8	19/ 8	23/ 8	20/ 8	16/ 8	13/ 9	11/ 9	10/ 9
	11/10	12/10	13/10	14/10	16/10	19/10	20/10	18/10	15/10	14/10	12/10	12/10
	13	12/12	13/12	13/12	14/11	16/11	17/11	16/11	14/11	13/12	12/12	11/12
	15	11/14	12/14	13/14	13/13	14/13	15/13	14/13	13/13	12/13	11/14	11/14
	17	10/16	10/16	11/16	12/16	13/16	13/16	13/16	12/16	11/16	10/16	10/16
5	10/18	10/18	10/16	10/16	11/16	11/16	12/16	11/16	11/16	10/16	10/16	10/18
	09/18	09/18	09/18	10/18	10/18	10/18	11/18	10/18	10/18	10/18	09/18	09/18
	12/ 7	12/ 7	14/ 7	18/ 6	22/ 6	27/ 6	26/ 6	19/ 7	12/ 8	08/ 9	06/10	05/10
	14/ 9	15/ 9	16/ 9	19/ 9	21/ 8	24/ 7	23/ 8	18/ 9	14/ 9	11/10	09/11	08/11
	15/10	15/10	16/10	17/10	19/10	20/10	20/10	16/10	13/11	11/12	10/12	09/13
	14/12	14/12	15/12	16/12	17/11	18/11	17/11	15/12	13/12	11/13	10/13	09/14
10	13/14	13/14	14/14	14/13	15/13	15/13	15/13	13/13	12/14	11/15	10/15	09/16
	15	13/14	13/14	14/14	13/14	14/14	13/14	12/15	11/17	10/17	09/17	09/17
	17	12/16	13/16	13/16	13/16	12/16	12/16	11/16	10/17	09/19	08/20	08/20
	19	11/16	12/16	12/16	12/16	11/18	11/18	10/18	09/19	08/20	08/20	08/20
	21	10/18	11/18	11/18	11/18	11/18	11/18	10/18	09/19	08/20	08/20	08/20
	19/ 7	20/ 7	22/ 7	25/ 7	28/ 6	30/ 6	26/ 6	17/ 8	10/ 9	07/11	05/12	04/13
15	23/ 7	23/ 7	24/ 7	25/ 7	27/ 7	27/ 6	23/ 8	17/ 9	12/10	09/12	07/13	06/14
	21/ 8	22/ 8	22/ 8	23/ 7	23/10	22/10	20/10	15/10	12/12	09/13	08/14	07/15
	13	19/12	20/12	20/11	20/11	19/11	17/11	14/12	11/13	09/14	08/15	07/16
	15	17/13	17/13	17/13	17/13	17/13	15/13	12/14	10/15	09/17	08/18	07/18
	17	15/14	15/14	15/14	15/14	14/14	13/14	11/15	10/17	09/18	08/19	07/20
	19	14/16	14/16	14/16	13/16	13/16	12/16	10/17	09/19	08/20	07/22	07/22
20	13/18	12/18	12/18	12/18	12/18	12/18	11/18	09/19	08/20	08/21	07/22	07/22
	25/ 8	26/ 8	28/ 7	31/ 7	33/ 7	33/ 6	26/ 6	15/ 8	08/10	05/14	03/17	02/20
	31/ 8	32/ 8	32/ 8	33/ 7	32/ 7	29/ 6	23/ 8	15/10	10/12	07/14	05/17	04/20
	29/ 8	29/ 8	29/ 8	29/ 7	27/ 7	25/ 6	20/10	14/11	10/13	08/14	06/17	05/20
	13	26/ 8	25/ 8	24/ 7	23/ 7	21/11	17/11	13/13	10/15	08/17	07/17	06/20
	15	22/ 8	22/ 8	21/13	20/13	18/13	15/13	12/14	09/16	08/18	07/17	06/20
25	19/14	19/14	19/14	18/14	17/14	15/14	13/14	11/16	09/18	08/20	07/20	06/20
	17	17/16	17/16	16/16	15/16	14/16	12/16	10/17	08/19	07/20	06/22	06/23
	19	15/18	15/18	14/18	13/18	12/18	11/18	09/20	08/21	07/22	06/23	06/25
	21	28/ 8	28/ 8	34/ 7	38/ 7	37/ 6	26/ 5	14/ 9	07/13	03/19	02/25	01/31
	9	39/ 8	39/ 8	39/ 7	37/ 7	32/ 6	23/ 8	14/10	08/13	05/19	03/23	03/26
	11	37/ 8	37/ 8	35/ 8	32/ 7	27/ 6	19/10	13/12	09/13	06/19	05/23	04/27
30	32/ 8	32/ 8	31/ 8	29/ 8	27/ 7	22/11	17/11	12/13	09/16	06/19	05/23	04/26
	13	28/ 8	27/ 8	25/ 8	22/ 7	19/13	15/13	11/15	08/17	07/19	05/23	05/27
	15	24/ 8	23/ 8	21/ 8	19/14	16/14	13/14	10/17	08/20	07/19	06/23	05/26
	17	21/ 8	20/ 8	18/16	17/16	14/16	12/16	09/18	08/20	06/22	05/26	05/27
	19	18/18	18/18	16/18	15/18	13/18	11/18	09/20	07/22	05/24	05/23	05/26
	21	28/ 8	29/ 8	37/ 8	41/ 7	40/ 6	27/ 5	12/ 9	05/17	02/26	01/42	01/57
35	45/ 9	45/ 9	46/ 8	45/ 8	43/ 7	36/ 6	23/ 8	12/11	07/17	04/24	02/31	02/39
	9	44/ 9	44/ 8	41/ 8	36/ 7	29/ 6	19/10	12/13	07/17	05/24	03/30	03/33
	11	39/ 9	38/ 8	34/ 8	30/ 7	24/ 6	17/11	11/14	07/17	05/24	04/30	03/33
	13	33/ 9	32/ 8	29/ 8	25/ 7	20/13	15/13	10/15	07/17	06/24	04/30	04/33
	15	28/ 9	27/ 8	24/ 8	21/ 7	17/14	13/14	10/18	07/17	06/24	05/30	04/33
	17	24/ 9	23/ 8	21/ 8	18/16	15/16	12/16	09/18	07/17	06/24	05/30	04/33
40	21/ 9	21/ 9	20/ 8	18/ 8	16/18	13/18	11/18	08/20	07/23	05/24	04/33	04/33
	19	24/ 9	24/ 9	23/ 8	21/ 8	18/16	15/16	12/16	09/18	07/17	06/24	05/30
	21	21/ 9	21/ 9	20/ 8	18/ 8	16/18	13/18	11/18	08/20	07/23	05/24	04/33
	9	45/ 9	45/ 9	44/ 8	41/ 8	36/ 7	29/ 6	19/10	12/13	07/17	05/24	04/30
	11	39/ 9	38/ 8	34/ 8	30/ 7	24/ 6	17/11	11/14	07/17	06/24	05/30	04/33
	13	33/ 9	32/ 8	29/ 8	25/ 7	20/13	15/13	10/15	07/17	06/24	05/30	04/33

ASR
LONGCRESTED
RMS VER ACC IN G'S/ENCOUNTERED MODAL PERIOD, T_{DE}, IN SECONDS
(ACC. X 100)

V	T0	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	.21/ 8	.22/ 8	.25/ 7	.33/ 7	.52/ 6	.81/ 5	.92/ 5	.69/ 6	.45/ 6	.30/ 7	.23/ 7	.20/ 8	.19/ 8
	9	.24/ 9	.25/ 9	.28/ 8	.34/ 8	.46/ 7	.64/ 6	.71/ 5	.51/ 6	.42/ 7	.32/ 8	.27/ 8	.24/ 9	.23/ 9
	11	.23/10	.24/10	.26/10	.30/ 9	.38/ 8	.50/ 6	.55/ 6	.46/ 8	.36/ 8	.30/ 9	.26/10	.24/10	.23/10
	13	.21/10	.22/10	.23/10	.26/10	.32/10	.39/ 9	.43/ 6	.31/ 9	.30/10	.22/10	.23/10	.22/10	.21/10
	15	.19/12	.19/11	.20/11	.22/10	.26/10	.32/10	.34/10	.30/10	.25/10	.22/10	.20/11	.19/11	.19/12
	17	.17/13	.17/13	.18/13	.19/13	.22/11	.26/10	.28/10	.25/10	.21/11	.19/12	.18/13	.17/13	.17/13
	19	.15/14	.15/14	.15/13	.17/13	.19/13	.22/13	.23/12	.21/13	.18/13	.16/13	.15/14	.15/14	.14/14
	21	.13/14	.13/14	.13/14	.14/14	.16/14	.19/14	.20/13	.18/14	.16/14	.14/14	.13/14	.13/14	.13/14
8	7	.40/ 7	.42/ 7	.48/ 7	.61/ 6	.79/ 6	.97/ 5	.92/ 5	.57/ 6	.31/ 8	.19/ 8	.13/ 9	.11/10	.10/10
	9	.42/ 8	.44/ 8	.48/ 7	.56/ 6	.67/ 6	.77/ 6	.71/ 5	.48/ 7	.31/ 9	.22/10	.17/10	.15/11	.14/11
	11	.38/10	.39/10	.42/ 9	.47/ 8	.54/ 6	.59/ 6	.54/ 6	.39/ 9	.27/10	.21/10	.17/11	.15/12	.15/12
	13	.33/10	.34/10	.36/10	.39/10	.43/ 6	.46/ 6	.43/ 6	.32/10	.24/10	.19/12	.16/12	.14/13	.14/13
	15	.28/11	.29/11	.30/10	.32/10	.35/10	.37/ 6	.34/10	.26/11	.20/12	.16/13	.14/13	.13/13	.13/13
	17	.24/12	.25/12	.25/12	.27/11	.29/10	.30/10	.28/10	.22/12	.17/13	.14/14	.13/14	.12/15	.12/15
	19	.21/13	.21/13	.22/13	.23/13	.24/12	.25/12	.23/12	.18/13	.15/14	.13/15	.11/15	.11/15	.10/16
	21	.18/14	.18/14	.19/14	.20/13	.21/13	.21/13	.20/13	.16/14	.13/15	.11/15	.10/17	.09/17	.09/17
10	7	.74/ 7	.77/ 7	.84/ 7	.95/ 7	1.07/ 6	1.13/ 6	.92/ 5	.47/ 7	.22/ 9	.12/10	.07/12	.05/13	.05/13
	9	.80/ 7	.81/ 7	.84/ 7	.89/ 7	.92/ 6	.90/ 6	.71/ 5	.40/ 8	.23/10	.14/12	.10/13	.08/14	.08/14
	11	.69/ 7	.69/ 7	.71/ 7	.72/ 7	.73/ 6	.69/ 6	.54/ 5	.33/ 9	.21/11	.14/13	.11/14	.09/15	.09/15
	13	.57/ 7	.57/ 7	.57/ 7	.58/ 7	.58/ 6	.54/ 6	.43/ 9	.27/10	.18/12	.13/13	.11/15	.09/16	.09/16
	15	.46/ 7	.47/ 7	.47/ 7	.47/ 7	.46/ 6	.43/ 6	.34/10	.23/11	.16/13	.12/14	.10/15	.09/17	.08/17
	17	.39/ 7	.39/ 7	.39/ 7	.39/ 7	.38/ 6	.35/ 6	.28/10	.19/13	.14/14	.11/15	.09/17	.08/18	.08/18
	19	.32/ 7	.32/ 7	.32/ 7	.32/ 7	.31/ 6	.29/ 6	.23/12	.16/13	.12/16	.09/18	.07/18	.07/18	.07/20
	21	.27/ 7	.27/ 7	.27/ 7	.27/ 7	.26/ 6	.24/ 6	.20/13	.14/15	.11/17	.09/18	.07/19	.07/20	.07/20
15	7	1.03/ 8	1.06/ 8	1.13/ 7	1.24/ 7	1.33/ 7	1.29/ 6	.92/ 5	.39/ 8	.15/10	.06/14	.03/17	.02/20	.02/20
	9	1.21/ 8	1.22/ 8	1.23/ 7	1.23/ 7	1.18/ 7	1.04/ 6	.71/ 5	.28/10	.17/11	.09/14	.05/17	.04/20	.04/20
	11	1.06/ 8	1.05/ 8	1.04/ 7	1.01/ 7	.94/ 7	.80/ 6	.54/ 5	.28/10	.16/13	.09/14	.07/17	.05/20	.05/20
	13	.86/ 8	.86/ 8	.84/ 7	.80/ 7	.73/ 7	.62/ 6	.43/ 9	.24/11	.14/14	.09/16	.07/17	.06/20	.05/20
	15	.70/ 8	.70/ 8	.69/ 8	.64/ 7	.58/ 7	.49/ 6	.34/10	.23/12	.13/15	.09/17	.07/17	.06/20	.05/20
	17	.58/ 8	.57/ 8	.55/ 8	.52/ 7	.47/ 7	.40/ 6	.28/10	.17/13	.11/16	.08/17	.06/17	.06/20	.05/20
	19	.48/ 8	.47/ 8	.46/ 8	.43/ 7	.39/ 7	.33/ 6	.23/13	.15/14	.10/17	.07/19	.06/20	.05/20	.05/20
	21	.40/ 8	.40/ 8	.38/ 8	.36/ 7	.33/ 7	.27/ 6	.20/13	.13/15	.09/18	.07/20	.06/22	.05/22	.05/20
20	7	1.20/ 8	1.22/ 8	1.32/ 8	1.47/ 7	1.57/ 7	1.48/ 6	.93/ 5	.31/ 8	.10/13	.03/19	.01/24	.01/29	.01/31
	9	1.60/ 8	1.59/ 8	1.58/ 8	1.56/ 7	1.45/ 7	1.20/ 6	.71/ 5	.28/10	.11/13	.05/19	.03/23	.02/26	.02/27
	11	1.45/ 8	1.43/ 8	1.38/ 8	1.31/ 7	1.16/ 7	.92/ 6	.54/ 5	.24/10	.11/13	.06/19	.04/23	.03/26	.02/27
	13	1.19/ 8	1.17/ 8	1.12/ 8	1.04/ 7	.91/ 7	.71/ 6	.43/ 9	.20/12	.11/13	.06/19	.04/23	.03/26	.02/27
	15	.91/ 8	.95/ 8	.90/ 8	.83/ 7	.72/ 7	.56/ 6	.34/10	.17/13	.10/13	.06/19	.04/23	.03/26	.03/27
	17	.79/ 8	.78/ 8	.74/ 8	.68/ 7	.58/ 7	.45/ 6	.28/11	.15/14	.09/17	.06/19	.04/23	.04/26	.03/27
	19	.66/ 8	.64/ 8	.61/ 8	.56/ 7	.48/ 7	.37/ 6	.23/13	.13/16	.08/18	.06/19	.04/23	.04/26	.03/27
	21	.55/ 8	.54/ 8	.51/ 8	.47/ 7	.40/ 7	.31/ 6	.20/14	.11/16	.07/20	.05/19	.04/23	.04/26	.03/27
25	7	1.26/ 8	1.32/ 8	1.45/ 8	1.62/ 8	1.79/ 7	1.67/ 6	.95/ 5	.25/ 9	.06/17	.02/25	.04/ 4	.04/ 4	.03/ 4
	9	1.91/ 9	1.94/ 8	1.96/ 8	1.88/ 8	1.74/ 7	1.38/ 6	.72/ 5	.23/10	.08/17	.03/24	.03/30	.02/37	.02/39
	11	1.81/ 9	1.81/ 8	1.77/ 8	1.61/ 8	1.40/ 7	1.05/ 6	.55/ 5	.20/11	.08/17	.04/24	.03/30	.02/33	.02/33
	13	1.51/ 9	1.51/ 9	1.45/ 8	1.29/ 8	1.10/ 7	.81/ 6	.43/ 9	.17/13	.08/17	.04/24	.03/30	.02/33	.02/33
	15	1.24/ 9	1.23/ 9	1.17/ 8	1.04/ 8	.87/ 7	.64/ 6	.34/10	.13/15	.08/17	.04/24	.03/30	.02/33	.02/33
	17	1.01/ 9	1.00/ 9	.95/ 8	.84/ 8	.70/ 7	.51/ 6	.28/11	.15/14	.07/17	.04/24	.03/30	.02/33	.02/33
	19	.84/ 9	.83/ 9	.79/ 8	.69/ 8	.57/ 7	.42/ 6	.23/13	.11/17	.07/17	.04/24	.03/30	.02/33	.02/33
	21	.70/ 9	.69/ 9	.66/ 8	.58/ 8	.48/ 7	.35/ 6	.20/14	.10/18	.06/17	.04/24	.03/30	.02/33	.02/33

SHORTCRESTED
RMS LON DISP IN FEET/ENCOUNTERED MODAL PERIOD, T_{OE} , IN SECONDS

52

ASB

53

ASR

SHORTCRESTED
RMS LON ACC IN G'S/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
(ACC. X 100)

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	15/7	14/7	14/7	13/7	13/7	13/7	13/7	13/7	13/7	13/7	13/7	13/7
9	17/8	17/8	16/8	15/8	14/8	13/8	12/8	12/8	13/8	14/8	14/8	15/8	15/8
11	16/10	16/10	15/10	14/10	13/9	11/9	11/9	11/9	11/9	12/9	13/9	14/9	14/9
13	14/10	13/10	12/10	11/10	10/10	09/10	09/10	09/10	10/10	11/10	12/10	12/10	12/10
15	13/12	12/12	11/12	10/12	09/11	08/11	08/11	08/11	08/11	09/11	10/11	11/11	11/11
17	11/13	10/13	09/13	08/13	07/13	07/13	07/13	07/13	07/13	08/13	09/13	09/13	09/13
19	10/14	09/14	08/14	07/14	06/14	06/14	06/14	06/14	06/14	07/14	08/14	08/14	08/14
21	09/16	08/16	07/16	06/16	05/16	05/16	05/16	05/16	06/16	06/16	07/16	07/16	07/16
8	7	15/7	14/7	14/7	13/7	12/7	12/8	12/8	12/9	12/9	13/9	13/9	14/9
9	17/8	17/8	16/8	15/8	14/8	12/8	11/8	11/10	12/10	13/10	15/10	16/10	16/10
11	16/10	15/10	14/10	13/10	12/10	11/10	10/10	10/11	11/11	11/11	12/11	13/11	13/11
13	15/10	14/10	13/10	12/10	11/10	09/10	09/11	09/11	10/12	11/12	12/12	13/12	13/12
15	13/12	12/12	11/12	10/12	09/12	08/12	07/12	08/13	09/13	10/13	11/13	12/13	12/13
17	11/13	10/13	09/13	08/13	07/13	06/13	06/13	07/14	07/14	08/14	09/14	10/14	11/14
19	10/14	09/14	08/14	07/14	06/14	05/14	05/14	06/15	06/15	07/15	08/15	09/15	09/15
21	09/16	08/16	07/16	06/16	05/16	05/16	05/16	06/16	06/16	07/16	08/16	08/16	08/16
10	7	15/7	14/7	13/7	13/7	13/8	12/10	12/13	13/13	13/13	13/13	14/13	14/13
9	17/8	17/8	16/8	15/8	14/8	13/8	12/12	13/13	13/13	14/13	15/13	16/13	16/13
11	16/10	15/10	14/10	13/10	12/10	11/10	10/13	11/13	12/13	13/13	14/13	15/13	16/13
13	15/10	14/10	13/10	12/10	11/10	10/12	10/13	10/13	11/13	12/13	13/13	14/13	14/13
15	13/12	12/12	11/12	10/12	09/12	08/13	08/13	09/14	10/14	11/14	12/15	13/15	13/15
17	11/13	10/13	09/13	08/13	07/14	07/14	07/14	08/15	08/15	09/15	10/15	11/15	11/15
19	10/14	09/14	08/14	07/14	06/14	06/14	06/15	06/16	07/16	08/16	09/16	10/16	10/16
21	09/16	08/16	07/16	06/16	05/16	05/16	05/16	06/17	06/17	07/17	08/17	09/17	09/17
15	7	14/8	13/8	13/7	13/7	12/14	12/14	12/14	12/14	12/14	12/14	12/17	12/17
9	16/10	16/10	15/10	14/10	13/10	13/14	13/14	12/14	13/17	14/17	15/17	15/17	15/17
11	15/10	14/10	13/10	12/10	11/10	10/14	11/14	11/17	12/17	13/17	14/20	15/20	15/20
13	13/12	12/12	11/12	10/12	09/12	09/14	09/17	10/17	11/17	12/20	13/20	14/20	14/20
15	11/13	10/13	09/13	08/13	07/14	08/17	08/17	08/17	09/20	10/20	11/20	12/20	12/20
17	10/14	09/14	08/14	07/14	06/14	07/17	07/17	07/17	08/20	09/20	10/20	11/20	11/20
19	09/16	08/16	07/16	06/16	05/16	06/14	06/17	06/17	07/20	08/20	09/20	10/20	10/20
21	08/16	07/16	06/16	05/16	04/16	05/17	05/17	06/20	06/20	07/20	08/20	08/20	08/20
20	7	13/8	13/8	13/8	12/13	12/13	11/13	10/13	10/13	09/13	08/13	08/13	07/13
9	16/9	16/9	15/8	14/8	13/8	12/13	11/13	11/13	10/19	10/19	10/19	10/19	10/19
11	15/10	14/10	13/10	12/10	11/10	10/13	10/19	10/19	10/19	10/23	11/23	11/23	11/23
13	13/12	12/12	11/12	10/12	09/12	08/19	08/19	09/23	09/23	10/23	10/23	10/26	10/26
15	11/13	10/13	09/13	08/13	07/19	07/19	07/19	08/23	08/23	09/23	09/26	09/26	09/26
17	10/14	09/14	08/14	07/14	06/14	06/19	06/23	06/23	07/23	07/26	08/26	08/26	08/26
19	09/16	08/16	07/16	06/16	05/16	05/19	05/23	05/23	06/23	06/26	07/26	07/26	07/26
21	08/16	07/16	06/16	05/16	04/16	05/17	05/17	06/23	06/23	07/26	07/26	07/26	07/26
25	7	13/7	12/7	12/9	12/17	11/17	10/17	10/17	09/17	08/17	08/17	07/17	07/17
9	16/9	16/9	15/9	14/9	13/17	12/17	11/17	10/17	09/17	08/17	08/17	07/17	07/17
11	15/10	14/10	13/10	12/10	11/17	10/17	09/17	09/17	09/17	08/17	08/17	08/17	08/17
13	14/10	13/10	12/10	11/10	10/17	09/17	08/17	08/17	08/17	08/17	08/17	08/17	08/17
15	13/13	12/12	11/12	10/12	09/17	08/17	07/17	07/17	07/17	08/33	08/33	08/33	08/33
17	11/13	10/13	09/13	08/13	07/17	07/17	06/17	06/17	06/33	07/33	07/33	07/33	07/33
19	10/14	09/14	08/14	07/14	06/17	06/17	06/17	06/17	06/33	07/33	07/33	07/33	07/33
21	09/16	08/16	07/17	06/17	05/17	05/17	05/17	05/33	05/33	06/33	06/33	07/33	07/33

ASR

SHORTCRESTED
RMS LAT DISP IN FEET/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	0	15	30	45	60	SHIP HEADING ANGLE IN DEGREES					120	135	150	165	180
						75	90	105	120	135					
0	7	.04/8	.05/8	.07/8	.08/8	.10/8	.11/8	.10/8	.10/8	.08/8	.06/8	.05/8	.04/8	.04/8	.04/8
	9	.07/10	.08/10	.10/10	.11/10	.13/10	.14/10	.14/10	.13/10	.12/10	.10/10	.08/10	.07/10	.07/10	.07/10
	11	.09/12	.10/12	.12/12	.14/12	.16/12	.17/12	.17/12	.16/12	.14/12	.12/12	.10/12	.09/12	.09/12	.09/12
	13	.11/13	.12/13	.14/13	.16/13	.18/13	.19/13	.19/13	.18/13	.16/13	.14/13	.12/13	.11/13	.11/13	.11/13
	15	.11/14	.12/14	.14/14	.16/14	.18/14	.19/14	.20/14	.19/14	.17/14	.14/14	.12/14	.11/14	.11/14	.11/14
	17	.12/16	.13/16	.14/16	.16/16	.18/16	.19/16	.20/16	.19/16	.17/16	.14/16	.12/16	.11/16	.11/16	.11/16
8	7	.04/8	.05/8	.07/8	.08/8	.10/8	.11/8	.10/8	.10/8	.08/8	.06/8	.05/8	.04/8	.04/8	.04/8
	9	.07/10	.08/10	.10/10	.11/10	.13/10	.14/10	.14/10	.13/10	.12/10	.10/10	.08/10	.07/10	.07/10	.07/10
	11	.09/12	.10/12	.12/12	.14/12	.16/12	.17/12	.17/12	.16/12	.14/12	.12/12	.10/12	.09/12	.09/12	.09/12
	13	.11/13	.12/13	.14/13	.16/13	.18/13	.19/13	.19/13	.18/13	.16/13	.14/13	.12/13	.11/13	.11/13	.11/13
	15	.11/14	.12/14	.14/14	.16/14	.18/14	.19/14	.20/14	.19/14	.17/14	.14/14	.12/14	.11/14	.11/14	.11/14
	17	.12/16	.13/16	.14/16	.16/16	.18/16	.19/16	.20/16	.19/16	.17/16	.14/16	.12/16	.11/16	.11/16	.11/16
10	7	.04/8	.05/8	.07/8	.08/8	.10/8	.11/8	.10/8	.10/8	.08/8	.06/8	.05/8	.04/8	.04/8	.04/8
	9	.07/10	.08/10	.10/10	.11/10	.13/10	.14/10	.14/10	.13/10	.12/10	.10/10	.08/10	.07/10	.07/10	.07/10
	11	.09/12	.10/12	.12/12	.14/12	.16/12	.17/12	.17/12	.16/12	.14/12	.12/12	.10/12	.09/12	.09/12	.09/12
	13	.11/13	.12/13	.14/13	.16/13	.18/13	.19/13	.19/13	.18/13	.16/13	.14/13	.12/13	.11/13	.11/13	.11/13
	15	.11/14	.12/14	.14/14	.16/14	.18/14	.19/14	.20/14	.19/14	.17/14	.14/14	.12/14	.11/14	.11/14	.11/14
	17	.12/16	.13/16	.14/16	.16/16	.18/16	.19/16	.20/16	.19/16	.17/16	.14/16	.12/16	.11/16	.11/16	.11/16
15	7	.04/8	.05/8	.07/8	.08/8	.10/8	.11/8	.10/8	.10/8	.08/8	.06/8	.05/8	.04/8	.04/8	.04/8
	9	.07/10	.08/10	.10/10	.11/10	.13/10	.14/10	.14/10	.13/10	.12/10	.10/10	.08/10	.07/10	.07/10	.07/10
	11	.09/12	.10/12	.12/12	.14/12	.16/12	.17/12	.17/12	.16/12	.14/12	.12/12	.10/12	.09/12	.09/12	.09/12
	13	.11/13	.12/13	.14/13	.16/13	.18/13	.19/13	.19/13	.18/13	.16/13	.14/13	.12/13	.11/13	.11/13	.11/13
	15	.11/14	.12/14	.14/14	.16/14	.18/14	.19/14	.20/14	.19/14	.17/14	.14/14	.12/14	.11/14	.11/14	.11/14
	17	.12/16	.13/16	.14/16	.16/16	.18/16	.19/16	.20/16	.19/16	.17/16	.14/16	.12/16	.11/16	.11/16	.11/16
20	7	.04/8	.05/8	.07/8	.08/8	.10/8	.11/8	.10/8	.10/8	.08/8	.06/8	.05/8	.04/8	.04/8	.04/8
	9	.07/10	.08/10	.10/10	.11/10	.13/10	.14/10	.14/10	.13/10	.12/10	.10/10	.08/10	.07/10	.07/10	.07/10
	11	.09/12	.10/12	.12/12	.14/12	.16/12	.17/12	.17/12	.16/12	.14/12	.12/12	.10/12	.09/12	.09/12	.09/12
	13	.11/13	.12/13	.14/13	.16/13	.18/13	.19/13	.19/13	.18/13	.16/13	.14/13	.12/13	.11/13	.11/13	.11/13
	15	.11/14	.12/14	.14/14	.16/14	.18/14	.19/14	.20/14	.19/14	.17/14	.14/14	.12/14	.11/14	.11/14	.11/14
	17	.12/16	.13/16	.14/16	.16/16	.18/16	.19/16	.20/16	.19/16	.17/16	.14/16	.12/16	.11/16	.11/16	.11/16
25	7	.04/8	.05/8	.07/8	.08/8	.10/8	.11/8	.10/8	.10/8	.08/8	.06/8	.05/8	.04/8	.04/8	.04/8
	9	.07/10	.08/10	.10/10	.11/10	.13/10	.14/10	.14/10	.13/10	.12/10	.10/10	.08/10	.07/10	.07/10	.07/10
	11	.09/12	.10/12	.12/12	.14/12	.16/12	.17/12	.17/12	.16/12	.14/12	.12/12	.10/12	.09/12	.09/12	.09/12
	13	.11/13	.12/13	.14/13	.16/13	.18/13	.19/13	.19/13	.18/13	.16/13	.14/13	.12/13	.11/13	.11/13	.11/13
	15	.11/14	.12/14	.14/14	.16/14	.18/14	.19/14	.20/14	.19/14	.17/14	.14/14	.12/14	.11/14	.11/14	.11/14
	17	.12/16	.13/16	.14/16	.16/16	.18/16	.19/16	.20/16	.19/16	.17/16	.14/16	.12/16	.11/16	.11/16	.11/16

ASR

SHORTCRESTED
RMS LAT VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
DE

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
6	7	7	7	7	7	7	7	7	7	7	7	7	7
9	9	9	9	9	9	9	9	9	9	9	9	9	9
11	11	11	11	11	11	11	11	11	11	11	11	11	11
13	13	13	13	13	13	13	13	13	13	13	13	13	13
15	15	15	15	15	15	15	15	15	15	15	15	15	15
17	17	17	17	17	17	17	17	17	17	17	17	17	17
19	19	19	19	19	19	19	19	19	19	19	19	19	19
21	21	21	21	21	21	21	21	21	21	21	21	21	21
8	8	8	8	8	8	8	8	8	8	8	8	8	8
10	10	10	10	10	10	10	10	10	10	10	10	10	10
12	12	12	12	12	12	12	12	12	12	12	12	12	12
14	14	14	14	14	14	14	14	14	14	14	14	14	14
16	16	16	16	16	16	16	16	16	16	16	16	16	16
18	18	18	18	18	18	18	18	18	18	18	18	18	18
20	20	20	20	20	20	20	20	20	20	20	20	20	20
22	22	22	22	22	22	22	22	22	22	22	22	22	22
24	24	24	24	24	24	24	24	24	24	24	24	24	24
26	26	26	26	26	26	26	26	26	26	26	26	26	26
28	28	28	28	28	28	28	28	28	28	28	28	28	28
30	30	30	30	30	30	30	30	30	30	30	30	30	30
32	32	32	32	32	32	32	32	32	32	32	32	32	32
34	34	34	34	34	34	34	34	34	34	34	34	34	34
36	36	36	36	36	36	36	36	36	36	36	36	36	36
38	38	38	38	38	38	38	38	38	38	38	38	38	38
40	40	40	40	40	40	40	40	40	40	40	40	40	40
42	42	42	42	42	42	42	42	42	42	42	42	42	42
44	44	44	44	44	44	44	44	44	44	44	44	44	44
46	46	46	46	46	46	46	46	46	46	46	46	46	46
48	48	48	48	48	48	48	48	48	48	48	48	48	48
50	50	50	50	50	50	50	50	50	50	50	50	50	50
52	52	52	52	52	52	52	52	52	52	52	52	52	52
54	54	54	54	54	54	54	54	54	54	54	54	54	54
56	56	56	56	56	56	56	56	56	56	56	56	56	56
58	58	58	58	58	58	58	58	58	58	58	58	58	58
60	60	60	60	60	60	60	60	60	60	60	60	60	60
62	62	62	62	62	62	62	62	62	62	62	62	62	62
64	64	64	64	64	64	64	64	64	64	64	64	64	64
66	66	66	66	66	66	66	66	66	66	66	66	66	66
68	68	68	68	68	68	68	68	68	68	68	68	68	68
70	70	70	70	70	70	70	70	70	70	70	70	70	70
72	72	72	72	72	72	72	72	72	72	72	72	72	72
74	74	74	74	74	74	74	74	74	74	74	74	74	74
76	76	76	76	76	76	76	76	76	76	76	76	76	76
78	78	78	78	78	78	78	78	78	78	78	78	78	78
80	80	80	80	80	80	80	80	80	80	80	80	80	80
82	82	82	82	82	82	82	82	82	82	82	82	82	82
84	84	84	84	84	84	84	84	84	84	84	84	84	84
86	86	86	86	86	86	86	86	86	86	86	86	86	86
88	88	88	88	88	88	88	88	88	88	88	88	88	88
90	90	90	90	90	90	90	90	90	90	90	90	90	90
92	92	92	92	92	92	92	92	92	92	92	92	92	92
94	94	94	94	94	94	94	94	94	94	94	94	94	94
96	96	96	96	96	96	96	96	96	96	96	96	96	96
98	98	98	98	98	98	98	98	98	98	98	98	98	98
100	100	100	100	100	100	100	100	100	100	100	100	100	100

ASR
SHORTCRESTED
RMS LAT ACC IN G'S/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
OE
(ACC. X 100)

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	13/ 7	18/ 7	23/ 7	28/ 7	30/ 7	31/ 7	30/ 7	27/ 7	23/ 7	18/ 7	12/ 7	10/ 7
9	9	13/ 8	17/ 8	22/ 8	26/ 8	28/ 8	29/ 8	28/ 8	25/ 8	22/ 8	17/ 8	13/ 8	11/ 8
11	11	11/11	16/ 9	20/ 9	23/ 9	25/ 9	25/ 9	24/ 9	23/10	20/10	16/10	13/10	11/10
13	13	10/12	14/11	17/11	20/11	21/11	22/11	21/11	20/11	17/11	14/11	12/11	11/11
15	15	09/12	12/12	15/12	17/12	18/12	19/12	18/12	17/12	15/12	13/12	10/12	09/12
17	17	08/13	11/13	13/13	15/13	16/13	16/13	16/13	15/13	13/13	11/13	09/13	08/13
19	19	07/14	08/13	11/13	13/13	14/13	14/13	14/13	13/13	11/13	09/13	08/13	07/13
21	21	06/14	07/14	10/14	11/14	12/14	12/14	12/14	11/14	10/14	08/14	07/14	06/14
8	7	12/ 7	14/ 7	19/ 7	24/ 7	28/ 7	31/ 7	30/ 7	27/ 7	22/ 7	17/ 7	11/ 8	09/ 8
9	9	13/ 8	15/ 8	19/ 8	23/ 8	26/ 8	28/ 8	28/ 8	25/ 8	21/ 9	16/10	12/11	10/11
11	11	12/10	14/10	17/10	21/10	23/10	25/11	24/11	22/11	19/11	15/11	12/11	10/11
13	13	11/13	12/13	15/13	18/13	20/13	22/13	21/13	19/13	17/13	14/13	11/13	10/13
15	15	10/13	11/13	13/13	16/13	18/13	19/13	18/13	17/13	14/12	12/12	10/12	09/12
17	17	09/13	10/13	12/13	15/13	16/13	16/13	16/13	15/13	12/13	10/13	08/13	07/13
19	19	08/13	08/13	10/13	12/13	13/13	14/13	14/13	13/13	11/14	09/14	07/14	06/14
21	21	07/14	07/14	09/14	10/14	11/14	12/14	12/14	11/14	09/14	08/14	06/15	05/15
10	7	13/ 7	15/ 7	21/ 7	25/ 7	29/ 7	31/ 7	30/ 7	26/ 7	22/ 7	16/ 7	11/11	08/11
9	9	14/ 8	16/ 8	20/ 8	24/ 8	27/ 8	29/ 8	28/ 9	25/ 9	21/11	16/11	12/12	10/12
11	11	13/10	15/10	18/10	22/10	24/10	26/10	24/11	22/11	18/11	14/12	11/12	10/13
13	13	12/11	13/11	16/11	19/11	21/11	22/11	21/12	19/12	16/12	13/13	10/13	09/13
15	15	11/13	12/13	14/13	16/13	18/13	19/13	18/13	16/13	14/13	11/13	09/14	08/14
17	17	10/14	10/14	12/14	14/13	16/13	16/13	16/13	14/13	12/14	10/14	08/15	07/15
19	19	08/14	09/14	11/14	12/14	13/14	14/14	13/14	12/14	10/15	08/15	07/16	06/16
21	21	07/14	08/14	09/14	11/14	12/14	12/14	12/14	11/15	09/15	07/15	06/16	05/16
15	7	14/ 7	17/ 7	22/ 7	27/ 7	30/ 7	32/ 7	30/ 7	26/ 7	21/ 7	15/10	10/14	07/14
9	9	15/ 8	17/ 8	21/ 8	25/ 8	28/ 8	30/ 8	28/ 8	25/10	20/11	15/14	11/14	09/14
11	11	15/10	16/10	19/10	22/10	25/10	26/10	24/11	22/11	18/11	14/14	10/14	09/14
13	13	13/11	14/11	17/11	20/11	22/11	23/11	21/12	19/12	16/14	12/14	09/17	08/17
15	15	12/13	13/13	15/13	17/13	19/13	19/13	18/13	16/14	13/14	11/14	08/17	07/17
17	17	10/14	11/14	13/14	15/14	16/13	17/13	16/14	14/14	12/14	09/17	07/17	06/17
19	19	09/14	10/14	11/14	13/14	14/14	14/14	13/14	12/14	10/17	08/17	06/17	05/17
21	21	08/16	08/16	10/14	11/14	12/14	13/14	12/14	10/14	09/17	07/17	06/20	05/20
20	7	15/ 7	18/ 7	23/ 7	28/ 7	31/ 7	33/ 7	31/13	27/13	21/13	15/13	10/13	07/13
9	9	16/ 8	18/ 8	22/ 8	26/ 8	29/ 8	31/ 8	28/13	25/13	20/13	15/13	10/13	08/13
11	11	16/10	17/10	20/10	23/10	26/10	27/10	25/13	22/13	18/13	13/13	10/19	08/19
13	13	14/11	15/11	18/11	20/11	22/11	23/11	21/13	19/13	15/13	12/19	09/19	07/19
15	15	12/13	13/13	15/13	17/13	19/13	20/13	18/13	16/13	13/19	10/19	08/19	07/19
17	17	11/14	11/14	13/14	15/13	16/13	17/13	16/13	14/13	11/19	09/19	07/23	06/23
19	19	09/16	10/16	11/14	13/14	14/14	15/13	13/13	12/19	10/19	08/19	06/23	05/23
21	21	08/16	09/16	10/16	11/16	12/15	13/14	12/13	10/19	09/19	07/23	05/23	04/23
25	7	16/ 7	18/ 7	24/ 7	29/ 7	32/ 7	34/17	31/17	27/17	21/17	15/17	09/17	06/17
9	9	17/ 8	19/ 8	23/ 8	27/ 9	30/ 9	31/17	29/17	25/17	20/17	14/17	09/17	07/17
11	11	16/10	18/10	21/10	24/10	26/10	27/17	25/17	21/17	17/17	13/17	09/17	07/17
13	13	15/10	16/10	18/10	21/11	23/11	24/17	21/17	18/17	15/17	11/17	08/17	06/17
15	15	13/13	14/13	16/13	18/13	19/13	20/17	18/17	16/17	13/17	10/17	07/17	06/17
17	17	11/14	12/14	14/14	15/13	16/13	17/17	16/17	14/17	11/17	08/17	06/17	05/17
19	19	10/16	10/14	12/14	13/14	14/17	15/17	13/17	12/17	10/17	07/17	06/17	05/17
21	21	08/16	09/16	10/16	11/17	12/17	13/17	12/17	10/17	08/17	07/17	06/17	05/17

ASR

SHORTCRESTED
RMS VER DISP IN FEET/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
OE

V TO	SHIP HEADING ANGLE IN DEGREES										165	180		
	0	15	30	45	60	75	90	105	120	135			150	
0	7	.11/8	.12/8	.14/8	.16/7	.18/7	.19/7	.19/7	.19/7	.18/7	.16/8	.14/8	.12/8	.11/8
	9	.17/10	.17/10	.18/10	.20/10	.21/9	.22/9	.22/9	.22/9	.21/9	.20/10	.18/10	.17/10	.17/10
	11	.20/11	.20/11	.21/11	.22/11	.23/11	.24/11	.24/11	.24/11	.23/11	.22/11	.21/11	.20/11	.20/11
	13	.22/13	.22/13	.23/13	.24/13	.24/13	.24/13	.24/13	.24/13	.24/13	.23/13	.23/13	.22/13	.22/13
	15	.23/16	.23/16	.24/16	.24/16	.24/16	.25/16	.25/16	.25/16	.24/16	.24/16	.23/16	.23/16	.23/16
	17	.24/18	.24/18	.24/18	.24/18	.24/18	.25/18	.25/18	.25/18	.24/18	.24/18	.24/18	.24/18	.24/18
5	19	.24/18	.24/18	.24/18	.24/18	.25/18	.25/18	.25/18	.25/18	.25/18	.24/18	.24/18	.24/18	.24/18
	21	.24/21	.24/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.24/21	.24/21	.24/21
	7	.14/7	.15/7	.17/7	.18/7	.20/7	.20/7	.20/7	.20/7	.17/8	.15/9	.13/10	.11/10	.10/10
	9	.19/10	.19/10	.20/10	.21/10	.23/10	.23/10	.23/10	.23/10	.21/10	.19/10	.17/11	.16/11	.16/11
	11	.22/11	.22/11	.22/11	.23/11	.24/11	.24/11	.24/11	.24/11	.23/12	.21/13	.20/13	.20/13	.19/13
	13	.23/13	.23/13	.24/13	.24/13	.24/13	.25/13	.25/13	.25/13	.23/14	.23/14	.22/14	.21/14	.21/14
10	15	.24/16	.24/16	.24/16	.25/16	.25/16	.25/16	.25/16	.24/16	.24/16	.23/16	.23/16	.23/17	.22/17
	17	.24/18	.24/18	.24/18	.25/18	.25/18	.25/18	.25/18	.25/18	.24/18	.24/18	.24/18	.23/18	.23/19
	19	.24/18	.25/18	.25/18	.25/18	.25/18	.25/18	.25/19	.25/19	.24/20	.24/20	.24/20	.24/20	.24/20
	21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/22	.24/22	.24/22	.24/22	.24/22
	7	.19/7	.19/7	.20/7	.21/7	.22/7	.22/7	.21/7	.20/7	.18/8	.15/13	.12/13	.11/13	.10/13
	9	.23/8	.23/8	.24/9	.24/9	.25/9	.24/10	.24/10	.24/10	.21/12	.19/14	.17/14	.16/14	.15/14
15	11	.24/11	.25/11	.25/11	.25/11	.25/11	.25/12	.25/12	.24/13	.22/14	.21/14	.20/15	.19/15	.18/15
	13	.25/13	.25/13	.25/13	.25/13	.25/13	.25/14	.25/14	.24/14	.23/15	.22/16	.21/16	.21/17	.21/17
	15	.25/16	.25/16	.25/16	.26/16	.26/16	.25/16	.25/16	.24/16	.24/17	.23/17	.23/18	.22/18	.22/18
	17	.25/18	.25/18	.25/18	.25/18	.25/18	.25/18	.25/18	.25/18	.24/18	.24/20	.23/20	.23/20	.23/20
	19	.25/18	.25/18	.25/18	.25/18	.25/18	.25/19	.25/20	.25/21	.24/21	.24/21	.24/22	.23/22	.23/22
	21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/21	.25/22	.25/22	.25/22	.24/23	.24/24	.24/24	.24/24
20	7	.22/8	.22/8	.23/8	.23/7	.24/7	.23/7	.22/7	.20/7	.18/14	.15/14	.12/14	.10/14	.09/17
	9	.28/8	.28/8	.28/8	.28/8	.27/8	.26/9	.25/10	.23/10	.21/17	.18/17	.16/17	.15/17	.14/17
	11	.28/11	.28/11	.28/11	.28/11	.27/11	.26/12	.25/12	.24/14	.22/17	.20/20	.18/20	.17/20	.16/20
	13	.28/13	.28/13	.27/13	.27/13	.27/14	.26/14	.25/14	.24/17	.23/20	.22/20	.21/20	.20/20	.20/20
	15	.27/16	.27/16	.27/16	.27/16	.26/16	.26/16	.25/16	.25/17	.24/20	.23/20	.22/20	.22/20	.22/20
	17	.27/18	.27/18	.26/18	.26/18	.26/18	.26/18	.25/18	.25/20	.24/20	.23/20	.23/22	.22/22	.22/22
25	19	.26/18	.26/18	.26/18	.26/18	.26/19	.25/20	.25/21	.25/21	.24/22	.24/22	.23/23	.23/24	.23/24
	21	.26/21	.26/21	.26/21	.26/21	.26/21	.25/21	.25/21	.25/22	.24/24	.24/25	.24/25	.24/25	.24/25
	7	.23/8	.23/8	.24/8	.25/8	.25/8	.24/7	.23/13	.21/13	.18/13	.15/13	.12/13	.10/13	.09/13
	9	.31/8	.31/8	.31/8	.30/8	.29/8	.28/8	.26/13	.23/19	.21/19	.18/19	.16/19	.15/23	.14/23
	11	.32/8	.32/8	.31/8	.30/8	.29/11	.28/11	.26/13	.24/19	.22/23	.20/23	.19/23	.18/23	.18/23
	13	.30/13	.30/13	.30/13	.29/13	.28/13	.27/13	.26/13	.24/23	.23/23	.22/23	.21/23	.20/26	.20/26
35	15	.29/16	.29/16	.29/16	.28/16	.28/16	.27/16	.26/19	.25/23	.24/23	.23/26	.22/26	.21/26	.21/26
	17	.28/18	.28/18	.28/18	.27/18	.27/18	.26/19	.25/19	.25/23	.24/23	.23/26	.22/26	.22/26	.22/26
	19	.27/18	.27/18	.27/18	.27/18	.26/20	.26/21	.25/21	.25/23	.24/26	.24/27	.23/27	.23/27	.23/27
	21	.27/21	.27/21	.27/21	.26/21	.26/21	.26/21	.25/23	.25/23	.24/27	.24/27	.24/27	.24/27	.24/27
	7	.23/8	.24/8	.25/8	.25/8	.26/8	.25/17	.24/17	.21/17	.18/17	.15/17	.12/17	.10/17	.09/17
	9	.34/9	.34/8	.34/8	.33/8	.32/8	.30/17	.27/17	.24/17	.21/17	.18/17	.16/17	.14/17	.14/17
45	11	.35/9	.35/9	.34/9	.33/9	.33/9	.29/17	.27/17	.25/17	.22/17	.20/17	.19/17	.18/33	.17/33
	13	.33/9	.33/9	.32/9	.31/13	.30/13	.28/17	.26/17	.25/17	.23/17	.22/33	.21/33	.20/33	.20/33
	15	.31/16	.31/16	.31/16	.30/16	.30/16	.27/17	.26/17	.25/17	.24/33	.23/33	.22/33	.21/33	.21/33
	17	.30/18	.30/18	.29/18	.28/18	.28/18	.27/17	.26/17	.25/24	.24/33	.23/33	.22/33	.21/33	.21/33
	19	.28/18	.28/18	.28/18	.28/18	.27/20	.26/21	.25/24	.25/24	.24/33	.24/33	.23/33	.22/33	.22/33
	21	.28/21	.28/21	.27/21	.27/21	.27/21	.26/21	.25/24	.25/24	.24/33	.24/33	.24/33	.23/33	.23/33

BSA

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ASR

SHORTCRESTED
RMS VER ACC IN G'S/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
(ACC. X 100)

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	30/ 7	34/ 7	42/ 5	51/ 5	58/ 5	62/ 6	63/ 6	61/ 6	55/ 6	47/ 6	38/ 7	27/ 7
9	30/ 8	33/ 8	38/ 8	43/ 8	48/ 8	51/ 7	52/ 7	51/ 7	47/ 7	42/ 8	36/ 8	31/ 8	29/ 8
11	28/10	29/10	32/ 9	36/ 9	39/ 9	41/ 8	42/ 8	41/ 8	39/ 9	35/ 9	31/ 9	28/ 9	27/10
13	24/10	25/10	27/10	30/10	32/10	34/10	34/10	33/10	32/10	29/10	27/10	25/10	24/10
15	21/11	22/11	23/11	25/10	27/10	28/10	28/10	28/10	26/10	25/10	23/11	21/11	21/11
17	18/13	19/13	20/13	21/12	22/12	23/11	23/11	23/11	22/12	21/12	19/13	18/13	18/13
19	16/13	16/13	17/13	18/13	19/13	20/13	20/13	19/13	19/13	18/13	17/13	16/13	16/13
21	14/14	14/14	15/14	15/14	16/14	17/14	17/14	17/14	16/14	15/14	14/14	14/14	14/14
8	7	52/ 7	55/ 7	61/ 6	66/ 6	70/ 5	71/ 6	69/ 6	63/ 6	54/ 6	43/ 6	31/ 6	18/ 9
9	50/ 7	52/ 7	55/ 7	58/ 7	60/ 6	60/ 6	57/ 6	52/ 6	45/ 6	36/ 9	28/10	22/ 9	19/10
11	43/ 9	44/ 9	46/ 9	48/ 8	48/ 8	48/ 8	45/ 9	41/ 9	36/10	30/10	24/11	20/11	19/11
13	36/10	37/10	38/10	39/10	39/10	38/10	36/10	33/10	29/10	25/11	21/12	18/12	17/12
15	30/10	31/10	31/10	32/10	32/10	31/10	30/10	27/11	24/12	21/13	18/13	16/13	15/13
17	26/12	26/12	26/12	27/11	27/11	26/11	25/12	23/12	20/13	18/13	15/14	14/14	13/14
19	22/13	22/13	22/13	23/13	22/13	22/13	21/13	19/13	17/14	15/14	13/15	12/15	12/16
21	19/14	19/14	19/14	19/14	19/14	19/14	18/14	16/14	15/15	13/16	12/16	11/17	10/17
10	7	85/ 7	86/ 7	89/ 7	91/ 7	91/ 7	87/ 6	80/ 6	69/ 6	56/ 6	42/ 6	28/ 6	12/13
9	84/ 7	84/ 7	87/ 7	88/ 7	80/ 7	75/ 7	67/ 7	57/ 6	46/ 6	35/ 6	24/ 9	16/13	13/13
11	70/ 7	70/ 7	70/ 7	68/ 7	65/ 7	60/ 7	53/ 7	45/ 7	37/ 6	28/10	20/14	15/14	13/14
13	57/ 7	57/ 7	56/ 7	55/ 7	52/ 7	48/ 7	42/ 7	36/ 7	29/10	23/13	17/14	13/15	13/15
15	47/ 7	46/ 7	46/ 7	44/ 7	42/ 7	39/ 7	34/ 7	29/11	24/13	19/14	15/15	12/16	11/16
17	38/ 7	38/ 7	38/ 7	36/ 7	34/ 7	32/ 7	28/12	24/13	20/14	16/15	13/16	11/17	10/17
19	32/ 7	32/ 7	31/ 7	30/ 7	29/ 7	26/ 7	24/13	20/14	17/15	14/16	10/18	09/18	08/19
21	27/ 7	27/ 7	27/ 7	26/ 7	24/ 7	22/13	20/14	17/16	14/16	12/18	10/18	08/19	08/19
15	7	113/ 7	114/ 7	115/ 7	114/ 7	111/ 7	103/ 7	92/ 7	77/ 6	60/ 6	43/ 6	27/ 6	08/14
9	121/ 8	120/ 8	118/ 8	113/ 7	105/ 7	94/ 7	81/ 7	65/ 7	52/ 7	40/ 7	28/ 6	18/11	09/14
11	103/ 8	102/ 8	99/ 8	93/ 8	86/ 7	76/ 7	65/ 7	52/ 7	41/ 7	31/ 7	22/11	15/17	09/17
13	83/ 8	82/ 8	79/ 8	75/ 8	68/ 8	60/ 7	51/ 7	41/ 7	33/ 7	25/ 7	18/14	10/20	08/20
15	67/ 8	66/ 8	64/ 8	60/ 8	55/ 8	48/ 7	41/ 7	33/ 7	27/ 7	21/14	15/20	09/20	08/20
17	55/ 8	54/ 8	52/ 8	49/ 8	45/ 8	39/ 7	33/ 7	28/ 7	23/ 7	18/14	13/20	08/20	07/20
19	45/ 8	45/ 8	43/ 8	41/ 8	37/ 8	33/ 7	28/ 7	23/ 7	19/ 7	15/17	11/20	07/20	06/20
21	38/ 8	38/ 8	36/ 8	34/ 8	31/ 8	27/ 7	23/ 7	19/ 7	15/17	11/20	08/20	07/20	06/20
20	7	132/ 8	133/ 8	133/ 8	132/ 8	127/ 7	118/ 7	104/ 7	86/ 7	66/ 7	45/ 6	26/ 6	06/13
9	157/ 8	155/ 8	150/ 8	142/ 8	130/ 8	114/ 8	96/ 7	76/ 7	56/ 7	37/ 6	21/ 6	10/13	06/13
11	137/ 8	135/ 8	130/ 8	121/ 8	109/ 8	94/ 8	78/ 8	61/ 7	44/ 7	29/ 7	17/13	09/19	06/19
13	111/ 8	110/ 8	105/ 8	97/ 8	87/ 8	75/ 8	61/ 8	48/ 7	35/ 7	23/ 7	14/13	08/23	06/23
15	90/ 8	89/ 8	85/ 8	78/ 8	70/ 8	60/ 8	49/ 8	38/ 7	28/ 7	19/13	12/23	07/23	06/23
17	73/ 8	72/ 8	69/ 8	64/ 8	57/ 8	49/ 8	40/ 8	31/ 7	23/ 7	15/13	10/23	06/26	05/26
19	60/ 8	60/ 8	57/ 8	52/ 8	47/ 8	40/ 8	33/ 8	26/ 7	19/ 7	13/19	09/26	06/26	05/26
21	51/ 8	50/ 8	48/ 8	44/ 8	39/ 8	34/ 8	28/ 8	22/ 7	16/ 7	11/23	07/26	05/26	05/26
25	7	145/ 8	146/ 8	147/ 8	146/ 8	141/ 8	131/ 7	115/ 7	95/ 7	72/ 6	49/ 6	27/ 6	05/17
9	190/ 8	188/ 8	182/ 8	171/ 8	155/ 8	135/ 8	112/ 8	88/ 7	63/ 7	40/ 6	22/ 6	09/17	05/17
11	172/ 8	170/ 8	162/ 8	150/ 8	138/ 8	114/ 8	93/ 8	71/ 8	50/ 7	32/ 7	17/17	08/17	05/17
13	142/ 8	139/ 8	133/ 8	122/ 8	108/ 8	91/ 8	74/ 8	56/ 8	39/ 7	25/ 7	14/17	07/17	04/17
15	115/ 8	113/ 8	107/ 8	98/ 8	87/ 8	73/ 8	59/ 8	44/ 8	31/ 7	20/ 7	11/17	06/17	04/33
17	93/ 8	92/ 8	87/ 8	80/ 8	70/ 8	58/ 8	48/ 8	36/ 8	25/ 7	16/17	09/17	05/33	04/33
19	77/ 8	76/ 8	72/ 8	66/ 8	58/ 8	49/ 8	39/ 8	30/ 8	21/ 7	14/17	08/33	05/33	04/33
21	64/ 8	63/ 8	60/ 8	55/ 8	48/ 8	41/ 8	33/ 8	25/ 8	18/ 7	12/17	07/33	04/33	04/33

SHORTCRESTED
RMS ROLL IN DEGREES/ENCOUNTERED MODAL PERIOD, T_{OE}, IN SECONDS

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ASR
SHORTCRESTED
RMS ROLL VEL IN DPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
Q	7	.13/ 8	.14/ 8	.15/ 8	.16/ 8	.17/ 8	.17/ 8	.17/ 8	.16/ 8	.15/ 8	.13/ 8	.12/ 8	.12/ 8
	9	.21/10	.23/10	.25/10	.27/10	.28/10	.28/10	.28/10	.27/10	.25/10	.23/10	.21/10	.21/10
	11	.24/10	.26/10	.28/10	.30/10	.31/10	.31/10	.31/10	.30/10	.28/10	.26/10	.24/10	.23/10
	13	.21/10	.24/10	.25/10	.27/10	.28/10	.29/10	.28/10	.27/10	.25/10	.23/10	.22/10	.21/10
	15	.18/10	.20/10	.21/10	.23/10	.24/10	.24/10	.24/10	.23/10	.21/10	.20/10	.18/10	.18/10
	17	.15/10	.16/10	.18/10	.19/10	.20/10	.20/10	.20/10	.19/10	.18/10	.16/10	.15/10	.15/10
	19	.12/10	.13/10	.14/10	.15/10	.16/10	.17/10	.17/10	.16/10	.15/10	.14/10	.13/10	.12/10
	21	.10/10	.11/10	.12/10	.13/10	.14/10	.14/10	.14/10	.13/10	.12/10	.11/10	.11/10	.10/10
S	7	.09/ 7	.10/ 7	.11/ 7	.13/ 8	.15/10	.18/10	.21/10	.24/10	.25/10	.27/10	.27/10	.27/10
	9	.15/11	.16/11	.18/11	.21/10	.25/10	.29/10	.33/10	.35/10	.37/10	.37/10	.36/10	.36/10
	11	.20/11	.21/11	.23/11	.26/11	.30/10	.33/10	.35/10	.36/10	.37/10	.35/10	.33/10	.33/10
	13	.20/11	.21/11	.23/11	.26/11	.30/10	.33/10	.35/10	.36/10	.37/10	.35/10	.33/10	.33/10
	15	.18/12	.18/11	.22/11	.22/11	.26/11	.27/10	.27/10	.26/10	.25/10	.23/10	.28/10	.27/10
	17	.15/12	.16/12	.17/11	.19/11	.20/11	.21/11	.22/10	.21/10	.20/10	.19/10	.18/10	.17/10
	19	.13/12	.13/12	.14/11	.16/11	.17/11	.18/11	.18/10	.17/10	.17/10	.15/10	.15/10	.14/10
	21	.11/12	.11/12	.12/11	.13/11	.14/11	.15/11	.15/10	.15/10	.14/10	.13/10	.12/10	.12/10
10	7	.07/ 7	.08/ 7	.09/ 7	.12/10	.17/10	.24/10	.30/10	.35/10	.38/10	.39/10	.38/10	.38/10
	9	.10/11	.10/11	.12/10	.15/10	.21/10	.27/10	.32/10	.36/10	.37/10	.37/10	.35/10	.34/10
	11	.13/13	.13/13	.15/12	.18/11	.22/10	.26/10	.29/10	.31/10	.32/10	.31/10	.29/10	.27/10
	13	.13/13	.14/13	.16/13	.18/12	.21/11	.23/10	.25/10	.26/10	.26/10	.23/10	.21/10	.21/10
	15	.12/13	.13/13	.14/13	.16/13	.18/11	.20/10	.21/10	.21/10	.20/10	.18/10	.17/10	.16/10
	17	.11/13	.11/13	.12/13	.14/13	.15/11	.16/11	.17/10	.18/10	.16/10	.14/10	.13/10	.13/10
	19	.09/13	.09/13	.10/13	.11/13	.13/11	.14/11	.14/10	.14/10	.13/10	.12/10	.11/10	.10/10
	21	.08/13	.08/13	.09/13	.10/13	.11/13	.12/11	.12/10	.12/10	.11/10	.10/10	.09/10	.09/10
15	7	.06/ 7	.06/ 7	.08/ 8	.12/10	.18/10	.23/10	.27/10	.30/10	.29/10	.26/10	.23/10	.21/10
	9	.07/10	.08/10	.09/10	.13/10	.18/10	.22/10	.25/10	.27/10	.25/10	.22/10	.19/10	.18/10
	11	.09/13	.09/13	.11/11	.14/10	.17/10	.20/10	.22/10	.23/10	.20/10	.18/10	.15/10	.14/10
	13	.10/14	.10/14	.11/13	.13/11	.16/10	.17/10	.18/10	.19/10	.16/10	.14/10	.12/10	.11/10
	15	.09/14	.09/14	.11/14	.12/13	.14/11	.15/10	.15/10	.15/10	.13/10	.11/10	.09/10	.08/10
	17	.09/14	.09/14	.11/14	.12/13	.14/11	.15/10	.15/10	.15/10	.13/10	.11/10	.09/10	.07/10
	19	.07/14	.08/14	.08/14	.09/14	.10/11	.10/10	.10/10	.10/10	.09/10	.07/10	.06/10	.05/10
	21	.06/14	.07/14	.07/14	.08/14	.09/13	.09/10	.09/10	.08/10	.07/10	.06/10	.05/10	.04/10
20	7	.05/ 7	.05/ 7	.07/ 8	.10/13	.14/13	.17/13	.19/13	.20/13	.19/13	.18/13	.16/13	.15/13
	9	.06/10	.06/10	.08/10	.11/10	.15/13	.17/13	.19/13	.20/13	.18/13	.15/13	.13/13	.12/13
	11	.07/13	.08/13	.09/11	.12/10	.14/10	.16/13	.17/13	.17/13	.15/13	.13/13	.10/13	.09/13
	13	.08/14	.09/14	.10/14	.12/13	.13/13	.15/13	.15/13	.14/13	.12/13	.10/13	.08/13	.07/13
	15	.08/14	.08/14	.09/14	.11/13	.12/13	.13/13	.12/13	.11/13	.10/13	.08/13	.05/13	.05/13
	17	.07/14	.08/14	.08/14	.09/14	.10/13	.11/13	.10/13	.09/13	.08/13	.07/13	.05/13	.04/13
	19	.07/14	.07/14	.08/14	.08/14	.09/13	.09/13	.09/13	.08/13	.07/13	.05/13	.04/13	.04/13
	21	.06/14	.06/14	.06/14	.07/14	.08/13	.08/13	.07/13	.07/13	.06/13	.05/13	.03/13	.03/13
25	7	.04/ 7	.05/ 7	.07/ 9	.11/ 9	.15/ 9	.18/ 9	.20/ 9	.19/ 9	.17/ 9	.15/ 9	.11/ 9	.09/17
	9	.05/ 9	.05/10	.08/10	.11/10	.14/10	.17/10	.19/10	.18/17	.16/17	.13/17	.10/17	.08/17
	11	.06/13	.06/13	.08/11	.11/10	.13/10	.15/10	.16/10	.15/17	.13/17	.11/17	.08/17	.06/17
	13	.07/14	.07/14	.08/13	.10/11	.12/11	.13/11	.14/10	.12/17	.11/17	.09/17	.06/17	.05/17
	15	.07/16	.07/16	.08/14	.10/13	.11/11	.12/11	.11/11	.10/17	.09/17	.07/17	.05/17	.04/17
	17	.06/16	.07/16	.07/16	.08/14	.09/11	.10/11	.09/11	.08/17	.07/17	.06/17	.04/17	.03/17
	19	.06/16	.06/16	.07/15	.07/14	.08/14	.08/11	.08/11	.07/17	.06/17	.05/17	.03/17	.03/17
	21	.05/16	.05/16	.06/16	.06/16	.07/14	.07/11	.07/11	.06/17	.05/17	.04/17	.03/17	.02/17

ASR
SHORTCRESTED
RMS ROLL ACC IN DS2/ENCOUNTERED MODAL PERIOD, T_{DE} IN SECONDS

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	12/7	13/7	14/7	15/7	16/7	16/7	15/7	14/7	13/7	12/7	11/7	10/7
9	15/10	16/10	17/10	18/10	19/10	20/10	20/10	20/10	19/10	17/10	16/10	15/10	14/10
11	16/10	16/10	17/10	18/10	20/10	20/10	21/10	20/10	19/10	18/10	17/10	16/10	15/10
13	14/10	15/10	16/10	17/10	18/10	18/10	18/10	18/10	17/10	16/10	15/10	14/10	13/10
15	11/10	12/10	13/10	14/10	15/10	15/10	15/10	15/10	14/10	13/10	12/10	11/10	10/10
17	09/10	10/10	10/10	11/10	12/10	12/10	12/10	12/10	11/10	10/10	09/10	09/10	09/10
19	08/10	08/10	08/10	09/10	10/10	10/10	10/10	10/10	09/10	08/10	08/10	08/10	08/10
21	06/10	07/10	07/10	08/10	08/10	08/10	09/10	08/10	08/10	08/10	07/10	06/10	06/10
5	7	10/6	12/6	13/6	15/6	16/6	16/6	16/6	15/6	14/6	13/6	12/6	11/6
9	12/11	13/11	14/11	16/11	18/11	18/11	18/11	18/11	17/11	16/11	15/11	14/11	13/11
11	14/11	15/11	16/11	18/11	19/11	20/11	20/11	20/11	19/11	18/11	17/11	16/11	15/11
13	13/11	14/11	15/11	16/11	18/11	19/11	20/11	20/11	19/11	18/11	17/11	16/11	15/11
15	11/11	12/11	13/11	14/11	15/11	16/11	16/11	16/11	15/11	14/11	13/11	12/11	11/11
17	10/11	11/11	12/11	13/11	14/11	15/11	16/11	16/11	15/11	14/11	13/11	12/11	11/11
19	08/11	09/11	10/11	11/11	12/11	13/11	13/11	13/11	12/11	11/11	10/11	09/11	08/11
21	07/12	07/11	07/11	08/11	09/11	09/11	09/11	09/11	09/11	08/11	08/11	07/11	07/11
10	7	09/7	10/7	12/7	15/7	16/7	16/7	16/7	15/7	14/7	13/7	12/7	11/7
9	09/7	10/7	11/7	13/7	16/7	16/7	16/7	16/7	15/7	14/7	13/7	12/7	11/7
11	10/13	10/13	11/13	13/13	16/13	16/13	16/13	16/13	15/13	14/13	13/13	12/13	11/13
13	09/13	10/13	11/13	13/13	16/13	16/13	16/13	16/13	15/13	14/13	13/13	12/13	11/13
15	08/13	09/13	10/13	12/13	15/13	16/13	16/13	16/13	15/13	14/13	13/13	12/13	11/13
17	07/13	08/13	09/13	11/13	14/13	15/13	16/13	16/13	15/13	14/13	13/13	12/13	11/13
19	06/13	07/13	08/13	10/13	13/13	14/13	15/13	16/13	15/13	14/13	13/13	12/13	11/13
21	05/13	06/13	07/13	09/13	12/13	13/13	14/13	15/13	14/13	13/13	12/13	11/13	10/13
15	7	09/7	10/7	12/7	15/7	16/7	16/7	16/7	15/7	14/7	13/7	12/7	11/7
9	08/7	09/7	10/7	11/7	13/7	14/7	14/7	14/7	13/7	12/7	11/7	10/7	09/7
11	08/13	09/13	10/13	12/13	15/13	16/13	16/13	16/13	15/13	14/13	13/13	12/13	11/13
13	07/13	08/13	09/13	11/13	14/13	15/13	16/13	16/13	15/13	14/13	13/13	12/13	11/13
15	07/14	08/14	09/14	11/14	14/14	15/14	16/14	16/14	15/14	14/14	13/14	12/14	11/14
17	06/14	07/14	08/14	10/14	13/14	14/14	15/14	16/14	15/14	14/14	13/14	12/14	11/14
19	05/14	06/14	07/14	09/14	12/14	13/14	14/14	15/14	14/14	13/14	12/14	11/14	10/14
21	04/14	05/14	06/14	08/14	11/14	12/14	13/14	14/14	13/14	12/14	11/14	10/14	09/14
20	7	08/7	09/7	11/7	13/7	14/7	14/7	14/7	13/7	12/7	11/7	10/7	09/7
9	08/8	09/8	10/8	12/8	15/8	16/8	16/8	16/8	15/8	14/8	13/8	12/8	11/8
11	07/12	08/12	09/12	11/12	14/12	15/12	16/12	16/12	15/12	14/12	13/12	12/12	11/12
13	07/14	08/14	09/14	11/14	14/14	15/14	16/14	16/14	15/14	14/14	13/14	12/14	11/14
15	06/14	07/14	08/14	10/14	13/14	14/14	15/14	16/14	15/14	14/14	13/14	12/14	11/14
17	05/14	06/14	07/14	09/14	12/14	13/14	14/14	15/14	14/14	13/14	12/14	11/14	10/14
19	05/14	06/14	07/14	09/14	12/14	13/14	14/14	15/14	14/14	13/14	12/14	11/14	10/14
21	04/14	05/14	06/14	08/14	11/14	12/14	13/14	14/14	13/14	12/14	11/14	10/14	09/14
25	7	08/7	09/7	11/7	13/7	14/7	14/7	14/7	13/7	12/7	11/7	10/7	09/7
9	07/8	08/8	09/8	11/8	14/8	15/8	16/8	16/8	15/8	14/8	13/8	12/8	11/8
11	06/12	07/12	08/12	10/12	13/12	14/12	15/12	16/12	15/12	14/12	13/12	12/12	11/12
13	06/14	07/14	08/14	10/14	13/14	14/14	15/14	16/14	15/14	14/14	13/14	12/14	11/14
15	05/14	06/14	07/14	09/14	12/14	13/14	14/14	15/14	14/14	13/14	12/14	11/14	10/14
17	05/16	06/16	07/16	09/16	12/16	13/16	14/16	15/16	14/16	13/16	12/16	11/16	10/16
19	04/16	05/16	06/16	08/16	11/16	12/16	13/16	14/16	13/16	12/16	11/16	10/16	09/16
21	04/16	05/16	06/16	08/16	11/16	12/16	13/16	14/16	13/16	12/16	11/16	10/16	09/16

ASR

SHORTCRESTED
RMS PITCH IN DEGREES/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	9	11	13	15	17	19	21	23	25	27	29	31
5	7	9	11	13	15	17	19	21	23	25	27	29	31
10	7	9	11	13	15	17	19	21	23	25	27	29	31
15	7	9	11	13	15	17	19	21	23	25	27	29	31
20	7	9	11	13	15	17	19	21	23	25	27	29	31
25	7	9	11	13	15	17	19	21	23	25	27	29	31
30	7	9	11	13	15	17	19	21	23	25	27	29	31
35	7	9	11	13	15	17	19	21	23	25	27	29	31
40	7	9	11	13	15	17	19	21	23	25	27	29	31
45	7	9	11	13	15	17	19	21	23	25	27	29	31
50	7	9	11	13	15	17	19	21	23	25	27	29	31
55	7	9	11	13	15	17	19	21	23	25	27	29	31
60	7	9	11	13	15	17	19	21	23	25	27	29	31
65	7	9	11	13	15	17	19	21	23	25	27	29	31
70	7	9	11	13	15	17	19	21	23	25	27	29	31
75	7	9	11	13	15	17	19	21	23	25	27	29	31
80	7	9	11	13	15	17	19	21	23	25	27	29	31
85	7	9	11	13	15	17	19	21	23	25	27	29	31
90	7	9	11	13	15	17	19	21	23	25	27	29	31
95	7	9	11	13	15	17	19	21	23	25	27	29	31
100	7	9	11	13	15	17	19	21	23	25	27	29	31
105	7	9	11	13	15	17	19	21	23	25	27	29	31
110	7	9	11	13	15	17	19	21	23	25	27	29	31
115	7	9	11	13	15	17	19	21	23	25	27	29	31
120	7	9	11	13	15	17	19	21	23	25	27	29	31
125	7	9	11	13	15	17	19	21	23	25	27	29	31
130	7	9	11	13	15	17	19	21	23	25	27	29	31
135	7	9	11	13	15	17	19	21	23	25	27	29	31
140	7	9	11	13	15	17	19	21	23	25	27	29	31
145	7	9	11	13	15	17	19	21	23	25	27	29	31
150	7	9	11	13	15	17	19	21	23	25	27	29	31
155	7	9	11	13	15	17	19	21	23	25	27	29	31
160	7	9	11	13	15	17	19	21	23	25	27	29	31
165	7	9	11	13	15	17	19	21	23	25	27	29	31
170	7	9	11	13	15	17	19	21	23	25	27	29	31
175	7	9	11	13	15	17	19	21	23	25	27	29	31
180	7	9	11	13	15	17	19	21	23	25	27	29	31
185	7	9	11	13	15	17	19	21	23	25	27	29	31
190	7	9	11	13	15	17	19	21	23	25	27	29	31
195	7	9	11	13	15	17	19	21	23	25	27	29	31
200	7	9	11	13	15	17	19	21	23	25	27	29	31
205	7	9	11	13	15	17	19	21	23	25	27	29	31
210	7	9	11	13	15	17	19	21	23	25	27	29	31
215	7	9	11	13	15	17	19	21	23	25	27	29	31
220	7	9	11	13	15	17	19	21	23	25	27	29	31
225	7	9	11	13	15	17	19	21	23	25	27	29	31
230	7	9	11	13	15	17	19	21	23	25	27	29	31
235	7	9	11	13	15	17	19	21	23	25	27	29	31
240	7	9	11	13	15	17	19	21	23	25	27	29	31
245	7	9	11	13	15	17	19	21	23	25	27	29	31
250	7	9	11	13	15	17	19	21	23	25	27	29	31
255	7	9	11	13	15	17	19	21	23	25	27	29	31
260	7	9	11	13	15	17	19	21	23	25	27	29	31
265	7	9	11	13	15	17	19	21	23	25	27	29	31
270	7	9	11	13	15	17	19	21	23	25	27	29	31
275	7	9	11	13	15	17	19	21	23	25	27	29	31
280	7	9	11	13	15	17	19	21	23	25	27	29	31
285	7	9	11	13	15	17	19	21	23	25	27	29	31
290	7	9	11	13	15	17	19	21	23	25	27	29	31
295	7	9	11	13	15	17	19	21	23	25	27	29	31
300	7	9	11	13	15	17	19	21	23	25	27	29	31

SHORTCRESTED
RMS PITCH VEL IN DPS/ENCOUNTERED MODAL PERIOD. T_{OE} . IN SECONDS

65

ASR

SHORTCRESTED
RMS PITCH ACC IN DS2/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
OE

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	18/6	18/6	19/6	19/6	19/6	19/6	19/5	18/6	18/6	17/6	17/6	17/6
9	9	15/7	15/6	15/6	15/6	14/6	14/6	14/6	14/6	14/6	14/7	14/7	14/7
11	11	12/7	12/7	11/7	11/6	11/6	10/6	10/6	10/6	11/7	11/7	11/7	11/7
13	13	09/7	09/7	08/6	08/6	08/6	08/6	08/6	08/6	08/7	08/7	08/7	08/7
15	15	07/7	07/7	07/7	06/6	06/6	06/6	06/6	06/6	06/7	07/7	07/7	07/7
17	17	06/7	06/7	05/7	05/7	05/6	05/6	05/6	05/6	05/7	05/7	05/7	05/7
19	19	05/7	04/7	04/7	04/6	04/6	04/6	04/6	04/6	04/7	04/7	04/7	04/7
21	21	04/7	04/7	03/7	03/7	03/6	03/6	03/6	03/6	03/7	04/7	04/7	04/7
9	7	28/7	27/7	28/8	28/8	22/6	19/6	17/6	14/6	12/6	10/8	09/8	09/8
9	9	24/7	23/7	21/7	20/6	17/6	15/6	13/6	11/6	09/9	08/9	08/9	08/9
11	11	19/7	18/7	16/7	15/7	13/6	11/6	09/6	08/6	07/9	06/9	06/9	06/10
13	13	14/7	14/7	13/7	11/7	10/6	08/6	07/6	06/6	05/9	05/10	05/10	05/10
15	15	11/7	11/7	10/7	09/7	08/7	06/6	05/6	05/6	04/10	04/10	04/10	04/10
17	17	09/7	08/7	08/7	07/7	06/7	05/6	04/6	04/6	03/10	03/10	03/10	03/10
19	19	07/7	07/7	06/7	06/7	05/7	04/6	03/6	03/6	03/10	03/10	03/10	03/10
21	21	06/7	06/7	05/7	05/7	04/7	03/6	03/6	02/6	02/10	02/10	02/10	02/10
10	7	33/7	32/7	30/7	27/7	24/7	20/6	16/6	12/6	09/6	07/13	05/13	05/13
9	9	31/7	29/7	27/7	24/7	20/7	17/7	13/6	10/6	07/13	05/13	04/13	04/13
11	11	25/7	24/7	21/7	19/7	16/7	12/7	10/7	07/6	05/13	04/13	03/13	03/13
13	13	19/7	18/7	16/7	14/7	12/7	09/7	07/7	05/6	04/13	03/13	03/13	03/13
15	15	15/7	14/7	13/7	11/7	09/7	07/7	06/7	03/6	02/13	02/13	02/13	02/13
17	17	12/7	11/7	10/7	09/7	07/7	06/7	04/7	03/6	02/13	02/13	02/13	02/13
19	19	10/7	09/7	08/7	08/7	06/7	05/7	04/7	03/6	02/13	02/13	02/13	02/13
21	21	08/7	07/7	07/7	06/7	05/7	04/7	03/7	02/6	02/13	01/13	01/13	01/13
15	7	36/7	35/7	33/7	30/7	26/7	22/7	17/6	12/6	08/6	05/10	03/10	03/10
9	9	37/7	34/7	32/7	28/7	23/7	19/7	14/7	10/6	06/6	04/10	03/14	02/14
11	11	30/8	28/8	25/7	23/7	18/7	14/7	11/7	05/7	04/6	02/17	02/17	02/17
13	13	24/8	22/8	20/8	17/7	14/7	11/7	08/7	05/7	03/6	02/17	01/20	01/20
15	15	19/8	18/8	16/8	13/7	11/7	09/7	06/7	04/7	03/6	02/17	01/20	01/20
17	17	15/8	15/8	12/8	11/7	09/7	07/7	05/7	03/7	02/6	01/20	01/20	01/20
19	19	12/8	12/8	11/8	10/8	09/7	06/7	04/7	03/7	02/6	01/20	01/20	01/20
21	21	10/8	09/8	08/8	07/7	06/7	05/7	03/7	02/7	01/6	01/20	01/20	01/20
20	7	38/8	37/8	36/8	34/8	28/7	23/7	18/7	13/7	08/7	04/7	02/13	02/13
9	9	42/8	41/8	39/8	36/8	32/8	21/8	16/7	11/7	06/7	03/13	02/13	01/13
11	11	36/8	35/8	33/8	30/8	26/8	21/8	12/7	08/7	05/7	02/13	01/13	01/13
13	13	28/8	28/8	26/8	24/8	20/8	17/8	09/7	06/7	03/7	02/13	01/13	01/13
15	15	22/8	22/8	21/8	19/8	16/8	13/8	07/7	05/7	03/7	01/13	01/23	01/23
17	17	18/8	18/8	16/8	15/8	13/8	10/8	06/7	04/7	02/7	01/13	01/23	01/23
19	19	15/8	14/8	13/8	12/8	10/8	08/8	05/7	03/7	02/7	01/13	01/23	01/23
21	21	12/8	12/8	11/8	10/8	09/8	08/8	04/7	02/7	01/7	01/13	01/23	00/23
25	7	38/8	38/8	37/8	36/8	30/7	25/7	19/7	14/7	09/6	04/9	02/9	02/9
9	9	41/8	40/8	39/8	38/8	30/8	24/8	18/7	12/7	07/6	03/17	02/17	01/17
11	11	41/8	41/8	38/8	35/8	25/8	19/8	14/8	09/7	05/7	02/17	01/17	01/17
13	13	33/8	33/8	31/8	28/8	20/8	15/8	11/8	07/7	04/7	02/17	01/17	01/17
15	15	27/8	26/8	24/8	22/8	19/8	12/8	08/8	05/7	03/7	01/17	01/17	01/17
17	17	21/8	21/8	20/8	18/8	15/8	12/8	09/8	04/7	02/7	01/17	01/17	01/17
19	19	17/8	17/8	16/8	14/8	12/8	10/8	08/8	03/7	02/7	01/17	01/17	00/17
21	21	14/8	14/8	13/8	12/8	10/8	08/8	06/8	03/7	02/7	01/17	00/17	00/17

ASR
SHORTCRESTED
RMS YAW VEL IN DPS/ENCOUNTERED MODAL PERIOD, T', IN SECONDS
OE

V TO	SHIP HEADING ANGLE IN DEGREES											180	
	0	15	30	45	60	75	90	105	120	135	150		165
0	7 .04/ 7 .04/ 8 .03/10 .03/10 .02/10 .02/10 .02/10 .01/10	7 .04/ 7 .04/ 8 .03/10 .03/10 .02/10 .02/10 .02/10 .01/10	7 .04/ 7 .04/ 8 .03/10 .03/10 .02/10 .02/10 .02/10 .01/10	7 .05/ 7 .04/ 7 .04/10 .03/10 .03/10 .02/10 .02/10 .01/10	6 .05/ 6 .05/ 7 .04/10 .03/10 .03/10 .02/10 .02/10 .02/10	7 .06/ 6 .05/ 7 .04/ 8 .03/10 .03/10 .02/10 .02/10 .02/10	7 .06/ 7 .05/ 8 .04/ 9 .03/11 .03/11 .02/11 .02/11 .02/12	6 .06/ 6 .05/ 7 .04/ 8 .03/10 .03/10 .02/10 .02/10 .02/10	5 .05/ 5 .05/ 7 .04/ 8 .03/ 9 .03/12 .02/12 .02/12 .02/12	7 .05/ 7 .04/ 7 .04/ 8 .03/ 9 .02/ 9 .02/12 .02/12 .01/12	7 .05/ 7 .04/ 7 .04/ 8 .03/ 9 .02/ 9 .02/12 .02/12 .01/13	7 .04/ 7 .04/ 8 .03/ 8 .03/ 9 .02/ 9 .02/12 .02/12 .01/13	7 .04/ 7 .04/ 8 .03/ 8 .03/ 9 .02/ 9 .02/12 .02/12 .01/13
	5 .04/ 7 .04/ 8 .03/ 9 .03/11 .02/11 .02/12 .02/12 .01/12	7 .04/ 7 .04/ 8 .03/ 9 .03/11 .02/11 .02/12 .02/12 .01/12	7 .04/ 7 .04/ 8 .03/ 9 .03/11 .02/11 .02/12 .02/12 .01/12	7 .05/ 7 .04/ 7 .04/ 8 .03/11 .03/11 .02/11 .02/12 .01/12	7 .05/ 7 .05/ 8 .04/ 9 .03/11 .03/12 .02/12 .02/12 .02/12	7 .06/ 7 .05/ 8 .04/ 9 .03/11 .03/12 .02/12 .02/12 .02/12	7 .06/ 7 .05/ 8 .04/ 9 .03/11 .03/12 .02/12 .02/12 .02/12	7 .06/ 7 .05/ 8 .04/ 9 .03/11 .03/12 .02/12 .02/12 .02/12	7 .05/ 7 .05/ 8 .04/ 9 .03/12 .02/12 .02/12 .02/12 .01/12	8 .05/ 8 .04/ 9 .04/ 9 .03/12 .02/12 .02/12 .02/12 .01/12	8 .05/ 8 .04/ 9 .04/ 9 .03/12 .02/12 .02/12 .02/12 .01/13	8 .04/ 8 .04/ 9 .03/ 9 .03/12 .02/12 .02/12 .02/12 .01/13	8 .04/ 8 .04/ 9 .03/ 9 .03/12 .02/12 .02/12 .02/12 .01/13
	10 .04/ 7 .04/ 8 .03/ 8 .03/10 .02/10 .02/13 .01/13 .01/13	7 .04/ 7 .04/ 8 .03/ 8 .03/10 .02/10 .02/13 .01/13 .01/13	7 .04/ 7 .04/ 8 .03/ 8 .03/10 .02/10 .02/13 .01/13 .01/13	7 .05/ 7 .04/ 7 .04/ 8 .03/ 9 .02/12 .02/13 .01/13 .01/13	7 .05/ 7 .04/ 8 .03/10 .03/10 .02/12 .02/12 .02/12 .01/13	8 .05/ 8 .04/ 9 .03/11 .03/12 .02/12 .02/12 .02/12 .01/12	8 .05/ 8 .04/ 9 .03/11 .03/12 .02/12 .02/12 .02/12 .01/12	8 .05/ 8 .04/ 9 .03/11 .03/12 .02/12 .02/12 .02/12 .01/12	8 .05/12 .04/12 .03/12 .03/12 .02/13 .02/13 .02/13 .01/13	8 .05/12 .04/12 .03/12 .03/12 .02/13 .02/13 .02/13 .01/13	8 .05/12 .04/12 .03/12 .03/12 .02/13 .02/13 .02/13 .01/13	8 .04/12 .04/14 .03/14 .03/14 .02/14 .02/14 .01/14 .01/14	8 .04/12 .04/14 .03/14 .03/14 .02/14 .02/14 .01/14 .01/14
	15 .03/ 7 .03/ 8 .03/ 8 .02/ 9 .02/10 .02/11 .01/12 .01/13	7 .03/ 7 .03/ 8 .03/ 8 .02/ 9 .02/10 .02/11 .01/12 .01/13	7 .03/ 7 .03/ 8 .03/ 8 .02/ 9 .02/10 .02/11 .01/12 .01/13	7 .04/ 7 .04/ 7 .03/ 8 .03/10 .02/10 .02/11 .01/12 .01/13	7 .05/10 .04/10 .03/10 .03/10 .02/10 .02/10 .01/10 .01/10	8 .05/10 .04/10 .03/10 .03/10 .02/10 .02/10 .01/10 .01/10	8 .05/10 .04/10 .03/10 .03/10 .02/10 .02/10 .01/10 .01/10	8 .05/10 .04/10 .03/10 .03/10 .02/10 .02/10 .01/10 .01/10	8 .05/12 .04/12 .03/12 .03/12 .02/13 .02/13 .02/13 .01/13	8 .05/12 .04/12 .03/12 .03/12 .02/13 .02/13 .02/13 .01/13	8 .05/12 .04/12 .03/12 .03/12 .02/13 .02/13 .02/13 .01/13	8 .04/12 .04/14 .03/14 .03/14 .02/14 .02/14 .01/14 .01/14	8 .04/12 .04/14 .03/14 .03/14 .02/14 .02/14 .01/14 .01/14
	20 .03/ 7 .03/ 8 .03/ 8 .02/ 9 .02/ 9 .01/10 .01/10 .01/10	7 .03/ 7 .03/ 8 .03/ 8 .02/ 9 .02/ 9 .01/10 .01/10 .01/10	7 .03/ 7 .03/ 8 .03/ 8 .02/ 9 .02/ 9 .01/10 .01/10 .01/10	7 .04/ 7 .04/ 7 .03/ 8 .03/10 .02/10 .02/11 .01/12 .01/13	7 .05/13 .04/13 .03/13 .03/13 .02/13 .02/13 .01/13 .01/13	8 .05/13 .04/13 .03/13 .03/13 .02/13 .02/13 .01/13 .01/13	8 .05/13 .04/13 .03/13 .03/13 .02/13 .02/13 .01/13 .01/13	8 .05/13 .04/13 .03/13 .03/13 .02/13 .02/13 .01/13 .01/13	8 .04/13 .04/13 .03/13 .03/13 .02/13 .02/13 .01/13 .01/13	8 .04/13 .04/13 .03/13 .03/13 .02/13 .02/13 .01/13 .01/13	8 .03/13 .03/13 .02/13 .02/13 .01/13 .01/13 .01/13 .01/13	8 .02/13 .02/13 .01/13 .01/13 .01/13 .01/13 .01/13 .01/13	8 .02/13 .02/13 .01/13 .01/13 .01/13 .01/13 .01/13 .01/13
	25 .03/ 7 .03/ 8 .02/ 9 .02/ 9 .01/10 .01/10 .01/10	7 .03/ 7 .03/ 8 .02/ 9 .02/ 9 .01/10 .01/10 .01/10	7 .03/ 7 .03/ 8 .02/ 9 .02/ 9 .01/10 .01/10 .01/10	7 .04/ 7 .04/ 7 .03/ 8 .03/10 .02/10 .02/11 .01/12 .01/13	7 .04/ 9 .03/ 9 .03/ 9 .02/ 9 .02/ 9 .01/ 9 .01/ 9 .01/ 9	8 .04/ 9 .03/ 9 .03/ 9 .02/ 9 .02/ 9 .01/ 9 .01/ 9 .01/ 9	8 .04/ 9 .03/ 9 .03/ 9 .02/ 9 .02/ 9 .01/ 9 .01/ 9 .01/ 9	8 .04/ 9 .03/ 9 .03/ 9 .02/ 9 .02/ 9 .01/ 9 .01/ 9 .01/ 9	8 .03/ 9 .03/ 9 .03/ 9 .02/17 .02/17 .01/17 .01/17 .01/17	8 .03/ 9 .03/ 9 .03/ 9 .02/17 .02/17 .01/17 .01/17 .01/17	8 .02/ 9 .02/17 .01/39 .01/39 .01/33 .01/33 .01/33 .01/33	8 .02/ 9 .02/17 .01/39 .01/39 .01/33 .01/33 .01/33 .01/33	8 .02/ 9 .02/17 .01/39 .01/39 .01/33 .01/33 .01/33 .01/33

ASR
SHORTCRESTED
RMS YAW ACC IN DS2/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	04/6	04/6	05/6	06/6	06/6	06/6	06/6	06/6	05/6	04/6	04/7	04/7
	9	03/7	03/7	04/7	05/6	05/6	05/6	05/6	04/7	04/7	03/7	03/7	03/7
	11	03/8	03/7	03/7	04/7	04/7	04/7	04/7	03/7	03/7	03/7	03/7	03/8
	13	02/10	02/10	03/10	03/7	03/7	03/7	03/7	03/7	02/7	02/8	02/8	02/8
	15	02/10	02/10	02/10	02/10	02/7	02/7	02/7	02/7	02/7	02/8	02/8	02/8
	17	01/10	01/10	02/10	02/10	02/7	02/7	02/7	02/7	02/7	02/8	02/8	02/8
	19	01/10	01/10	01/10	01/10	01/10	01/7	01/7	01/7	01/8	01/8	01/8	01/8
	21	01/10	01/10	01/10	01/10	01/10	01/7	01/7	01/7	01/8	01/8	01/8	01/8
8	7	04/6	05/6	05/6	06/6	06/6	06/6	06/6	05/7	05/7	04/8	03/8	03/8
	9	04/7	04/7	05/7	05/7	05/7	05/7	05/7	04/8	04/8	03/8	03/9	03/9
	11	03/7	03/7	03/7	04/7	04/7	04/7	04/7	03/8	03/8	02/9	02/9	02/9
	13	02/8	02/8	03/7	03/7	03/7	03/7	03/8	03/8	02/9	02/9	02/9	02/9
	15	02/8	02/8	02/7	02/7	02/7	02/7	02/8	02/9	02/9	02/9	02/9	02/9
	17	02/8	02/8	02/7	02/7	02/7	02/7	02/8	02/9	02/9	02/9	02/9	02/9
	19	01/11	01/11	01/8	01/7	01/7	01/7	01/8	01/9	01/9	01/9	01/9	01/9
	21	01/11	01/11	01/8	01/7	01/7	01/8	01/9	01/9	01/9	01/9	01/9	01/9
10	7	05/6	05/6	06/6	06/6	07/6	06/6	06/6	05/6	04/8	03/12	03/12	03/12
	9	04/7	04/7	05/7	05/7	05/7	05/7	04/8	04/8	03/12	03/12	03/12	03/12
	11	03/7	03/7	03/7	04/7	04/7	04/7	03/12	03/12	03/12	03/12	03/12	03/12
	13	03/7	03/7	03/7	03/7	03/7	03/8	03/8	03/12	03/12	03/12	03/12	03/12
	15	02/8	02/7	02/7	02/7	02/7	02/8	02/12	02/12	02/12	02/12	02/12	02/12
	17	02/8	02/8	02/7	02/7	02/7	02/8	02/12	02/12	02/12	02/12	02/12	02/12
	19	01/8	01/8	01/7	02/8	02/8	02/8	02/12	02/12	02/12	02/12	02/12	02/12
	21	01/8	01/8	01/7	02/8	02/8	02/8	02/12	02/12	02/12	02/12	02/12	02/12
15	7	05/6	06/6	06/6	07/6	07/6	06/6	06/6	05/10	04/10	03/10	02/14	02/14
	9	04/7	05/7	05/7	05/7	05/7	05/7	04/10	03/10	03/14	02/14	02/14	02/14
	11	03/7	04/7	04/7	04/7	04/7	04/10	03/10	03/10	02/14	02/14	02/14	02/14
	13	03/8	03/7	03/7	03/7	03/7	03/10	02/14	02/14	02/14	02/14	02/14	02/14
	15	02/8	02/8	02/7	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	17	02/8	02/8	02/7	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	19	01/8	01/8	01/8	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	21	01/8	01/8	01/8	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
20	7	06/6	06/6	06/6	07/6	07/6	06/6	06/6	05/10	04/10	03/10	02/14	02/14
	9	05/7	05/7	05/7	05/7	05/7	05/7	04/10	03/10	03/14	02/14	02/14	02/14
	11	04/7	04/7	04/7	04/7	04/7	04/10	03/10	03/10	02/14	02/14	02/14	02/14
	13	03/8	03/8	03/7	03/7	03/7	03/10	02/14	02/14	02/14	02/14	02/14	02/14
	15	02/8	02/8	02/7	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	17	02/8	02/8	02/7	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	19	01/8	01/8	01/8	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	21	01/8	01/8	01/8	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
25	7	06/6	06/6	06/6	07/6	07/6	06/6	06/6	05/10	04/10	03/10	02/14	02/14
	9	05/7	05/7	05/7	05/7	05/7	05/7	04/10	03/10	03/14	02/14	02/14	02/14
	11	04/7	04/7	04/7	04/7	04/7	04/10	03/10	03/10	02/14	02/14	02/14	02/14
	13	03/7	03/7	03/7	03/7	03/7	03/10	02/14	02/14	02/14	02/14	02/14	02/14
	15	02/7	02/7	02/7	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	17	02/8	02/7	02/7	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	19	01/8	01/8	01/8	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14
	21	01/8	01/8	01/8	02/7	02/7	02/10	02/14	02/14	02/14	02/14	02/14	02/14

SHORTCRESTED
ROWS LAT DISP IN FEET/ENCOUNTERED MODAL PERIOD, τ , IN SECONDS
OE
ROLLER CHOCK - 8.0 FT AFT DF AP, ON CL, AND 26.07 FT ABOVE KEEL

V	T0	0	15	30	45	60	75	90	105	120	135	150	165	180
SHIP HEADING ANGLE IN DEGREES														
0	7	-11/ 7	-12/ 7	-13/ 7	-15/ 7	-16/ 7	-17/ 7	-18/ 7	-18/ 7	-17/ 7	-15/ 7	-14/ 7	-12/ 7	-11/ 7
9	9	-13/10	-14/10	-16/10	-17/10	-19/10	-21/10	-21/10	-21/10	-20/10	-19/10	-17/10	-16/10	-15/10
11	11	-14/10	-14/10	-16/10	-18/10	-20/10	-21/10	-22/10	-22/10	-21/10	-20/10	-18/10	-17/10	-15/10
13	13	-13/10	-14/10	-15/10	-17/10	-19/10	-20/10	-21/10	-21/10	-20/10	-19/10	-17/10	-15/10	-15/10
15	15	-13/14	-13/14	-15/16	-17/16	-19/16	-20/16	-21/16	-21/16	-20/16	-18/10	-16/10	-15/10	-14/10
17	17	-12/16	-13/16	-15/16	-17/16	-19/16	-20/16	-21/16	-20/16	-19/16	-17/16	-16/16	-14/16	-13/16
19	19	-12/16	-13/16	-15/18	-17/18	-19/18	-20/18	-20/18	-20/18	-19/18	-17/18	-15/18	-14/18	-13/18
21	21	-12/21	-13/21	-15/21	-17/21	-19/21	-20/21	-20/21	-20/21	-19/21	-17/21	-15/21	-13/21	-12/21
7	7	-09/ 7	-10/ 7	-11/ 7	-13/ 7	-16/ 8	-18/ 8	-19/ 8	-20/ 8	-20/ 9	-19/ 9	-18/ 9	-17/10	-17/10
9	9	-12/10	-12/10	-14/10	-16/10	-19/10	-21/10	-23/10	-23/10	-23/10	-23/10	-21/10	-20/10	-20/10
11	11	-12/10	-13/10	-15/10	-17/10	-19/10	-21/10	-23/10	-23/10	-23/10	-22/10	-21/10	-19/10	-19/10
13	13	-12/11	-13/10	-14/10	-17/10	-19/10	-21/10	-22/10	-22/10	-22/10	-21/10	-19/10	-18/10	-17/10
15	15	-12/16	-13/16	-14/16	-16/16	-18/16	-20/16	-21/16	-21/16	-21/15	-19/15	-18/10	-16/10	-16/10
17	17	-12/16	-12/16	-14/16	-16/16	-18/16	-20/16	-21/16	-21/16	-20/16	-19/16	-17/17	-15/17	-15/17
19	19	-11/18	-12/18	-14/18	-16/18	-18/18	-20/18	-21/18	-21/18	-20/18	-18/18	-16/20	-14/20	-14/20
21	21	-11/21	-12/21	-14/21	-16/21	-18/21	-20/21	-21/21	-21/21	-20/21	-18/22	-16/22	-14/22	-14/22
7	7	-08/ 7	-08/ 7	-10/ 7	-12/ 8	-16/10	-19/10	-22/10	-24/10	-25/10	-25/10	-23/10	-22/10	-21/10
9	9	-10/10	-10/10	-12/10	-15/10	-18/10	-21/10	-24/10	-25/10	-25/10	-25/10	-23/10	-22/10	-21/10
11	11	-11/11	-11/11	-13/10	-16/10	-18/10	-21/10	-23/10	-24/10	-24/10	-23/10	-22/13	-20/13	-20/13
13	13	-11/12	-11/12	-13/12	-16/11	-18/10	-20/14	-22/14	-23/14	-23/14	-22/14	-20/14	-19/14	-18/14
15	15	-11/16	-11/16	-13/16	-16/16	-18/16	-20/16	-22/16	-23/16	-22/16	-20/16	-18/16	-17/16	-17/16
17	17	-11/18	-11/18	-13/18	-15/18	-18/18	-20/18	-21/18	-21/18	-21/18	-20/18	-18/18	-16/19	-16/19
19	19	-10/18	-11/18	-13/18	-15/19	-18/20	-20/20	-21/20	-21/20	-20/20	-19/20	-17/21	-16/21	-15/21
21	21	-11/21	-11/21	-13/21	-16/21	-18/21	-20/21	-21/21	-21/22	-20/22	-19/22	-17/22	-15/23	-15/23
7	7	-06/ 7	-07/ 7	-09/ 8	-12/10	-16/10	-20/10	-24/10	-27/10	-29/10	-29/10	-28/14	-28/14	-27/14
9	9	-08/10	-09/10	-11/10	-14/10	-17/10	-21/10	-26/14	-27/14	-27/14	-26/14	-26/14	-25/14	-25/17
11	11	-09/11	-10/11	-12/11	-15/10	-18/10	-21/10	-23/14	-25/14	-25/14	-25/14	-24/17	-22/17	-22/17
13	13	-10/13	-10/13	-12/13	-15/13	-18/14	-20/14	-22/14	-24/14	-24/14	-23/17	-22/17	-20/17	-20/17
15	15	-10/16	-10/16	-12/16	-15/16	-18/16	-20/16	-22/17	-23/17	-23/17	-22/17	-20/17	-19/17	-19/17
17	17	-10/18	-10/18	-12/18	-15/18	-18/18	-20/18	-21/17	-22/17	-22/20	-21/20	-19/20	-18/20	-18/20
19	19	-10/18	-10/18	-12/18	-15/19	-18/20	-20/21	-21/21	-22/21	-22/21	-20/21	-19/22	-17/22	-17/22
21	21	-10/21	-11/21	-13/21	-15/21	-18/21	-20/21	-21/22	-22/22	-21/22	-20/23	-19/23	-17/24	-16/24
7	7	-06/ 8	-06/ 8	-08/ 8	-11/13	-15/13	-20/13	-25/13	-29/13	-31/13	-32/13	-32/13	-32/13	-32/63
9	9	-07/10	-08/10	-10/10	-13/10	-17/13	-21/13	-25/13	-28/19	-30/19	-30/19	-30/19	-30/19	-30/19
11	11	-08/12	-09/12	-11/11	-14/13	-17/13	-21/13	-25/19	-27/19	-28/19	-28/19	-28/19	-27/23	-27/23
13	13	-09/13	-10/13	-12/13	-14/13	-17/13	-21/19	-24/19	-26/19	-26/19	-26/23	-26/23	-25/23	-25/23
15	15	-09/14	-10/14	-12/14	-14/16	-18/16	-21/19	-23/19	-25/19	-25/23	-24/23	-24/23	-24/23	-23/23
17	17	-09/18	-10/18	-12/18	-15/18	-17/19	-20/19	-23/19	-24/23	-25/23	-24/23	-23/23	-22/23	-22/23
19	19	-09/18	-10/18	-12/18	-15/20	-17/19	-20/19	-22/23	-24/23	-24/23	-23/23	-22/23	-21/23	-21/23
21	21	-09/21	-10/21	-12/21	-15/21	-18/21	-20/23	-22/23	-23/23	-24/23	-23/23	-22/23	-20/26	-20/26
7	7	-05/ 8	-05/ 8	-08/ 9	-12/17	-17/17	-23/17	-28/17	-33/17	-35/17	-35/17	-35/17	-34/17	-34/17
9	9	-06/10	-07/10	-09/10	-13/17	-18/17	-23/17	-28/17	-32/17	-35/17	-36/17	-36/17	-36/17	-36/17
11	11	-07/12	-08/12	-10/11	-14/17	-19/17	-23/17	-27/17	-31/17	-33/17	-34/17	-34/17	-33/17	-33/17
13	13	-08/14	-09/14	-11/14	-14/17	-18/17	-22/17	-26/17	-29/17	-31/17	-31/17	-31/17	-31/24	-30/24
15	15	-08/14	-09/14	-11/16	-14/17	-18/17	-22/17	-25/17	-28/17	-29/17	-30/24	-29/24	-29/24	-28/24
17	17	-08/18	-09/18	-11/18	-14/17	-18/17	-21/17	-25/17	-27/24	-28/24	-28/24	-28/24	-27/30	-27/30
19	19	-08/18	-09/18	-11/18	-14/20	-18/17	-21/24	-26/24	-26/24	-27/24	-26/30	-26/30	-26/30	-25/30
21	21	-08/21	-09/21	-11/21	-14/21	-18/24	-21/24	-24/24	-26/24	-27/24	-26/30	-25/30	-24/30	-24/30

SHORTCRESTED
RMS LAT VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
DE
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.0 FT ABOVE KEEL

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ASR

SHORTCRESTED
RMS LAT ACC IN G'S/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
OE
ROLLER CHECK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL
(ACC. X 100)

V 10	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	30/ 7	32/ 7	38/ 6	44/ 6	50/ 6	55/ 6	58/ 6	52/ 6	46/ 6	39/ 7	33/ 7	31/ 7
9	28/ 8	30/ 8	34/ 8	39/ 7	43/ 7	47/ 7	48/ 7	47/ 7	47/ 7	41/ 7	36/ 7	31/ 8	30/ 8
11	23/ 9	24/ 10	28/ 10	31/ 10	35/ 10	38/ 10	39/ 10	39/ 10	37/ 10	33/ 10	30/ 10	27/ 10	25/ 10
13	19/ 10	20/ 10	22/ 10	25/ 10	28/ 10	30/ 10	31/ 10	31/ 10	30/ 10	27/ 10	24/ 10	21/ 10	21/ 10
15	15/ 10	16/ 10	18/ 10	21/ 10	23/ 10	25/ 10	25/ 10	25/ 10	24/ 10	22/ 10	20/ 10	18/ 10	17/ 10
17	13/ 10	13/ 10	15/ 10	17/ 10	19/ 10	20/ 10	20/ 10	21/ 10	21/ 10	20/ 10	18/ 10	15/ 10	14/ 10
18	11/ 10	11/ 10	13/ 10	14/ 10	16/ 10	17/ 10	18/ 10	18/ 10	17/ 10	15/ 10	14/ 10	13/ 10	12/ 10
21	08/ 10	09/ 10	11/ 10	12/ 10	13/ 10	14/ 10	15/ 10	15/ 10	14/ 10	13/ 10	11/ 10	10/ 10	10/ 10
5	7	34/ 7	36/ 7	41/ 6	48/ 6	53/ 6	56/ 6	57/ 7	51/ 7	45/ 8	38/ 8	32/ 8	30/ 8
9	31/ 7	32/ 7	36/ 7	41/ 7	45/ 7	47/ 7	48/ 8	47/ 8	44/ 8	40/ 10	35/ 10	31/ 10	29/ 10
11	26/ 9	27/ 9	30/ 10	34/ 10	37/ 10	39/ 10	39/ 10	38/ 10	36/ 10	32/ 10	29/ 10	26/ 10	24/ 10
13	21/ 10	22/ 10	24/ 10	27/ 10	30/ 10	31/ 10	31/ 10	31/ 10	29/ 10	26/ 10	23/ 10	21/ 10	20/ 10
15	17/ 10	18/ 10	20/ 10	22/ 10	24/ 10	25/ 10	25/ 10	25/ 10	23/ 10	21/ 10	19/ 10	17/ 10	16/ 10
17	14/ 10	15/ 10	16/ 10	18/ 10	20/ 10	21/ 10	21/ 10	21/ 10	19/ 10	17/ 10	15/ 10	14/ 10	13/ 10
19	12/ 10	12/ 10	14/ 10	15/ 10	17/ 10	18/ 10	18/ 10	18/ 10	16/ 10	15/ 10	13/ 10	11/ 10	11/ 10
21	10/ 10	11/ 10	12/ 10	13/ 10	14/ 10	15/ 10	15/ 10	15/ 10	14/ 10	12/ 10	11/ 10	10/ 10	09/ 10
10	7	37/ 7	39/ 7	44/ 6	50/ 6	55/ 6	57/ 6	57/ 7	49/ 10	42/ 10	35/ 10	29/ 10	27/ 10
9	33/ 7	35/ 7	39/ 7	43/ 7	47/ 7	47/ 8	48/ 8	46/ 10	46/ 10	40/ 10	34/ 10	26/ 10	24/ 10
11	28/ 8	29/ 8	32/ 8	35/ 9	38/ 10	39/ 10	39/ 10	37/ 10	33/ 10	29/ 10	24/ 10	21/ 10	19/ 10
13	23/ 10	23/ 10	26/ 10	28/ 10	30/ 10	30/ 10	31/ 10	29/ 10	27/ 10	23/ 10	20/ 10	17/ 10	15/ 10
15	18/ 11	19/ 10	21/ 10	23/ 10	25/ 10	26/ 10	26/ 10	25/ 10	24/ 10	19/ 10	16/ 10	14/ 10	13/ 10
17	15/ 11	16/ 11	17/ 10	19/ 10	20/ 10	20/ 10	21/ 10	20/ 10	18/ 10	16/ 10	13/ 10	11/ 10	10/ 10
19	13/ 11	13/ 11	14/ 11	16/ 10	17/ 10	17/ 10	18/ 10	17/ 10	15/ 10	13/ 10	11/ 10	09/ 10	09/ 10
21	11/ 11	11/ 11	12/ 11	13/ 10	15/ 10	15/ 10	15/ 10	14/ 10	13/ 10	11/ 10	09/ 10	08/ 10	07/ 10
15	7	39/ 7	41/ 7	46/ 6	52/ 6	56/ 7	57/ 10	55/ 10	44/ 10	36/ 10	28/ 10	21/ 10	18/ 10
9	35/ 7	37/ 7	40/ 7	44/ 7	47/ 7	47/ 8	48/ 10	46/ 10	42/ 10	37/ 10	30/ 10	24/ 10	21/ 10
11	29/ 8	30/ 8	33/ 8	36/ 8	38/ 10	38/ 10	37/ 10	34/ 10	29/ 10	24/ 10	19/ 10	15/ 10	13/ 14
13	24/ 8	24/ 9	27/ 10	29/ 10	31/ 10	31/ 10	30/ 10	27/ 10	24/ 10	20/ 10	16/ 10	12/ 14	11/ 14
15	19/ 11	20/ 11	22/ 10	24/ 10	25/ 10	25/ 10	25/ 10	24/ 10	20/ 10	16/ 10	13/ 10	10/ 14	09/ 14
17	16/ 12	16/ 12	18/ 11	20/ 10	21/ 10	21/ 10	21/ 10	20/ 10	19/ 10	16/ 10	11/ 14	09/ 14	08/ 17
19	13/ 13	14/ 12	15/ 12	16/ 10	17/ 10	17/ 10	18/ 10	16/ 10	14/ 10	11/ 10	09/ 14	07/ 17	07/ 17
21	11/ 13	12/ 13	13/ 12	14/ 11	15/ 10	15/ 10	15/ 10	13/ 10	12/ 10	10/ 10	08/ 17	06/ 17	06/ 17
20	7	43/ 7	43/ 7	48/ 6	53/ 6	56/ 7	56/ 7	53/ 7	39/ 13	30/ 13	21/ 13	14/ 13	11/ 13
9	37/ 7	38/ 7	42/ 7	45/ 7	47/ 7	47/ 8	47/ 8	44/ 8	37/ 13	25/ 13	18/ 13	13/ 13	10/ 13
11	30/ 8	31/ 8	34/ 8	37/ 8	38/ 8	38/ 9	36/ 9	32/ 13	27/ 13	21/ 13	15/ 13	11/ 19	09/ 19
13	25/ 8	25/ 8	28/ 9	30/ 10	31/ 10	31/ 10	29/ 10	26/ 13	22/ 13	17/ 13	13/ 13	09/ 19	08/ 19
15	20/ 11	21/ 11	23/ 10	24/ 10	25/ 10	25/ 10	24/ 13	21/ 13	18/ 13	14/ 13	11/ 19	08/ 19	07/ 19
17	17/ 13	17/ 13	19/ 12	20/ 11	21/ 13	21/ 13	20/ 13	18/ 13	15/ 13	12/ 19	09/ 19	07/ 23	06/ 23
19	14/ 13	14/ 13	16/ 13	17/ 13	18/ 13	18/ 13	17/ 13	15/ 13	13/ 19	10/ 19	08/ 19	06/ 23	05/ 23
21	12/ 14	12/ 13	13/ 13	14/ 13	15/ 13	15/ 13	14/ 13	13/ 19	11/ 19	09/ 19	07/ 23	05/ 23	05/ 23
25	7	43/ 7	43/ 7	48/ 6	53/ 6	56/ 6	56/ 9	53/ 9	38/ 9	28/ 9	19/ 17	12/ 17	09/ 17
9	37/ 7	39/ 7	42/ 7	46/ 9	48/ 9	47/ 9	44/ 9	40/ 9	31/ 17	24/ 17	16/ 17	11/ 17	08/ 17
11	31/ 8	32/ 8	35/ 9	37/ 9	39/ 9	38/ 9	36/ 17	31/ 17	26/ 17	20/ 17	14/ 17	09/ 17	07/ 17
13	25/ 9	26/ 9	28/ 9	30/ 9	31/ 9	31/ 9	29/ 17	26/ 17	21/ 17	16/ 17	12/ 17	08/ 17	07/ 17
15	21/ 9	21/ 9	23/ 10	25/ 10	26/ 10	26/ 10	25/ 17	21/ 17	18/ 17	14/ 17	10/ 17	07/ 17	06/ 17
17	17/ 13	18/ 13	19/ 13	20/ 13	20/ 13	21/ 13	20/ 17	18/ 17	15/ 17	12/ 17	09/ 17	06/ 17	05/ 17
19	14/ 14	15/ 13	16/ 13	17/ 13	18/ 17	18/ 17	17/ 17	15/ 17	13/ 17	10/ 17	08/ 17	05/ 17	05/ 17

ASR

SHORTCRESTED
RMS VER DISP IN FEET/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
DE
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	39/7	38/7	38/7	38/7	38/7	38/6	38/7	38/7	39/7	39/7	39/7	39/7
9	42/8	41/8	40/8	39/8	38/8	37/8	36/8	37/8	38/8	39/8	40/8	41/8	41/8
11	40/10	39/10	38/10	37/10	35/10	34/10	34/10	34/10	35/10	37/10	38/10	39/10	39/10
13	37/12	36/12	35/12	34/12	33/13	32/13	31/13	32/13	33/13	34/13	35/12	36/12	36/12
15	34/14	34/14	33/14	32/14	31/14	30/14	29/15	29/15	30/15	32/14	33/14	34/14	34/14
17	32/16	31/16	30/16	29/15	28/16	28/16	28/16	28/16	29/16	30/16	31/16	31/16	32/16
19	30/18	30/18	29/18	29/18	28/18	27/18	27/18	27/18	28/18	29/18	29/18	30/18	30/18
21	28/21	28/21	28/21	28/21	27/21	27/21	27/21	27/21	27/21	28/21	28/21	29/21	29/21
8	7	41/7	40/7	39/7	38/7	37/7	36/7	35/8	34/8	33/9	32/9	32/9	32/9
9	45/8	44/8	43/8	41/8	39/8	37/8	35/9	34/10	34/10	35/10	35/10	36/10	36/10
11	42/10	42/10	40/10	38/10	36/10	34/10	33/11	33/11	33/11	34/11	34/12	35/12	35/12
13	38/12	38/12	37/12	35/13	33/13	32/13	31/13	31/13	31/13	32/13	33/13	33/13	33/13
15	35/14	35/14	34/14	33/14	31/14	30/14	29/15	29/15	29/15	30/15	31/15	31/15	32/15
17	33/16	32/16	32/16	31/16	29/16	29/17	28/17	28/17	29/17	29/17	29/17	30/17	30/17
19	31/18	31/18	30/18	29/18	28/18	28/18	27/18	27/19	27/19	28/20	28/20	29/20	29/20
21	29/21	29/21	29/21	28/21	27/21	27/21	27/21	27/21	27/22	28/22	28/22	28/22	28/22
10	7	40/7	40/7	39/7	37/7	36/7	34/7	32/10	31/13	29/13	28/13	27/13	27/13
9	46/8	45/8	44/8	42/8	39/8	37/8	35/10	33/13	32/13	32/13	32/13	31/13	31/13
11	43/9	43/9	42/10	39/10	37/10	35/10	33/12	32/13	31/13	30/13	32/13	32/13	32/13
13	40/12	39/12	38/12	36/13	34/13	32/13	31/13	30/14	30/14	30/15	30/15	31/15	31/15
15	36/14	36/14	35/14	33/14	32/14	30/15	29/16	29/16	29/16	29/17	29/17	30/17	30/17
17	33/16	33/16	32/16	31/16	30/17	29/18	28/18	28/18	28/18	28/18	28/19	29/20	29/20
19	31/18	31/18	30/18	30/18	29/18	28/18	27/18	27/20	27/21	27/21	28/21	28/22	28/22
21	30/21	30/21	29/21	29/21	28/21	27/21	27/21	26/22	26/22	27/22	27/23	27/23	27/24
15	7	40/7	40/7	39/7	38/7	36/7	34/10	32/14	29/14	27/14	25/14	24/14	23/20
9	48/8	47/8	46/8	44/8	41/8	38/8	35/10	33/14	31/14	29/17	28/17	28/17	28/17
11	46/8	45/8	43/8	41/10	39/10	36/10	33/14	30/17	30/17	29/20	29/20	29/20	29/20
13	41/13	41/13	40/13	38/13	35/13	33/14	31/14	30/17	29/17	29/20	29/20	29/20	29/20
15	38/14	37/14	36/14	35/14	33/14	31/14	29/17	28/17	28/20	28/20	28/20	28/20	28/20
17	35/16	34/16	33/16	32/16	31/17	29/17	28/17	27/20	27/20	27/20	27/20	28/20	28/20
19	32/18	32/18	31/18	30/18	29/18	28/20	27/21	27/21	27/20	27/20	27/20	28/20	28/20
21	31/21	31/21	30/21	29/21	28/21	27/21	27/21	26/22	26/23	26/24	26/25	27/25	27/25
20	7	40/8	40/8	40/8	39/8	37/13	35/13	32/13	29/13	26/13	24/13	23/13	22/13
9	51/8	51/8	49/8	47/8	44/8	40/8	38/13	33/13	30/13	28/13	27/13	27/27	27/27
11	49/8	49/8	47/8	44/8	41/8	38/13	34/13	32/13	30/23	29/23	28/23	28/23	28/23
13	44/8	44/8	42/8	40/13	37/13	35/13	33/13	30/23	28/23	27/26	27/26	27/26	27/26
15	40/14	40/14	38/14	37/14	34/14	32/13	30/19	28/23	27/23	27/26	27/26	27/26	27/26
17	37/16	36/16	35/16	34/16	32/17	30/19	28/23	26/26	26/26	26/26	26/27	26/27	26/27
19	34/18	34/18	33/18	32/18	30/19	28/21	26/23	26/23	26/26	26/27	26/27	26/27	26/27
21	32/21	32/21	31/21	30/21	29/21	28/21	27/23	26/23	26/26	26/27	26/27	26/27	26/27
25	7	40/8	40/8	40/8	40/8	38/17	36/17	34/17	31/17	28/17	26/17	25/17	24/17
9	55/8	55/8	53/8	50/8	47/9	43/17	39/17	35/17	32/17	30/17	29/17	29/17	29/17
11	54/8	53/8	51/8	48/9	44/9	40/17	36/17	33/17	31/17	29/17	29/17	29/33	29/33
13	48/9	48/9	46/9	43/9	40/17	37/17	34/17	31/17	29/17	28/33	28/33	28/33	28/33
15	43/9	43/9	41/14	39/14	37/17	34/17	31/17	29/17	28/33	28/33	28/33	28/33	28/33
17	39/16	39/16	36/16	36/17	34/17	32/17	30/17	28/24	27/33	27/33	27/33	27/33	27/33
19	36/18	36/18	35/18	33/18	32/18	30/17	28/24	27/24	27/33	27/33	27/33	27/33	27/33
21	34/21	33/21	33/21	31/21	30/21	29/24	28/24	27/24	26/33	26/33	26/33	27/33	27/33

ASR

SHORTCRESTED
RMS VER VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL. AND 26.07 FT ABOVE KEEL

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7 .37/7 .35/7 .30/8 .25/9 .21/10 .18/13 .15/16 .14/18	7 .37/7 .35/7 .30/8 .25/9 .21/10 .18/13 .15/16 .13/18	7 .37/7 .34/7 .29/8 .24/9 .20/10 .17/13 .15/16 .13/18	7 .37/6 .34/7 .28/8 .23/9 .20/10 .19/11 .17/14 .15/16 .13/18	6 .38/6 .33/7 .27/8 .23/10 .19/11 .16/14 .14/16 .13/18	6 .39/6 .33/7 .27/8 .22/10 .19/12 .16/14 .14/16 .12/18	6 .39/6 .33/7 .27/8 .22/10 .19/12 .16/14 .14/16 .12/18	6 .39/6 .33/7 .27/8 .22/10 .19/12 .16/14 .14/16 .12/18	6 .39/6 .34/7 .28/8 .23/10 .19/11 .17/13 .15/14 .13/17 .11/19	6 .39/6 .34/7 .28/8 .23/10 .19/11 .17/13 .15/14 .13/17 .11/19	6 .39/6 .34/7 .28/8 .23/10 .19/11 .17/13 .15/14 .13/17 .11/19	7 .38/7 .35/7 .30/8 .25/9 .21/10 .18/13 .15/16 .13/18	7 .38/7 .35/7 .30/8 .25/9 .21/10 .18/13 .15/16 .13/18
8	7 .46/7 .44/7 .37/7 .31/8 .26/8 .22/11 .18/14 .16/18	7 .45/7 .44/7 .37/7 .31/8 .26/8 .22/11 .18/14 .16/18	7 .44/7 .42/7 .36/7 .29/8 .24/10 .21/13 .18/16 .16/18	7 .43/7 .40/7 .34/7 .28/8 .23/10 .20/13 .17/16 .15/18	7 .41/7 .38/7 .31/7 .26/10 .22/11 .18/14 .16/16 .14/18	6 .39/6 .35/7 .29/7 .24/10 .20/12 .17/14 .15/16 .13/18	6 .37/6 .32/7 .26/9 .22/10 .18/13 .16/14 .14/16 .12/18	6 .34/6 .29/8 .24/10 .20/11 .17/13 .15/14 .13/17 .11/19	6 .31/7 .26/9 .23/10 .19/11 .17/13 .15/14 .13/17 .11/19	8 .29/8 .26/9 .22/10 .19/11 .17/13 .15/14 .13/17 .11/19	9 .27/9 .25/10 .22/10 .19/11 .17/13 .15/14 .13/17 .11/19	9 .25/9 .24/10 .21/10 .18/11 .16/13 .14/14 .12/17 .11/19	9 .24/9 .24/10 .21/10 .18/11 .16/13 .14/14 .12/17 .11/19
10	7 .50/7 .51/7 .43/8 .36/8 .30/8 .25/8 .21/14 .18/18	7 .49/7 .50/7 .43/7 .36/7 .30/8 .25/8 .21/14 .18/18	7 .48/7 .48/7 .41/7 .34/7 .28/8 .24/10 .21/13 .18/16	7 .46/7 .45/7 .38/7 .32/8 .26/10 .22/11 .18/14 .16/16	7 .44/7 .41/7 .35/7 .29/8 .24/10 .20/12 .17/14 .15/18	7 .40/7 .37/7 .31/7 .26/10 .22/11 .18/14 .16/16	7 .36/7 .32/7 .27/8 .22/10 .18/13 .16/14 .14/16	7 .31/6 .28/7 .23/12 .19/13 .15/13 .13/16 .12/18	7 .27/6 .24/13 .20/13 .17/13 .15/13 .13/14 .12/16	7 .23/13 .21/13 .18/13 .16/13 .15/13 .13/14 .12/16	7 .19/13 .18/13 .16/13 .15/13 .14/14 .12/17 .11/19	7 .17/13 .16/13 .15/13 .14/13 .12/15 .11/17 .10/19	7 .16/13 .15/13 .14/13 .12/15 .11/17 .10/19 .09/21
15	9 .53/7 .58/8 .50/8 .42/8 .34/8 .29/8 .24/8 .21/8	7 .53/7 .58/8 .50/8 .42/8 .34/8 .29/8 .24/8 .21/8	7 .52/7 .55/8 .47/8 .39/8 .32/8 .27/8 .23/8 .20/8	7 .50/7 .51/7 .44/8 .36/8 .30/8 .25/8 .21/8 .18/18	7 .47/7 .47/7 .39/8 .33/8 .27/8 .23/8 .19/16	7 .43/7 .41/7 .34/7 .28/7 .24/8 .20/14 .17/14	7 .37/7 .35/7 .29/7 .24/10 .20/14 .17/14 .15/17	7 .31/7 .28/7 .24/10 .20/14 .17/14 .15/17 .13/17	7 .25/6 .22/10 .19/14 .16/14 .14/17 .12/20 .11/20	7 .22/10 .19/14 .16/14 .14/17 .12/20 .11/20 .10/20	7 .19/10 .18/14 .15/17 .13/17 .12/20 .11/20 .10/20	7 .12/17 .11/17 .11/20 .10/20 .09/20 .08/20 .08/20	7 .10/14 .11/17 .11/20 .10/20 .09/20 .08/20 .08/20
20	7 .56/8 .66/8 .59/8 .49/8 .40/8 .34/8 .28/8 .24/8	8 .56/8 .66/8 .59/8 .49/8 .40/8 .34/8 .28/8 .24/8	8 .55/8 .63/8 .55/8 .46/8 .38/8 .31/8 .26/8 .23/8	8 .53/8 .58/8 .51/8 .45/8 .37/8 .31/8 .26/8 .22/8	7 .50/7 .53/8 .46/8 .39/8 .32/8 .27/8 .23/8 .19/18	7 .45/7 .46/8 .38/7 .32/8 .26/8 .22/8 .19/16	7 .40/7 .38/7 .32/8 .26/8 .22/8 .19/16 .16/19	7 .33/7 .30/7 .25/7 .21/3 .16/13 .14/13 .12/23 .10/23	7 .25/7 .23/13 .19/13 .16/13 .14/13 .12/23 .10/23	7 .18/13 .16/13 .14/13 .12/23 .10/23 .09/20 .08/20	7 .12/13 .12/13 .11/23 .09/23 .08/26 .07/26 .07/26	7 .08/13 .08/23 .08/23 .08/26 .07/26 .07/26 .07/27	7 .07/13 .08/13 .08/23 .08/23 .07/26 .07/26 .06/27
25	7 .58/8 .69/8 .57/8 .47/8 .39/8 .32/8 .28/8 .24/8	8 .58/8 .69/8 .57/8 .47/8 .39/8 .32/8 .28/8 .24/8	8 .57/8 .64/8 .54/8 .44/8 .36/8 .30/8 .25/8 .21/8	8 .56/8 .66/8 .59/8 .49/8 .40/8 .34/8 .28/8 .24/8	8 .53/8 .60/8 .52/8 .45/8 .37/8 .31/8 .26/8 .22/8	8 .48/7 .52/8 .45/8 .38/7 .32/8 .27/8 .23/8 .19/17	8 .43/7 .43/8 .36/8 .30/8 .25/8 .21/7 .15/17	8 .35/7 .33/7 .28/8 .23/17 .17/17 .14/17 .12/17	8 .26/9 .24/17 .20/17 .17/17 .14/17 .12/17 .11/17	8 .18/17 .16/17 .14/17 .12/17 .10/24 .08/33	8 .12/17 .11/17 .09/17 .08/33 .07/33 .06/33 .06/33	8 .08/17 .07/17 .07/17 .06/33 .06/33 .06/33 .06/33	8 .06/17 .06/17 .06/17 .06/33 .06/33 .06/33 .06/33

ASR

SHORTCRESTED
RMS VER ACC IN G'S/ENCOUNTERED MODAL PERIOD, T, IN SECONDS
QE

(ACC. X 100)
ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.07 FT ABOVE KEEL

V TO		SHIP HEADING ANGLE IN DEGREES										165	180	
		0	15	30	45	60	75	90	105	120	135			150
0	7	1.13/ 6	1.14/ 6	1.16/ 6	1.21/ 6	1.26/ 6	1.31/ 6	1.34/ 6	1.35/ 6	1.33/ 6	1.29/ 6	1.24/ 6	1.20/ 6	1.18/ 6
9	9	.97/ 7	.97/ 7	.98/ 7	.99/ 6	1.00/ 6	1.03/ 6	1.03/ 6	1.04/ 6	1.04/ 6	1.03/ 6	1.02/ 7	1.00/ 7	.99/ 7
11	11	.77/ 7	.77/ 7	.76/ 7	.77/ 6	.77/ 6	.78/ 6	.78/ 6	.78/ 6	.79/ 6	.79/ 7	.79/ 7	.79/ 7	.78/ 7
13	13	.61/ 7	.61/ 7	.60/ 7	.59/ 6	.59/ 6	.60/ 6	.60/ 6	.60/ 6	.61/ 6	.61/ 7	.62/ 7	.62/ 7	.62/ 7
15	15	.49/ 7	.48/ 7	.47/ 7	.47/ 7	.47/ 7	.47/ 6	.47/ 6	.47/ 6	.48/ 7	.48/ 7	.49/ 7	.49/ 7	.49/ 7
17	17	.39/ 7	.39/ 7	.38/ 7	.38/ 7	.38/ 7	.38/ 6	.38/ 6	.38/ 6	.39/ 7	.39/ 7	.39/ 7	.40/ 7	.40/ 7
19	19	.33/ 7	.33/ 7	.32/ 7	.31/ 7	.31/ 7	.31/ 6	.31/ 6	.31/ 6	.32/ 7	.32/ 7	.33/ 7	.33/ 7	.33/ 7
21	21	.27/ 7	.27/ 7	.26/ 7	.26/ 7	.26/ 7	.26/ 6	.26/ 6	.26/ 6	.27/ 7	.27/ 7	.27/ 7	.27/ 7	.27/ 7
5	7	1.63/ 7	1.62/ 7	1.59/ 6	1.55/ 6	1.49/ 6	1.39/ 6	1.28/ 6	1.15/ 6	1.00/ 6	.87/ 6	.75/ 6	.65/ 6	.62/ 6
9	9	1.45/ 7	1.44/ 7	1.39/ 7	1.33/ 7	1.24/ 7	1.13/ 6	1.01/ 6	.89/ 6	.78/ 6	.69/ 6	.61/ 6	.56/ 6	.54/ 6
11	11	1.15/ 7	1.14/ 7	1.10/ 7	1.04/ 7	.96/ 7	.87/ 7	.77/ 6	.68/ 6	.60/ 6	.53/ 6	.48/ 6	.45/ 6	.44/ 6
13	13	.90/ 7	.89/ 7	.86/ 7	.81/ 7	.74/ 7	.67/ 7	.60/ 7	.53/ 6	.47/ 6	.42/ 6	.39/ 6	.36/ 6	.36/ 6
15	15	.71/ 7	.70/ 7	.68/ 7	.64/ 7	.59/ 7	.53/ 7	.47/ 7	.42/ 6	.37/ 6	.34/ 6	.31/ 6	.30/ 6	.30/ 6
17	17	.57/ 7	.57/ 7	.54/ 7	.51/ 7	.47/ 7	.43/ 7	.38/ 7	.34/ 7	.30/ 7	.27/ 6	.26/ 6	.24/ 6	.24/ 6
19	19	.47/ 7	.46/ 7	.45/ 7	.42/ 7	.39/ 7	.35/ 7	.31/ 7	.28/ 7	.25/ 6	.23/ 6	.21/ 6	.20/ 6	.20/ 6
21	21	.39/ 7	.39/ 7	.37/ 7	.35/ 7	.32/ 7	.29/ 7	.26/ 7	.23/ 6	.21/ 6	.19/ 6	.18/ 6	.17/ 6	.17/ 6
10	7	1.98/ 7	1.96/ 7	1.91/ 7	1.83/ 7	1.70/ 7	1.53/ 7	1.33/ 6	1.10/ 6	.87/ 6	.66/ 6	.49/ 6	.37/ 6	.32/ 6
9	9	1.87/ 7	1.84/ 7	1.77/ 7	1.65/ 7	1.49/ 7	1.30/ 7	1.10/ 7	.89/ 6	.69/ 6	.52/ 6	.40/ 6	.32/ 6	.29/ 6
11	11	1.51/ 7	1.48/ 7	1.42/ 7	1.31/ 7	1.18/ 7	1.02/ 7	.85/ 7	.68/ 7	.53/ 6	.41/ 6	.32/ 6	.27/ 6	.27/ 6
13	13	1.18/ 7	1.16/ 7	1.11/ 7	1.02/ 7	.92/ 7	.79/ 7	.66/ 7	.53/ 7	.41/ 6	.32/ 6	.26/ 6	.21/ 6	.21/ 6
15	15	.94/ 7	.92/ 7	.88/ 7	.81/ 7	.72/ 7	.62/ 7	.52/ 7	.42/ 6	.33/ 6	.26/ 6	.21/ 6	.18/ 6	.18/ 6
17	17	.75/ 7	.74/ 7	.70/ 7	.65/ 7	.58/ 7	.50/ 7	.42/ 7	.34/ 7	.27/ 6	.21/ 6	.18/ 6	.16/ 6	.16/ 6
19	19	.62/ 7	.61/ 7	.58/ 7	.53/ 7	.48/ 7	.41/ 7	.34/ 7	.28/ 7	.22/ 6	.18/ 6	.15/ 6	.13/ 6	.13/ 6
21	21	.51/ 7	.50/ 7	.48/ 7	.44/ 7	.40/ 7	.34/ 7	.29/ 7	.23/ 7	.19/ 6	.15/ 6	.13/ 6	.12/ 6	.12/ 6
15	7	2.30/ 7	2.27/ 7	2.21/ 7	2.10/ 7	1.94/ 7	1.72/ 7	1.46/ 7	1.17/ 6	.87/ 6	.60/ 6	.38/ 6	.23/ 6	.18/ 6
9	9	2.32/ 7	2.29/ 7	2.18/ 7	2.02/ 7	1.81/ 7	1.55/ 7	1.27/ 7	.98/ 7	.71/ 6	.48/ 6	.31/ 6	.20/ 6	.16/ 6
11	11	1.91/ 7	1.87/ 7	1.78/ 7	1.64/ 7	1.45/ 7	1.23/ 7	.99/ 7	.76/ 7	.55/ 7	.37/ 6	.24/ 6	.17/ 6	.14/ 6
13	13	1.51/ 8	1.48/ 8	1.40/ 7	1.29/ 7	1.13/ 7	.96/ 7	.77/ 7	.59/ 7	.43/ 7	.29/ 6	.20/ 6	.14/ 6	.13/ 6
15	15	1.19/ 8	1.17/ 8	1.11/ 7	1.02/ 7	.89/ 7	.76/ 7	.61/ 7	.47/ 7	.34/ 7	.23/ 6	.16/ 6	.12/ 6	.12/ 6
17	17	.95/ 8	.94/ 8	.89/ 8	.82/ 7	.72/ 7	.61/ 7	.49/ 7	.37/ 7	.27/ 7	.19/ 6	.14/ 6	.11/ 6	.11/ 6
19	19	.79/ 8	.77/ 8	.73/ 8	.67/ 7	.59/ 7	.50/ 7	.40/ 7	.31/ 7	.23/ 7	.16/ 6	.12/ 6	.09/ 6	.09/ 6
21	21	.65/ 8	.64/ 8	.61/ 8	.56/ 7	.49/ 7	.41/ 7	.33/ 7	.26/ 7	.19/ 7	.14/ 6	.10/ 6	.08/ 6	.08/ 6
20	7	2.53/ 8	2.51/ 8	2.45/ 8	2.34/ 7	2.17/ 7	1.93/ 7	1.63/ 7	1.29/ 7	.94/ 7	.62/ 6	.35/ 6	.18/ 6	.12/ 6
9	9	2.80/ 8	2.76/ 8	2.63/ 8	2.43/ 8	2.17/ 8	1.85/ 7	1.50/ 7	1.14/ 7	.79/ 7	.50/ 7	.28/ 6	.15/ 6	.10/ 6
11	11	2.37/ 8	2.33/ 8	2.21/ 8	2.02/ 8	1.78/ 8	1.49/ 8	1.19/ 8	.89/ 7	.61/ 7	.39/ 7	.22/ 6	.12/ 6	.09/ 6
13	13	1.89/ 8	1.85/ 8	1.76/ 8	1.60/ 8	1.40/ 8	1.17/ 8	.93/ 7	.69/ 7	.48/ 7	.30/ 7	.17/ 6	.10/ 6	.08/ 6
15	15	1.51/ 8	1.48/ 8	1.40/ 8	1.27/ 8	1.11/ 8	.92/ 8	.73/ 7	.54/ 7	.38/ 7	.24/ 7	.14/ 6	.09/ 6	.07/ 6
17	17	1.21/ 8	1.19/ 8	1.13/ 8	1.02/ 8	.89/ 8	.74/ 8	.59/ 7	.44/ 7	.30/ 7	.19/ 6	.12/ 6	.08/ 6	.07/ 6
19	19	.98/ 8	.97/ 8	.92/ 8	.84/ 8	.76/ 8	.61/ 8	.48/ 8	.36/ 7	.25/ 7	.16/ 6	.10/ 6	.07/ 6	.06/ 6
21	21	.82/ 8	.81/ 8	.76/ 8	.69/ 8	.61/ 8	.50/ 8	.40/ 8	.30/ 7	.21/ 7	.14/ 6	.09/ 6	.06/ 6	.05/ 6
25	7	2.69/ 8	2.69/ 8	2.64/ 8	2.54/ 8	2.37/ 8	2.13/ 7	1.81/ 7	1.44/ 7	1.05/ 7	.68/ 6	.37/ 6	.19/ 6	.15/ 6
9	9	3.31/ 8	3.26/ 8	3.11/ 8	2.87/ 8	2.55/ 8	2.17/ 8	1.75/ 8	1.32/ 7	.91/ 7	.56/ 6	.29/ 6	.14/ 6	.11/ 6
11	11	2.90/ 8	2.85/ 8	2.70/ 8	2.46/ 8	2.16/ 8	1.80/ 8	1.42/ 8	1.05/ 8	.71/ 7	.43/ 7	.22/ 6	.11/ 6	.08/ 6
13	13	2.35/ 8	2.30/ 8	2.19/ 8	1.97/ 8	1.72/ 8	1.42/ 8	1.12/ 8	.82/ 8	.55/ 7	.33/ 7	.17/ 6	.09/ 6	.07/ 6
15	15	1.88/ 8	1.84/ 8	1.74/ 8	1.57/ 8	1.37/ 8	1.13/ 8	.88/ 8	.64/ 8	.43/ 7	.26/ 7	.14/ 6	.08/ 6	.06/ 6
17	17	1.52/ 8	1.49/ 8	1.40/ 8	1.27/ 8	1.10/ 8	.91/ 8	.71/ 8	.52/ 8	.35/ 7	.21/ 7	.12/ 6	.07/ 6	.05/ 6
19	19	1.24/ 8	1.22/ 8	1.15/ 8	1.04/ 8	.90/ 8	.74/ 8	.58/ 8	.42/ 8	.28/ 7	.17/ 7	.10/ 6	.06/ 6	.05/ 6

ASR

RMS LON DISP IN FEET/ENCOUNTERED MODAL PERIOD, T_{OE}, IN SECONDS
 ROLLER CHOCK - 8.0 FT AFT OF AP, ON CL, AND 26.0 FT ABOVE KEEL

V	T ₀	SHIP HEADING ANGLE IN DEGREES											180
		0	15	30	45	60	75	90	105	120	135	150	165
0	7	.05/ 8	.05/ 8	.05/ 8	.04/ 8	.04/ 8	.04/ 8	.04/ 8	.04/ 8	.04/ 8	.04/ 8	.04/ 8	.04/ 8
	9	.08/10	.08/10	.07/10	.07/10	.06/10	.05/10	.05/10	.05/10	.05/10	.05/10	.06/10	.06/10
	11	.10/12	.10/12	.09/12	.09/12	.08/12	.07/12	.06/12	.06/12	.07/12	.07/12	.08/12	.08/12
	13	.12/14	.12/14	.11/14	.11/14	.10/14	.09/14	.07/14	.07/14	.07/14	.08/14	.09/14	.09/14
	15	.13/16	.13/16	.12/16	.11/16	.10/16	.09/16	.08/16	.07/16	.07/16	.08/16	.09/16	.10/16
	17	.14/18	.14/18	.13/18	.12/18	.11/18	.10/18	.09/18	.08/18	.08/18	.09/18	.10/18	.11/18
	19	.15/20	.15/20	.14/20	.13/20	.12/20	.11/20	.10/20	.09/20	.09/20	.10/20	.11/20	.11/20
	21	.16/22	.16/22	.15/22	.14/22	.13/22	.12/22	.11/22	.10/22	.09/22	.10/22	.11/22	.12/22
8	7	.04/ 7	.04/ 7	.04/ 7	.04/ 6	.04/ 6	.04/ 8	.04/ 9	.04/10	.05/10	.06/10	.07/10	.07/10
	9	.06/10	.06/10	.06/10	.05/10	.05/10	.05/10	.05/11	.05/11	.05/11	.05/11	.06/11	.06/11
	11	.08/13	.08/13	.07/13	.06/13	.06/13	.05/12	.05/12	.05/12	.05/12	.05/12	.06/12	.06/12
	13	.09/14	.09/14	.08/14	.08/14	.07/14	.06/14	.06/14	.06/14	.06/14	.06/14	.07/14	.07/14
	15	.10/16	.10/16	.09/16	.09/16	.08/16	.07/16	.07/16	.07/16	.07/16	.07/16	.08/16	.08/16
	17	.11/18	.11/18	.10/18	.09/18	.08/18	.07/18	.07/18	.07/18	.07/18	.07/18	.08/18	.08/18
	19	.12/21	.12/21	.11/21	.10/21	.09/21	.08/21	.08/21	.08/21	.08/21	.08/21	.09/21	.09/21
	21	.13/23	.13/23	.12/23	.11/23	.10/23	.09/23	.08/23	.08/23	.08/23	.08/23	.09/23	.09/23
10	7	.04/ 7	.04/ 7	.04/ 7	.04/ 7	.04/ 7	.05/12	.06/13	.08/13	.10/13	.12/13	.14/13	.15/13
	9	.05/10	.05/10	.05/10	.05/10	.05/11	.06/12	.08/13	.11/13	.14/13	.16/13	.19/13	.20/13
	11	.06/13	.06/13	.06/13	.06/13	.06/13	.07/13	.08/13	.10/13	.13/13	.16/13	.19/13	.20/13
	13	.07/14	.07/14	.07/14	.06/14	.06/14	.07/15	.09/15	.13/15	.16/15	.19/15	.22/15	.23/15
	15	.08/16	.08/16	.08/16	.07/16	.07/16	.08/17	.10/17	.13/17	.16/17	.19/17	.22/17	.24/16
	17	.09/18	.09/18	.09/18	.08/18	.08/18	.09/19	.11/19	.14/19	.17/19	.20/19	.23/19	.25/18
	19	.10/21	.10/21	.09/21	.08/21	.08/21	.09/22	.11/22	.14/22	.17/22	.20/22	.23/22	.25/20
	21	.11/23	.11/23	.10/23	.09/23	.09/23	.10/24	.12/24	.15/24	.18/24	.21/24	.24/24	.26/22
15	7	.04/ 7	.04/ 7	.04/ 7	.04/ 7	.05/14	.08/14	.13/14	.19/17	.26/20	.33/20	.38/20	.41/20
	9	.05/ 7	.05/ 7	.05/ 7	.05/11	.05/14	.09/14	.14/17	.20/17	.27/17	.34/20	.39/20	.43/20
	11	.05/13	.05/13	.05/13	.05/13	.06/14	.09/17	.14/17	.20/17	.26/20	.33/20	.38/20	.43/20
	13	.06/14	.06/14	.06/14	.06/14	.06/14	.09/17	.13/17	.19/20	.25/20	.31/20	.36/20	.41/20
	15	.07/16	.07/16	.07/16	.06/16	.07/17	.09/17	.13/17	.19/20	.25/20	.31/20	.36/20	.41/20
	17	.08/18	.08/18	.08/18	.07/18	.07/18	.09/17	.13/17	.19/20	.25/20	.31/20	.36/20	.41/20
	19	.09/21	.09/21	.08/21	.08/21	.08/21	.09/21	.12/20	.17/20	.22/20	.27/20	.32/20	.37/20
	21	.10/23	.10/23	.09/23	.08/23	.08/23	.09/24	.12/24	.17/24	.22/24	.27/24	.32/24	.37/24
20	7	.04/ 8	.04/ 8	.04/ 8	.04/13	.07/13	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	9	.05/ 8	.05/ 8	.04/ 8	.05/13	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	11	.05/13	.05/13	.05/13	.05/13	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	13	.06/14	.06/14	.06/14	.06/14	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	15	.07/16	.07/16	.06/16	.06/16	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	17	.08/18	.08/18	.07/18	.06/18	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	19	.09/21	.09/21	.08/21	.08/21	.08/21	.09/21	.12/20	.17/20	.22/20	.27/20	.32/20	.37/20
	21	.10/23	.10/23	.09/23	.08/23	.08/23	.09/24	.12/24	.17/24	.22/24	.27/24	.32/24	.37/24
25	7	.04/ 8	.04/ 8	.04/ 8	.06/17	.11/17	.18/17	.26/17	.33/17	.40/17	.46/17	.53/17	.54/17
	9	.05/ 8	.05/ 8	.04/ 8	.06/17	.11/17	.18/17	.26/17	.33/17	.40/17	.46/17	.53/17	.54/17
	11	.05/13	.05/13	.05/13	.05/13	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	13	.06/14	.06/14	.06/14	.06/14	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	15	.07/16	.07/16	.06/16	.06/16	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	17	.08/18	.08/18	.07/18	.06/18	.07/19	.13/19	.20/19	.27/19	.34/19	.40/39	.46/39	.49/42
	19	.09/21	.09/21	.08/21	.08/21	.08/21	.09/21	.12/20	.17/20	.22/20	.27/20	.32/20	.37/20
	21	.10/23	.10/23	.09/23	.08/23	.08/23	.09/24	.12/24	.17/24	.22/24	.27/24	.32/24	.37/24

SHORTCRESTED
RMS LOW VEL IN FPS/ENCOUNTERED MODAL PERIOD, T, IN SECONDS

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ASR

RMS LON ACC IN G'S/ENCOUNTERED MODAL PERIOD, T_{OE}, IN SECONDS
(ACC. X 100)

ROLLER CHOCK - 8.0 FT AFT OF AP, DN CL, AND 26.07 FT ABOVE KEEL

V TO	0	15	30	45	60	75	90	105	120	135	150	165	180
0	7	9	11	13	15	17	19	21	23	25	27	29	31
5	7	9	11	13	15	17	19	21	23	25	27	29	31
10	7	9	11	13	15	17	19	21	23	25	27	29	31
15	7	9	11	13	15	17	19	21	23	25	27	29	31
20	7	9	11	13	15	17	19	21	23	25	27	29	31
25	7	9	11	13	15	17	19	21	23	25	27	29	31
30	7	9	11	13	15	17	19	21	23	25	27	29	31
35	7	9	11	13	15	17	19	21	23	25	27	29	31
40	7	9	11	13	15	17	19	21	23	25	27	29	31
45	7	9	11	13	15	17	19	21	23	25	27	29	31
50	7	9	11	13	15	17	19	21	23	25	27	29	31
55	7	9	11	13	15	17	19	21	23	25	27	29	31
60	7	9	11	13	15	17	19	21	23	25	27	29	31
65	7	9	11	13	15	17	19	21	23	25	27	29	31
70	7	9	11	13	15	17	19	21	23	25	27	29	31
75	7	9	11	13	15	17	19	21	23	25	27	29	31
80	7	9	11	13	15	17	19	21	23	25	27	29	31
85	7	9	11	13	15	17	19	21	23	25	27	29	31
90	7	9	11	13	15	17	19	21	23	25	27	29	31
95	7	9	11	13	15	17	19	21	23	25	27	29	31
100	7	9	11	13	15	17	19	21	23	25	27	29	31
105	7	9	11	13	15	17	19	21	23	25	27	29	31
110	7	9	11	13	15	17	19	21	23	25	27	29	31
115	7	9	11	13	15	17	19	21	23	25	27	29	31
120	7	9	11	13	15	17	19	21	23	25	27	29	31
125	7	9	11	13	15	17	19	21	23	25	27	29	31
130	7	9	11	13	15	17	19	21	23	25	27	29	31
135	7	9	11	13	15	17	19	21	23	25	27	29	31
140	7	9	11	13	15	17	19	21	23	25	27	29	31
145	7	9	11	13	15	17	19	21	23	25	27	29	31
150	7	9	11	13	15	17	19	21	23	25	27	29	31
155	7	9	11	13	15	17	19	21	23	25	27	29	31
160	7	9	11	13	15	17	19	21	23	25	27	29	31
165	7	9	11	13	15	17	19	21	23	25	27	29	31
170	7	9	11	13	15	17	19	21	23	25	27	29	31
175	7	9	11	13	15	17	19	21	23	25	27	29	31
180	7	9	11	13	15	17	19	21	23	25	27	29	31

DTNSRDC ISSUES THREE TYPES OF REPORTS

- 1. DTNSRDC REPORTS, A FORMAL SERIES, CONTAIN INFORMATION OF PERMANENT TECHNICAL VALUE. THEY CARRY A CONSECUTIVE NUMERICAL IDENTIFICATION REGARDLESS OF THEIR CLASSIFICATION OR THE ORIGINATING DEPARTMENT.**
- 2. DEPARTMENTAL REPORTS, A SEMIFORMAL SERIES, CONTAIN INFORMATION OF A PRELIMINARY, TEMPORARY, OR PROPRIETARY NATURE OR OF LIMITED INTEREST OR SIGNIFICANCE. THEY CARRY A DEPARTMENTAL ALPHANUMERICAL IDENTIFICATION.**
- 3. TECHNICAL MEMORANDA, AN INFORMAL SERIES, CONTAIN TECHNICAL DOCUMENTATION OF LIMITED USE AND INTEREST. THEY ARE PRIMARILY WORKING PAPERS INTENDED FOR INTERNAL USE. THEY CARRY AN IDENTIFYING NUMBER WHICH INDICATES THEIR TYPE AND THE NUMERICAL CODE OF THE ORIGINATING DEPARTMENT. ANY DISTRIBUTION OUTSIDE DTNSRDC MUST BE APPROVED BY THE HEAD OF THE ORIGINATING DEPARTMENT ON A CASE-BY-CASE BASIS.**