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RESPONSE AMPLITUDE OPERATOR PREDICTIONS FOR THE USS BELKNAP (DLG-26) AND USS JOSEPH HEWES (DE 1052) CLASS DESTROYERS

T. R. Applebee, et al

Naval Ship Research and Development Center
Bethesda, Maryland

November 1974

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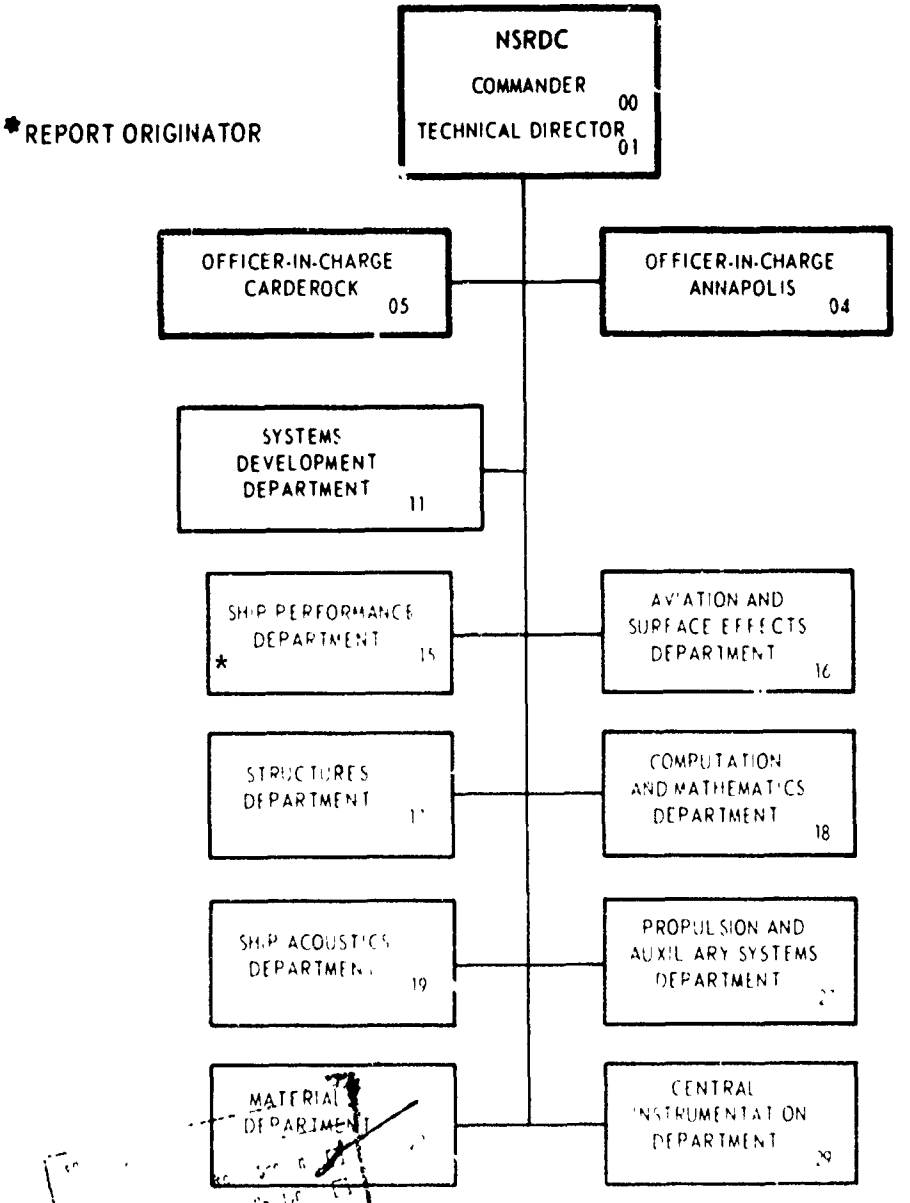

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The purpose of this investigation is to predict the response amplitude operators (squared transfer functions) for the DLG-26 and DE-1052 Class Destroyers. The response amplitude operators, RAOs, are computed for the ships in LAMPS (Light Airborne Multipurpose System) configuration and are to be used for ship motion predictions in ship/helicopter interface design. Motion response amplitude operators are presented for speeds 10 and 20 knots, at ship headings relative to the sea of 0, 30, 60, 90, 120, 150, and 180 degrees (180 degrees denoting head seas).

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by

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SHIP PERFORMANCE DEPARTMENT

November 1974

Report SPD-590-01

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NOTATION

L	Ship length
L_A	Lateral displacement
L_O	Longitudinal displacement
L_V	Vertical displacement
px, $p\theta$, $p\psi$	Phase differences, (angles) for surge, pitch, and yaw
$R(t)$	Ship response to a sinusoidal excitation
R_A	Response amplitude
S_R	Ship motion spectral density
S_ζ	Pierson-Moskowitz spectral density ordinates
t	Time variable
x^*, y^*, z^*	Coordinates of any point measured from the origin of the coordinate system
X	Surge
ε	Phase angle
λ	Wavelength
θ	Pitch
ψ	Yaw
ω	Wave frequency
ω_E	Wave frequence encounter

ABSTRACT

The purpose of this investigation is to predict the response amplitude operators (squared transfer functions) for the DLG-26 and DE-1052 Class Destroyers. The response amplitude operators, RAOs, are computed for the ships in LAMPS (Light Airborne Multipurpose System) configuration and are to be used for ship motion predictions in ship/helicopter interface design. Motion response amplitude operators are presented for speeds 10 and 20 knots, at ship headings relative to the sea of 0, 30, 60, 90, 120, 150, and 180 degrees (180 degrees denoting head seas).

ADMINISTRATIVE INFORMATION

This investigation was performed at the Naval Ship Research and Development Center (NSRDC) and authorized by the Naval Air Engineering Center (NAEC) Project Order 5-4007. It is identified as Work Unit Number 1-1568-012.

INTRODUCTION

Using a computer-implemented procedure, the ship motion response amplitude operators were predicted for the DLG-26 and DE-1052 Class Destroyers in LAMPS (Light Airborne Multipurpose System) configuration; that is, the ship conditions represent the cases for helicopter operations. Although the RAOs were computed at a single, specific point on each ship, simple transformations make it possible to obtain ship motions at any arbitrary position on the ship (for example, on the helicopter platform). The RAOs computed for

1. Ship headings of 0, 30, 60, 90, 120, 150, and 180 degrees
2. Ship speeds of 10 and 20 knots,

are presented in both tables and figures.

SHIP PARTICULARS

The ship particulars, supplied by NAVSEC Code 6136 and 6134B, and computer-fitted body plans for the DLG-26 and the DE-1078 (a member of the DE-1052 Class) are given in Tables 1 and 2, respectively. It should be noted that the ship particulars represent the ships in LAMPS (Light Airborne Multipurpose System) configuration conditions.

APPROACH

The RAOs were determined using the NSRDC Ship Motion and Sea Load Computer Program.[1] This program utilizes the calculation procedure described by Bales, Meyers, and Rossignol.[2] That is, the ship response, R, to a sinusoidal excitation of unit amplitude for a given wave encounter frequency, ω_E is taken as

$$R(t) = R_A \cos(\omega_E t - \varepsilon) \tag{1}$$

where t is the time variable, ε is the phase angle (lag with respect to the maximum wave elevation at the origin), and R_A is the response amplitude (frequency response function). Further, it should be noted that the ship motion spectral density, S_R, is

$$S_R(\omega) = [R_A(\omega)]^2 \cdot S_\zeta(\omega) \tag{2}$$

where $S_\zeta(\omega)$ is the irregular wave spectral density and $[R_A(\omega)]^2$ is the RAO. Equation 2 may be used to determine the ship motions in a seaway[2]; however, it should be noted that the realism of the predicted ship responses will be strongly affected by the model of the wave spectrum selected. It has

---

[1] Meyers, W.G., D.J. Sheridan and N. Salvesen, "Manual NSRDC Ship Motion and Sea Load Computer Program," NSRDC Report 3376 (in preparation).

[2] Bales, S.L., W.C. Meyers and G.A. Rossignol, "Helicopter Landing Platform Response Predictions of DLG-26 and DE-1040 Class Destroyers," NSRDC Report 3868, July 1973.

been established frequently by different authors that the single parameter Pierson-Moskowitz wave spectrum is an inadequate wave spectra model for many ship motion problems.[3, 4,5,6,7]

RESULTS

Tables 3 through 30 in the Appendix present the ship response amplitude operators with respect to ω_E, wave encounter frequency, λ/L, wavelength/ship length, and L/λ. The dimension of ω_E, identified as WE in tables, is radians/second. The RAOs for surge, sway, and heave are in $feet^2/feet^2$, and for roll, pitch, and yaw in $degrees^2/feet^2$. The phase angles are in degrees. Ship heading angle to the waves is defined as 180 degrees for head waves, and 150 degrees for waves approaching the ship from 30 degrees off the port bow.

The RAOs were computed at the intersection of the longitudinal centerline at the waterplane section with the transverse plane through the center of gravity. Responses at other points along the ship can be found by using the data in the tables and equations (15) of Reference 2, i.e.,

$$L_O = x - y^* \psi + z^* \theta, \text{ (longitudinal)}$$

$$L_A = y - z^* \phi + x^* \psi, \text{ (lateral)}$$

$$L_V = z - x^* \theta + y^* \phi, \text{ (vertical)} \qquad (3)$$

---

[3] Hadler, J.B. and T.H. Sarchin, "Seakeeping Criteria and Specifications," SNAME Seakeeping Symposium, Webb Institute of Naval Architecture, October 1973.

[4] Baitis, A.E., S.L. Bales and W.G. Meyers, "Design Acceleration and Ship Motions for LNG Cargo Tanks," Tenth Symposium on Naval Hydrodynamics, June 1974.

[5] Cummins, W.E., "Prediction of Seakeeping Performance," 17th American Towing Tank Conference State of the Art Report - Seakeeping, June 1974.

[6] Hoffman, D., "Analysis of Measured and Calculated Spectra," International Symposium on the Dynamics of Marine Vehicles and Structures in Waves, University College, London, April 1974.

[7] Hoffman, D., "Environmental Condition Representation," 17th American Towing Tank Conference State of the Art Report - Seakeeping, June 1974.

Equation 3 represents the linear ship responses at a point (x*, y*, z*) in a right-handed orthogonal coordinate system.

For example, the longitudinal displacement, velocity, and acceleration at a point (x*, y*, z*) on a helicopter platform is found by applying the above L_0 equation for each ω_{Ei} as follows:

1. Determine the dimensional transfer functions for surge, pitch, and yaw:

$$x_i = \sqrt{\text{Surge RAO}_i}$$

$$\theta_i = \sqrt{\text{Pitch RAO}_i}/(180/\pi)$$

$$\psi_i = \sqrt{\text{Yaw RAO}_i}/(180/\pi) \qquad (4)$$

2. Determine the phase differences for surge, pitch, and yaw (merely converting to radians):

$$px_i = (\text{Phase of surge})_i/(180/\pi)$$

$$p\theta_i = (\text{Phase of Pitch})_i/(180/\pi)$$

$$p\psi_i = (\text{Phase of Yaw})_i/(180/\pi) \qquad (5)$$

3. Determine the real and imaginary parts:

$$\text{Real} = x_i \cdot \cos(px_i) + z^* \cdot \theta_i \cdot \cos(p\theta_i) - y^* \cdot \psi \cdot \cos(p\psi_i)$$

$$\text{Imaginary} = x_i \cdot \sin(px_i) + z^* \cdot \theta_i \cdot \sin(p\theta_i) - y^* \cdot \psi \cdot \sin(p\psi_i) \qquad (6)$$

4. Determine the amplitude and phase of linear displacement:

$$(\text{Displacement Amplitude})_i = \sqrt{(\text{Real})^2 + (\text{Imaginary})^2}$$

$$(\text{Displacement Phase})_i = \text{Arctan (Imaginary/Real)} \qquad (7)$$

5. Determine the amplitude and phase of linear velocity:

$$(\text{Velocity Amplitude})_i = \omega_{Ei}\ (\text{Displacement Amplitude})_i$$

$$(\text{Velocity Phase})_i = (\text{Displacement Phase})_i + \pi/2 \qquad (8)$$

6. Determine the amplitude and phase of linear acceleration:

$$(\text{Acceleration Amplitude})_i = \omega_{Ei}\ (\text{Velocity Amplitude})_i/g$$

$$(\text{Acceleration Phase})_i = (\text{Velocity Phase})_i + \pi/2 \qquad (9)$$

where g is the acceleration of gravity.

It should be noted that the amplitude results, for each ω_{Ei}, of steps 4, 5, and 6 are in the form of dimensional transfer functions. Hence, the values should be squared in order to determine the RAOs at point (x*, y*, z*). Also, by definition, x* is positive aft, y* is positive starboard, and z* is positive upward. Further details are given in References 1 and 2.

Figures 1 through 4 present plots of the RAOs across wave frequency ω. Figures 1 and 2 present the curves for the DLG-26 at 10 and 20 knots, respectively, across all headings. Figures 3 and 4 present the DE-1078 plots in an identical manner.

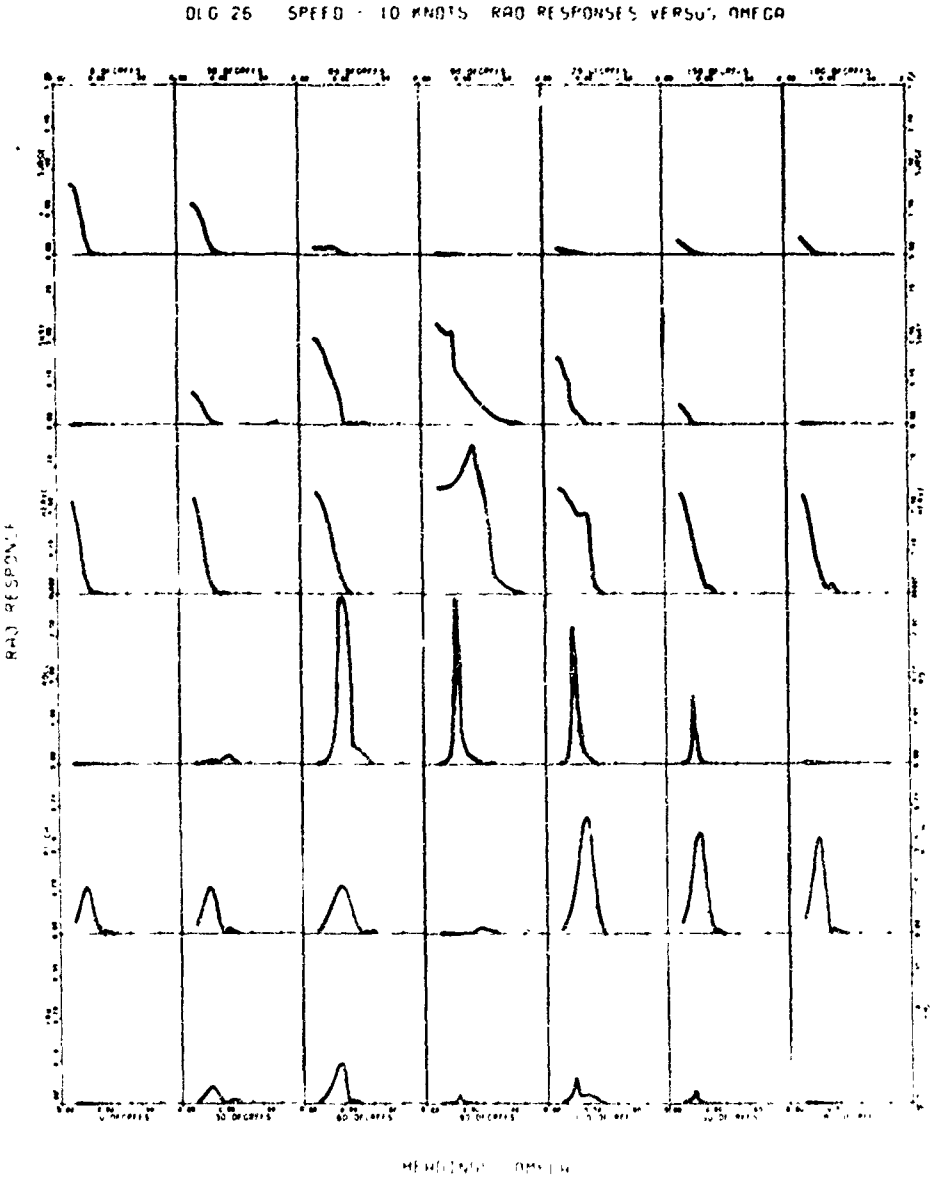

Figure 1 - DLG-26 Response Amplitude Operators, 10 Knots

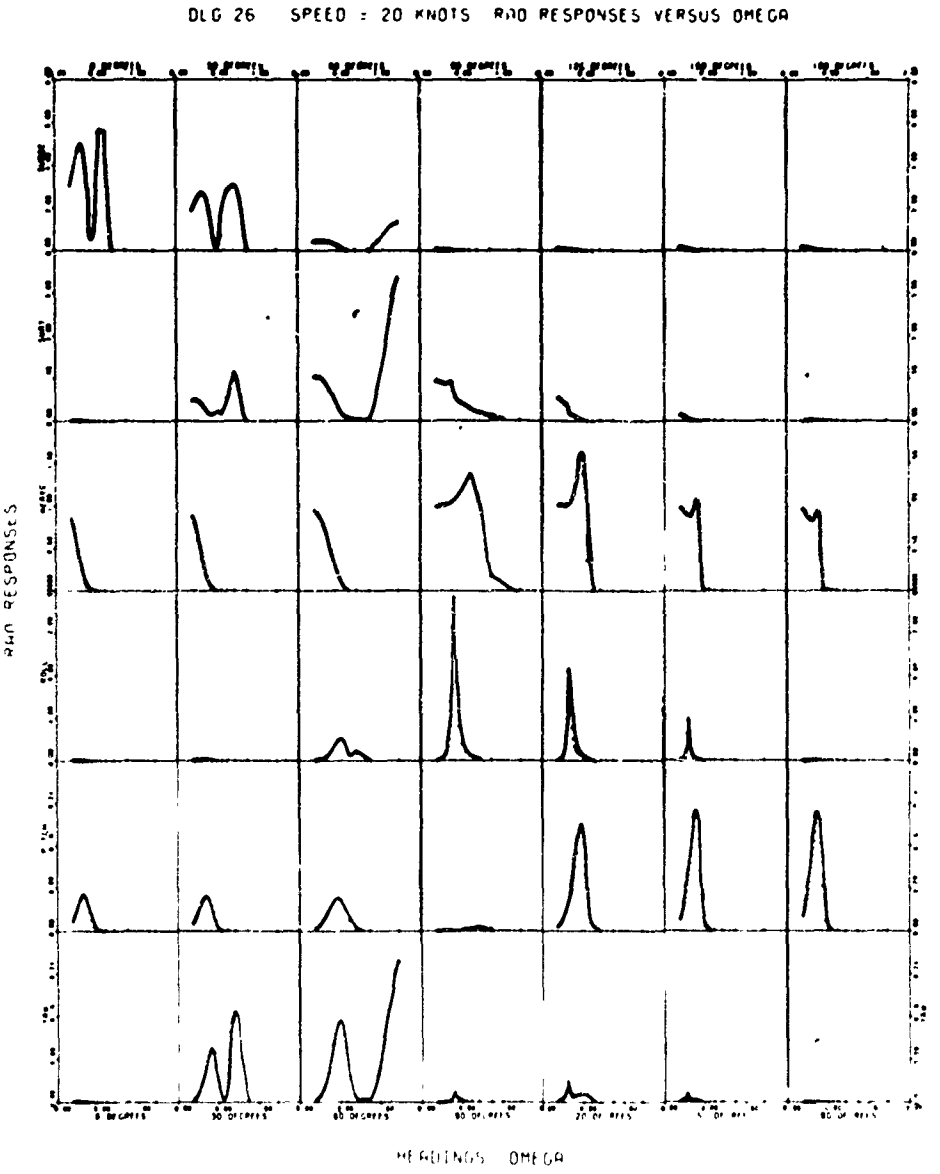

Figure 2 - DLG-26 Response Amplitude Operators, 20 Knots

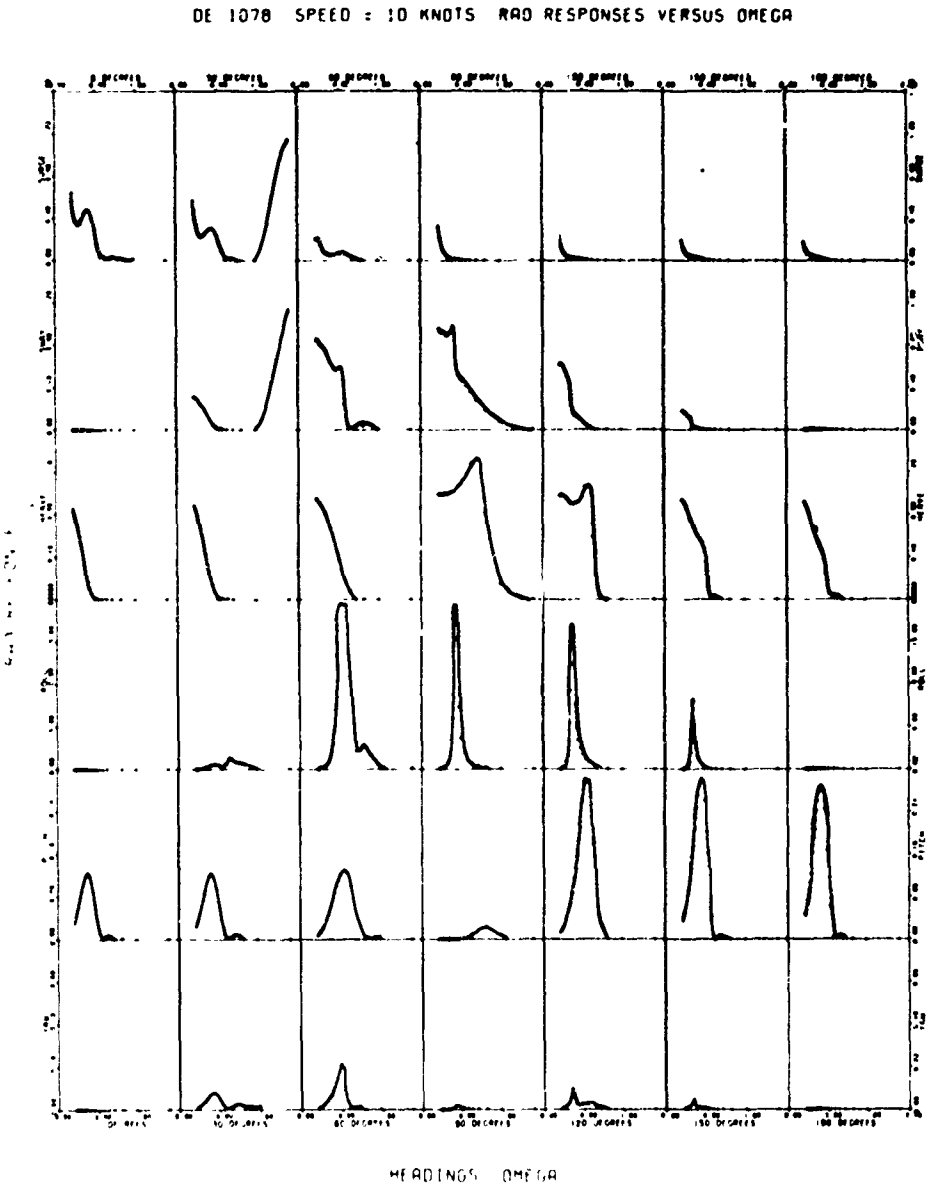

Figure 3 - DE-1078 Response Amplitude Operators, 10 Knots

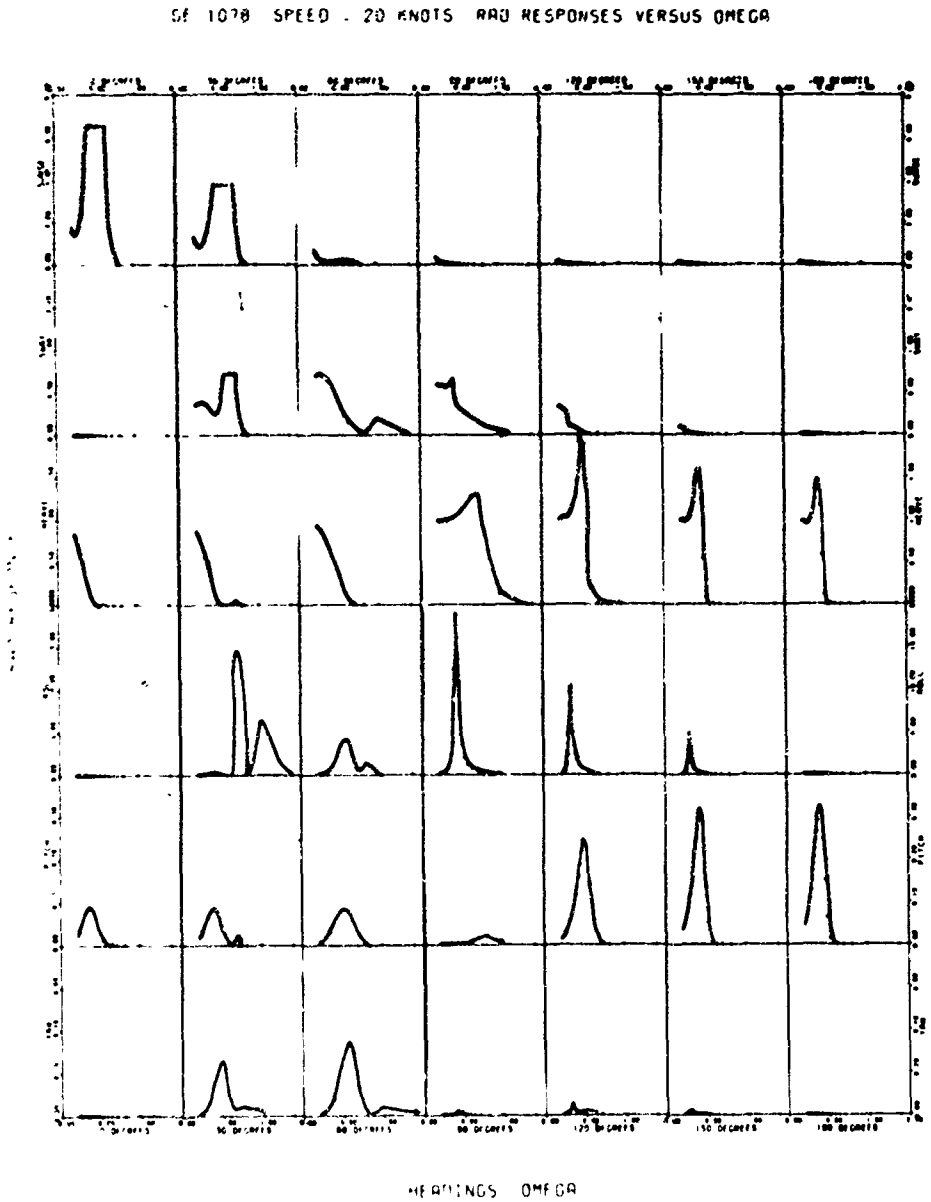

Figure 4 - DE-1078 Response Amplitude Operators, 20 Knots

TABLE 1 - SHIP PARTICULARS AND COMPUTER-FITTED BODY PLAN FOR THE DLG-26 IN LAMPS CONFIGURATION

DLG 26 LAMPS CONFIGURATION
TABLE OF SHIP PARTICULARS

SHIP LENGTH(LBP)	L	524.00 FEET	LENGTH/BEAM	9.632
MAXIMUM BEAM*	B	54.40 FEET	BEAM/DRAFT	2.848
MAXIMUM DRAFT*	T	19.10 FEET	DRAFT/BEAM	.351
DISPLACEMENT	W	7922 TONS,SW	W/(.01L)**3	55.066
DESIGN SPEED	V	19.99 KNOTS	FROUDE NUMBER	.260
VERTICAL CG	KG	20.02 FEET	KG/BEAM	.368
METACENTRIC HT.	GM	5.58 FEET	GM/BEAM	.103
LONGITUD. CG**	LCG	6.64 FEET	LCG/LENGTH	.025
ROLL GYRADIUS	RRG	18.89 FEET	RRG/BEAM	.347
PITCH GYRADIUS	PRG	131.00 FEET	PRG/LENGTH	.250
YAW GYRADIUS	YRG	131.00 FEET	YRG/LENGTH	.250
EST. ROLL PERIOD		8.86 SECS	ROLL FREQ.(RAD)	.709
TRANSOM WIDTH	TW	29.20 FEET	TW/BEAM	.537
WATERPLANE AREA	AWP	21063 SQ. FEET	AWP/(LB)	.739
WETTED SURFACE	WS	32265 SQ. FEET	WS/(2LT+2BT+LB)	.638
BILGE KEEL WS	BWS	1538 SQ. FEET	BWS/WS	.048
LONGITUD. CB**	LCB	6.64 FEET	LCB/LENGTH	.025
LONGITUD. CF**	LCF	-.10 FEET	LCF/LENGTH	-.000
VERTICAL CB	KB	11.29 FEET	KB/BEAM	.207
METACENTER	KM	25.60 FEET	KM/BEAM	.471
BLOCK COEFF.	CB	.51		
SECTION COEFF.	CX	.82		
PRISMATIC COEFF.	CP	.62		

* AT STA. 11.00

** AFT OF MIDSHIPS

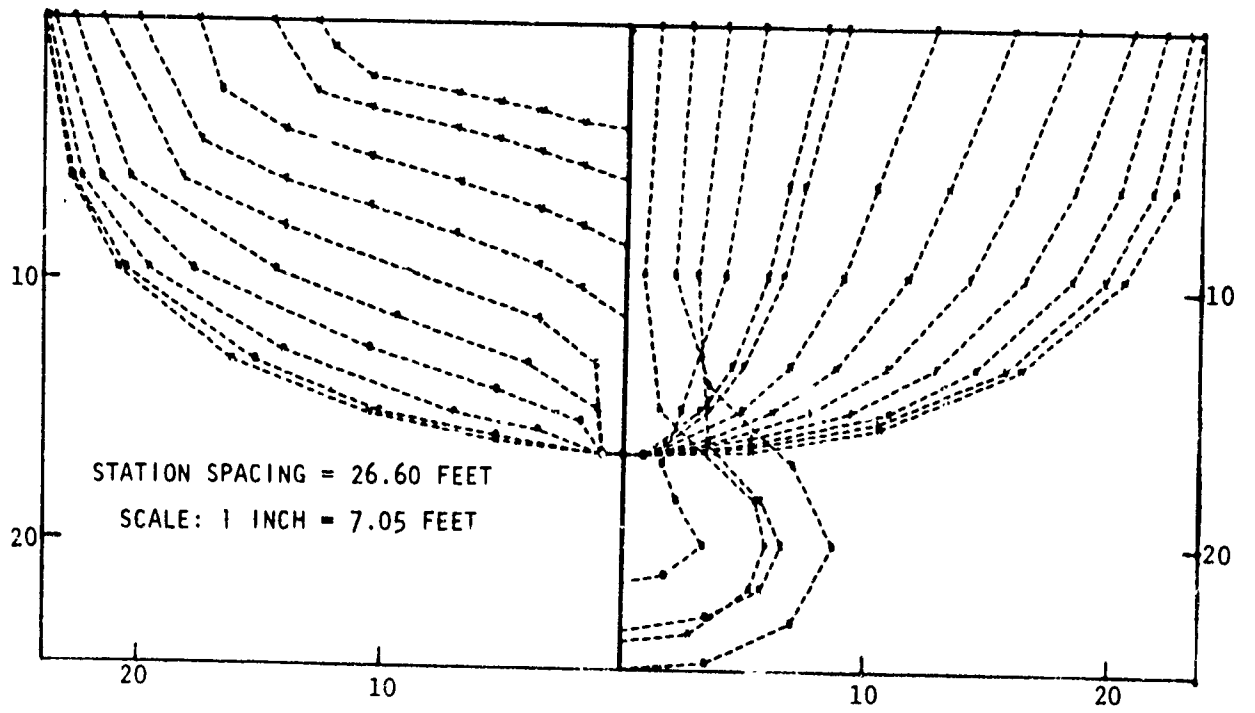

TABLE 2 - SHIP PARTICULARS AND COMPUTER-FITTED BODY PLAN FOR THE DE-1078 IN LAMPS CONFIGURATION

DE 1078 LAMPS CONFIGURATION
TABLE OF SHIP PARTICULARS

SHIP LENGTH(LBP)	L	415.00 FEET	LENGTH/BEAM	8.944
MAXIMUM BEAM*	B	46.40 FEET	BEAM/DRAFT	2.994
MAXIMUM DRAFT*	T	15.50 FEET	DRAFT/BEAM	.334
DISPLACEMENT	W	4179 TONS,SW	W/(.01L)**3	58.481
DESIGN SPEED	V	20.00 KNOTS	FROUDE NUMBER	.292
VERTICAL CG	KG	17.50 FEET	KG/BEAM	.377
METACENTRIC HT.	GM	4.47 FEET	GM/BEAM	.096
LONGITUD. CG**	LCG	-1.97 FEET	LCG/LENGTH	-.009
ROLL GYRADIUS	RRG	15.01 FEET	RRG/BEAM	.345
PITCH GYRADIUS	PRG	103.75 FEET	PRG/LENGTH	.250
YAW GYRADIUS	YRG	103.75 FEET	YRG/LENGTH	.250
EST. ROLL PERIOD		8.39 SECS	ROLL FREQ.(RAD)	.749
TRANSOM WIDTH	TW	35.60 FEET	TW/BEAM	.767
WATERPLANE AREA	AWP	14245 SQ. FEET	AWP/(LB)	.740
WETTED SURFACE	WS	21098 SQ. FEET	WS/(2LT+2BT+LB)	.629
BILGE KEEL WS	BWS	435 SQ. FEET	BWS/WS	.021
LONGITUD. CB**	LCB	-1.97 FEET	LCB/LENGTH	-.009
LONGITUD. CF**	LCF	-.14 FEET	LCF/LENGTH	-.001
VERTICAL CB	KB	9.03 FEET	KB/BEAM	.195
METACENTER	KM	21.97 FEET	KM/BEAM	.473
BLOCK COEFF.	CB	.49		
SECTION COEFF.	CX	.81		
PRISMATIC COEFF.	CP	.61		

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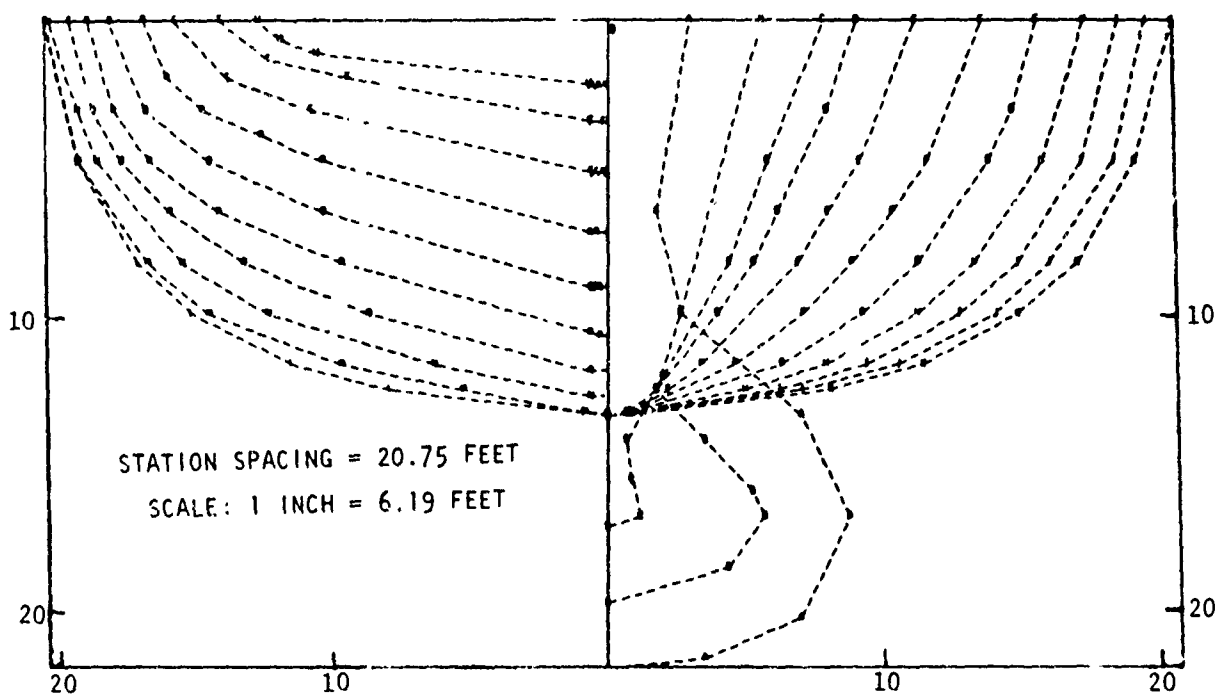
** AFT OF MIDSHIPS



APPENDIX

SUMMARY OF INVESTIGATION

TABLE 3 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 0 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT)

HEADING = 0. DEG (HEAD SEAS=180) SHIP SPEED = 5.99 KNOTS FROUDE NUMBER = .1300 WAVE SLOPE (360*P/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.255	.238	4.20	1.32[illegible]E+00	-102.7	8.9878E-15	-90.0	8.7159E-01	.2	2.8139E-16	-115.3	2.1548E-02	87.0	2.8478E-16	-166.9
.263	.256	3.90	1.3214E+00	-102.3	8.8231E-15	-90.9	8.5242E-01	.2	3.3735E-16	-116.5	2.4943E-02	86.7	2.3661E-16	-166.5
.271	.278	3.60	1.3170E+00	-101.9	8.6066E-15	-91.1	8.2871E-01	.3	4.1110E-16	-117.7	2.9871E-02	86.3	2.7568E-16	-165.9
.277	.294	3.40	1.3117E+00	-101.7	8.4269E-15	-91.3	8.1964E-01	.3	4.7389E-16	-118.6	3.1585E-02	86.0	3.8675E-16	-165.5
.284	.312	3.20	1.3037E+00	-101.4	8.2134E-15	-91.5	7.8730E-01	.3	5.5137E-16	-119.5	3.4906E-02	85.7	3.4278E-16	-165.0
.291	.333	3.00	1.2922E+00	-101.2	8.0264E-15	-91.7	7.6225E-01	.4	6.5175E-16	-120.5	3.8792E-02	85.3	3.9124E-16	-164.6
.299	.357	2.80	1.2759E+00	-101.0	7.8383E-15	-91.9	7.3367E-01	.4	7.8338E-16	-121.5	4.3339E-02	84.8	4.5411E-16	-164.3
.307	.385	2.60	1.2529E+00	-100.8	7.5731E-15	-92.2	6.9939E-01	.4	9.5411E-16	-122.4	4.8550E-02	84.2	5.2081E-16	-163.8
.317	.417	2.40	1.2206E+00	-100.6	7.2146E-15	-92.7	6.5861E-01	.4	1.1787E-15	-123.4	5.4483E-02	83.5	6.1484E-16	-163.2
.327	.455	2.20	1.1754E+00	-100.5	6.7429E-15	-93.3	6.0777E-01	.4	1.4779E-15	-124.2	6.2143E-02	82.6	7.1633E-16	-162.3
.338	.500	2.00	1.1123E+00	-100.4	6.1355E-15	-94.2	5.4659E-01	.4	1.8804E-15	-124.9	6.8407E-02	81.6	8.3321E-16	-161.3
.344	.526	1.90	1.0720E+00	-100.3	5.7735E-15	-94.8	5.1118E-01	.4	2.1314E-15	-125.2	7.2154E-02	81.0	8.9698E-16	-160.7
.351	.556	1.80	1.0244E+00	-100.3	5.3691E-15	-95.6	4.7219E-01	.5	2.4220E-15	-125.3	7.5868E-02	80.3	9.6312E-16	-160.0
.357	.588	1.70	9.6830E-01	-100.3	4.9205E-15	-96.6	4.2938E-01	.5	2.7564E-15	-125.3	7.9376E-02	79.5	1.0383E-15	-159.2
.365	.625	1.60	9.0238E-01	-100.4	4.4271E-15	-97.8	3.8264E-01	.6	3.1366E-15	-125.2	8.2481E-02	78.6	1.0958E-15	-158.5
.372	.667	1.50	8.2524E-01	-100.5	3.8912E-15	-99.4	3.3203E-01	.7	3.5596E-15	-124.8	8.4855E-02	77.5	1.1555E-15	-157.2
.380	.714	1.40	7.3562E-01	-100.7	3.3187E-15	-101.5	2.7797E-01	.8	4.0124E-15	-124.1	8.6644E-02	76.3	1.2025E-15	-156.0
.389	.769	1.30	6.3290E-01	-101.1	2.7407E-15	-104.4	2.2232E-01	1.0	4.5099E-15	-122.9	8.5695E-02	74.7	1.2449E-15	-154.5
.398	.833	1.20	5.1736E-01	-101.7	2.1501E-15	-108.4	1.6570E-01	1.3	4.9560E-15	-120.9	8.2770E-02	72.8	1.2499E-15	-152.7
.408	.909	1.10	3.9168E-01	-102.7	1.5786E-15	-114.5	1.1074E-01	2.0	5.2230E-15	-117.7	7.6227E-02	70.3	1.1921E-15	-150.4
.419	1.000	1.00	2.6260E-01	-104.6	1.0766E-15	-124.0	6.1686E-02	3.3	5.1218E-15	-112.6	6.5043E-02	67.0	1.0451E-15	-147.4
.430	1.111	.90	1.4298E-01	-108.4	6.9897E-16	-139.6	2.4191E-02	6.9	4.4447E-15	-103.6	4.8927E-02	62.3	7.8902E-16	-143.3
.441	1.250	.80	5.2463E-02	-118.5	4.7662E-16	-160.4	3.8839E-03	23.9	3.2218E-15	-85.6	2.9115E-02	55.8	4.4103E-16	-136.8
.453	1.429	.70	1.0816E-02	-158.5	3.5886E-16	176.2	2.0934E-03	133.6	2.3963E-15	-46.8	1.4547E-02	39.9	1.1157E-16	-121.6
.465	1.667	.60	1.4159E-02	130.7	1.9489E-16	157.2	9.8641E-03	155.5	4.2395E-15	3.3	1.6266E-03	-21.4	2.4815E-17	2.7
.474	2.000	.50	1.2151E-02	116.3	4.3993E-18	117.7	5.7322E-03	155.2	7.4284E-15	37.3	4.4672E-03	-109.2	2.0386E-16	69.1
.476	2.500	.40	2.8664E-03	-49.7	1.1165E-16	-25.3	2.6646E-04	-11.5	1.8563E-15	98.8	2.1876E-03	-157.8	7.8515E-17	108.5
.459	3.333	.30	3.5421E-04	19.4	5.9052E-17	128.3	4.3950E-05	-35.6	1.2617E-15	-99.7	1.3499E-03	40.5	7.8695E-16	-103.8
.377	5.000	.20	9.5949E-03	-52.1	1.0094E-17	20.7	3.6243E-04	-59.3	4.6310E-16	-165.0	9.9520E-05	82.6	1.1879E-16	-161.1
.066	10.000	.10	2.1315E+00	149.2	3.4624E-14	106.5	2.5429E-05	136.0	1.9248E-17	43.7	1.5801E-05	-6.3	2.2625E-16	54.6

TABLE 4 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 0 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 0. DEG (HEAD SEAS=180) SHIP SPEED = 19.99 KNOTS FROUDE NUMBER = .2600 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 88

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.217	.238	4.2u	3.u158E+u0	-102.0	1.6147E-14	-92.2	8.4613E-01	.2	2.6654E-16	-123.6	1.8045E-02	84.9	1.5588E-16	-152.2
.211	.256	3.9[illegible]	3.1426E+u0	-101.6	1.6369E-14	-92.5	8.2659E-01	.2	3.1702E-16	-124.8	2.0665E-02	84.5	1.9529E-16	-152.7
.215	.278	3.6[illegible]	3.2888E+00	-101.1	1.6565E-14	-92.8	8.0261E-01	.2	3.8248E-16	-126.1	2.3815E-02	84.1	2.4731E-16	-153.1
.218	.294	3.4[illegible]	3.3989E+00	-100.8	1.6672E-14	-93.0	7.8350E-01	.1	4.3731E-16	-127.0	2.6272E-02	83.7	2.9159E-16	-153.3
.221	.312	3.2[illegible]	3.52u8E+u0	-100.6	1.6751E-14	-93.3	7.6131E-01	.1	5.0387E-16	-127.9	2.9067E-02	83.4	3.4617E-16	-153.4
.224	.333	3.0u	3.6557E+u0	-100.3	1.6790E-14	-93.7	7.3537E-01	.1	5.8538E-16	-128.9	3.2249E-02	82.9	4.1419E-16	-153.5
.227	.357	2.8[illegible]	3.8052E+00	-100.0	1.6774E-14	-94.2	7.0488E-01	.0	6.8605E-16	-129.9	3.5869E-02	82.5	5.0802E-16	-153.5
.23u	.385	2.6u	3.9734E+30	-99.7	1.6678E-14	-94.9	6.6881E-01	-.0	8.1134E-16	-130.9	3.9972E-02	81.9	6.0974E-16	-153.6
.232	.417	2.4u	4.1518E+00	-99.4	1.6469E-14	-95.7	6.2592E-01	-.1	9.6820E-16	-132.[illegible]	4.4583E-02	81.2	7.5195E-16	-153.2
.235	.455	2.2u	4.3479E+30	-99.1	1.6100E-14	-96.8	5.7468E-01	-.2	1.1649E-15	-133.0	4.9677E-02	80.4	9.3886E-16	-152.9
.237	.5u0	2.0u	4.5532E+30	-98.8	1.550uE-14	-98.5	5.1331E-01	-.3	1.4100E-15	-133.9	5.5113E-02	79.4	1.1877E-15	-152.5
.238	.526	1.9u	4.6553E+00	-98.7	1.5086E-14	-99.5	4.7825E-01	-.3	1.5526E-15	-134.4	5.7856E-02	78.7	1.3425E-15	-152.2
.238	.556	1.8u	4.7531E+u0	-98.5	1.4575E-14	-100.8	4.3998E-01	-.4	1.7082E-15	-134.8	6.0513E-02	78.1	1.5228E-15	-151.9
.23u	.588	1.7u	4.8415E+00	-98.4	1.3954E-14	-102.5	3.9834E-01	-.4	1.8751E-15	-135.1	6.2961E-02	77.3	1.7381E-15	-151.6
.238	.625	1.6u	4.9133E+u0	-98.3	1.3206E-14	-104.6	3.5330E-01	-.5	2.0487E-15	-135.4	6.5022E-02	76.3	1.9784E-15	-151.2
.237	.667	1.5u	4.95u3E+u0	-98.2	1.2319E-14	-107.3	3.0498E-01	-.6	2.2202E-15	-135.6	6.6443E-02	75.3	2.2451E-15	-150.8
.236	.714	1.4u	4.9545E+00	-98.1	1.1291E-14	-110.9	2.5384E-01	-.6	2.3739E-15	-135.6	6.6877E-02	74.0	2.5537E-15	-150.3
.233	.769	1.3u	4.8826E+u0	-98.2	1.0143E-14	-115.9	2.0081E-01	-.6	2.4839E-15	-135.5	6.5859E-02	72.6	2.8885E-15	-149.7
.23u	.833	1.2u	4.7035E+00	-98.3	8.9438E-15	-122.9	1.4758E-01	-.5	2.5099E-15	-135.1	6.2806E-02	70.8	3.2277E-15	-149.1
.224	.9u9	1.1u	4.3648E+u0	-98.6	7.8567E-15	-133.u	9.6842E-02	-.0	2.3952E-15	-134.3	5.7059E-02	68.6	3.5221E-15	-148.5
.216	1.000	1.0u	3.7967E+u0	-99.5	7.1699E-15	-147.4	5.2570E-02	1.3	2.0727E-15	-132.9	4.8048E-02	65.9	3.6746E-15	-148.2
.205	1.111	.9u	2.9240E+u0	-101.5	7.4034E-15	-166.3	1.9778E-02	5.5	1.4979E-15	-130.3	3.5693E-02	62.3	3.5194E-15	-148.5
.188	1.25u	.8u	1.7266E+u0	-107.3	9.3206E-15	172.2	3.u748E-03	26.8	7.4926E-16	-124.3	2.1231E-02	56.9	2.8879E-15	-150.7
.164	1.429	.7u	5.4119E-01	-136.4	1.4333E-14	150.5	2.3064E-03	127.2	1.4868E-16	-96.9	7.9506E-03	46.4	1.6747E-15	-150.3
.127	1.667	.6u	1.6137E+u0	134.7	2.107uE-14	123.5	7.8536E-03	146.0	2.3711E-16	11.0	8.6608E-04	8.3	6.5771E-16	153.9
.u69	2.10u	.5u	3.u031E+u1	113.4	9.u822E-14	67.9	4.u173E-03	140.1	9.8166E-16	32.u	1.1681E-03	-101.4	3.5765E-15	109.2
.u3u	2.50u	.4u	4.7u27E+u1	-19.2	2.u583E-12	-46.2	9.8797E-04	-18.5	2.2496E-16	39.1	4.7851E-04	-113.9	1.6322E-15	70.9
.215	3.333	.3u	9.6035E-u3	-3.3	1.7226E-15	138.0	2.7017E-05	-46.1	1.8789E-16	-116.7	8.2162E-04	48.4	3.6685E-16	-112.7
.635	5.uuu	.2u	1.1u13E-03	-53.0	4.0473E-16	-129.0	4.5786E-04	-38.7	2.5143E-13	-116.0	1.5110E-04	84.3	4.5461E-16	-119.6
2.08	10.00u	.1u	9.u835E-u7	131.6	2.2180E-20	90.0	1.6120E-05	-176.2	8.4210E-19	-156.9	1.1573E-06	-17.7	1.2488E-19	29.8

TABLE 5 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 30 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=13.1FT) ***

HEADING = 30. DEG (HEAD SEAS=180) SHIP SPEED = 9.99 KNOTS FROUDE NUMBER = .1360 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.261	.238	4.20	9.4285E-01	-104.3	2.9367E-01	89.4	8.9941E-01	.2	9.2608E-03	68.0	1.6621E-02	87.5	4.9355E-03	12.4
.27.	.256	3.9.	9.4074E-01	-103.9	2.8884E-01	89.3	8.8397E-01	.2	1.1086E-02	66.9	1.9849E-02	87.2	5.8876E-03	12.9
.279	.278	3.6.	9.3710E-01	-103.4	2.8250E-01	89.2	8.6463E-01	.3	1.3495E-02	65.7	2.2481E-02	86.9	6.6184E-03	13.4
.285	.294	3.40	9.3340E-01	-103.1	2.7744E-01	89.1	8.4894E-01	.3	1.5551E-02	64.8	2.4329E-02	86.7	7.1468E-03	13.9
.29.	.312	3.20	9.2847E-01	-102.9	2.7454E-01	89.0	8.3225E-01	.3	1.8216E-02	63.9	2.7113E-02	86.3	8.3998E-03	14.1
.306	.335	3.00	9.2164E-01	-102.6	2.7148E-01	88.9	8.1311E-01	.3	2.1541E-02	62.9	3.0389E-02	85.9	9.7151E-03	14.3
.309	.357	2.80	9.1211E-01	-102.4	2.6664E-01	88.7	7.9008E-01	.3	2.6053E-02	61.9	3.4211E-02	85.4	1.1265E-02	14.6
.318	.385	2.60	8.9889E-01	-102.2	2.5963E-01	88.5	7.6211E-01	.3	3.1838E-02	60.9	3.8688E-02	84.9	1.3181E-02	15.0
.328	.417	2.40	8.8056E-01	-102.0	2.4999E-01	88.2	7.2787E-01	.3	3.9571E-02	59.9	4.3906E-02	84.3	1.5286E-02	15.6
.339	.455	2.20	8.5519E-01	-101.9	2.3713E-01	87.7	6.8558E-01	.3	5.0122E-02	58.9	4.9995E-02	83.6	1.7891E-02	16.4
.352	.500	2.00	8.1954E-01	-101.7	2.2032E-01	87.1	6.3294E-01	.3	6.4822E-02	57.9	5.7007E-02	82.7	2.0988E-02	17.4
.358	.526	1.90	7.9673E-01	-101.7	2.1017E-01	86.6	6.0188E-01	.3	7.4328E-02	57.6	6.0845E-02	82.2	2.2737E-02	18.0
.366	.556	1.80	7.6968E-01	-101.7	1.9871E-01	86.1	5.6710E-01	.3	8.5704E-02	57.2	6.4864E-02	81.6	2.4618E-02	18.6
.373	.588	1.70	7.3757E-01	-101.7	1.8581E-01	85.5	5.2820E-01	.3	9.9357E-02	57.0	6.9000E-02	81.0	2.6621E-02	19.3
.382	.625	1.60	6.9944E-01	-101.7	1.7139E-01	84.7	4.8475E-01	.4	1.1576E-01	56.9	7.3139E-02	80.2	2.8715E-02	20.1
.390	.667	1.50	6.5435E-01	-101.8	1.5695E-01	83.7	4.3835E-01	.3	1.3695E-01	57.0	7.7418E-02	79.2	3.1431E-02	21.1
.400	.714	1.40	6.0092E-01	-102.0	1.4039E-01	82.5	3.8675E-01	.3	1.6239E-01	57.3	8.1284E-02	78.1	3.4899E-02	22.2
.411	.769	1.30	5.3796E-01	-102.2	1.2177E-01	80.8	3.2995E-01	.4	1.9238E-01	58.1	8.4284E-02	76.8	3.6588E-02	23.6
.421	.833	1.20	4.6454E-01	-102.6	1.0139E-01	78.4	2.6844E-01	.4	2.2644E-01	59.3	8.5737E-02	75.2	3.8311E-02	25.2
.433	.909	1.10	3.8054E-01	-103.3	7.9888E-02	75.0	2.0367E-01	.5	2.6221E-01	61.3	8.4657E-02	73.1	3.8955E-02	27.3
.446	1.000	1.00	2.8741E-01	-104.4	5.8422E-02	69.7	1.3859E-01	.9	2.9356E-01	64.5	7.9722E-02	70.5	3.7624E-02	29.8
.460	1.111	.90	1.9025E-01	-106.5	3.8746E-02	61.5	7.8367E-02	1.6	3.0780E-01	69.9	6.9403E-02	66.9	3.3260E-02	33.2
.475	1.250	.80	9.9595E-02	-110.8	2.0343E-02	47.8	3.0734E-02	4.0	2.8524E-01	79.5	5.2639E-02	61.7	2.4911E-02	38.1
.492	1.429	.70	3.2728E-02	-122.9	1.3006E-02	25.5	4.4328E-03	16.3	2.1927E-01	100.9	3.0674E-02	53.1	1.3843E-02	47.2
.510	1.667	.60	6.4655E-03	-175.6	7.5512E-03	-4.6	2.2646E-03	141.9	1.9590E-01	148.8	9.6859E-03	33.7	2.3825E-03	75.2
.528	2.000	.50	1.0957E-02	120.4	2.7655E-03	-40.8	9.3608E-03	157.6	4.3615E-01	-157.8	1.9506E-03	-53.2	3.8834E-03	-156.1
.544	2.500	.40	2.0428E-03	97.2	8.5339E-04	-162.4	2.0512E-03	151.4	6.6065E-01	-117.4	5.4481E-03	-126.1	7.8316E-03	-114.6
.550	3.333	.30	4.9388E-03	-58.4	3.3604E-04	146.6	1.6414E-03	-24.8	1.7024E-01	29.9	9.3312E-04	98.8	3.9150E-03	25.2
.512	5.000	.20	3.9712E-04	174.1	9.8675E-04	121.8	6.5602E-05	139.1	8.3410E-02	-97.1	6.8226E-04	-148.4	2.5858E-03	-107.7
.211	10.00	.10	3.1605E-03	-68.0	2.4733E-02	119.7	1.4846E-05	3.7	5.8352E-04	-130.8	1.9790E-05	167.5	6.1514E-04	-119.1

TABLE 6 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 30 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 30. DEG (HEAD SEAS=180) SHIP SPEED = 19.99 KNOTS FROUDE NUMBER = .2600 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 88

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.220	.238	4.20	1.8647E+00	-103.7	4.7563E-01	88.3	8.7728E-01	.1	9.6821E-03	60.3	1.3718E-02	84.5	3.9531E-03	24.7
.225	.256	3.90	1.9240E+00	-103.2	4.8619E-01	88.1	8.6152E-01	.1	1.0319E-02	59.1	1.5781E-02	84.3	4.8695E-03	24.6
.230	.278	3.60	1.9916E+00	-102.8	4.8391E-01	87.9	8.4204E-01	.1	1.2448E-02	57.9	1.8295E-02	84.0	6.0644E-03	24.2
.234	.294	3.40	2.0421E+00	-102.5	4.8571E-01	87.7	8.2643E-01	.1	1.4239E-02	56.9	2.0276E-02	83.7	7.0720E-03	24.1
.238	.312	3.20	2.0974E+00	-102.2	4.8673E-01	87.5	8.0819E-01	.0	1.6424E-02	56.0	2.2553E-02	83.4	8.3847E-03	24.1
.242	.333	3.00	2.1579E+00	-101.9	4.8672E-01	87.2	7.8674E-01	.0	1.9120E-02	55.0	2.5179E-02	83.1	9.8387E-03	24.1
.246	.357	2.80	2.2241E+00	-101.6	4.8528E-01	86.9	7.6134E-01	-.0	2.2484E-02	53.9	2.8215E-02	82.7	1.1744E-02	24.1
.250	.385	2.60	2.2961E+00	-101.3	4.8188E-01	86.4	7.3143E-01	-.1	2.6728E-02	52.8	3.1736E-02	82.3	1.4177E-02	24.3
.255	.417	2.40	2.3735E+00	-101.6	4.7574E-01	85.9	6.9461E-01	-.1	3.2146E-02	51.7	3.5794E-02	81.7	1.7317E-02	24.5
.259	.455	2.20	2.4551E+00	-100.7	4.6576E-01	85.1	6.5058E-01	-.2	3.9132E-02	50.6	4.0466E-02	81.0	2.1436E-02	24.8
.264	.500	2.00	2.5374E+00	-100.4	4.5028E-01	84.0	5.9675E-01	-.3	4.9198E-02	49.4	4.5759E-02	80.1	2.6927E-02	25.1
.266	.526	1.90	2.5767E+00	-100.3	4.3977E-01	83.3	5.6554E-01	-.4	5.3699E-02	48.9	4.8614E-02	79.6	3.0356E-02	25.4
.268	.556	1.80	2.6129E+00	-100.2	4.2691E-01	82.5	5.3099E-01	-.5	5.3944E-02	48.4	5.1567E-02	79.0	3.4350E-02	25.6
.270	.588	1.70	2.6435E+00	-100.1	4.1125E-01	81.4	4.9277E-01	-.6	6.6991E-02	47.9	5.4560E-02	78.3	3.8837E-02	25.9
.272	.625	1.60	2.6652E+00	-100.0	3.9226E-01	80.1	4.5056E-01	-.7	7.4852E-02	47.4	5.7696E-02	77.5	4.4513E-02	26.3
.273	.667	1.50	2.6729E+00	-99.9	3.6937E-01	78.4	4.0413E-01	-.8	9.3448E-02	47.1	6.0223E-02	76.5	5.0987E-02	26.7
.275	.714	1.40	2.6596E+00	-99.8	3.4201E-01	76.2	3.5337E-01	-1.0	9.2529E-02	46.8	6.2509E-02	75.3	5.8322E-02	27.1
.275	.769	1.30	2.6146E+00	-99.8	3.0978E-01	73.3	2.9846E-01	-1.2	1.0153E-01	46.6	6.4006E-02	74.0	6.6791E-02	27.7
.275	.833	1.20	2.5230E+00	-99.9	2.7274E-01	69.1	2.4009E-01	-1.4	1.0936E-01	46.7	6.4212E-02	72.3	7.6179E-02	28.3
.274	.909	1.10	2.3637E+00	-100.2	2.3203E-01	63.0	1.7981E-01	-1.6	1.1408E-01	47.1	6.2481E-02	70.2	8.5934E-02	29.0
.271	1.000	1.00	2.1087E+00	-100.7	1.9108E-01	53.8	1.2846E-01	-1.7	1.1257E-01	48.0	5.7777E-02	67.5	9.4784E-02	29.8
.265	1.111	.90	1.7262E+00	-101.8	1.5749E-01	39.6	6.6729E-02	-1.5	1.0856E-01	49.8	4.9318E-02	64.1	9.9514E-02	30.6
.256	1.250	.80	1.1967E+00	-104.4	1.4497E-01	18.9	2.5313E-02	.2	7.4208E-02	53.4	3.6567E-02	59.3	9.4715E-02	31.2
.242	1.429	.70	5.6966E-01	-112.2	1.6943E-01	-5.3	3.3885E-03	13.6	3.5993E-02	62.6	2.0685E-02	51.9	7.2057E-02	30.8
.218	1.667	.60	1.2334E-01	-157.7	2.1589E-01	-28.1	2.1294E-03	136.8	6.7157E-03	186.1	6.2922E-03	37.1	2.9764E-02	23.5
.177	2.000	.50	6.7431E-01	121.0	1.6704E-01	-58.2	7.3033E-03	148.4	2.1698E-02	-163.6	6.2965E-04	-40.9	7.7147E-03	-66.8
.106	2.500	.40	2.7714E+00	105.2	5.2650E-01	-177.3	1.1258E-03	138.3	3.8638E-02	-147.3	2.1866E-03	-119.3	7.6872E-02	-119.4
.035	3.333	.30	2.1881E+02	-50.8	4.3702E+01	97.8	1.7069E-03	-57.1	3.4546E-03	44.5	9.7151E-05	-150.5	1.6726E-01	120.3
.364	5.400	.20	1.8265E-03	166.7	7.1304E-03	127.6	5.6148E-05	141.3	1.5153E-02	-111.8	4.1088E-05	-144.3	3.5809E-03	118.8
1.5411	.080	.10	3.3819E-06	-85.2	3.6141E-05	133.9	1.1208E-04	37.1	5.4017E-05	158.4	4.3467E-05	-84.8	1.3833E-05	-8.8

TABLE 7 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 60 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 60. DEG (HEAD SEAS=180) SHIP SPEED = 9.99 KNOTS FROUDE NUMBER = .1300 WAVE SLOPE (360*R/LAMBDA), K*R = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.279	.238	4.2u	2.u2.9E-u1	-111.6	9.u>59E-01	89.7	9.5855E-01	.2	2.7145E-02	77.2	9.4777E-03	88.7	4.3744E-03	11.2
.289	.256	3.9u	2.8896E-u1	-110.9	7.9615E-01	89.7	9.5143E-01	.2	3.2235E-02	76.5	6.3399E-03	88.5	5.0144E-03	11.8
.299	.278	3.6u	2.3592E-01	-110.3	8.u105E-01	89.7	9.4569E-01	.2	3.9393E-02	75.7	7.4931E-03	88.2	6.0941E-03	11.4
.307	.294	3.4u	2.8374E-u1	-109.9	8.u172E-01	89.7	9.4078E-01	.2	4.u539E-02	75.0	8.4270E-03	87.9	6.9488E-03	11.4
.316	.312	3.2u	2.8137E-u1	-109.u	7.9994E-01	89.7	9.3473E-01	.2	5.3208E-02	74.u	9.5285E-03	87.6	7.9372E-03	11.5
.325	.333	3.0u	2.7877E-u1	-109.0	7.9537E-01	89.6	9.2720E-01	.1	6.2943E-02	73.6	1.0838E-02	87.4	9.0941E-03	11.7
.335	.357	2.80	2.758?E-01	-108.7	7.8756E-01	89.6	9.1774E-01	.1	7.5552E-02	72.7	1.2408E-02	87.1	1.8462E-02	12.0
.346	.385	2.60	2.7243E-u1	-108.3	7.7>95E-01	89.5	9.0573E-01	.1	9.2274E-02	71.8	1.43u9E-02	86.8	1.2108E-02	12.5
.359	.417	2.4u	2.68u1E-u1	-107.9	7.5991E-01	89.4	8.9629E-u1	.2	1.1508E-01	70.8	1.6632E-02	86.5	1.4887E-02	13.1
.373	.455	2.2u	2.63>0E-u1	-107.6	7.385uE-01	89.2	8.7618E-01	.2	1.4726E-01	69.8	1.9502E-02	86.1	1.6534E-02	13.9
.389	.500	2.0u	2.57u1E-u1	-107.4	7.1877E-01	89.0	8.4619E-01	.2	1.9572E-01	68.6	2.3208E-02	85.6	1.9994E-02	14.8
.397	.526	1.90	2.5378E-01	-107.3	7.1u62E-01	88.9	8.3304E-01	.1	2.2993E-u1	68.1	2.5510E-02	85.3	2.2326E-02	14.9
.4u7	.556	1.8u	2.4959E-u1	-107.2	6.9951E-01	88.8	8.1766E-01	.1	2.7340E-01	67.5	2.8124E-02	84.9	2.4962E-02	15.4
.417	.588	1.7u	2.4473E-01	-107.2	6.8511E-01	88.7	7.9954E-01	.1	3.2964E-u1	66.7	3.1101E-02	84.5	2.7956E-02	15.9
.428	.625	1.6u	2.39u3E-01	-107.1	6.67u1E-01	88.4	7.78u9E-01	.1	4.0386E-u1	66.4	3.4497E-02	84.0	3.1378E-02	16.5
.44u	.6u7	1.5u	2.3230E-u1	-107.2	6.4u8uE-01	88.1	7.5255E-01	.1	5.0418E-u1	66.0	3.8377E-02	83.5	3.5282E-02	17.4
.453	.714	1.4u	2.2427E-u1	-107.2	6.16u1E-01	87.7	7.2196E-u1	.0	6.u355E-01	65.7	4.2804E-02	82.9	3.9782E-02	18.3
.467	.769	1.3u	2.14u1E-01	-107.3	5.8622E-01	87.2	6.8515E-u1	-.0	7.4372E-01	65.6	4.7839E-02	82.2	4.4976E-02	19.5
.483	.833	1.2u	2.u292E-u1	-107.5	5.>284E-01	86.6	6.4259E-01	-.1	1.1492E+00	65.8	5.3699E-02	81.3	5.1544E-02	21.0
.500	.909	1.1u	1.88u9E-u1	-107.9	5.1777E-01	85.9	5.9359E-01	-.1	1.6433E+00	66.6	6.0546E-02	80.2	5.9876E-02	23.0
.520	1.000	1.00	1.7119E-01	-108.4	4.7579E-01	84.9	5.3370E-01	-.2	2.4802E+00	68.4	6.8077E-02	78.9	6.9389E-02	25.6
.542	1.111	.9u	1.4965E-01	-109.1	4.2853E-01	83.6	4.6069E-01	-.4	4.0294E+00	71.9	7.5910E-02	77.1	7.9668E-02	29.4
.568	1.25u	.8u	1.2335E-u1	-110.3	3.8u41E-01	82.3	3.7274E-01	-.6	7.2824E+00	78.7	8.3471E-02	74.8	8.9900E-02	35.5
.598	1.429	.7u	9.2027E-02	-112.2	3.376uE-01	83.9	2.7347E-01	-.8	1.5160E+01	94.5	8.8245E-02	71.6	9.3918E-02	47.7
.633	1.667	.6u	5.7u81E-02	-115.9	2.2718E-u1	99.1	1.6450E-01	-.9	2.9665E+01	133.8	8.6593E-02	66.8	5.4258E-02	73.8
.676	2.uuu	.5u	2.3958E-02	-124.6	1.2109E-02	117.4	6.3063E-02	-.4	1.3103E+01	-160.9	7.0744E-02	59.8	4.6565E-03	49.2
.729	2.50u	.4u	4.2396E-03	-158.8	1.6474E-02	-25.9	4.4572E-03	10.u	1.6996E+00	-87.6	3.5053E-02	42.6	5.7133E-03	24.6
.797	3.333	.3u	2.6269E-03	112.3	1.6414E-02	-18.9	7.1805E-03	161.7	1.3769E+00	3.4	4.5427E-03	-35.6	2.2898E-04	-163.2
.88u	5.L0L	.2u	4.3320E-04	-66.9	4.99u1E-03	131.8	1.3665E-04	-22.3	7.6471E-02	144 0	4.4724E-03	-170.7	8.4817E-04	-32.9
.952	10.000	.1u	8.u3u7E-05	-102.7	4.6208E-04	-134.9	6.3652E-05	-59.7	3.9289E-02	-148 1	5.2720E-04	79.2	5.2730E-04	39.5

TABLE 8 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 60 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 60. DEG (HEAD SEAS=180)
SHIP SPEED = 19.99 KNOTS
FROUDE NUMBER = .2600
WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG
WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.255	.238	4.20	4.1426E-01	-111.3	1.0337E+00	89.1	9.4434E-01	.1	2.5163E-02	71.7	4.3718E-03	82.7	3.6265E-03	19.5
.263	.256	3.90	4.1616E-01	-110.6	1.0325E+00	89.1	9.3662E-01	.1	2.9806E-02	70.8	5.0857E-03	82.9	4.2459E-03	19.8
.271	.278	3.60	4.1864E-01	-109.9	1.0292E+00	89.0	9.2681E-01	.1	3.5855E-02	69.8	5.9635E-03	83.1	5.0286E-03	20.1
.277	.294	3.40	4.2064E-01	-109.5	1.0255E+00	88.9	9.1876E-01	.1	4.0964E-02	69.0	6.6648E-03	83.2	5.6738E-03	20.4
.284	.312	3.20	4.2291E-01	-109.0	1.0205E+00	88.9	9.0917E-01	.1	4.7237E-02	68.2	7.4820E-03	83.3	6.4471E-03	20.7
.291	.333	3.00	4.2563E-01	-108.6	1.0213E+00	88.8	8.9948E-01	.1	5.5156E-02	67.3	8.5240E-03	83.2	7.6156E-03	20.4
.299	.357	2.80	4.2876E-01	-108.2	1.0262E+00	88.7	8.8937E-01	.0	6.5333E-02	66.4	9.8482E-03	82.9	9.2637E-03	19.9
.307	.385	2.60	4.3211E-01	-107.8	1.0278E+00	88.6	8.7681E-01	-.0	7.8547E-02	65.3	1.1449E-02	82.6	1.1304E-02	19.5
.317	.417	2.40	4.3560E-01	-107.4	1.0252E+00	88.5	8.6103E-01	-.1	9.6090E-02	64.1	1.3402E-02	82.3	1.3868E-02	19.3
.327	.455	2.20	4.3955E-01	-107.1	1.0171E+00	88.3	8.4094E-01	-.1	1.1999E-01	62.8	1.5809E-02	81.9	1.7152E-02	19.4
.338	.500	2.00	4.4213E-01	-106.8	1.0018E+00	88.0	8.1501E-01	-.2	1.5354E-01	61.4	1.8805E-02	81.4	2.1446E-02	19.5
.344	.526	1.90	4.4337E-01	-106.6	9.9067E-01	87.8	7.9919E-01	-.3	1.7554E-01	60.6	2.0579E-02	81.1	2.4103E-02	19.7
.351	.556	1.80	4.4425E-01	-106.5	9.7673E-01	87.5	7.8102E-01	-.4	2.0230E-01	59.8	2.2571E-02	80.8	2.7197E-02	19.9
.357	.588	1.70	4.4461E-01	-106.4	9.5945E-01	87.2	7.6004E-01	-.5	2.3520E-01	59.0	2.4813E-02	80.4	3.0822E-02	20.2
.365	.625	1.60	4.4422E-01	-106.3	9.3820E-01	86.9	7.3572E-01	-.6	2.7608E-01	58.2	2.7338E-02	79.9	3.5181E-02	20.5
.372	.667	1.50	4.4277E-01	-106.3	9.1217E-01	86.5	7.0742E-01	-.7	3.2746E-01	57.3	3.0180E-02	79.4	4.0185E-02	20.8
.380	.714	1.40	4.3980E-01	-106.3	8.8040E-01	85.9	6.7433E-01	-.8	3.9281E-01	56.5	3.3373E-02	78.7	4.6266E-02	21.2
.389	.769	1.30	4.3482E-01	-106.3	8.4235E-01	85.3	6.3838E-01	-1.1	4.8001E-01	55.6	3.7244E-02	77.8	5.4737E-02	21.6
.396	.833	1.20	4.2678E-01	-106.4	8.0730E-01	84.4	5.9617E-01	-1.4	5.9486E-01	54.8	4.1611E-02	76.7	6.5129E-02	22.1
.406	.909	1.10	4.1428E-01	-106.7	7.5404E-01	83.3	5.4590E-01	-1.7	7.4661E-01	54.1	4.6395E-02	75.3	7.7638E-02	22.7
.419	1.000	1.00	3.9537E-01	-107.0	6.8612E-01	81.7	4.8602E-01	-2.2	9.4712E-01	53.6	5.1443E-02	73.7	9.2525E-02	23.6
.436	1.111	.90	3.6720E-01	-107.6	6.0110E-01	79.4	4.1503E-01	-2.9	1.2178E+00	53.4	5.6378E-02	71.5	1.0988E-01	24.7
.441	1.250	.80	3.2588E-01	-108.5	4.9738E-01	75.9	3.3208E-01	-4.0	1.5296E+00	53.6	6.0384E-02	68.5	1.2853E-01	26.1
.453	1.429	.70	2.6667E-01	-110.1	3.7642E-01	70.2	2.3831E-01	-5.5	1.8666E+00	54.8	6.1645E-02	64.5	1.4532E-01	28.1
.465	1.667	.60	1.8609E-01	-113.2	2.4759E-01	60.1	1.3976E-01	-7.9	2.0491E+00	57.6	5.7851E-02	58.5	1.5092E-01	30.8
.474	2.000	.50	9.6483E-02	-120.9	1.3573E-01	39.7	5.2337E-02	-12.4	1.6754E+00	64.9	4.4291E-02	48.8	1.2558E-01	34.9
.476	2.500	.40	1.7820E-02	-155.5	7.5748E-02	.7	3.8481E-03	-24.3	5.8155E-01	93.7	2.0479E-02	29.9	6.9688E-02	43.3
.459	3.333	.30	2.4068E-02	110.9	2.6961E-02	-46.5	3.8475E-03	152.5	7.5378E-01	-164.8	2.0506E-03	-45.7	5.5848E-03	-162.6
.377	5.000	.20	6.9817E-04	-72.4	4.8695E-02	140.2	5.3214E-04	3.4	7.7097E-02	-105.4	1.0611E-03	161.3	5.8592E-03	-91.4
.260	10.000	.10	2.6239E+00	-91.1	9.6668E+00	21.1	1.9433E-04	-100.6	1.2905E-02	18.4	4.1575E-05	-130.3	2.6231E-01	74.9

TABLE 9 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 90 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 90. DEG (HEAD SEAS=180)
SHIP SPEED = 9.99 KNOTS
FROUDE NUMBER = .1300
WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG
WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.303	.238	4.20	1.9891E-02	-169.3	9.3931E-01	89.8	9.9859E-01	.1	3.8975E-02	91.6	3.3357E-05	-76.6	9.4036E-06	68.6
.315	.256	3.90	1.7757E-02	-168.8	9.4114E-01	89.8	9.9981E-01	.1	4.6860E-02	91.9	3.3679E-05	-73.8	1.0816E-05	70.8
.327	.278	3.60	1.5737E-02	-168.2	9.3835E-01	89.8	1.0008E+00	.1	5.7315E-02	92.1	3.4685E-05	-70.2	1.1584E-05	56.1
.337	.294	3.40	1.4437E-02	-167.8	9.3362E-01	89.8	1.0012E+00	.1	6.6307E-02	92.3	3.5872E-05	-68.6	1.3925E-05	63.8
.347	.312	3.20	1.3179E-02	-167.4	9.2833E-01	89.8	1.0013E+00	.1	7.7559E-02	92.5	3.7623E-05	-67.1	1.8376E-05	72.4
.359	.333	3.00	1.1964E-02	-167.0	9.1625E-01	89.8	1.0010E+00	.1	9.1911E-02	92.7	4.0141E-05	-65.7	2.6487E-05	80.6
.371	.357	2.80	1.0793E-02	-166.5	9.0320E-01	89.7	9.9991E-01	.2	1.1064E-01	92.9	4.3740E-05	-64.7	4.0679E-05	87.6
.385	.385	2.60	9.6781E-03	-166.0	8.9291E-01	89.7	9.9922E-01	.2	1.3604E-01	93.2	4.7460E-05	-63.8	5.8064E-05	91.4
.401	.417	2.40	8.6353E-03	-165.4	8.9555E-01	89.8	1.0026E+00	.2	1.7233E-01	93.8	4.8362E-05	-59.2	6.7165E-05	91.6
.419	.455	2.20	7.6335E-03	-164.9	8.9219E-01	89.8	1.0046E+00	.2	2.2530E-01	94.5	5.0685E-05	-55.4	9.1096E-05	93.9
.439	.500	2.00	6.6648E-03	-164.3	8.8223E-01	89.8	1.0064E+00	.2	3.0729E-01	95.4	5.5172E-05	-51.8	1.4337E-04	97.3
.451	.526	1.90	6.1959E-03	-163.9	8.7463E-01	89.8	1.0069E+00	.2	3.6545E-01	95.9	5.8618E-05	-50.1	1.8883E-04	99.1
.463	.556	1.80	5.7391E-03	-163.6	8.6526E-01	89.8	1.0069E+00	.2	4.4488E-01	96.5	6.3265E-05	-48.4	2.5593E-04	100.8
.476	.588	1.70	5.2926E-03	-163.2	8.5494E-01	89.8	1.0065E+00	.2	5.5222E-01	97.3	6.9693E-05	-46.7	3.5387E-04	102.5
.491	.625	1.60	4.8748E-03	-162.9	8.5709E-01	89.9	1.0103E+00	.2	7.0576E-01	98.6	7.2120E-05	-43.4	4.4745E-04	104.8
.507	.667	1.50	4.4646E-03	-162.6	8.5720E-01	90.0	1.0142E+00	.2	9.3593E-01	100.2	7.5611E-05	-40.0	6.1470E-04	106.3
.525	.714	1.40	4.0624E-03	-162.2	8.5595E-01	90.2	1.0181E+00	.3	1.3041E+00	102.4	8.3552E-05	-36.5	9.2158E-04	109.4
.545	.769	1.30	3.6685E-03	-161.9	8.5459E-01	90.4	1.0216E+00	.3	1.9468E+00	105.7	9.3[illegible]E-05	-33.0	1.5206E-03	113.4
.567	.833	1.20	3.2830E-03	-161.5	8.5594E-01	90.9	1.0243E+00	.3	3.2105E+00	111.0	1.0952E-04	-29.5	2.8133E-03	119.4
.592	.909	1.10	2.9228E-03	-161.2	8.7399E-01	92.7	1.0334E+00	.4	6.0189E+00	121.4	1.2578E-04	-24.4	5.6671E-03	131.1
.621	1.000	1.00	2.5702E-03	-160.9	8.6148E-01	97.0	1.0448E+00	.6	1.2474E+01	143.8	1.5149E-04	-18.7	1.3083E-02	155.1
.655	1.111	.90	2.2233E-03	-160.7	6.5277E-01	101.7	1.0573E+00	.7	1.5905E+01	-174.6	1.9567E-04	-12.9	1.9173E-02	-161.8
.694	1.250	.80	1.8968E-03	-160.6	4.9953E-01	96.8	1.0798E+00	1.1	7.6677E+00	-141.6	2.6489E-04	-5.6	1.0620E-02	-125.0
.742	1.429	.70	1.5779E-03	-160.6	4.6529E-01	92.2	1.1133E+00	1.7	3.2363E+00	-127.0	3.9891E-04	2.7	5.4318E-03	-107.4
.802	1.667	.60	1.2752E-03	-160.9	4.3139E-01	89.9	1.1687E+00	3.0	1.5618E+00	-121.4	6.8453E-04	13.2	3.2897E-03	-95.6
.878	2.000	.50	9.8715E-04	-161.6	3.8011E-01	87.7	1.2624E+00	5.9	8.1504E-01	-120.5	1.4427E-03	27.2	2.2351E-03	-85.9
.982	2.500	.40	7.1333E-04	-162.7	3.0697E-01	84.9	1.3937E+00	14.0	4.3973E-01	-123.3	3.9822E-03	51.0	1.7551E-03	-75.1
1.134	3.333	.30	4.1250E-04	-164.1	2.1075E-01	79.4	1.1169E+00	35.6	2.2862E-01	-131.0	1.0306E-02	100.7	1.5467E-03	-62.7
1.385	5.000	.20	1.7991E-04	-170.9	9.5595E-02	65.7	1.8941E-01	49.6	9.5663E-02	-147.9	4.1276E-03	162.2	1.3840E-03	-50.5
1.964	10.000	.10	2.4394E-05	145.9	8.0292E-03	3.5	5.9151E-03	2.3	1.3083E-02	156.2	2.6537E-04	166.0	7.8117E-04	-61.2

TABLE 10 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 90 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 90. DEG (HEAD SEAS=180) SHIP SPEED = 19.99 KNOTS FROUDE NUMBER = .2600 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.303	.238	4.20	1.9918E-02	-169.3	9.3390E-01	89.4	9.9323E-01	.1	3.8814E-02	90.9	1.9152E-04	-50.1	2.1719E-05	34.3
.315	.256	3.96	1.7794E-02	-168.8	9.3564E-01	89.5	9.9462E-01	.1	4.6665E-02	91.2	1.8774E-04	-47.7	2.7287E-05	33.9
.327	.278	3.63	1.5763E-02	-168.3	9.3329E-01	89.5	9.9572E-01	.1	5.7108E-02	91.5	1.9606E-04	-45.7	3.3622E-05	39.2
.337	.294	3.40	1.4462E-02	-167.9	9.2911E-01	89.5	9.9618E-01	.1	6.6115E-02	91.7	2.0318E-04	-44.6	3.8951E-05	46.2
.347	.312	3.20	1.3203E-02	-167.5	9.2259E-01	89.5	9.9631E-01	.1	7.7408E-02	91.9	2.1204E-04	-43.7	4.5589E-05	56.0
.359	.333	3.00	1.1988E-02	-167.0	9.1348E-01	89.4	9.9596E-01	.1	9.1844E-02	92.0	2.2329E-04	-43.1	5.4327E-05	67.8
.371	.357	2.80	1.0816E-02	-166.5	9.0151E-01	89.4	9.9490E-01	.1	1.1073E-01	92.2	2.3795E-04	-42.8	6.4907E-05	79.6
.385	.385	2.60	9.7034E-03	-166.0	8.9252E-01	89.4	9.9428E-01	.1	1.3629E-01	92.5	2.5367E-04	-42.1	5.6023E-05	86.6
.401	.417	2.40	8.6573E-03	-165.5	8.9452E-01	89.5	9.9738E-01	.1	1.7258E-01	93.2	2.6229E-04	-39.2	6.5343E-05	86.8
.419	.455	2.20	7.6520E-03	-164.9	8.9154E-01	89.5	1.0022E+00	.1	2.2577E-01	93.9	2.7531E-04	-36.5	8.7389E-05	89.3
.439	.500	2.00	6.6857E-03	-164.3	8.8249E-01	89.4	1.0025E+00	.1	3.0841E-01	94.8	2.9490E-04	-34.1	1.3551E-04	94.7
.451	.526	1.90	6.2174E-03	-164.0	8.7555E-01	89.4	1.0032E+00	.1	3.6423E-01	95.3	3.0831E-04	-33.1	1.7810E-04	97.6
.463	.556	1.80	5.7592E-03	-163.7	8.6700E-01	89.4	1.0034E+00	.1	4.4771E-01	95.9	3.2510E-04	-32.3	2.4189E-04	100.4
.476	.588	1.70	5.3123E-03	-163.3	8.5763E-01	89.3	1.0033E+00	.1	5.5668E-01	96.6	3.4569E-04	-31.5	3.3633E-04	102.8
.491	.625	1.60	4.8942E-03	-163.0	8.6041E-01	89.4	1.0074E+00	.1	7.1156E-01	97.9	3.5698E-04	-29.1	4.2740E-04	104.1
.507	.667	1.50	4.4837E-03	-162.7	8.6171E-01	89.5	1.0117E+00	.2	9.4454E-01	99.6	3.7260E-04	-26.7	5.8948E-04	106.4
.525	.714	1.40	4.0811E-03	-162.3	8.6246E-01	89.5	1.0160E+00	.2	1.3186E+00	101.9	3.9416E-04	-24.4	8.0805E-04	109.7
.545	.769	1.30	3.6807E-03	-162.0	8.6447E-01	89.7	1.0200E+00	.2	1.9738E+00	105.2	4.2409E-04	-22.1	1.4755E-03	114.0
.567	.833	1.20	3.3008E-03	-161.6	8.7194E-01	90.1	1.0235E+00	.3	3.2565E+00	110.6	4.6530E-04	-20.0	2.7554E-03	120.1
.592	.909	1.10	2.9401E-03	-161.3	9.0173E-01	91.7	1.0302E+00	.4	6.1172E+00	121.4	5.2359E-04	-16.4	5.5634E-03	131.9
.621	1.000	1.00	2.5868E-03	-161.0	9.1043E-01	96.2	1.0452E+00	.5	1.2495E+01	144.3	5.5734E-04	-12.3	1.2709E-02	156.2
.655	1.111	.90	2.2332E-03	-160.7	7.6747E-01	102.0	1.0586E+00	.8	1.5353E+01	-174.6	6.4313E-04	-8.2	1.8023E-02	-161.5
.694	1.250	.80	1.9116E-03	-160.6	5.2580E-01	98.3	1.0817E+00	1.2	7.4329E+00	-142.7	7.5409E-04	-2.5	1.0012E-02	-127.1
.742	1.429	.70	1.5911E-03	-160.6	4.7344E-01	93.8	1.1153E+00	1.9	3.2609E+00	-128.5	9.4175E-04	4.4	5.2041E-03	-109.6
.802	1.667	.60	1.2869E-03	-160.9	4.3182E-01	91.2	1.1689E+00	3.3	1.5723E+00	-123.1	1.2673E-03	13.5	3.1803E-03	-98.7
.878	2.000	.50	9.9355E-04	-161.6	3.7063E-01	88.8	1.2506E+00	6.3	8.3685E-01	-122.2	1.9625E-03	25.9	2.1238E-03	-89.9
.982	2.500	.40	7.1419E-04	-162.9	3.0123E-01	85.8	1.3718E+00	14.3	4.6212E-01	-124.8	3.7454E-03	46.2	1.6148E-03	-80.8
1.134	3.333	.30	4.2567E-04	-164.9	2.0427E-01	81.1	1.1239E+00	35.8	2.4386E-01	-131.7	7.7776E-03	87.1	1.3501E-03	-68.8
1.389	5.000	.20	1.8446E-04	-176.9	9.1417E-02	65.8	1.7569E-01	50.5	1.0270E-01	-147.3	4.0625E-03	144.5	1.1623E-03	-58.2
1.964	10.000	.10	2.4265E-05	146.1	7.8417E-03	2.2	6.7716E-03	.6	1.3186E-02	157.3	2.8561E-04	156.3	7.7784E-04	-67.1

TABLE 11 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 120 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 120. DEG (HEAD SEAS=180) | SHIP SPEED = 9.99 KNOTS | FROUDE NUMBER = .1300 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.327	.238	4.20	1.1054E-01	103.5	6.1533E-01	89.3	9.8696E-01	.1	3.7820E-02	107.4	7.5553E-03	-85.2	2.7361E-03	-176.6
.340	.256	3.90	1.0698E-01	102.1	6.2201E-01	89.9	9.8752E-01	.1	4.7158E-02	109.1	8.6610E-03	-84.8	3.2781E-03	-176.2
.355	.278	3.60	1.0328E-01	100.6	6.2312E-01	90.0	9.8754E-01	.0	6.0232E-02	111.0	1.0061E-02	-84.5	3.9827E-03	-176.6
.367	.294	3.40	1.0071E-01	99.5	6.2031E-01	90.0	9.8709E-01	.0	7.2075E-02	112.3	1.1213E-02	-84.2	4.5652E-03	-177.1
.379	.312	3.20	9.8045E-02	98.4	6.1432E-01	90.0	9.8605E-01	-.0	8.7630E-02	113.6	1.2592E-02	-83.9	5.2593E-03	-178.0
.392	.333	3.00	9.5248E-02	97.2	6.0484E-01	90.0	9.8420E-01	-.0	1.0861E-01	115.1	1.4264E-02	-83.6	6.0903E-03	-179.1
.407	.357	2.80	9.2292E-02	96.0	5.9154E-01	90.0	9.8117E-01	-.1	1.3784E-01	116.7	1.6314E-02	-83.2	7.0924E-03	179.6
.424	.385	2.60	8.9136E-02	94.6	5.7408E-01	90.0	9.7645E-01	-.1	1.8023E-01	118.5	1.8864E-02	-82.8	8.3149E-03	178.0
.443	.417	2.40	8.5727E-02	93.2	5.5215E-01	90.0	9.6926E-01	-.1	2.4502E-01	120.7	2.2079E-02	-82.3	9.8339E-03	176.2
.465	.455	2.20	8.1995E-02	91.6	5.2547E-01	90.1	9.5844E-01	-.1	3.5106E-01	123.2	2.6200E-02	-81.6	1.1778E-02	174.1
.490	.500	2.00	7.7845E-02	89.9	4.9391E-01	90.3	9.4224E-01	-.1	5.4202E-01	126.5	3.1562E-02	-80.8	1.4396E-02	171.7
.504	.526	1.90	7.5573E-02	88.9	4.7635E-01	90.5	9.3131E-01	-.1	7.0037E-01	128.7	3.4852E-02	-80.2	1.6112E-02	170.5
.519	.556	1.80	7.3143E-02	87.9	4.5766E-01	90.9	9.1791E-01	-.2	9.3762E-01	131.3	3.8644E-02	-79.6	1.8264E-02	169.2
.536	.588	1.70	7.0529E-02	86.9	4.3793E-01	91.5	9.0145E-01	-.2	1.3144E+00	134.7	4.3023E-02	-78.9	2.1100E-02	168.0
.554	.625	1.60	6.7804E-02	85.9	4.3016E-01	92.9	8.9291E-01	-.3	1.9592E+00	140.8	4.8317E-02	-78.2	2.5751E-02	169.0
.575	.667	1.50	6.4825E-02	84.8	4.1789E-01	95.0	8.8323E-01	-.4	3.1640E+00	149.4	5.4678E-02	-77.4	3.2989E-02	170.8
.597	.714	1.40	6.1540E-02	83.5	3.9184E-01	98.3	8.7134E-01	-.5	5.5701E+00	162.7	6.2375E-02	-76.3	4.4413E-02	174.8
.623	.769	1.30	5.7896E-02	82.2	3.2646E-01	103.3	8.5669E-01	-.7	9.9107E+00	-175.2	7.1762E-02	-75.1	5.8898E-02	-176.0
.651	.833	1.20	5.3825E-02	80.7	2.0983E-01	109.1	8.3868E-01	-.9	1.2747E+01	-142.5	8.3284E-02	-73.5	5.7951E-02	-161.3
.684	.909	1.10	4.9247E-02	79.0	1.4442E-01	96.2	8.1665E-01	-1.3	9.1572E+00	-112.1	9.7457E-02	-71.6	3.6880E-02	-154.1
.722	1.000	1.00	4.4064E-02	77.0	1.2835E-01	88.7	7.8997E-01	-1.8	5.2526E+00	-93.5	1.1477E-01	-69.0	2.4317E-02	-160.1
.767	1.111	.90	3.8171E-02	74.8	1.1021E-01	85.3	7.5797E-01	-2.3	3.1025E+00	-83.3	1.3534E-01	-65.7	2.0321E-02	-170.7
.821	1.250	.80	3.1320E-02	72.5	8.6530E-02	84.6	7.4198E-01	-2.7	1.8809E+00	-75.9	1.6321E-01	-60.7	1.9525E-02	-179.0
.887	1.429	.70	2.3601E-02	69.7	5.7133E-02	83.3	7.4553E-01	-1.9	1.2006E+00	-70.6	1.9514E-01	-53.0	1.9985E-02	173.6
.971	1.667	.60	1.5218E-02	66.0	2.6107E-02	79.7	7.5489E-01	3.2	7.9359E-01	-67.6	2.1671E-01	-40.5	2.0205E-02	164.9
1.081	2.000	.50	6.8752E-03	60.0	4.7212E-03	74.9	5.8301E-01	22.4	4.1329E-01	-68.0	1.7590E-01	-17.9	1.6348E-02	156.0
1.235	2.500	.40	1.4522E-03	44.0	6.0633E-04	-89.7	7.0846E-02	49.7	1.2560E-01	-76.0	4.9560E-02	11.3	8.5942E-03	142.5
1.471	3.333	.30	6.9000E-05	-54.8	3.9709E-03	-116.8	1.3726E-02	-36.0	1.3667E-02	-149.9	1.7159E-04	-2.4	8.4546E-04	89.5
1.895	5.000	.20	1.5146E-05	178.7	2.6006E-04	125.0	5.6258E-04	-87.6	3.9333E-03	111.8	2.3007E-04	-118.0	2.9922E-04	-47.0
2.976	10.000	.10	7.1345E-09	-134.5	7.0729E-06	42.4	1.6820E-06	65.4	8.5908E-05	.8	1.0001E-05	-103.9	6.5322E-06	-176.7

TABLE 12 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 120 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 120. DEG (HEAD SEAS=180) SHIP SPEED = 19.99 KNOTS FROUDE NUMBER = .2400 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.351	.238	4.20	8.3070E-02	103.6	5.3827E-01	89.8	1.0055E+00	.0	4.6370E-02	112.3	7.8428E-03	-78.7	1.4827E-03	-168.2
.366	.256	3.90	7.3646E-02	102.2	5.3661E-01	89.9	1.0086E+00	-.0	5.9712E-02	114.0	8.9111E-03	-78.4	1.8592E-03	-169.5
.384	.278	3.60	7.6104E-02	100.7	5.3027E-01	89.9	1.0115E+00	-.0	7.[illegible]12E-02	115.8	1.0275E-02	-78.1	2.3637E-03	-171.4
.395	.294	3.40	7.3659E-02	99.6	5.2314E-01	89.9	1.0132E+00	-.0	9.4442E-02	117.1	1.1406E-02	-77.9	2.7924E-03	-172.9
.410	.312	3.20	7.1128E-02	98.4	5.1347E-01	89.9	1.0145E+00	-.1	1.1770E-01	118.5	1.2771E-02	-77.7	3.3157E-03	-174.7
.425	.333	3.00	6.8496E-02	97.2	5.0111E-01	89.9	1.0153E+00	-.1	1.4936E-01	120.0	1.4438E-02	-77.5	3.9593E-03	-176.7
.443	.357	2.80	6.5740E-02	96.0	4.8592E-01	89.9	1.0152E+00	-.1	1.9823E-01	121.8	1.6500E-02	-77.1	4.7615E-03	-178.9
.463	.385	2.60	6.2831E-02	94.6	4.6784E-01	89.9	1.0139E+00	-.1	2.7241E-01	123.9	1.9088E-02	-76.7	5.7838E-03	178.7
.485	.417	2.40	5.9735E-02	93.1	4.4697E-01	90.0	1.0106E+00	-.1	3.9625E-01	126.6	2.2381E-02	-76.1	7.1384E-03	176.1
.511	.455	2.20	5.6406E-02	91.6	4.2370E-01	90.3	1.0044E+00	-.1	6.2572E-01	130.3	2.6633E-02	-75.4	9.0612E-03	173.4
.540	.500	2.00	5.2802E-02	89.8	4.0156E-01	91.2	9.9591E-01	-.2	1.1199E+00	136.4	3.2158E-02	-74.4	1.2178E-02	171.3
.557	.526	1.90	5.0928E-02	89.0	4.0025E-01	92.6	9.9957E-01	-.2	1.6005E+00	142.5	3.5432E-02	-73.8	1.4864E-02	172.5
.575	.556	1.80	4.8941E-02	88.1	3.9624E-01	94.5	1.0038E+00	-.2	2.4340E+00	150.7	3.9287E-02	-73.1	1.8943E-02	174.5
.595	.588	1.70	4.6826E-02	87.2	3.8402E-01	97.3	1.0088E+00	-.2	3.9363E+00	162.7	4.3863E-02	-72.3	2.5187E-02	178.4
.618	.625	1.60	4.4568E-02	86.1	3.6727E-01	101.5	1.0147E+00	-.2	6.4181E+00	-178.7	4.9342E-02	-71.3	3.3395E-02	-173.6
.642	.667	1.50	4.2146E-02	85.0	3.4642E-01	104.9	1.0221E+00	-.2	8.6227E+00	-151.9	5.5957E-02	-70.2	3.7061E-02	-160.6
.669	.714	1.40	3.9536E-02	83.8	1.8854E-01	101.7	1.0314E+00	-.2	7.5261E+00	-123.5	6.4008E-02	-68.7	2.8694E-02	-149.4
.700	.769	1.30	3.6710E-02	82.5	1.5943E-01	95.0	1.0436E+00	-.1	4.9054E+00	-102.6	7.3868E-02	-66.9	1.9108E-02	-148.1
.736	.833	1.20	3.3634E-02	81.0	1.4798E-01	90.5	1.0599E+00	-.0	3.0653E+00	-89.5	8.5977E-02	-64.7	1.4407E-02	-154.3
.776	.909	1.10	3.0259E-02	79.4	1.3448E-01	88.1	1.0844E+00	.3	1.9950E+00	-81.2	1.0098E-01	-61.8	1.2727E-02	-162.7
.824	1.000	1.00	2.6480E-02	77.9	1.1803E-01	87.7	1.1472E+00	1.3	1.3266E+00	-74.5	1.2139E-01	-57.6	1.2368E-02	-169.2
.880	1.111	.90	2.2301E-02	76.2	9.7415E-02	87.0	1.2553E+00	3.4	9.3275E-01	-69.0	1.4716E-01	-51.8	1.2972E-02	-174.9
.947	1.250	.80	1.7685E-02	74.2	7.2894E-02	85.4	1.4269E+00	8.5	6.9523E-01	-64.4	1.7698E-01	-43.3	1.4208E-02	179.2
1.032	1.429	.70	1.2557E-02	71.8	4.5501E-02	83.0	1.6183E+00	20.5	5.1748E-01	-61.1	2.0010E-01	-29.6	1.5136E-02	172.8
1.139	1.667	.60	7.2136E-03	68.1	2.1352E-02	80.9	1.3818E+00	48.1	3.2221E-01	-58.5	1.7408E-01	-7.5	1.4116E-02	168.3
1.283	2.000	.50	2.9578E-03	59.6	4.7901E-03	72.7	3.5965E-01	87.1	1.6543E-01	-58.1	7.8872E-02	18.7	1.1297E-02	162.1
1.488	2.500	.40	5.7409E-04	39.6	1.1361E-04	-42.4	4.4577E-03	92.8	4.0562E-02	-67.5	1.0976E-02	42.0	4.9917E-03	152.3
1.809	3.333	.30	4.9228E-05	-40.4	1.4836E-03	-109.7	3.5677E-03	-5.2	4.1077E-03	-160.6	3.4501E-04	-27.4	2.8791E-04	102.6
2.401	5.000	.20	1.0484E-05	-178.5	5.6504E-05	111.7	6.7499E-05	-90.9	1.1323E-03	96.9	8.3866E-05	-133.5	7.4173E-05	-50.6
3.988	10.000	.10	1.8876E-08	-154.8	1.0380E-05	4.2	1.1296E-06	63.7	3.9605E-05	7.5	4.6799E-06	-107.9	3.2512E-06	-174.3

TABLE 13 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 150 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES ••• DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) •••

HEADING = 150. DEG (HEAD SEAS=180) | SHIP SPEED = 9.99 KNOTS | FROUDE NUMBER = .1300 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.345	.238	4.20	2.5902E-01	94.1	1.7891E-01	89.6	9.4434E-01	.0	1.6867E-02	116.4	2.1079E-02	-83.9	2.5383E-03	-179.0
.359	.256	3.90	2.4924E-01	93.0	1.7699E-01	89.6	9.3714E-01	.0	2.1717E-02	118.3	2.4245E-02	-83.4	3.0020E-03	-179.7
.376	.278	3.60	2.3855E-01	91.9	1.7299E-01	89.6	9.2734E-01	-.0	2.8786E-02	120.2	2.8214E-02	-82.9	3.5677E-03	179.2
.388	.294	3.40	2.3079E-01	91.1	1.6904E-01	89.6	9.1883E-01	-.1	3.5437E-02	121.6	3.1442E-02	-82.5	4.0128E-03	178.2
.402	.312	3.20	2.2245E-01	90.2	1.6396E-01	89.6	9.0823E-01	-.1	4.4487E-02	123.0	3.5265E-02	-82.[illegible]	4.5226E-03	177.1
.417	.333	3.00	2.1341E-01	89.3	1.5767E-01	89.6	8.9493E-01	-.2	5.7200E-02	124.5	3.9827E-02	-81.	5.1089E-03	175.8
.434	.357	2.80	2.0353E-01	88.3	1.5011E-01	89.6	8.7810E-01	-.2	7.5778E-02	126.1	4.5313E-02	-80.	5.7880E-03	174.3
.453	.385	2.60	1.9267E-01	87.2	1.4123E-01	89.7	8.5666E-01	-.3	1.0433E-01	127.9	5.1956E-02	-80.1	6.5850E-03	172.6
.474	.417	2.40	1.8062E-01	86.1	1.3102E-01	90.0	8.2912E-01	-.4	1.5123E-01	130.0	6.0045E-02	-79.2	7.5433E-03	170.6
.498	.455	2.20	1.6713E-01	84.8	1.1953E-01	90.4	7.9351E-01	-.6	2.3574E-01	132.6	6.9913E-02	-78.0	8.7508E-03	168.4
.527	.500	2.00	1.5189E-01	83.3	1.0701E-01	91.4	7.4721E-01	-.9	4.1039E-01	136.4	8.1884E-02	-76.5	1.0424E-02	166.0
.543	.526	1.90	1.4354E-01	82.5	1.0164E-01	92.5	7.2172E-01	-1.1	5.7905E-01	139.8	8.8951E-02	-75.7	1.1769E-02	165.5
.560	.556	1.80	1.3468E-01	81.8	9.7666E-02	94.5	6.9772E-01	-1.3	8.7694E-01	145.4	9.7258E-02	-74.7	1.3983E-02	166.2
.579	.588	1.70	1.2518E-01	80.9	9.2357E-02	97.5	6.7039E-01	-1.6	1.4388E+00	153.2	1.0659E-01	-73.6	1.7232E-02	167.6
.601	.625	1.60	1.1499E-01	80.0	8.3754E-02	102.5	6.3930E-01	-2.1	2.5797E+00	165.3	1.1704E-01	-72.4	2.2091E-02	171.2
.624	.667	1.50	1.0405E-01	79.0	6.5268E-02	111.0	6.0405E-01	-2.7	4.7201E+00	-173.8	1.2859E-01	-70.8	2.7704E-02	-179.9
.650	.714	1.40	9.2342E-02	77.9	3.2796E-02	118.0	5.6431E-01	-3.4	6.2352E+00	-141.7	1.4114E-01	-69.0	2.5264E-02	-165.1
.680	.769	1.30	7.9872E-02	76.7	1.4973E-02	105.6	5.1992E-01	-4.5	4.3406E+00	-111.7	1.5427E-01	-66.8	1.4202E-02	-158.6
.713	.833	1.20	6.6707E-02	75.3	1.1912E-02	92.2	4.7096E-01	-5.8	2.3888E+00	-94.4	1.6703E-01	-64.1	8.4125E-03	-166.6
.752	.909	1.10	5.3023E-02	73.7	9.3637E-03	88.3	4.1767E-01	-7.6	1.3278E+00	-86.1	1.7749E-01	-60.6	6.5010E-03	-178.9
.796	1.000	1.00	3.9066E-02	72.1	6.0183E-03	89.3	3.6499E-01	-9.9	7.5704E-01	-81.6	1.8517E-01	-56.0	5.6987E-03	171.3
.849	1.111	.90	2.5566E-02	70.3	2.7398E-03	93.7	3.1709E-01	-12.4	4.3447E-01	-78.9	1.8609E-01	-49.4	5.0858E-03	163.6
.914	1.250	.80	1.3705E-02	68.1	5.0959E-04	113.3	2.6470E-01	-13.7	2.4501E-01	-79.5	1.6446E-01	-40.0	4.1934E-03	154.9
.993	1.429	.70	4.9562E-03	65.0	5.0380E-04	-143.4	1.7757E-01	-12.0	1.2654E-01	-86.1	1.1830E-01	-25.7	2.8132E-03	141.7
1.094	1.667	.60	5.8378E-04	57.5	1.8684E-03	-127.5	5.1643E-02	-11.4	3.9697E-02	-105.3	4.0012E-02	-1.7	1.0363E-03	124.2
1.229	2.000	.50	6.9540E-05	-104.4	2.1444E-03	-130.9	5.5400E-02	-61.4	1.4433E-02	-157.7	9.4103E-05	28.5	2.1500E-04	57.2
1.420	2.500	.40	1.4826E-04	-130.8	3.8686E-04	-166.7	1.6298E-02	-39.0	1.1155E-02	149.9	[illegible]4692E-03	-117.9	4.0229E-04	-23.5
1.718	3.333	.30	2.3713E-05	53.0	1.2234E-04	59.8	7.0488E-04	-131.6	5.5491E-04	45.0	3.4095E-06	-63.4	4.6821E-05	-126.5
2.265	5.000	.20	2.3674E-06	164.4	7.1547E-06	128.4	7.3719E-06	-18.4	1.1205E-04	131.0	1.4642E-05	-9.8	9.4683E-06	-30.5
3.717	10.000	.10	4.6501E-07	168.1	9.9974E-07	79.4	2.0977E-06	-7.9	9.2857E-06	107.8	2.8348E-06	179.0	6.2808E-07	-73.7

TABLE 14 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 150 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES ••• DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) •••

HEADING = 150. DEG (HEAD SEAS=180) SHIP SPEED = 19.99 KNOTS FROUDE NUMBER = .2500 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.387	.238	4.20	1.6415E-01	94.0	1.4208E-01	89.5	9.8070E-01	-.1	2.5396E-02	122.7	2.1341E-02	-78.7	1.4783E-03	-174.2
.404	.256	3.90	1.5584E-01	93.0	1.3791E-01	89.5	9.7770E-01	-.2	3.3922E-02	124.4	2.4544E-02	-78.2	1.7914E-03	-176.2
.425	.278	3.60	1.4697E-01	91.8	1.3231E-01	89.5	9.7283E-01	-.2	4.7148E-02	126.2	2.8602E-02	-77.6	2.1815E-03	-178.4
.440	.294	3.40	1.4068E-01	91.0	1.2774E-01	89.5	9.6814E-01	-.3	6.0439E-02	127.5	3.1930E-02	-77.1	2.4966E-03	179.9
.457	.312	3.20	1.3403E-01	90.1	1.2250E-01	89.5	9.6188E-01	-.3	7.9850E-02	129.0	3.5897E-02	-76.5	2.8697E-03	178.0
.475	.333	3.00	1.2699E-01	89.2	1.1662E-01	89.6	9.5358E-01	-.4	1.0974E-01	130.8	4.0657E-02	-75.8	[illegible]	176.0
.496	.357	2.80	1.1949E-01	88.2	1.1017E-01	89.8	9.4261E-01	-.5	1.5912E-01	133.0	4.6406E-02	-75.0	3.8917E-03	173.8
.520	.385	2.60	1.1145E-01	87.1	1.0331E-01	90.3	9.2809E-01	-.6	2.4911E-01	136.1	5.3378E-02	-73.9	4.6625E-03	171.5
.547	.417	2.40	1.0284E-01	86.0	9.8280E-02	91.8	9.1397E-01	-.8	4.3986E-01	142.1	6.1497E-02	-72.7	5.9456E-03	170.6
.578	.455	2.20	9.3583E-02	84.8	9.5643E-02	95.6	9.0653E-01	-1.0	9.4435E-01	154.4	7.2588E-02	-71.1	8.6389E-03	173.1
.614	.500	2.00	8.3460E-02	83.5	8.3941E-02	103.9	8.9825E-01	-1.2	2.5142E+00	179.8	8.6534E-02	-69.1	1.4033E-02	-177.4
.635	.526	1.90	7.8037E-02	82.8	6.4022E-02	110.1	8.9403E-01	-1.4	3.7537E+00	-156.9	9.4903E-02	-67.8	1.6056E-02	-165.8
.658	.556	1.80	7.2352E-02	82.0	3.8687E-02	110.2	8.9003E-01	-1.6	3.8598E+00	-128.6	1.0441E-01	-66.4	1.3121E-02	-152.9
.683	.588	1.70	6.6391E-02	81.2	2.7259E-02	100.6	8.8653E-01	-1.7	2.7071E+00	-105.5	1.1518E-01	-64.7	8.2156E-03	-148.5
.710	.625	1.60	6.0143E-02	80.3	2.4977E-02	92.5	8.8388E-01	-1.9	1.6909E+00	-90.8	1.2730E-01	-62.7	5.4873E-03	-153.6
.741	.667	1.50	5.3604E-02	79.4	2.3528E-02	88.5	8.8235E-01	-1.9	1.0822E+00	-82.0	1.4072E-01	-60.3	4.4193E-03	-162.5
.775	.714	1.40	4.6758E-02	78.4	2.0983E-02	86.7	8.8374E-01	-1.8	7.2461E-01	-76.6	1.5553E-01	-57.7	4.0553E-03	-171.2
.814	.769	1.30	3.9577E-02	77.5	1.7836E-02	86.8	9.0721E-01	-1.4	4.9298E-01	-71.7	1.7411E-01	-54.4	3.9761E-03	-177.2
.859	.833	1.20	3.2205E-02	76.5	1.4015E-02	86.8	9.4863E-01	-.9	3.4915E-01	-68.0	1.9398E-01	-48.4	4.0321E-03	177.6
.911	.909	1.10	2.4779E-02	75.5	9.8251E-03	86.4	1.0094E+00	3.0	2.5570E-01	-65.3	2.1276E-01	-41.7	4.1188E-03	172.7
.972	1.000	1.00	1.7521E-02	74.3	5.6486E-03	85.4	1.0681E+00	9.6	1.9209E-01	-63.9	2.2403E-01	-32.4	4.1454E-03	166.8
1.044	1.111	.90	1.0691E-02	73.0	2.3030E-03	86.1	1.0524E+00	23.1	1.3042E-01	-63.8	2.1464E-01	-18.7	3.7564E-03	161.4
1.133	1.250	.80	5.0853E-03	70.6	4.3654E-04	90.9	7.2427E-01	48.3	7.3573E-02	-64.9	1.5911E-01	1.4	2.9364E-03	157.0
1.243	1.429	.70	1.5929E-03	65.1	4.5387E-05	-122.7	1.6738E-01	60.8	3.4176E-02	-69.7	6.9084E-02	25.2	1.9218E-03	149.6
1.386	1.667	.60	1.5592E-04	49.0	6.0408E-04	-110.8	8.9439E-04	22.5	8.9074E-03	-91.0	1.0189E-02	53.0	6.5861E-04	136.8
1.579	2.000	.50	3.2734E-05	-90.1	7.2722E-04	-117.4	1.2022E-02	-16.1	2.9595E-03	-156.8	9.5655E-05	-94.3	7.4965E-05	79.3
1.853	2.500	.40	3.3901E-05	-127.6	9.8803E-05	-147.2	1.9305E-03	-18.1	2.3637E-03	149.8	9.1044E-04	-81.6	1.0586E-04	-14.8
2.303	3.333	.30	3.4016E-06	61.5	2.9084E-05	48.4	7.6056E-05	-157.2	1.3885E-04	11.5	3.0342E-05	-142.9	7.6747E-06	-148.5
3.142	5.000	.20	1.3135E-06	152.9	7.9926E-06	114.7	7.5327E-06	-41.1	6.1345E-05	113.8	2.0295E-06	77.4	4.9873E-06	-53.2
5.470	10.000	.10	1.9866E-07	155.4	7.5388E-07	73.9	9.9708E-07	-28.7	2.7754E-06	105.1	9.1711E-07	163.1	1.6049E-07	-90.5

TABLE 15 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 180 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES ••• DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) •••

HEADING = 180. DEG (HEAD SEAS=180) SHIP SPEED = 9.99 KNOTS FROUDE NUMBER = .1300 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.351	.238	4.20	3.1570E-01	92.2	0.	0.0	9.2182E-01	.0	0.	0.0	2.7516E-02	-83.3	0.	0.0
.366	.256	3.90	3.0227E-01	91.2	0.	0.0	9.1082E-01	-.0	0.	0.0	3.1619E-02	-82.8	0.	0.0
.384	.278	3.60	2.8749E-01	90.2	0.	0.0	8.9632E-01	-.1	0.	0.0	3.6733E-02	-82.2	0.	0.0
.396	.294	3.40	2.7673E-01	89.4	0.	0.0	8.8403E-01	-.1	0.	0.0	4.0865E-02	-81.7	0.	0.0
.410	.312	3.20	2.6511E-01	88.5	0.	0.0	8.6902E-01	-.2	0.	0.0	4.5726E-02	-81.2	0.	0.0
.426	.333	3.00	2.5249E-01	87.7	0.	0.0	8.5055E-01	-.2	0.	0.0	5.1471E-02	-80.5	0.	0.0
.443	.357	2.80	2.3870E-01	86.8	0.	0.0	8.2768E-01	-.3	0.	0.0	5.8303E-02	-79.8	0.	0.0
.463	.385	2.60	2.2353E-01	85.8	0.	0.0	7.9917E-01	-.5	0.	0.0	6.6453E-02	-78.9	0.	0.0
.485	.417	2.40	2.0673E-01	84.6	0.	0.0	7.6343E-01	-.7	0.	0.0	7.6173E-02	-77.8	0.	0.0
.511	.455	2.20	1.8802E-01	83.4	0.	0.0	7.1843E-01	-.9	0.	0.0	8.7688E-02	-76.4	0.	0.0
.540	.500	2.00	1.6707E-01	82.0	0.	0.0	6.6305E-01	-1.4	0.	0.0	1.0123E-01	-74.7	0.	0.0
.557	.526	1.90	1.5575E-01	81.3	0.	0.0	6.3604E-01	-1.7	0.	0.0	1.0953E-01	-73.8	0.	0.0
.575	.556	1.80	1.4373E-01	80.6	0.	0.0	6.0581E-01	-2.1	0.	0.0	1.1863E-01	-72.7	0.	0.0
.595	.588	1.70	1.3098E-01	79.7	0.	0.0	5.7205E-01	-2.6	0.	0.0	1.2850E-01	-71.4	0.	0.0
.618	.625	1.60	1.1749E-01	78.8	0.	0.0	5.3452E-01	-3.3	0.	0.0	1.3904E-01	-69.9	0.	0.0
.642	.667	1.50	1.0328E-01	77.9	0.	0.0	4.9310E-01	-4.2	0.	0.0	1.4997E-01	-68.1	0.	0.0
.669	.714	1.40	8.8418E-02	76.8	0.	0.0	4.4788E-01	-5.4	0.	0.0	1.6070E-01	-65.9	0.	0.0
.700	.769	1.30	7.3051E-02	75.5	0.	0.0	3.9921E-01	-7.0	0.	0.0	1.7019E-01	-63.3	0.	0.0
.736	.833	1.20	5.7453E-02	74.3	0.	0.0	3.4769E-01	-9.1	0.	0.0	1.7654E-01	-60.0	0.	0.0
.776	.909	1.10	4.2061E-02	72.8	0.	0.0	2.9453E-01	-11.9	0.	0.0	1.7729E-01	-55.9	0.	0.0
.824	1.000	1.00	2.7481E-02	71.5	0.	0.0	2.4703E-01	-15.4	0.	0.0	1.7282E-01	-50.1	0.	0.0
.880	1.111	.90	1.4979E-02	69.9	0.	0.0	2.0011E-01	-19.0	0.	0.0	1.5337E-01	-42.2	0.	0.0
.947	1.250	.80	5.8129E-03	68.1	0.	0.0	1.4171E-01	-21.9	0.	0.0	1.1122E-01	-30.6	0.	0.0
1.032	1.429	.70	9.6204E-04	65.6	0.	0.0	6.3912E-02	-30.0	0.	0.0	4.8371E-02	-12.6	0.	0.0
1.139	1.667	.60	1.6684E-05	-110.9	0.	0.0	5.1456E-02	-70.9	0.	0.0	2.4228E-03	17.4	0.	0.0
1.283	2.000	.50	2.5897E-04	-124.5	0.	0.0	4.1929E-02	-56.7	0.	0.0	6.2446E-03	-137.3	0.	0.0
1.488	2.500	.40	8.0831E-06	-163.1	0.	0.0	8.2771E-04	-55.6	0.	0.0	2.9251E-03	-101.0	0.	0.0
1.809	3.333	.30	4.1926E-06	.1	0.	0.0	1.4612E-04	-147.2	0.	0.0	2.4007E-04	118.1	0.	0.0
2.401	5.000	.20	3.5996E-06	61.0	0.	0.0	1.3666E-05	-98.0	0.	0.0	2.9949E-06	-151.9	0.	0.0
3.988	10.000	.10	4.2758E-08	-44.1	0.	0.0	2.5279E-06	-175.9	0.	0.0	1.9938E-06	35.3	0.	0.0

TABLE 16 - DLG-26, RESPONSE AMPLITUDE OPERATORS, 180 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DLG-26 LAMPS CONFIGURATION (DRAFT=19.1FT) ***

HEADING = 180. DEG (HEAD SEAS=180) SHIP SPEED = 19.99 KNOTS FROUDE NUMBER = .2600 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.399	.238	4.20	1.8919E-01	92.2	0.	0.0	9.6467E-01	-.2	0.	0.0	2.7898E-02	-78.2	0.	0.0
.418	.256	3.90	1.7851E-01	91.2	0.	0.0	9.5857E-01	-.3	0.	0.0	3.2118E-02	-77.6	0.	0.0
.440	.278	3.60	1.6758E-01	90.1	0.	0.0	9.4986E-01	-.4	0.	0.0	3.7423E-02	-76.8	0.	0.0
.456	.294	3.40	1.5896E-01	89.3	0.	0.0	9.4209E-01	-.4	0.	0.0	4.1752E-02	-76.2	0.	0.0
.474	.312	3.20	1.5039E-01	88.5	0.	0.0	9.3228E-01	-.5	0.	0.0	4.6863E-02	-75.5	0.	0.0
.494	.333	3.00	1.4131E-01	87.6	0.	0.0	9.1985E-01	-.6	0.	0.0	5.2929E-02	-74.7	0.	0.0
.516	.357	2.80	1.3165E-01	86.6	0.	0.0	9.0407E-01	-.7	0.	0.0	6.0148E-02	-73.6	0.	0.0
.541	.385	2.60	1.2135E-01	85.6	0.	0.0	8.8579E-01	-.9	0.	0.0	6.8766E-02	-72.4	0.	0.0
.570	.417	2.40	1.1039E-01	84.6	0.	0.0	8.7475E-01	-1.1	0.	0.0	7.9504E-02	-70.9	0.	0.0
.603	.455	2.20	9.8573E-02	83.5	0.	0.0	8.6214E-01	-1.5	0.	0.0	9.2485E-02	-69.0	0.	0.0
.642	.500	2.00	8.5794E-02	82.3	0.	0.0	8.4841E-01	-1.9	0.	0.0	1.0960E-01	-66.5	0.	0.0
.664	.526	1.90	7.9024E-02	81.6	0.	0.0	8.4146E-01	-2.1	0.	0.0	1.1941E-01	-65.0	0.	0.0
.688	.555	1.80	7.1993E-02	80.9	0.	0.0	8.3472E-01	-2.3	0.	0.0	1.3027E-01	-63.2	0.	0.0
.714	.588	1.70	6.4705E-02	80.1	0.	0.0	8.2840E-01	-2.5	0.	0.0	1.4212E-01	-61.2	0.	0.0
.744	.625	1.60	5.7 75E-02	79.2	0.	0.0	8.2252E-01	-2.6	0.	0.0	1.5478E-01	-58.7	0.	0.0
.777	.667	1.50	4.9413E-02	78.4	0.	0.0	8.1926E-01	-2.5	0.	0.0	1.6835E-01	-55.8	0.	0.0
.814	.714	1.40	4.1403E-02	77.7	0.	0.0	8.3406E-01	-2.2	0.	0.0	1.8485E-01	-51.9	0.	0.0
.856	.769	1.30	3.3354E-02	76.9	0.	0.0	8.6163E-01	-1.0	0.	0.0	2.0144E-01	-47.0	0.	0.0
.904	.833	1.20	2.5430E-02	76.0	0.	0.0	9.0054E-01	1.8	0.	0.0	2.1563E-01	-40.6	0.	0.0
.960	.909	1.10	1.7881E-02	75.1	0.	0.0	9.3337E-01	7.4	0.	0.0	2.2195E-01	-32.1	0.	0.0
1.026	1.000	1.00	1.1016E-02	74.1	0.	0.0	9.0530E-01	18.6	0.	0.0	2.1044E-01	-20.1	0.	0.0
1.104	1.111	.90	5.3903E-03	72.8	0.	0.0	6.8147E-01	39.6	0.	0.0	1.6435E-01	-2.2	0.	0.0
1.200	1.250	.80	1.8062E-03	69.4	0.	0.0	2.2229E-01	69.2	0.	0.0	8.3301E-02	20.2	0.	0.0
1.321	1.429	.70	2.3610E-04	60.8	0.	0.0	4.0166E-03	76.7	0.	0.0	1.8508E-02	46.7	0.	0.0
1.476	1.667	.60	1.5821E-05	-96.2	0.	0.0	1.5738E-02	-27.6	0.	0.0	2.3110E-04	105.2	0.	0.0
1.688	2.000	.50	6.4612E-05	-117.9	0.	0.0	7.2300E-03	-10.5	0.	0.0	1.5157E-03	-88.9	0.	0.0
1.994	2.500	.40	2.7266E-06	-179.8	0.	0.0	1.9574E-04	-56.2	0.	0.0	3.2358E-04	-84.4	0.	0.0
2.483	3.333	.30	3.8320E-06	-9.9	0.	0.0	5.9053E-05	158.9	0.	0.0	1.2680E-05	135.4	0.	0.0
3.413	5.000	.20	1.0892E-06	63.2	0.	0.0	1.4585E-07	-140.7	0.	0.0	4.3116E-06	-119.5	0.	0.0
6.012	10.000	.10	5.6739E-08	-32.1	0.	0.0	6.7581E-07	174.2	0.	0.0	7.4626E-07	23.4	0.	0.0

TABLE 17 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 0 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 0. DEG (HEAD SEAS=180) | SHIP SPEED = 10.00 KNOTS | FROUDE NUMBER = .1462 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.280	.238	4.20	6.4034E-01	-47.2	9.5353E-15	-92.0	8.6128E-01	.5	5.[illegible]27E-16	-126.1	3.2054E-02	84.2	3.7629E-16	-165.0
.288	.256	3.90	5.6449E-01	-51.4	9.4786E-15	-92.2	8.4341E-01	.5	6.5362E-16	-127.3	3.6760E-02	83.7	4.4472E-16	-164.9
.297	.278	3.60	4.9692E-01	-56.4	9.3635E-15	-92.4	8.2123E-01	.5	8.1450E-16	-128.6	4.2443E-02	83.2	5.2896E-16	-164.7
.303	.294	3.40	4.5699E-01	-60.3	9.2463E-15	-92.6	8.0336E-01	.5	9.5411E-16	-129.6	4.6893E-02	82.7	5.9633E-16	-164.4
.310	.312	3.20	4.2164E-01	-64.6	9.0895E-15	-92.8	7.8243E-01	.5	1.1291E-15	-130.5	5.1972E-02	82.3	6.7493E-16	-164.1
.318	.333	3.00	3.9141E-01	-69.6	8.8850E-15	-93.1	7.5774E-01	.5	1.3510E-15	-131.4	5.7775E-02	81.8	7.6719E-16	-163.7
.326	.357	2.80	3.6697E-01	-75.1	8.6229E-15	-93.5	7.2843E-01	.6	1.6359E-15	-132.3	6.4403E-02	81.2	8.7615E-16	-163.3
.334	.385	2.60	3.4921E-01	-81.3	8.2906E-15	-94.0	6.9341E-01	.6	2.0064E-15	-133.2	7.1948E-02	80.5	1.0055E-15	-162.7
.344	.417	2.40	3.3921E-01	-88.2	7.8726E-15	-94.6	6.5133E-01	.7	2.4939E-15	-134.0	8.0467E-02	79.7	1.1595E-15	-162.0
.354	.455	2.20	3.3829E-01	-95.6	7.3494E-15	-95.5	6.0053E-01	.7	3.1414E-15	-134.7	8.9925E-02	78.6	1.3426E-15	-161.2
.366	.500	2.00	3.4793E-01	-103.4	6.6985E-15	-96.7	5.3906E-01	.8	4.0055E-15	-135.3	1.0008E-01	77.4	1.5586E-15	-160.2
.372	.526	1.90	3.5714E-01	-107.4	6.3174E-15	-97.5	5.0366E-01	.9	4.5390E-15	-135.4	1.0523E-01	76.6	1.6790E-15	-159.6
.378	.556	1.80	3.6943E-01	-111.4	5.8952E-15	-98.5	4.6482E-01	1.0	5.1502E-15	-135.5	1.1023E-01	75.8	1.8068E-15	-159.0
.385	.588	1.70	3.8486E-01	-115.4	5.4522E-15	-99.7	4.2322E-01	1.1	5.8765E-15	-135.4	1.1509E-01	74.8	1.9588E-15	-158.3
.392	.625	1.60	4.0328E-01	-119.4	4.9777E-15	-101.1	3.7870E-01	1.2	6.7306E-15	-135.2	1.1950E-01	73.6	2.1332E-15	-157.5
.399	.667	1.50	4.2398E-01	-123.2	4.4466E-15	-103.0	3.3038E-01	1.3	7.6572E-15	-134.7	1.2278E-01	72.2	2.3033E-15	-156.5
.407	.714	1.40	4.4565E-01	-127.0	3.8664E-15	-105.[illegible]	2.7860E-01	1.5	8.6430E-15	-133.8	1.2424E-01	70.5	2.4558E-15	-155.3
.415	.769	1.30	4.6588E-01	-130.5	3.2431E-15	-108.8	2.2413E-01	1.9	9.5646E-15	-132.3	1.2296E-01	68.5	2.5689E-15	-153.9
.424	.833	1.20	4.8052E-01	-133.8	2.6063E-15	-113.5	1.6853E-01	2.5	1.0260E-14	-130.0	1.1776E-01	66.1	2.6097E-15	-152.1
.433	.909	1.10	4.8288E-01	-136.8	1.9904E-15	-120.3	1.1441E-01	3.5	1.0452E-14	-126.4	1.0723E-01	63.1	2.5304E-15	-149.8
.442	1.000	1.00	4.6292E-01	-139.4	1.4463E-15	-130.2	6.5800E-02	5.7	9.7854E-15	-120.2	9.0142E-02	59.1	2.2709E-15	-146.7
.451	1.111	.90	4.0761E-01	-141.3	1.0291E-15	-144.6	2.8023E-02	11.0	8.0553E-15	-108.8	6.6184E-02	53.6	1.7765E-15	-142.3
.461	1.250	.80	3.0554E-01	-142.0	7.6496E-16	-163.3	6.4746E-03	30.1	5.9275E-15	95.7	3.7769E-02	45.1	1.0597E-15	-134.8
.469	1.429	.70	1.6284E-01	-139.9	5.8578E-16	177.7	2.7098E-03	109.1	6.1630E-15	-44.3	1.2373E-02	28.8	3.3274E-16	-115.9
.475	1.667	.60	3.4506E-02	-124.6	3.1336E-16	165.3	7.9141E-03	144.3	1.2100E-14	-6.8	1.7833E-03	-47.5	1.0280E-16	-21.5
.475	2.000	.50	1.5978E-02	-9.9	1.8026E-17	-154.7	4.9745E-03	153.3	1.4149E-14	20.0	7.0144E-03	-129.6	5.3176E-16	16.0
.464	2.500	.40	2.9317E-[illegible]2	[illegible]	2.0216E-16	-47.1	6.3369E-04	-74.5	2.4415E-15	107.6	2.6480E-03	-177.8	3.2205E-16	97.7
.422	3.333	.30	2.6382E-02	[illegible]	2.0429E-16	101.3	9.4052E-05	-36.5	2.5666E-15	-140.3	2.1203E-03	6.9	4.8367E-16	-130.0
.282	5.000	.20	1.8077E-02	[illegible]	1.8903E-1[illegible]	-3.6	3.5939E-04	-99.5	9.7572E-16	158.5	1.5329E-04	46.8	8.7829E-16	150.8
.35	10.000	.10	2.9903E-03	6	3.5976E-17	26.9	6.3875E-05	11.5	2.4616E-16	-55.0	3.8957E-05	-109.2	3.5516E-17	-59.7

TABLE 18 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 0 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 0. DEG (HEAD SEAS=180) SHIP SPEED = 20.00 KNOTS FROUDE NUMBER = .2923 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.219	.238	4.20	1.7266E+00	-46.1	2.0066E-14	-95.6	8.3808E-01	.3	6.3360E-16	-138.0	2.4461E-02	77.8	3.2906E-16	-146.1
.222	.256	3.90	1.6096E+00	-50.3	2.0522E-14	-95.9	8.1721E-01	.3	7.6156E-16	-138.9	2.7971E-02	77.8	3.9379E-16	-146.1
.226	.278	3.60	1.5086E+00	-55.1	2.1010E-14	-96.2	7.9189E-01	.3	9.2842E-16	-139.9	3.2192E-02	77.7	4.8022E-16	-146.1
.228	.294	3.40	1.4543E+00	-58.8	2.1352E-14	-96.6	7.7192E-01	.3	1.0687E-15	-140.5	3.5484E-02	77.6	5.5471E-16	-146.1
.230	.312	3.20	1.4135E+00	-62.9	2.1704E-14	-97.0	7.4891E-01	.3	1.2395E-15	-141.3	3.9229E-02	77.4	6.4772E-16	-146.1
.232	.333	3.00	1.3903E+00	-67.6	2.2062E-14	-97.5	7.2225E-01	.3	1.4492E-15	-142.0	4.3493E-02	77.1	7.6547E-16	-146.1
.234	.357	2.80	1.3906E+00	-72.8	2.2418E-14	-98.1	6.9117E-01	.3	1.7086E-15	-142.8	4.8344E-02	76.7	9.1687E-16	-146.1
.236	.385	2.60	1.4236E+00	-78.6	2.2758E-14	-98.9	6.5473E-01	.2	2.0318E-15	-143.6	5.3845E-02	76.2	1.1149E-15	-146.1
.237	.417	2.40	1.5037E+00	-85.1	2.3060E-14	-100.0	6.1176E-01	.2	2.4365E-15	-144.4	6.0029E-02	75.5	1.3788E-15	-146.1
.238	.455	2.20	1.6542E+00	-92.1	2.3288E-14	-101.4	5.6085E-01	.1	2.9439E-15	-145.2	6.6860E-02	74.7	1.7379E-15	-146.1
.238	.500	2.00	1.9154E+00	-99.5	2.3386E-14	-103.4	5.0035E-01	.0	3.5754E-15	-146.0	7.4147E-02	73.5	2.2371E-15	-145.9
.237	.526	1.90	2.1032E+00	-103.4	2.3361E-14	-104.7	4.6597E-01	-.0	3.9422E-15	-146.4	7.7819E-02	72.8	2.5599E-15	-145.9
.236	.556	1.80	2.3600E+00	-107.2	2.3270E-14	-106.3	4.2855E-01	-.1	4.3423E-15	-146.7	8.1371E-02	72.0	2.9466E-15	-145.7
.234	.588	1.70	2.6907E+00	-111.0	2.3103E-14	-108.2	3.8796E-01	-.1	4.7709E-15	-147.1	8.4633E-02	71.0	3.4119E-15	-145.5
.232	.625	1.60	3.1290E+00	-114.8	2.2849E-14	-110.7	3.4414E-01	-.2	5.2162E-15	-147.4	8.7361E-02	69.9	3.9733E-15	-145.3
.229	.667	1.50	3.7174E+00	-118.4	2.2512E-14	-113.9	2.9721E-01	-.2	5.6560E-15	-147.6	8.9210E-02	68.7	4.6506E-15	-145.0
.225	.714	1.40	4.5206E+00	-122.0	2.2128E-14	-118.0	2.4758E-01	-.1	6.0507E-15	-147.8	8.9706E-02	67.2	5.4639E-15	-144.6
.219	.769	1.30	5.6413E+00	-125.3	2.1803E-14	-123.6	1.9614E-01	.1	6.3346E-15	-147.8	8.8221E-02	65.4	6.4262E-15	-144.2
.211	.833	1.20	7.2500E+00	-128.3	2.1807E-14	-131.0	1.4447E-01	.5	6.4055E-15	-147.7	8.3979E-02	63.4	7.5271E-15	-143.5
.201	.909	1.10	9.6486E+00	-130.9	2.2776E-14	-141.0	9.5209E-02	1.7	6.1169E-15	-147.4	7.6127E-02	61.0	8.6919E-15	-142.7
.187	1.000	1.00	1.3424E+01	-132.9	2.6138E-14	-153.8	5.2274E-02	4.5	5.2904E-15	-146.5	6.3989E-02	58.1	9.6934E-15	-141.8
.167	1.111	.90	1.9895E+01	-134.0	3.4976E-14	-168.4	2.0737E-02	12.7	3.7920E-15	-144.8	4.7647E-02	54.8	9.9867E-15	-140.9
.141	1.250	.80	3.2883E+01	-133.2	5.5439E-14	176.8	5.2968E-03	44.4	1.7752E-15	-141.0	2.8941E-02	51.1	8.6367E-15	-141.4
.104	1.429	.70	6.5869E+01	-130.3	1.4109E-13	159.2	5.1241E-03	102.7	2.5733E-16	-120.3	1.2816E-02	43.1	6.0968E-15	-143.9
.049	1.667	.60	3.2116E+02	-116.7	2.2426E-12	111.5	1.3994E-02	110.9	1.2100E-15	22.6	5.0639E-03	48.9	9.7839E-15	152.3
.036	2.000	.50	3.5410E+02	-8.0	2.6135E-11	73.2	6.5435E-03	83.2	7.0478E-15	42.3	1.5273E-03	26.2	1.4458E-13	134.5
.175	2.500	.40	1.5009E+00	36.1	1.0779E-14	-40.4	1.0172E-03	-77.0	2.1061E-16	88.0	1.9621E-03	-154.6	1.0646E-15	82.8
.430	3.333	.30	2.4333E-02	179.6	3.6328E-16	115.4	2.0239E-04	-14.0	3.3364E-15	-141.1	1.6523E-03	12.8	4.1489E-16	-126.2
.996	5.000	.20	1.3910E-04	112.0	2.5438E-17	-6.8	7.3934E-04	-23.9	1.8401E-15	-10.3	7.6742E-04	50.5	1.5969E-17	159.8
2.907	10.000	.10	2.7561E-06	-143.3	3.4302E-20	90.0	5.0613E-05	35.7	8.6938E-20	90.0	1.0808E-04	-139.6	2.5900E-20	-90.0

TABLE 19 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 30 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 30. DEG (HEAD SEAS=180) | SHIP SPEED = 10.00 KNOTS | FROUDE NUMBER = .1462 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.288	.238	4.20	5.6697E-01	-41.1	3.1176E-01	88.3	8.9015E-01	.4	1.7134E-02	57.4	2.4320E-02	84.5	9.2857E-03	14.1
.297	.256	3.90	4.9321E-01	-44.7	3.1031E-01	88.2	8.7607E-01	.4	2.0933E-02	56.2	2.8037E-02	84.1	1.0906E-02	14.2
.306	.278	3.60	4.2627E-01	-49.0	3.0724E-01	88.1	8.5843E-01	.4	2.6073E-02	54.9	3.2571E-02	83.6	1.2896E-02	14.5
.313	.294	3.40	3.8573E-01	-52.3	3.0407E-01	87.9	8.4411E-01	.4	3.0556E-02	54.0	3.6159E-02	83.3	1.4489E-02	14.7
.321	.312	3.20	3.4874E-01	-56.2	2.9943E-01	87.8	8.2719E-01	.4	3.6211E-02	53.0	4.0297E-02	82.9	1.6351E-02	15.1
.329	.333	3.00	3.1561E-01	-60.6	2.9429E-01	87.5	8.0707E-01	.5	4.3444E-02	52.0	4.5085E-02	82.5	1.8542E-02	15.5
.338	.357	2.80	2.8674E-01	-65.7	2.8720E-01	87.3	7.8295E-01	.5	5.2845E-02	51.1	5.0643E-02	82.0	2.1145E-02	16.0
.348	.385	2.60	2.6264E-01	-71.5	2.7822E-01	86.9	7.5381E-01	.5	6.5270E-02	50.1	5.7103E-02	81.4	2.4260E-02	16.5
.358	.417	2.40	2.4397E-01	-78.1	2.6691E-01	86.4	7.1834E-01	.6	8.1993E-02	49.1	6.4602E-02	80.7	2.8015E-02	17.2
.370	.455	2.20	2.3159E-01	-85.6	2.5273E-01	85.7	6.7482E-01	.6	1.0493E-01	48.2	7.3257E-02	79.9	3.2568E-02	18.0
.383	.500	2.00	2.2650E-01	-93.8	2.3546E-01	84.9	6.2152E-01	.7	1.3723E-01	47.4	8.3172E-02	78.8	3.8260E-02	18.9
.390	.526	1.90	2.2702E-01	-98.3	2.2725E-01	84.4	5.9236E-01	.7	1.5961E-01	47.0	8.8907E-02	78.1	4.2350E-02	19.3
.397	.556	1.80	2.2991E-01	-102.8	2.1743E-01	83.8	5.5970E-01	.7	1.8663E-01	46.7	9.4914E-02	77.3	4.6830E-02	19.8
.405	.588	1.70	2.3530E-01	-107.5	2.0587E-01	83.0	5.2312E-01	.7	2.1927E-01	46.5	1.0109E-01	76.4	5.1700E-02	20.4
.413	.625	1.60	2.4325E-01	-112.1	1.9239E-01	82.0	4.8214E-01	.7	2.5866E-01	46.5	1.0727E-01	75.4	5.6925E-02	21.2
.422	.667	1.50	2.5368E-01	-116.8	1.7688E-01	80.7	4.3649E-01	.7	3.0588E-01	46.6	1.1316E-01	74.2	6.2416E-02	22.1
.432	.714	1.40	2.6627E-01	-121.3	1.5927E-01	79.1	3.8579E-01	.8	3.6170E-01	47.1	1.1832E-01	72.8	6.7977E-02	23.1
.442	.769	1.30	2.8025E-01	-125.8	1.3963E-01	77.0	3.3005E-01	.9	4.2542E-01	47.9	1.2207E-01	71.1	7.3248E-02	24.4
.453	.833	1.20	2.9406E-01	-130.0	1.1821E-01	74.1	2.6977E-01	1.1	4.9590E-01	49.2	1.2339E-01	69.1	7.7587E-02	26.0
.464	.909	1.10	3.0486E-01	-134.1	9.5608E-02	70.0	2.0630E-01	1.4	5.6411E-01	51.4	1.2087E-01	66.5	7.9920E-02	27.9
.476	1.000	1.00	3.0773E-01	-137.8	7.2857E-02	64.2	1.4239E-01	2.1	6.1394E-01	55.0	1.1263E-01	63.3	7.8555E-02	30.4
.490	1.111	.90	2.9494E-01	-141.1	5.1540E-02	55.6	8.2876E-02	3.6	6.1655E-01	61.2	9.6620E-02	59.0	7.1112E-02	33.9
.503	1.250	.80	2.5598E-01	-143.9	3.3549E-02	42.8	3.4991E-02	7.5	5.3981E-01	73.0	7.1624E-02	52.8	5.5103E-02	39.1
.518	1.429	.70	1.8184E-01	-145.5	2.0289E-02	24.2	7.1090E-03	23.6	4.1787E-01	99.5	3.9942E-02	43.0	3.0622E-02	49.3
.532	1.667	.60	8.0556E-02	-144.1	1.0619E-02	.2	2.5091E-03	116.5	5.3426E-01	148.1	1.1232E-02	21.2	7.3890E-03	82.0
.544	2.000	.50	6.8404E-03	-118.0	2.4122E-03	-29.7	8.3225E-03	148.7	1.2858E+00	-172.5	2.6090E-03	-80.3	9.3968E-03	-173.4
.550	2.500	.40	1.6206E-02	9.7	9.9674E-04	154.4	1.9113E-03	162.6	8.8193E-01	-136.2	8.0196E-03	-146.7	2.0225E-02	-127.3
.536	3.333	.30	2.5081E-03	113.0	2.9756E-04	151.1	2.0541E-03	-55.7	6.8174E-01	3.4	1.1914E-03	58.6	1.4413E-02	-.2
.453	5.000	.20	4.7280E-03	-16.1	4.4754E-03	78.1	5.5124E-05	92.6	1.2451E-01	-165.9	9.2986E-04	170.3	1.1637E-02	-150.7
.014	10.000	.10	1.2669E+03	-53.3	6.6373E+03	169.0	5.3381E-04	-92.4	4.1250E-02	175.7	7.2418E-04	-108.4	2.2526E+01	-112.8

TABLE 20 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 30 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES ••• DE 1078 (DRAFT=15.5FT) •••

HEADING = 30. DEG (HEAD SEAS=180) | SHIP SPEED = 20.00 KNOTS | FROUDE NUMBER = .2923 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.235	.238	4.20	1.2875E+00	-40.3	5.5465E-01	85.3	8.6419E-01	.4	1.9319E-02	46.1	1.8079E-02	77.8	7.4507E-03	32.3
.240	.256	3.90	1.1698E+00	-43.8	5.6280E-01	85.2	8.4647E-01	.4	2.3211E-02	45.2	2.0753E-02	78.0	8.8010E-03	32.4
.245	.278	3.60	1.0627E+00	-47.9	5.7119E-01	84.9	8.2892E-01	.4	2.8305E-02	44.2	2.3998E-02	78.1	1.0591E-02	32.5
.248	.294	3.40	9.9820E-01	-51.1	5.7682E-01	84.7	8.0789E-01	.4	3.2611E-02	43.5	2.6555E-02	78.1	1.2124E-02	32.5
.252	.312	3.20	9.4038E-01	-54.7	5.8238E-01	84.4	7.8622E-01	.4	3.7881E-02	42.8	2.9494E-02	78.1	1.4026E-02	32.4
.255	.333	3.00	8.9039E-01	-58.9	5.8821E-01	84.1	7.6585E-01	.3	4.4445E-02	42.0	3.2942E-02	77.9	1.6552E-02	32.2
.259	.357	2.80	8.4956E-01	-63.7	5.9533E-01	83.6	7.4143E-01	.3	5.2884E-02	41.0	3.7176E-02	77.4	2.0343E-02	31.5
.263	.385	2.60	8.2214E-01	-69.3	6.0111E-01	83.0	7.1226E-01	.2	6.3617E-02	40.0	4.2078E-02	76.8	2.5229E-02	31.0
.266	.417	2.40	8.1278E-01	-75.6	6.0478E-01	82.3	6.7714E-01	.1	7.7398E-02	39.0	4.7743E-02	76.1	3.1629E-02	30.6
.269	.455	2.20	8.2879E-01	-82.7	6.0516E-01	81.3	6.3454E-01	-.0	9.5224E-02	38.0	5.4240E-02	75.2	4.0160E-02	30.4
.272	.500	2.00	8.8203E-01	-90.6	6.0046E-01	79.9	5.8249E-01	-.2	1.1834E-01	37.0	6.1566E-02	74.1	5.1747E-02	30.3
.273	.526	1.90	9.2838E-01	-94.8	5.9540E-01	79.0	5.5219E-01	-.2	1.3230E-01	36.6	6.5493E-02	73.5	5.9097E-02	30.3
.274	.556	1.80	9.9247E-01	-99.1	5.8797E-01	77.9	5.1860E-01	-.3	1.4806E-01	36.1	6.9532E-02	72.8	6.7778E-02	30.4
.275	.588	1.70	1.0792E+00	-103.6	5.7762E-01	76.6	4.8137E-01	-.5	1.6568E-01	35.7	7.3590E-02	71.9	7.8068E-02	30.5
.275	.625	1.60	1.1953E+00	-108.0	5.6374E-01	74.9	4.4018E-01	-.6	1.8508E-01	35.3	7.7521E-02	71.0	9.0294E-02	30.7
.275	.667	1.50	1.3499E+00	-112.4	5.4566E-01	72.8	3.9475E-01	-.7	2.0586E-01	35.0	8.1100E-02	69.9	1.0482E-01	30.9
.274	.714	1.40	1.5556E+00	-116.8	5.2278E-01	70.2	3.4498E-01	-.8	2.2712E-01	34.7	8.3988E-02	68.6	1.2201E-01	31.2
.271	.769	1.30	1.8302E+00	-121.0	4.9475E-01	66.6	2.9103E-01	-1.0	2.4707E-01	34.5	8.5690E-02	67.1	1.4214E-01	31.6
.268	.833	1.20	2.1987E+00	-125.0	4.6209E-01	61.7	2.3358E-01	-1.0	2.6248E-01	34.5	8.5507E-02	65.3	1.6513E-01	32.1
.263	.909	1.10	2.6964E+00	-128.7	4.2718E-01	55.0	1.7422E-01	-.9	2.6807E-01	34.7	8.2503E-02	63.1	1.9008E-01	32.6
.255	1.000	1.00	3.3717E+00	-132.0	3.9636E-01	45.5	1.1589E-01	-.4	2.5596E-01	35.2	7.5547E-02	60.5	2.1415E-01	33.1
.244	1.111	.90	4.2972E+00	-135.0	3.8932E-01	30.8	6.4832E-02	.8	2.2381E-01	36.3	6.4347E-02	56.7	2.4302E-01	33.7
.227	1.250	.80	5.5412E+00	-137.2	4.5523E-01	11.4	2.5450E-02	5.3	1.5949E-01	38.9	4.7538E-02	51.5	2.5722E-01	34.3
.202	1.429	.70	7.1112E+00	-137.7	6.9359E-01	-9.4	4.6482E-03	29.2	7.0767E-02	46.8	2.6745E-02	44.5	2.2709E-01	34.4
.163	1.667	.60	8.6418E+00	-134.1	1.2409E+00	-28.7	3.8545E-03	113.9	9.1752E-03	98.4	8.1672E-03	32.8	1.2028E-01	28.8
.101	2.000	.50	7.1414E+00	107.8	3.0432E+00	-56.4	7.3630E-03	130.6	5.5884E-02	-170.7	6.2156E-04	-27.6	4.1807E-02	-35.8
.014	2.500	.40	2.9301E+04	18.6	5.4427E+06	148.5	5.1497E-02	31.0	1.4325E+01	154.5	2.4005E-02	6.2	3.1283E+03	-125.3
.202	3.333	.30	1.1860E-01	109.9	2.8162E-02	-162.1	1.6169E-03	-69.2	6.9187E-02	-2.3	2.1263E-04	75.5	3.5302E-02	7.8
.654	5.000	.20	1.1692E-03	-18.5	8.0131E-03	-122.2	2.2481E-04	143.8	6.1184E+00	-100.6	1.0726E-03	174.9	2.3386E-02	-105.8
2.221	10.000	.10	6.3865E-07	-77.2	1.8531E-06	51.2	8.9764E-06	-82.3	5.5654E-06	145.2	4.6862E-06	75.5	1.0171E-06	-102.9

TABLE 21 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 60 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES ••• DE 1078 (DRAFT=15.5FT) •••

HEADING = 60. DEG (HEAD SEAS=180) | SHIP SPEED = 10.00 KNOTS | FROUDE NUMBER = .1462 | WAVE SLOPE (360*R/LAMBDA), K*R, = .2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.317	.238	4.20	4.3195E-01	-25.3	9.3616E-01	88.9	9.5249E-01	.3	4.6217E-02	69.2	7.8632E-03	84.2	8.9748E-03	12.2
.321	.256	3.90	3.6882E-01	-27.4	8.5207E-01	88.9	9.4676E-01	.3	5.6006E-02	68.3	9.1954E-03	84.1	1.0293E-02	12.6
.332	.278	3.60	3.1046E-01	-29.7	8.4461E-01	88.8	9.3924E-01	.3	6.9233E-02	67.3	1.0850E-02	84.0	1.1898E-02	13.1
.341	.294	3.40	2.7468E-01	-31.6	8.3792E-01	88.8	9.3290E-01	.3	8.0797E-02	66.5	1.2184E-02	83.9	1.3178E-02	13.6
.350	.312	3.20	2.4099E-01	-33.8	8.2913E-01	88.7	9.2515E-01	.3	9.5460E-02	65.7	1.3750E-02	83.8	1.4677E-02	14.1
.360	.333	3.00	2.0964E-01	-36.3	8.1819E-01	88.6	9.1562E-01	.4	1.1441E-01	64.9	1.5602E-02	83.7	1.6452E-02	14.8
.371	.357	2.80	1.8069E-01	-39.2	8.0476E-01	88.5	9.0380E-01	.4	1.3942E-01	64.0	1.7810E-02	83.5	1.8583E-02	15.4
.384	.385	2.60	1.5413E-01	-42.7	7.9181E-01	88.3	8.8988E-01	.4	1.7351E-01	63.0	2.0516E-02	83.3	2.1376E-02	16.0
.397	.417	2.40	1.2982E-01	-46.9	7.9075E-01	88.2	8.7717E-01	.4	2.2267E-01	61.8	2.4110E-02	82.8	2.5860E-02	16.0
.412	.455	2.20	1.0834E-01	-52.1	7.9365E-01	88.1	8.6062E-01	.4	2.9490E-01	60.6	2.8591E-02	82.3	3.1411E-02	16.2
.430	.500	2.00	8.9887E-02	-58.5	7.6922E-01	87.8	8.3868E-01	.3	4.0602E-01	59.4	3.4244E-02	81.7	3.8428E-02	16.9
.439	.526	1.90	8.1885E-02	-62.3	7.5879E-01	87.5	8.2503E-01	.3	4.8487E-01	58.8	3.7625E-02	81.3	4.2665E-02	17.3
.449	.556	1.80	7.4756E-02	-66.5	7.4591E-01	87.3	8.0909E-01	.3	5.8710E-01	58.3	4.1454E-02	80.9	4.7519E-02	17.9
.460	.588	1.70	6.8553E-02	-71.3	7.3037E-01	86.9	7.9039E-01	.3	7.2225E-01	57.9	4.5806E-02	80.5	5.3125E-02	18.5
.472	.625	1.60	6.3336E-02	-76.6	7.1194E-01	86.5	7.6835E-01	.3	9.0495E-01	57.5	5.0739E-02	79.9	5.9654E-02	19.4
.485	.667	1.50	5.9176E-02	-82.5	6.9041E-01	86.0	7.4223E-01	.3	1.1585E+00	57.3	5.6354E-02	79.3	6.7331E-02	20.3
.499	.714	1.40	5.6147E-02	-88.9	6.6565E-01	85.3	7.1111E-01	.3	1.5217E+00	57.2	6.2729E-02	78.6	7.6458E-02	21.5
.514	.769	1.30	5.4307E-02	-95.9	6.4150E-01	84.5	6.7566E-01	.3	2.0719E+00	57.5	7.0157E-02	77.7	8.8324E-02	23.0
.531	.833	1.20	5.3756E-02	-103.3	6.2084E-01	83.6	6.3666E-01	.2	2.9589E+00	58.3	7.9045E-02	76.6	1.0448E-01	24.8
.549	.909	1.10	5.4610E-02	-111.0	5.9781E-01	82.4	5.8929E-01	.2	4.4387E+00	60.0	8.9044E-02	75.2	1.2411E-01	27.3
.570	1.000	1.00	5.6819E-02	-118.8	5.7618E-01	80.8	5.3160E-01	.1	7.1080E+00	63.2	9.9980E-02	73.5	1.4827E-01	30.9
.594	1.111	.90	6.0120E-02	-126.5	5.6482E-01	79.3	4.6144E-01	.0	1.2454E+01	69.1	1.1126E-01	71.3	1.7789E-01	36.7
.620	1.250	.80	6.3792E-02	-134.1	5.8032E-01	79.6	3.7703E-01	-.0	2.4603E+01	81.1	1.2143E-01	68.4	2.0955E-01	47.1
.651	1.429	.70	6.6224E-02	-141.3	5.8480E-01	89.4	2.8045E-01	.0	4.9453E+01	108.8	1.2799E-01	64.4	1.9230E-01	69.1
.688	1.667	.60	6.4012E-02	-148.4	2.4196E-01	114.0	1.7537E-01	.5	4.3912E+01	159.3	1.2486E-01	58.7	3.8768E-02	95.2
.731	2.000	.50	5.1408E-02	-155.6	8.8462E-03	112.4	7.3943E-02	2.6	1.0941E+01	-152.9	1.0038E-01	49.5	1.1508E-02	26.9
.784	2.500	.40	2.4390E-02	-163.9	2.4310E-02	-29.0	8.9153E-03	17.5	2.1790E+00	-81.0	4.6651E-02	31.5	1.4385E-02	22.4
.848	3.333	.30	7.4860E-04	176.1	3.4091E-02	-22.4	6.3873E-03	153.4	2.8295E+00	-9.2	4.9008E-03	-61.1	2.4713E-05	67.8
.921	5.000	.20	2.7298E-04	-4.3	8.8089E-03	129.7	4.3702E-04	-124.9	3.6108E-01	136.2	5.2289E-03	163.4	1.8384E-03	-79.0
.928	10.000	.10	2.0658E-06	-25.2	2.1429E-03	158.2	1.0208E-05	158.0	1.7713E-01	152.3	6.6664E-04	30.9	7.8498E-04	-12.9

TABLE 22 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 60 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 60. DEG (HEAD SEAS=180) | SHIP SPEED = 20.00 KNOTS | FROUDE NUMBER = .2923 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

W, RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.280	.238	4.20	6.5535E-01	-25.0	1.1016E+00	87.1	9.2977E-01	.3	4.7119E-02	58.7	5.5069E-03	71.8	7.6264E-03	25.0
.288	.256	3.90	5.6996E-01	-27.0	1.1130E+00	87.0	9.2359E-01	.3	5.6579E-02	57.8	6.5653E-03	72.2	9.1537E-03	24.2
.297	.278	3.60	4.9020E-01	-29.3	1.1228E+00	87.0	9.1564E-01	.2	6.9193E-02	56.8	7.8827E-03	72.7	1.1049E-02	23.7
.303	.294	3.40	4.4024E-01	-31.2	1.1282E+00	86.9	9.0908E-01	.2	8.0064E-02	56.1	8.9459E-03	73.0	1.2586E-02	23.5
.310	.312	3.20	3.9294E-01	-33.3	1.1324E+00	86.9	9.0121E-01	.2	9.3650E-02	55.3	1.0195E-02	73.2	1.4412E-02	23.3
.318	.333	3.00	3.4838E-01	-35.7	1.1350E+00	86.8	8.9171E-01	.2	1.1089E-01	54.4	1.1675E-02	73.5	1.6614E-02	23.3
.326	.357	2.80	3.0668E-01	-38.6	1.1358E+00	86.6	8.8015E-01	.1	1.3314E-01	53.5	1.3441E-02	73.7	1.9309E-02	23.3
.334	.385	2.60	2.6802E-01	-42.0	1.1342E+00	86.4	8.6595E-01	.1	1.6242E-01	52.5	1.5567E-02	73.9	2.2649E-02	23.4
.344	.417	2.40	2.3263E-01	-46.0	1.1294E+00	86.2	8.4833E-01	.0	2.0184E-01	51.4	1.8150E-02	73.9	2.6939E-02	23.6
.354	.455	2.20	2.0083E-01	-51.0	1.1203E+00	85.9	8.2622E-01	-.1	2.5626E-01	50.2	2.1320E-02	73.9	3.2487E-02	23.8
.366	.500	2.00	1.7313E-01	-57.1	1.1055E+00	85.5	7.9912E-01	-.2	3.3360E-01	49.0	2.5248E-02	73.8	3.9876E-02	24.1
.372	.526	1.90	1.6104E-01	-60.8	1.0952E+00	85.2	7.8119E-01	-.2	3.8473E-01	48.3	2.7565E-02	73.6	4.4520E-02	24.3
.378	.556	1.80	1.5027E-01	-64.8	1.0825E+00	84.8	7.6191E-01	-.3	4.4722E-01	47.6	3.0163E-02	73.4	4.9993E-02	24.5
.385	.588	1.70	1.4089E-01	-69.3	1.0711E+00	84.5	7.4158E-01	-.4	5.2581E-01	46.9	3.3286E-02	73.0	5.7374E-02	24.5
.392	.625	1.60	1.3313E-01	-74.4	1.0598E+00	84.0	7.1990E-01	-.6	6.2609E-01	46.1	3.7039E-02	72.5	6.7136E-02	24.3
.399	.667	1.50	1.2741E-01	-80.1	1.0431E+00	83.4	6.9461E-01	-.8	7.5346E-01	45.3	4.1292E-02	71.9	7.8859E-02	24.3
.407	.714	1.40	1.2407E-01	-86.4	1.0199E+00	82.7	6.6495E-01	-1.0	9.1680E-01	44.5	4.6101E-02	71.1	9.3048E-02	24.4
.415	.769	1.30	1.2357E-01	-93.2	9.8870E-01	81.8	6.3002E-01	-1.2	1.1281E+00	43.7	5.1510E-02	70.2	1.1035E-01	24.6
.424	.833	1.20	1.2648E-01	-100.4	9.4755E-01	80.6	5.8869E-01	-1.6	1.4031E+00	43.1	5.7529E-02	69.0	1.3156E-01	24.9
.433	.909	1.10	1.3352E-01	-108.0	8.9407E-01	79.0	5.3964E-01	-2.0	1.7613E+00	42.5	6.4090E-02	67.5	1.5766E-01	25.4
.442	1.000	1.00	1.4553E-01	-115.7	8.2541E-01	76.9	4.8140E-01	-2.6	2.2227E+00	42.1	7.0965E-02	65.6	1.8962E-01	26.0
.452	1.111	.90	1.6326E-01	-123.5	7.3847E-01	73.9	4.1247E-01	-3.4	2.7971E+00	41.9	7.7605E-02	63.2	2.2805E-01	26.9
.461	1.250	.80	1.8706E-01	-131.1	6.3058E-01	69.5	3.3190E-01	-4.6	3.4501E+00	42.1	8.2844E-02	59.8	2.7192E-01	28.0
.469	1.429	.70	2.1506E-01	-138.6	5.0178E-01	62.6	2.4042E-01	-6.2	4.0186E+00	43.0	8.4385E-02	55.3	3.1519E-01	29.4
.475	1.667	.60	2.3933E-01	-145.9	3.6027E-01	51.0	1.4317E-01	-8.7	4.0541E+00	45.3	7.8131E-02	48.6	3.3890E-01	31.5
.476	2.000	.50	2.3597E-01	-153.3	2.3315E-01	29.9	5.4929E-02	-12.5	2.8160E+00	52.2	5.8402E-02	38.2	2.9762E-01	34.8
.464	2.500	.40	1.5489E-01	-162.0	1.6287E-01	-5.3	4.1469E-03	-16.9	7.0704E-01	86.9	2.4408E-02	18.7	1.3409E-01	42.2
.422	3.333	.30	9.3406E-03	168.5	6.2282E-02	-42.1	4.0460E-03	140.3	1.3849E+00	-178.2	1.6803E-03	-67.2	1.0828E-02	-179.3
.282	5.000	.20	3.7991E-02	15.7	2.7030E-01	129.5	5.7924E-04	-51.6	2.0313E-02	-70.6	6.2648E-04	155.8	3.6349E-02	-114.9
.356	10.000	.10	1.0465E-03	-130.1	5.2815E-03	-139.6	6.1921E-05	-119.7	1.5249E-01	-29.0	7.2935E-05	-13.0	2.5421E-02	-19.1

TABLE 23 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 90 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 90. DEG (HEAD SEAS=180) | SHIP SPEED = 10.00 KNOTS | FROUDE NUMBER = .1462 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.341	.238	4.20	3.1740E-01	-6.2	9.5906E-01	89.1	9.9207E-01	.2	6.2253E-02	89.3	1.7761E-04	-53.4	1.0215E-04	35.5
.353	.256	3.90	2.6930E-01	-6.5	9.4664E-01	89.2	9.9100E-01	.2	7.5339E-02	89.5	1.8926E-04	-52.8	1.0654E-04	47.5
.368	.278	3.60	2.2523E-01	-6.9	9.3083E-01	89.2	9.8903E-01	.3	9.3050E-02	89.7	2.0483E-04	-52.5	1.2760E-04	60.8
.379	.294	3.40	1.9810E-01	-7.1	9.1823E-01	89.1	9.8700E-01	.3	1.0860E-01	89.8	2.1813E-04	-52.4	1.5645E-04	69.3
.390	.312	3.20	1.7263E-01	-7.4	9.2097E-01	89.2	9.8780E-01	.3	1.2830E-01	90.2	2.2656E-04	-50.7	1.6568E-04	69.6
.403	.333	3.00	1.4892E-01	-7.7	9.2677E-01	89.3	9.8979E-01	.3	1.5405E-01	90.7	2.3418E-04	-48.3	1.7264E-04	69.3
.417	.357	2.80	1.2702E-01	-8.1	9.2900E-01	89.3	9.9172E-01	.2	1.8873E-01	91.2	2.4420E-04	-45.9	1.9247E-04	71.6
.433	.385	2.60	1.0691E-01	-8.5	9.1734E-01	89.3	9.9346E-01	.2	2.3703E-01	91.8	2.5746E-04	-43.6	2.3378E-04	76.0
.451	.417	2.40	8.8606E-02	-8.9	9.1148E-01	89.3	9.9479E-01	.2	3.0723E-01	92.5	2.7529E-04	-41.5	3.1453E-04	81.9
.471	.455	2.20	7.2081E-02	-9.5	9.1131E-01	89.3	9.9537E-01	.2	4.1504E-01	93.4	2.9981E-04	-39.4	4.7103E-04	88.2
.494	.500	2.00	5.7329E-02	-10.1	8.9709E-01	89.3	9.9457E-01	.3	5.9351E-01	94.6	3.3462E-04	-37.5	7.8011E-04	94.0
.506	.526	1.90	5.0614E-02	-10.5	8.8878E-01	89.3	9.9335E-01	.3	7.3055E-01	95.4	3.5769E-04	-36.6	1.0408E-03	96.7
.520	.556	1.80	4.4260E-02	-10.9	8.9396E-01	89.4	9.9607E-01	.3	9.1744E-01	96.6	3.7493E-04	-34.6	1.2729E-03	98.4
.535	.588	1.70	3.8343E-02	-11.3	9.0108E-01	89.5	9.9770E-01	.3	1.1894E+00	98.2	3.9465E-04	-32.3	1.6268E-03	101.0
.552	.625	1.60	3.2877E-02	-11.8	9.0852E-01	89.8	1.0034E+00	.3	1.6090E+00	100.3	4.2007E-04	-29.9	2.2416E-03	104.6
.570	.667	1.50	2.7858E-02	-12.3	9.1801E-01	90.0	1.0072E+00	.3	2.3039E+00	103.4	4.5322E-04	-27.4	3.3647E-03	109.3
.590	.714	1.40	2.3282E-02	-12.9	9.3268E-01	90.6	1.0109E+00	.3	3.5667E+00	108.1	4.9711E-04	-24.9	5.5810E-03	115.5
.612	.769	1.30	1.9146E-02	-13.7	9.5680E-01	91.8	1.0142E+00	.4	6.1439E+00	116.0	5.5632E-04	-22.3	1.0435E-02	124.8
.637	.833	1.20	1.5437E-02	-14.5	9.8264E-01	95.0	1.0174E+00	.4	1.1865E+01	131.3	6.3043E-04	-19.6	2.1867E-02	141.1
.665	.909	1.10	1.2070E-02	-15.4	8.9869E-01	101.8	1.0290E+00	.6	1.9547E+01	161.3	7.2606E-04	-15.3	3.7880E-02	173.4
.698	1.000	1.00	9.1572E-03	-16.6	6.3094E-01	103.5	1.0429E+00	.7	1.5388E+01	-161.7	8.6229E-04	-10.7	3.2367E-02	-146.9
.736	1.111	.90	6.6890E-03	-18.0	5.1604E-01	97.8	1.0592E+00	1.0	7.3610E+00	-138.8	1.0787E-03	-5.6	1.7382E-02	-121.6
.780	1.250	.80	4.8149E-03	-20.0	4.8257E-01	94.9	1.0831E+00	1.5	3.6420E+00	-128.2	1.4263E-03	.8	9.5153E-03	-107.7
.834	1.429	.70	2.9313E-03	-22.6	4.5594E-01	91.8	1.1247E+00	2.4	1.9988E+00	-124.1	2.0397E-03	4.8	5.8956E-03	-97.6
.901	1.667	.60	1.6777E-03	-26.9	4.1627E-01	89.8	1.1844E+00	4.1	1.1451E+00	-122.9	3.3169E-03	19.2	4.1351E-03	-89.9
.987	2.000	.50	8.0937E-04	-34.4	3.5862E-01	88.0	1.2797E+00	8.3	7.1055E-01	-124.6	6.3790E-03	35.1	3.1701E-03	-80.5
1.104	2.500	.40	3.5533E-04	-51.1	2.8210E-01	84.9	1.3279E+00	18.8	4.3841E-01	-128.8	1.4515E-02	62.7	2.6302E-03	-70.1
1.274	3.333	.30	1.6334E-04	-64.3	1.8649E-01	78.7	8.1884E-01	39.0	2.5945E-01	-137.2	2.3123E-02	111.9	2.3970E-03	-58.5
1.561	5.000	.20	7.6604E-06	-110.6	7.9507E-02	62.7	1.5090E-01	42.7	1.2174E-01	-153.8	8.2202E-03	159.0	2.1323E-03	-49.1
2.207	10.000	.10	1.1293E-05	138.4	7.0635E-03	-10.7	6.6274E-03	-9.3	1.8597E-02	146.2	8.2594E-04	151.5	1.2409E-03	-69.6

TABLE 24 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 90 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 90. DEG (HEAD SEAS=180) SHIP SPEED = 20.00 KNOTS FROUDE NUMBER = .2923 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.341	.238	4.20	3.1673E-01	-6.2	9.4056E-01	88.2	9.8595E-01	.2	6.1639E-02	85.8	9.7170E-04	-37.8	2.7595E-04	25.7
.353	.256	3.90	2.6867E-01	-6.5	9.3129E-01	88.2	9.8483E-01	.2	7.4910E-02	86.1	1.0178E-03	-37.5	2.4203E-04	33.8
.368	.278	3.60	2.2465E-01	-6.8	9.1892E-01	88.2	9.8277E-01	.2	9.2970E-02	86.4	1.0749E-03	-37.6	2.2288E-04	45.3
.379	.294	3.40	1.9754E-01	-7.1	9.0874E-01	88.2	9.8064E-01	.2	1.0889E-01	86.6	1.1218E-03	-37.8	2.2513E-04	54.6
.390	.312	3.20	1.7210E-01	-7.4	9.1154E-01	88.3	9.8181E-01	.2	1.2859E-01	87.1	1.1605E-03	-36.5	2.3756E-04	54.9
.403	.333	3.00	1.4841E-01	-7.7	9.1711E-01	88.4	9.8427E-01	.2	1.5426E-01	87.7	1.1991E-03	-34.6	2.5117E-04	54.1
.417	.357	2.80	1.2654E-01	-8.0	9.1976E-01	88.4	9.8668E-01	.1	1.8906E-01	88.4	1.2447E-03	-32.8	2.6849E-04	56.4
.433	.385	2.60	1.0647E-01	-8.4	9.1917E-01	88.5	9.8894E-01	.1	2.3786E-01	89.1	1.2995E-03	-31.1	2.9761E-04	61.6
.451	.417	2.40	8.8189E-02	-8.9	9.1503E-01	88.5	9.9086E-01	.1	3.0928E-01	89.9	1.3671E-03	-29.5	3.5672E-04	69.5
.471	.455	2.20	7.1695E-02	-9.4	9.0725E-01	88.4	9.9211E-01	.1	4.1979E-01	90.8	1.4530E-03	-28.1	4.8305E-04	79.1
.494	.500	2.00	5.6976E-02	-10.1	8.9617E-01	88.4	9.9218E-01	.1	6.0422E-01	92.1	1.5666E-03	-26.9	7.5507E-04	88.6
.506	.526	1.90	5.0277E-02	-10.5	8.8980E-01	88.3	9.9152E-01	.1	7.4674E-01	92.9	1.6384E-03	-26.4	9.9546E-04	93.0
.520	.556	1.80	4.3941E-02	-10.9	8.8612E-01	88.4	9.9482E-01	.1	9.3886E-01	94.2	1.6940E-03	-24.9	1.2188E-03	95.1
.535	.588	1.70	3.8043E-02	-11.3	9.0501E-01	88.5	9.9910E-01	.2	1.2193E+00	96.0	1.7549E-03	-23.1	1.5552E-03	98.2
.552	.625	1.60	3.2595E-02	-11.7	9.1539E-01	88.7	1.0036E+00	.2	1.6547E+00	98.3	1.8290E-03	-21.3	2.1388E-03	102.6
.570	.667	1.50	2.7596E-02	-12.3	9.2986E-01	88.9	1.0082E+00	.2	2.3804E+00	101.6	1.9206E-03	-19.5	3.2144E-03	108.2
.590	.714	1.40	2.3040E-02	-12.9	9.5229E-01	89.3	1.0129E+00	.3	3.7063E+00	106.6	2.0356E-03	-17.7	5.3639E-03	115.5
.612	.769	1.30	1.8924E-02	-13.7	9.9013E-01	90.5	1.0175E+00	.3	6.4110E+00	115.1	2.1832E-03	-15.9	1.0114E-02	126.0
.637	.833	1.20	1.5236E-02	-14.6	1.0370E+00	93.9	1.0223E+00	.4	1.2245E+01	131.4	2.3722E-03	-14.0	2.1103E-02	143.5
.665	.909	1.10	1.1892E-02	-15.5	9.6073E-01	101.2	1.0352E+00	.6	1.8836E+01	162.0	2.5581E-03	-10.7	3.4117E-02	176.4
.698	1.000	1.00	9.0042E-03	-16.7	6.8378E-01	103.8	1.0504E+00	.8	1.4066E+01	-162.9	2.8211E-03	-7.2	2.7795E-02	-145.8
.736	1.111	.90	6.5610E-03	-18.2	5.4525E-01	99.2	1.0686E+00	1.1	6.9200E+00	-141.6	3.2085E-03	-3.2	1.5422E-02	-122.3
.780	1.250	.80	4.5133E-03	-20.2	4.9518E-01	95.5	1.0941E+00	1.7	3.5444E+00	-131.6	3.7615E-03	1.7	8.7309E-03	-109.5
.834	1.429	.70	2.8583E-03	-23.0	4.5947E-01	93.2	1.1358E+00	2.8	2.0034E+00	-127.7	4.5916E-03	8.5	5.4980E-03	-100.1
.901	1.667	.60	1.6321E-03	-27.5	4.1462E-01	91.1	1.1934E+00	4.8	1.1832E+00	-126.5	6.0933E-03	17.3	3.9662E-03	-93.4
.987	2.000	.50	7.8656E-04	-35.6	3.5353E-01	89.1	1.2779E+00	9.2	7.5889E-01	-127.9	8.9707E-03	30.8	2.9532E-03	-85.1
1.104	2.500	.40	3.3366E-04	-52.0	2.7490E-01	85.9	1.3126E+00	19.7	4.8499E-01	-131.4	1.5084E-02	53.9	2.3617E-03	-76.3
1.274	3.333	.30	1.5153E-04	-70.5	1.7890E-01	79.4	8.1952E-01	41.1	2.9420E-01	-138.3	2.0976E-02	96.1	2.0306E-03	-66.5
1.561	5.000	.20	1.3760E-05	-111.7	7.5060E-02	62.7	1.2923E-01	43.5	1.3495E-01	-152.8	8.6334E-03	142.0	1.8198E-03	-59.7
2.207	10.000	.10	1.0948E-05	139.7	6.8962E-03	-12.4	6.4080E-03	-12.8	1.8799E-02	147.6	8.9057E-04	146.8	1.3026E-03	-76.1

TABLE 25 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 120 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES ••• DE 1078 (DRAFT=15.5FT) •••

HEADING = 120. DEG (HEAD SEAS=180) | SHIP SPEED = 10.00 KNOTS | FROUDE NUMBER = .1462 | WAVE SLOPE (360*R/LAMBDA), K*R = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.371	.238	4.20	2.3449E-01	12.0	1.1424E-01	89.7	9.8014E-01	.1	6.3102E-02	111.8	1.2745E-02	-81.0	3.8086E-03	-175.9
.386	.256	3.90	1.9736E-01	13.3	1.2203E-01	89.9	9.8132E-01	.1	7.9924E-02	114.3	1.4524E-02	-80.7	4.6757E-03	-175.2
.403	.278	3.60	1.6456E-01	14.7	1.2448E-01	90.0	9.8217E-01	.0	1.0473E-01	116.9	1.6771E-02	-80.3	5.8667E-03	-175.4
.418	.294	3.40	1.4430E-01	15.8	1.2271E-01	90.1	9.8243E-01	-.0	1.2831E-01	118.7	1.8815E-02	-80.0	6.8939E-03	-176.0
.436	.312	3.20	1.2554E-01	17.0	1.1791E-01	90.1	9.8228E-01	-.1	1.5073E-01	120.7	2.0822E-02	-79.7	8.1626E-03	-177.0
.446	.333	3.00	1.0828E-01	18.5	1.0898E-01	90.2	9.8153E-01	-.1	1.8679E-01	122.8	2.3492E-02	-79.4	9.7426E-03	-178.3
.463	.357	2.80	9.2442E-02	20.1	9.9820E-02	90.3	9.7991E-01	-.1	2.1749E-01	125.1	2.6763E-02	-78.9	1.1739E-02	-179.9
.482	.385	2.60	7.8142E-02	22.1	9.8284E-02	90.4	9.7701E-01	-.2	3.9127E-01	127.7	3.0827E-02	-78.4	1.4322E-02	178.3
.504	.417	2.40	6.5239E-02	24.3	9.6367E-02	90.7	9.7223E-01	-.2	3.5894E-01	130.8	3.5950E-02	-77.8	1.7791E-02	176.2
.529	.455	2.20	5.3753E-02	27.1	9.4080E-02	91.2	9.6465E-01	-.3	3.8541E-01	134.7	4.2510E-02	-77.1	2.2747E-02	174.1
.557	.500	2.00	4.3662E-02	30.3	9.1458E-02	92.2	9.5290E-01	-.4	1.5738E+00	140.2	5.1045E-02	-76.0	3.0601E-02	172.1
.574	.526	1.90	3.9131E-02	32.2	9.0021E-01	93.2	9.4485E-01	-.5	2.2336E+00	144.1	5.6279E-02	-75.4	3.4657E-02	171.4
.591	.556	1.80	3.4940E-02	34.3	8.8433E-01	94.6	9.3488E-01	-.5	3.3590E+00	149.5	6.2308E-02	-74.7	4.5411E-02	171.4
.611	.588	1.70	3.1083E-02	36.7	8.6603E-01	97.1	9.2254E-01	-.7	5.4280E+00	157.4	6.9268E-02	-73.9	5.8863E-02	172.9
.632	.625	1.60	2.7560E-02	39.4	8.3073E-01	101.7	9.1183E-01	-.8	9.2654E+00	170.6	7.7461E-02	-72.9	7.8952E-02	178.3
.655	.667	1.50	2.4384E-02	42.6	8.5139E-01	108.2	9.0854E-01	-.9	1.4767E+01	-167.0	8.7525E-02	-71.8	9.8831E-02	-169.0
.681	.714	1.40	2.1549E-02	46.2	2.2035E-01	110.1	9.0531E-01	-1.1	1.5948E+01	-136.8	9.9722E-02	-70.5	9.0367E-02	-151.6
.710	.769	1.30	1.9041E-02	50.2	1.5255E-01	100.4	9.0204E-01	-1.2	1.2379E+01	-109.3	1.1464E-01	-68.9	5.6105E-02	-141.0
.744	.833	1.20	1.6838E-02	54.5	1.4583E-01	91.2	9.0118E-01	-1.5	7.6563E+00	-91.0	1.3301E-01	-66.8	3.3962E-02	-142.8
.782	.909	1.10	1.4912E-02	59.3	1.4424E-01	86.6	9.0265E-01	-1.7	4.8924E+00	-79.3	1.5572E-01	-64.2	2.5520E-02	-151.8
.825	1.000	1.00	1.3220E-02	64.6	1.4241E-01	83.9	9.0950E-01	-1.8	3.3669E+00	-71.7	1.8361E-01	-60.8	2.3689E-02	-162.5
.874	1.111	.90	1.1693E-02	70.2	1.1001E-01	81.6	9.2487E-01	-1.7	2.4731E+00	-66.8	2.1681E-01	-56.2	2.4697E-02	-172.5
.930	1.250	.80	1.0171E-02	76.8	8.2238E-02	80.3	9.6701E-01	-.2	1.8058E+00	-63.1	2.5685E-01	-49.4	2.6197E-02	179.6
1.017	1.429	.70	8.4337E-03	84.2	5.4337E-02	78.9	1.0598E+00	4.9	1.2627E+00	-59.4	2.9847E-01	-38.5	2.7596E-02	173.9
1.114	1.667	.60	6.1385E-03	91.2	2.7153E-02	73.9	1.0749E+00	18.7	8.7037E-01	-56.8	2.9752E-01	-21.1	2.8789E-02	167.7
1.243	2.000	.50	3.8273E-03	99.4	6.4486E-03	59.4	5.9233E-01	47.1	5.0947E-01	-57.3	1.7835E-01	3.5	2.5913E-02	159.7
1.423	2.500	.40	1.1646E-03	87.4	5.0661E-04	-35.9	3.5962E-02	72.9	1.4670E-01	-66.6	4.1835E-02	28.0	1.3871E-02	150.1
1.701	3.333	.30	1.1095E-04	45.1	2.9224E-03	-110.5	6.8441E-03	8.0	1.7147E-02	-143.8	4.5018E-05	83.1	1.4707E-03	111.1
2.200	5.000	.20	1.3596E-05	-47.2	2.2121E-04	133.4	3.4699E-04	-85.1	3.2596E-03	120.3	2.5629E-04	-116.5	4.2608E-04	-32.9
3.4851	0.000	.10	6.1630E-07	-129.6	1.4700E-05	49.5	1.4835E-05	44.0	1.4702E-04	70.3	4.9545E-05	-113.6	1.1685E-05	-111.9

TABLE 26 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 120 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 120. DEG (HEAD SEAS=180) | SHIP SPEED = 20.00 KNOTS, FROUDE NUMBER = .2923 | WAVE SLOPE (360*R/LAMBDA), K*R* = 2.25 DEG, WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.401	.238	4.20	1.7113E-01	12.0	5.2231E-01	89.5	1.0040E+00	-.0	7.8325E-02	118.1	1.3826E-02	-71.2	1.6861E-03	-162.8
.419	.256	3.90	1.4269E-01	13.2	5.2203E-01	89.6	1.0087E+00	-.1	1.0343E-01	120.8	1.5534E-02	-71.0	2.2927E-03	-164.9
.439	.278	3.60	1.1753E-01	14.7	5.1771E-01	89.8	1.0137E+00	-.1	1.4251E-01	123.6	1.7702E-02	-70.8	3.1650E-03	-167.8
.454	.294	3.40	1.0221E-01	15.8	5.1236E-01	89.9	1.0172E+00	-.1	1.8166E-01	125.6	1.9491E-02	-70.6	3.9554E-03	-170.0
.470	.312	3.20	8.8124E-02	17.1	5.0490E-01	90.0	1.0206E+00	-.1	2.3841E-01	127.7	2.1643E-02	-70.4	4.9807E-03	-172.5
.498	.333	3.00	7.5260E-02	18.5	4.9532E-01	90.2	1.0241E+00	-.1	3.2447E-01	130.1	2.4263E-02	-70.2	6.3366E-03	-175.0
.508	.357	2.80	6.3593E-02	20.2	4.8371E-01	90.4	1.0273E+00	-.2	4.6301E-01	132.9	2.7496E-02	-69.9	8.1875E-03	-177.7
.531	.385	2.60	5.3098E-02	22.1	4.7037E-01	90.9	1.0302E+00	-.2	7.0461E-01	136.5	3.1540E-02	-69.5	1.0849E-02	179.7
.557	.417	2.40	4.3749E-02	24.4	4.5590E-01	91.7	1.0323E+00	-.2	1.1756E+00	141.4	3.6675E-02	-68.9	1.5017E-02	177.4
.587	.455	2.20	3.5517E-02	27.2	4.4052E-01	93.6	1.0333E+00	-.3	2.2513E+00	149.5	4.3288E-02	-68.1	2.2491E-02	176.4
.621	.500	2.00	2.8370E-02	30.6	4.1522E-01	98.2	1.0321E+00	-.4	5.2314E+00	165.5	5.1914E-02	-67.0	3.8268E-02	-179.6
.641	.526	1.90	2.5166E-02	32.7	3.8227E-01	103.1	1.0406E+00	-.4	7.9107E+00	-178.7	5.7031E-02	-66.3	4.8917E-02	-178.9
.662	.556	1.80	2.2234E-02	35.2	3.0611E-01	108.1	1.0531E+00	-.3	1.0414E+01	-156.2	6.3003E-02	-65.5	5.4834E-02	-157.1
.686	.588	1.70	1.9572E-02	37.8	2.1419E-01	107.9	1.0685E+00	-.3	1.0080E+01	-130.5	7.0077E-02	-64.5	4.6188E-02	-142.2
.712	.625	1.60	1.7171E-02	40.8	1.6810E-01	101.4	1.0879E+00	-.2	7.3759E+00	-108.8	7.8532E-02	-63.3	3.0058E-02	-133.7
.740	.667	1.50	1.5018E-02	44.2	1.5851E-01	95.0	1.1130E+00	-.0	4.9200E+00	-93.4	8.8721E-02	-61.8	2.0403E-02	-133.5
.772	.714	1.40	1.3100E-02	47.9	1.5719E-01	91.1	1.1457E+00	.2	3.3509E+00	-82.6	1.0110E-01	-59.9	1.5323E-02	-139.8
.809	.769	1.30	1.1402E-02	52.0	1.5292E-01	88.6	1.1893E+00	.6	2.4076E+00	-74.9	1.1622E-01	-57.5	1.3418E-02	-147.0
.850	.833	1.20	9.9034E-03	56.7	1.4313E-01	86.7	1.2479E+00	1.4	1.8283E+00	-69.1	1.3472E-01	-54.5	1.3254E-02	-155.5
.898	.909	1.10	8.5765E-03	61.8	1.2770E-01	85.0	1.3263E+00	2.7	1.4568E+00	-64.8	1.5713E-01	-50.7	1.4073E-02	-163.7
.954	1.000	1.00	7.3211E-03	68.3	1.0897E-01	84.8	1.4669E+00	5.4	1.1267E+00	-60.9	1.8601E-01	-45.0	1.4044E-02	-169.7
1.020	1.111	.90	6.1366E-03	75.6	8.8741E-02	84.5	1.6852E+00	10.9	8.7635E-01	-57.0	2.1884E-01	-36.8	1.6043E-02	-174.3
1.100	1.250	.80	4.9080E-03	83.3	6.7100E-02	82.9	1.9322E+00	21.7	6.9883E-01	-53.3	2.4371E-01	-24.7	1.7910E-02	-178.8
1.199	1.429	.70	3.5355E-03	90.2	4.3956E-02	78.9	1.8927E+00	41.3	5.7370E-01	-49.8	2.2695E-01	-7.7	2.0468E-02	176.8
1.327	1.667	.60	2.1527E-03	94.5	2.1658E-02	75.8	1.0499E+00	73.1	3.7279E-01	-47.8	1.4185E-01	13.0	1.9160E-02	172.3
1.498	2.000	.50	1.1202E-03	93.7	6.3911E-03	66.8	1.9325E-01	104.4	1.8914E-01	-47.5	5.7517E-02	32.4	1.5343E-02	167.9
1.743	2.500	.40	3.3284E-04	84.3	2.4356E-04	18.8	8.1445E-03	87.4	4.2300E-02	-58.6	7.6572E-03	58.8	6.8072E-03	159.9
2.126	3.333	.30	7.2106E-05	26.4	9.2487E-04	-109.8	1.9333E-03	7.2	6.2716E-03	-160.9	3.4970E-04	-22.5	4.1744E-04	119.4
2.839	5.000	.20	1.0160E-05	-122.8	7.0356E-05	112.6	1.9431E-04	-52.5	1.3157E-03	95.9	2.4133E-04	-150.4	1.2089E-04	-44.0
4.764	10.000	.10	5.2532E-07	-136.2	7.3829E-06	30.7	6.2080E-06	48.0	1.0795E-04	67.7	2.8726E-05	-118.2	7.1385E-06	-108.7

TABLE 27 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 150 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES ••• DE 1078 (DRAFT=15.5FT) •••

HEADING = 150. DEG (HEAD SEAS=180) | SHIP SPEED = 10.00 KNOTS | FROUDE NUMBER = .1462 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.393	.238	4.20	1.8991E-01	26.1	1.7811E-01	89.6	9.4110E-01	-.1	3.1897E-02	124.6	3.4412E-02	-80.2	3.8507E-03	-177.5
.410	.256	3.90	1.8014E-01	28.5	1.7653E-01	89.8	9.3517E-01	-.1	4.2705E-02	127.2	3.9454E-02	-79.6	4.6657E-03	-178.2
.429	.278	3.60	1.3346E-01	31.3	1.7295E-01	89.9	9.2707E-01	-.2	5.9512E-02	129.8	4.5774E-02	-79.0	5.7028E-03	-179.4
.444	.294	3.40	1.1738E-01	33.5	1.6935E-01	89.9	9.2002E-01	-.3	7.6304E-02	131.6	5.0914E-02	-78.5	6.5529E-03	179.5
.459	.312	3.20	1.0265E-01	36.0	1.6472E-01	90.1	9.1121E-01	-.4	1.0050E-01	133.5	5.6999E-02	-78.0	7.5673E-03	178.2
.477	.333	3.00	8.9248E-02	38.8	1.5900E-01	90.3	9.0016E-01	-.5	1.3685E-01	135.5	6.4262E-02	-77.3	8.7964E-03	176.8
.496	.357	2.80	7.7175E-02	42.0	1.5218E-01	90.6	8.8620E-01	-.6	1.9442E-01	137.7	7.2997E-02	-76.5	1.0323E-02	175.1
.518	.385	2.60	6.6416E-02	45.7	1.4429E-01	91.1	8.6846E-01	-.8	2.9234E-01	140.3	8.3577E-02	-75.6	1.2298E-02	173.4
.543	.417	2.40	5.6955E-02	50.0	1.3547E-01	92.0	8.4578E-01	-1.0	4.7620E-01	143.7	9.6459E-02	-74.4	1.5036E-02	171.6
.571	.455	2.20	4.8770E-02	54.9	1.2594E-01	93.9	8.1663E-01	-1.3	8.7561E-01	148.7	1.1217E-01	-72.9	1.9298E-02	170.1
.604	.500	2.00	4.1826E-02	60.6	1.1539E-01	98.3	7.7898E-01	-1.7	1.9602E+00	158.1	1.3120E-01	-71.1	2.7317E-02	170.6
.623	.526	1.90	3.8802E-02	63.7	1.0803E-01	102.9	7.5615E-01	-1.9	3.2627E+00	166.8	1.4203E-01	-69.9	3.4515E-02	173.2
.643	.556	1.80	3.6139E-02	67.2	9.4214E-02	111.0	7.3862E-01	-2.3	5.5258E+00	-176.9	1.5523E-01	-68.7	4.3858E-02	-178.1
.666	.588	1.70	3.3749E-02	70.8	6.1491E-02	121.2	7.2000E-01	-2.7	8.2032E+00	-151.3	1.7020E-01	-67.3	4.7932E-02	-162.8
.690	.625	1.60	3.1598E-02	74.6	2.6140E-02	120.0	6.9981E-01	-3.2	7.8650E+00	-121.0	1.8703E-01	-65.6	3.4241E-02	-146.9
.718	.667	1.50	2.9642E-02	78.6	1.6428E-02	99.8	6.7830E-01	-3.8	5.1637E+00	-97.8	2.0579E-01	-63.6	1.8371E-02	-142.7
.748	.714	1.40	2.7826E-02	82.6	1.7172E-02	86.9	6.5581E-01	-4.5	3.1495E+00	-83.7	2.2634E-01	-61.2	1.1183E-02	-150.3
.783	.769	1.30	2.6067E-02	86.7	1.6970E-02	82.0	6.3289E-01	-5.2	2.0179E+00	-75.3	2.4812E-01	-58.2	8.9047E-03	-162.3
.822	.833	1.20	2.4248E-02	90.8	1.4348E-02	79.7	6.0997E-01	-6.0	1.3718E+00	-70.6	2.6966E-01	-54.5	8.4826E-03	-173.7
.867	.909	1.10	2.2206E-02	94.9	1.0134E-02	78.2	5.8615E-01	-6.4	9.7108E-01	-68.7	2.8779E-01	-49.7	8.5775E-03	176.4
.919	1.000	1.00	1.9704E-02	99.0	5.6969E-03	77.7	5.6029E-01	-6.0	6.8313E-01	-68.6	2.9817E-01	-43.4	8.5023E-03	168.1
.982	1.111	.90	1.6404E-02	103.3	2.4731E-03	78.9	5.4045E-01	-3.2	4.3484E-01	-67.8	2.9798E-01	-34.1	7.9647E-03	162.8
1.057	1.250	.80	1.2074E-02	107.2	4.0185E-04	80.2	4.7232E-01	4.7	2.6068E-01	-69.4	2.6084E-01	-20.4	6.9113E-03	157.0
1.151	1.429	.70	6.9781E-03	109.1	1.6475E-04	-107.6	2.6517E-01	20.2	1.4130E-01	-75.5	1.6247E-01	-.5	5.1811E-03	148.1
1.270	1.667	.60	2.5545E-03	104.3	1.4642E-03	-113.9	2.9986E-02	24.3	5.2434E-02	-95.5	4.2986E-02	26.4	2.3566E-03	134.2
1.430	2.000	.50	4.2274E-04	77.7	1.9347E-03	-124.8	3.5453E-02	-42.7	2.0702E-02	-145.2	3.4393E-04	90.4	4.1302E-04	90.3
1.657	2.500	.40	1.2411E-04	-20.2	5.5206E-04	-160.4	9.3930E-03	1.1	1.3166E-02	165.6	5.7365E-03	-105.5	4.5437E-04	-5.8
2.013	3.333	.30	2.2358E-05	-114.5	1.6213E-04	74.3	8.7503E-04	-142.2	1.3766E-03	35.9	1.6789E-05	-64.6	6.6844E-05	-98.7
2.668	5.000	.20	7.1068E-06	19.1	1.7558E-05	-171.8	5.1836E-05	9.0	4.1622E-04	171.3	1.7759E-05	71.2	1.4173E-05	2.5
4.422	10.000	.10	7.6717E-07	150.3	2.1450E-06	-175.7	5.7973E-06	-51.0	2.5344E-06	46.1	1.9494E-05	129.8	9.0567E-08	29.9

TABLE 28 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 150 DEGREES, 20 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 150. DEG (HEAD SEAS=180) SHIP SPEED = 20.00 KNOTS FROUDE NUMBER = .2923 WAVE SLOPE (360*R/LAMBDA), K*R = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.446	.238	4.20	1.1562E-01	26.1	1.3703E-01	89.7	9.9012E-01	-.3	5.4753E-02	133.7	3.5089E-02	-72.5	2.1710E-03	-170.7
.467	.256	3.90	9.6101E-02	28.5	1.3364E-01	89.9	9.9081E-01	-.4	7.8559E-02	136.1	4.0113E-02	-72.0	2.7833E-03	-173.1
.491	.278	3.60	7.8833E-02	31.4	1.2912E-01	90.2	9.9076E-01	-.5	1.1953E-01	138.8	4.6465E-02	-71.3	3.6155E-03	-176.1
.509	.294	3.40	6.8542E-02	33.6	1.2551E-01	90.5	9.9013E-01	-.6	1.6525E-01	140.8	5.1666E-02	-70.8	4.3567E-03	-178.1
.529	.312	3.20	5.9204E-02	36.1	1.2151E-01	91.0	9.8985E-01	-.7	2.3933E-01	143.4	5.7858E-02	-70.1	5.3359E-03	179.9
.551	.333	3.00	5.0799E-02	38.9	1.1724E-01	91.9	9.8670E-01	-.8	3.7210E-01	146.8	6.5277E-02	-69.3	6.7140E-03	178.1
.575	.357	2.80	4.3303E-02	42.2	1.1288E-01	93.4	9.8339E-01	-.9	6.3584E-01	151.8	7.4220E-02	-68.3	8.8529E-03	176.9
.603	.385	2.60	3.6693E-02	46.0	1.0814E-01	96.7	9.7844E-01	-1.0	1.2544E+00	160.6	8.5038E-02	-67.1	1.2672E-02	177.6
.635	.417	2.40	3.0953E-02	50.5	9.7840E-02	104.9	9.7670E-01	-1.1	2.8694E+00	-180.0	9.8273E-02	-65.6	1.9792E-02	-173.9
.672	.455	2.20	2.6081E-02	55.9	5.4987E-02	116.3	9.8908E-01	-1.3	4.8242E+00	-138.5	1.1519E-01	-63.6	2.2282E-02	-148.4
.715	.500	2.00	2.2007E-02	62.1	2.7061E-02	100.7	1.0099E+00	-1.3	2.9789E+00	-97.0	1.3693E-01	-61.0	1.0043E-02	-131.8
.739	.526	1.90	2.0245E-02	65.4	2.7203E-02	92.6	1.0254E+00	-1.3	2.0344E+00	-84.5	1.5009E-01	-59.4	6.6020E-03	-134.8
.766	.556	1.80	1.8648E-02	69.0	2.8133E-02	88.2	1.0457E+00	-1.2	1.4291E+00	-75.8	1.6506E-01	-57.5	5.0325E-03	-142.3
.796	.588	1.70	1.7202E-02	72.8	2.8001E-02	85.8	1.0722E+00	-1.0	1.0501E+00	-69.7	1.8204E-01	-55.2	4.4623E-03	-151.3
.829	.625	1.60	1.5883E-02	76.9	2.6545E-02	84.2	1.1066E+00	-.5	8.0529E-01	-65.4	2.0114E-01	-52.5	4.4019E-03	-159.8
.865	.667	1.50	1.4663E-02	81.1	2.3917E-02	82.9	1.1504E+00	.3	6.3986E-01	-62.4	2.2227E-01	-49.3	4.5982E-03	-167.6
.906	.714	1.40	1.3504E-02	85.5	2.0364E-02	81.5	1.2037E+00	1.8	5.2221E-01	-60.7	2.4485E-01	-45.3	4.9052E-03	-174.5
.953	.769	1.30	1.2325E-02	90.6	1.6737E-02	82.0	1.3056E+00	4.5	4.0409E-01	-58.0	2.7242E-01	-39.8	5.1029E-03	-178.8
1.006	.833	1.20	1.1061E-02	96.0	1.2980E-02	82.1	1.4401E+00	9.3	3.1449E-01	-55.7	2.9891E-01	-32.5	5.3240E-03	177.7
1.068	.909	1.10	9.5808E-03	101.4	9.2186E-03	81.2	1.5750E+00	17.7	2.4686E-01	-53.6	3.1543E-01	-22.8	5.5559E-03	174.4
1.141	1.000	1.00	7.7586E-03	106.7	5.6221E-03	78.5	1.5861E+00	31.6	1.9446E-01	-52.1	3.0311E-01	-9.8	5.7837E-03	170.5
1.228	1.111	.90	5.5878E-03	111.0	2.5322E-03	74.1	1.2443E+00	53.3	1.4211E-01	-52.0	2.3840E-01	7.1	5.5632E-03	166.2
1.334	1.250	.80	3.4761E-03	112.8	6.4231E-04	68.3	5.4547E-01	82.8	8.1669E-02	-53.7	1.3465E-01	26.5	4.4168E-03	163.0
1.467	1.429	.70	1.8331E-03	110.3	2.3340E-05	3.5	8.0747E-02	112.1	3.6311E-02	-59.0	5.1389E-02	46.1	2.9159E-03	159.4
1.639	1.667	.60	6.3387E-04	101.8	2.8723E-04	-99.0	1.8327E-03	43.3	9.1951E-03	-83.7	7.7073E-03	76.1	1.0774E-03	148.5
1.873	2.000	.50	1.1415E-04	65.9	4.7275E-04	-116.2	6.9990E-03	9.4	3.9826E-03	-152.8	1.4968E-04	-112.4	1.1364E-04	107.0
2.211	2.500	.40	4.5668E-05	-15.5	1.1430E-04	-155.2	8.9792E-04	-11.4	2.8237E-03	156.7	6.6522E-04	-64.3	1.0867E-04	-4.8
2.750	3.333	.30	1.6235E-05	-122.2	4.3259E-05	55.7	2.2092E-05	-115.7	6.1815E-04	15.9	1.5501E-04	-123.5	1.5790E-05	-128.2
3.775	5.000	.20	1.7477E-06	44.0	1.3005E-05	171.6	2.8037E-05	-34.7	1.8831E-04	154.5	4.6003E-05	105.7	1.0195E-05	-19.2
6.636	10.000	.10	6.2914E-07	-177.7	5.4974E-07	-151.1	3.5212E-06	-8.9	5.2217E-06	105.7	1.1833E-05	168.1	2.6724E-07	-32.1

TABLE 29 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 180 DEGREES, 10 KNOTS

SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 180. DEG (HEAD SEAS=180) | SHIP SPEED = 10.00 KNOTS | FROUDE NUMBER = .1462 | WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG | WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	(SURGE / R)**2 PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	(SWAY / R)**2 PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	(HEAVE / R)**2 PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	(ROLL / R)**2 PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	(PITCH / R)**2 PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	(YAW / R)**2 PHASE DEG
.401	.238	4.20	1.7724E-01	31.5	0.	0.0	9.2013E-01	-.1	0.	0.0	4.4668E-02	-79.6	0.	0.0
.419	.256	3.90	1.4980E-01	34.3	0.	0.0	9.1072E-01	-.2	0.	0.0	5.1198E-02	-78.9	0.	0.0
.439	.276	3.60	1.2536E-01	37.7	0.	0.0	8.9830E-01	-.3	0.	0.0	5.9336E-02	-78.2	0.	0.0
.454	.294	3.40	1.1071E-01	40.3	0.	0.0	8.8781E-01	-.4	0.	0.0	6.5912E-02	-77.6	0.	0.0
.470	.312	3.20	9.7372E-02	43.2	0.	0.0	8.7501E-01	-.5	0.	0.0	7.3647E-02	-77.0	0.	0.0
.488	.333	3.00	8.5330E-02	46.5	0.	0.0	8.5942E-01	-.7	0.	0.0	8.2798E-02	-76.2	0.	0.0
.508	.357	2.80	7.4574E-02	50.1	0.	0.0	8.3997E-01	-.9	0.	0.0	9.3679E-02	-75.2	0.	0.0
.531	.385	2.60	6.5087E-02	54.5	0.	0.0	8.1599E-01	-1.1	0.	0.0	1.0666E-01	-74.1	0.	0.0
.557	.417	2.40	5.6847E-02	59.4	0.	0.0	7.8613E-01	-1.4	0.	0.0	1.2214E-01	-72.7	0.	0.0
.587	.455	2.20	4.9813E-02	64.8	0.	0.0	7.4882E-01	-1.8	0.	0.0	1.4045E-01	-71.0	0.	0.0
.621	.500	2.00	4.3915E-02	70.8	0.	0.0	7.0210E-01	-2.4	0.	0.0	1.6164E-01	-68.8	0.	0.0
.641	.526	1.90	4.1433E-02	74.1	0.	0.0	6.8098E-01	-2.8	0.	0.0	1.7473E-01	-67.6	0.	0.0
.662	.556	1.80	3.9188E-02	77.6	0.	0.0	6.5913E-01	-3.3	0.	0.0	1.8937E-01	-66.1	0.	0.0
.686	.588	1.70	3.7129E-02	81.2	0.	0.0	6.3562E-01	-3.9	0.	0.0	2.0535E-01	-64.4	0.	0.0
.712	.625	1.60	3.5203E-02	84.8	0.	0.0	6.1057E-01	-4.6	0.	0.0	2.2254E-01	-62.4	0.	0.0
.740	.667	1.50	3.3337E-02	88.4	0.	0.0	5.8429E-01	-5.4	0.	0.0	2.4056E-01	-60.0	0.	0.0
.773	.714	1.40	3.1435E-02	92.1	0.	0.0	5.5713E-01	-6.3	0.	0.0	2.5855E-01	-57.1	0.	0.0
.809	.769	1.30	2.9365E-02	95.7	0.	0.0	5.2928E-01	-7.3	0.	0.0	2.7484E-01	-53.5	0.	0.0
.850	.833	1.20	2.6954E-02	99.2	0.	0.0	4.9992E-01	-8.1	0.	0.0	2.8639E-01	-49.1	0.	0.0
.898	.909	1.10	2.3983E-02	102.6	0.	0.0	4.6821E-01	-8.3	0.	0.0	2.8791E-01	-43.5	0.	0.0
.954	1.000	1.00	2.0144E-02	106.1	0.	0.0	4.3211E-01	-7.1	0.	0.0	2.7921E-01	-35.4	0.	0.0
1.020	1.111	.90	1.5265E-02	109.2	0.	0.0	3.7556E-01	-2.5	0.	0.0	2.4454E-01	-23.9	0.	0.0
1.100	1.250	.80	9.5548E-03	111.1	0.	0.0	2.4361E-01	7.5	0.	0.0	1.6712E-01	-7.3	0.	0.0
1.200	1.429	.70	4.2214E-03	108.6	0.	0.0	5.8463E-02	13.8	0.	0.0	6.1837E-02	15.6	0.	0.0
1.327	1.667	.60	9.8550E-04	92.2	0.	0.0	3.2082E-02	-50.7	0.	0.0	3.1657E-03	52.9	0.	0.0
1.499	2.000	.50	1.6177E-04	21.9	0.	0.0	3.8732E-02	-32.2	0.	0.0	5.3778E-03	-124.1	0.	0.0
1.743	2.500	.40	1.4416E-04	-53.3	0.	0.0	1.1598E-03	60.6	0.	0.0	3.8436E-03	-83.6	0.	0.0
2.127	3.333	.30	3.0528E-05	165.1	0.	0.0	2.5906E-04	-150.6	0.	0.0	3.5429E-04	134.3	0.	0.0
2.839	5.000	.20	5.5076E-06	-97.5	0.	0.0	1.1571E-05	-24.0	0.	0.0	6.3609E-05	-94.5	0.	0.0
4.765	10.000	.10	1.2941E-07	4.9	0.	0.0	5.6809E-06	175.3	0.	0.0	1.1324E-05	-.8	0.	0.0

TABLE 30 - DE-1078, RESPONSE AMPLITUDE OPERATORS, 180 DEGREES, 20 KNOTS

*** SHIP MOTIONS IN REGULAR WAVES *** DE 1078 (DRAFT=15.5FT) ***

HEADING = 180. DEG (HEAD SEAS=180) SHIP SPEED = 20.00 KNOTS FROUDE NUMBER = .2923 WAVE SLOPE (360*R/LAMBDA), K*R, = 2.25 DEG WAVE STEEPNESS (2*R/LAMBDA) = 1 / 80

RESPONSE AMPLITUDE OPERATORS

WE RPS	L/LAM	LAM/L	(SURGE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(SWAY / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(HEAVE / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(ROLL / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(PITCH / R)**2 AMPL. RATIO SQUARED	PHASE DEG	(YAW / R)**2 AMPL. RATIO SQUARED	PHASE DEG
.402	.238	4.20	1.0117E-01	31.5	0.	0.0	9.7917E-01	-.5	0.	0.0	4.5360E-02	-72.2	0.	0.0
.403	.256	3.90	8.4676E-02	34.0	0.	0.0	9.7778E-01	-.6	0.	0.0	5.1968E-02	-71.5	0.	0.0
.510	.278	3.60	6.9869E-02	37.8	0.	0.0	9.7523E-01	-.7	0.	0.0	6.0270E-02	-70.7	0.	0.0
.529	.294	3.40	6.0783E-02	40.4	0.	0.0	9.7266E-01	-.8	0.	0.0	6.7019E-02	-69.9	0.	0.0
.550	.312	3.20	5.2767E-02	43.4	0.	0.0	9.6918E-01	-.9	0.	0.0	7.4986E-02	-69.1	0.	0.0
.573	.333	3.00	4.5601E-02	46.8	0.	0.0	9.6453E-01	-1.1	0.	0.0	8.4425E-02	-68.1	0.	0.0
.600	.357	2.80	3.9261E-02	50.6	0.	0.0	9.5832E-01	-1.2	0.	0.0	9.5626E-02	-66.8	0.	0.0
.630	.385	2.60	3.3729E-02	55.0	0.	0.0	9.5245E-01	-1.4	0.	0.0	1.0900E-01	-65.3	0.	0.0
.664	.417	2.40	2.9018E-02	60.2	0.	0.0	9.6022E-01	-1.5	0.	0.0	1.2589E-01	-63.4	0.	0.0
.703	.455	2.20	2.5041E-02	66.1	0.	0.0	9.7429E-01	-1.7	0.	0.0	1.4699E-01	-61.0	0.	0.0
.749	.500	2.00	2.1719E-02	72.5	0.	0.0	9.9916E-01	-1.7	0.	0.0	1.7342E-01	-57.7	0.	0.0
.775	.526	1.90	2.0270E-02	76.0	0.	0.0	1.0178E+00	-1.6	0.	0.0	1.8898E-01	-55.7	0.	0.0
.804	.556	1.80	1.8939E-02	79.7	0.	0.0	1.0420E+00	-1.3	0.	0.0	2.0621E-01	-53.4	0.	0.0
.836	.588	1.70	1.7699E-02	83.6	0.	0.0	1.0728E+00	-.8	0.	0.0	2.2504E-01	-50.6	0.	0.0
.871	.625	1.60	1.6520E-02	87.3	0.	0.0	1.1109E+00	.1	0.	0.0	2.4513E-01	-47.3	0.	0.0
.911	.667	1.50	1.5357E-02	91.4	0.	0.0	1.1572E+00	1.7	0.	0.0	2.6594E-01	-43.3	0.	0.0
.955	.714	1.40	1.4133E-02	96.0	0.	0.0	1.2462E+00	4.4	0.	0.0	2.9068E-01	-37.8	0.	0.0
1.005	.769	1.30	1.2768E-02	100.7	0.	0.0	1.3563E+00	9.2	0.	0.0	3.1260E-01	-30.8	0.	0.0
1.063	.833	1.20	1.1143E-02	105.5	0.	0.0	1.4574E+00	17.2	0.	0.0	3.2373E-01	-21.5	0.	0.0
1.130	.909	1.10	9.1447E-03	110.1	0.	0.0	1.4519E+00	30.0	0.	0.0	3.0864E-01	-9.4	0.	0.0
1.209	1.000	1.00	6.7850E-03	113.9	0.	0.0	1.1717E+00	49.3	0.	0.0	2.4898E-01	6.1	0.	0.0
1.304	1.111	.90	4.3687E-03	115.8	0.	0.0	5.8677E-01	76.5	0.	0.0	1.5048E-01	24.9	0.	0.0
1.420	1.250	.80	2.4294E-03	114.6	0.	0.0	1.1746E-01	105.4	0.	0.0	6.3636E-02	44.0	0.	0.0
1.565	1.429	.70	1.0000E-03	107.3	0.	0.0	1.4240E-03	85.7	0.	0.0	1.3974E-02	69.8	0.	0.0
1.753	1.667	.60	2.3239E-04	87.3	0.	0.0	9.6375E-03	5.6	0.	0.0	4.2651E-04	146.2	0.	0.0
2.010	2.000	.50	5.7750E-05	14.6	0.	0.0	3.5235E-03	6.7	0.	0.0	1.4069E-03	-75.5	0.	0.0
2.362	2.500	.40	3.1259E-05	-61.3	0.	0.0	2.3228E-04	-55.9	0.	0.0	2.0253E-04	-77.7	0.	0.0
2.979	3.333	.30	3.9998E-06	173.6	0.	0.0	1.0009E-04	165.9	0.	0.0	4.8952E-06	-89.8	0.	0.0
4.117	5.000	.20	2.3664E-06	-111.7	0.	0.0	1.4335E-05	10.8	0.	0.0	5.1775E-05	-116.5	0.	0.0
6.32110.000		.10	3.3350E-07	60.2	0.	0.0	4.6018E-06	-129.3	0.	0.0	1.2161E-05	56.0	0.	0.0

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