

FIG. 1

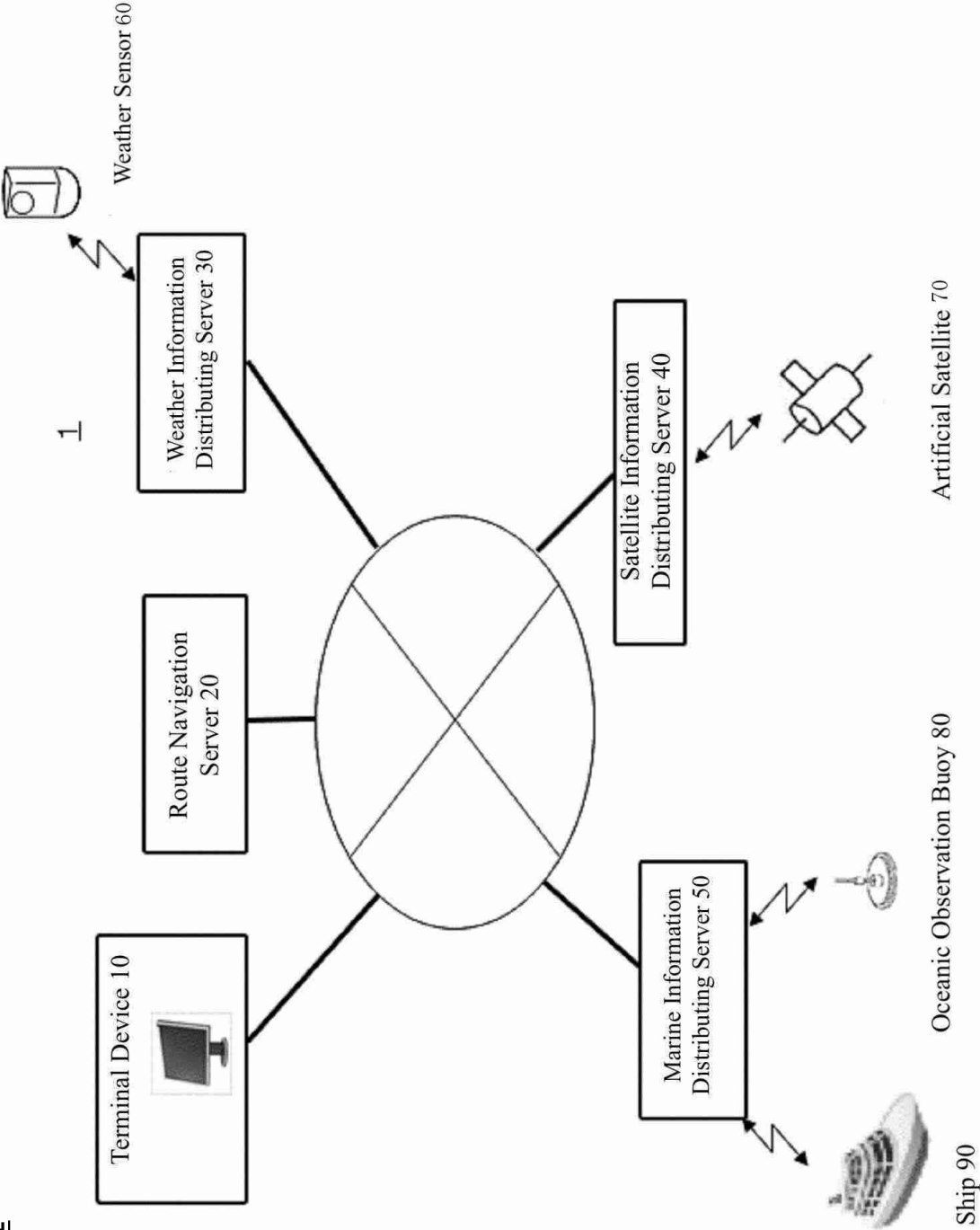


FIG. 2

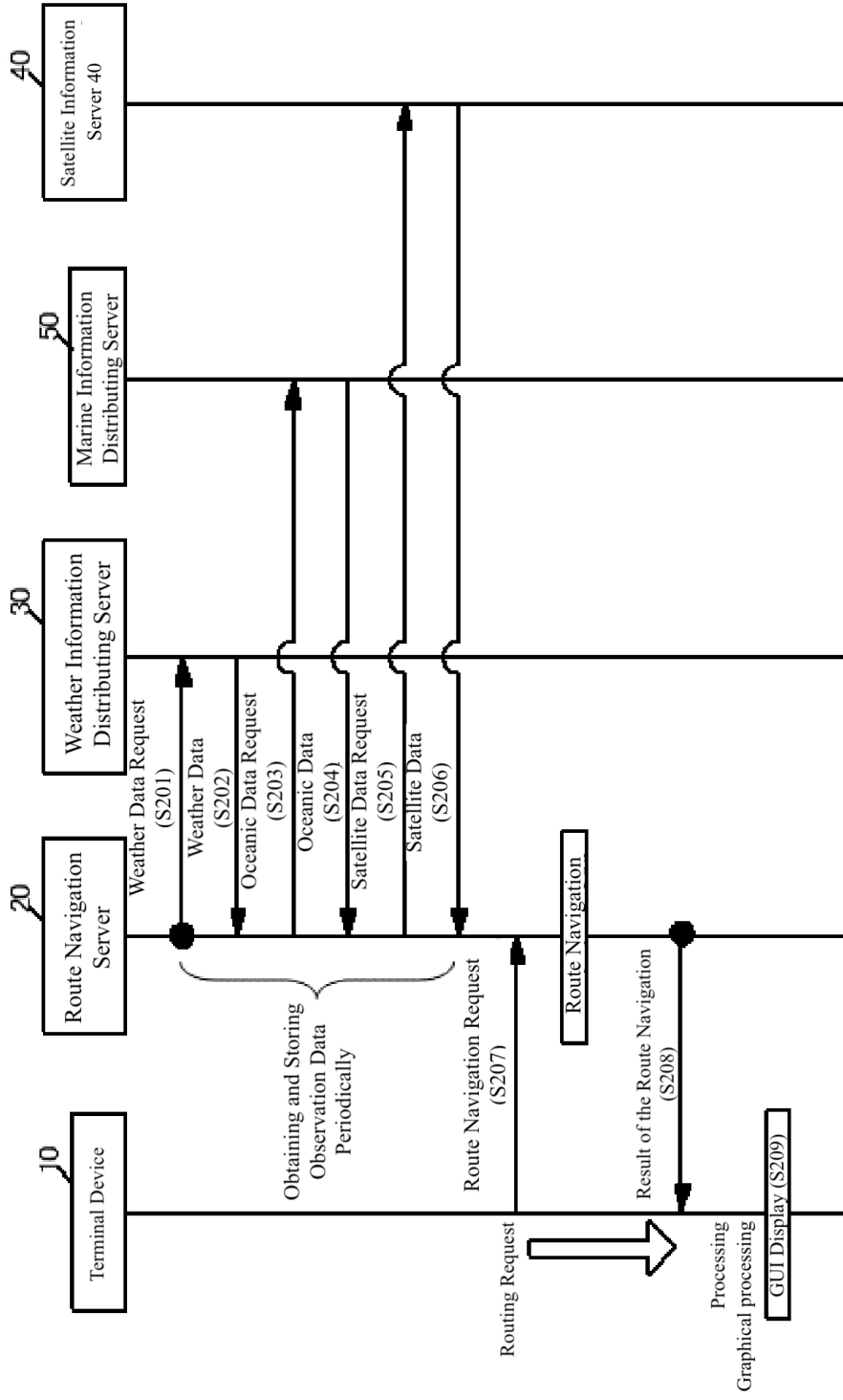


FIG. 3

1

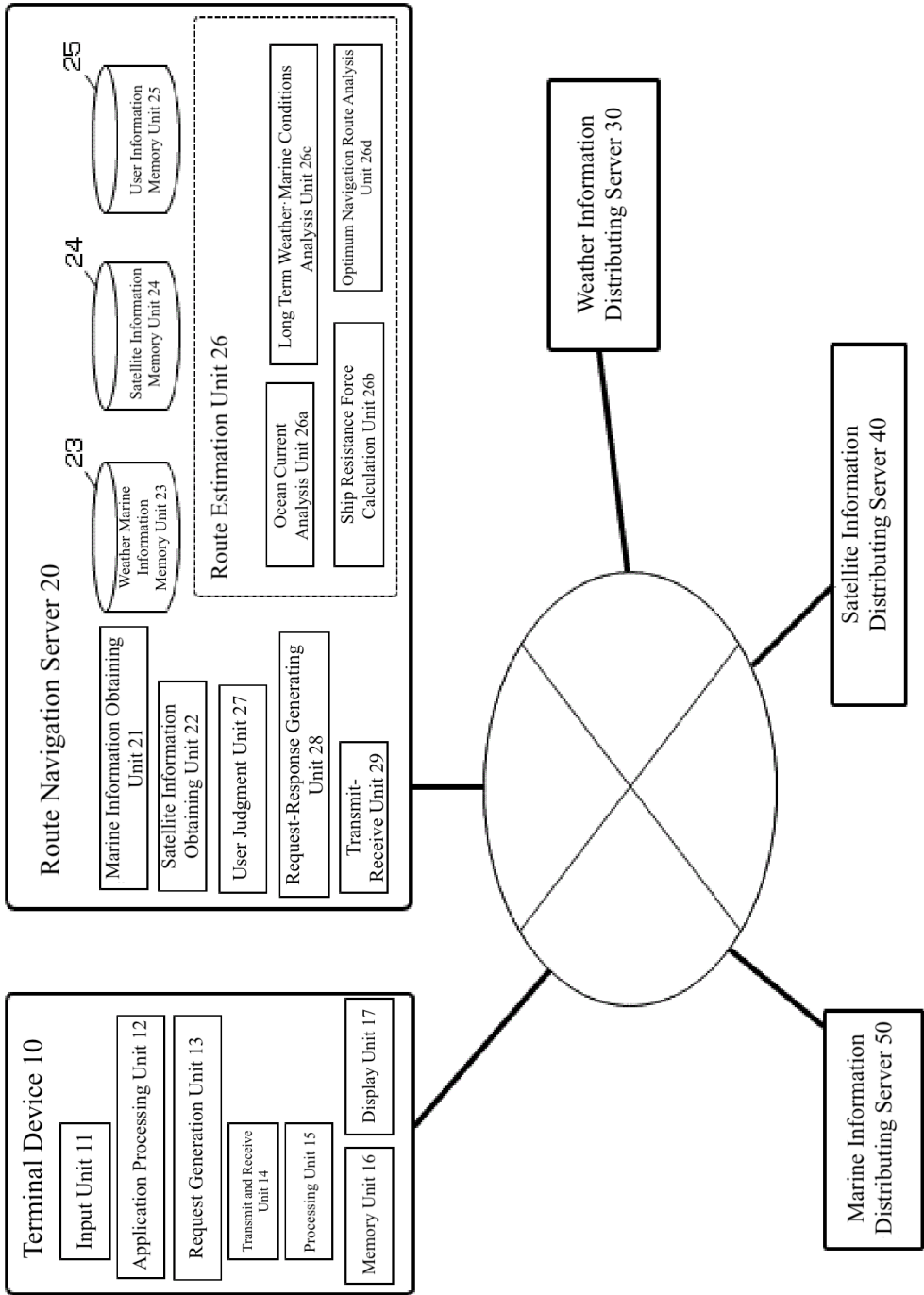
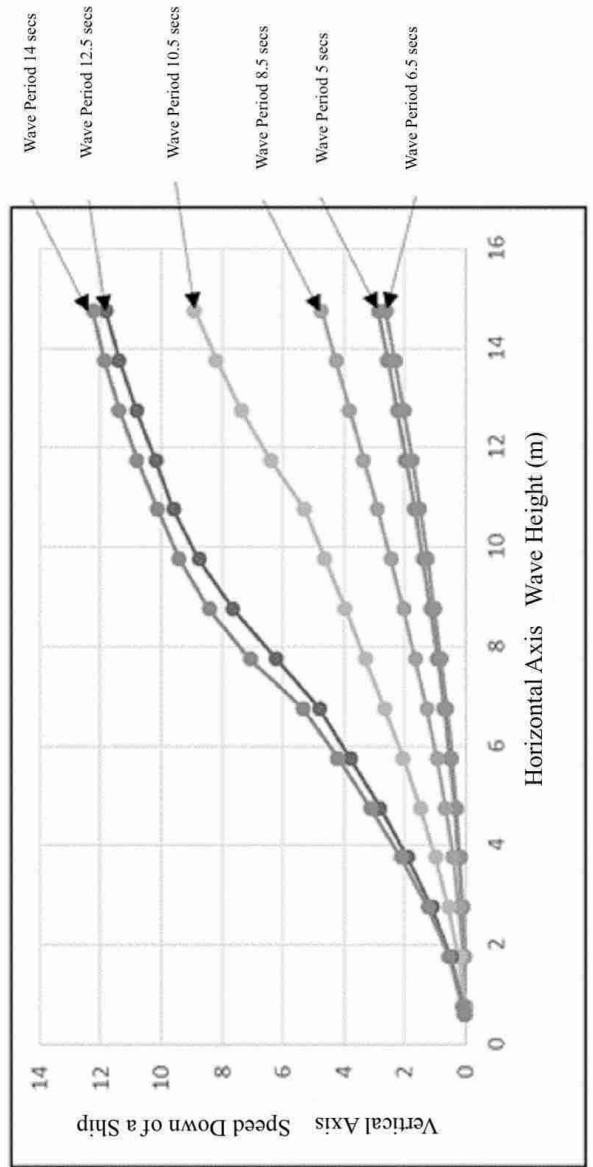


FIG. 4(a)

Wave Height	5	6.5	8.5	10.5	12.5	14	Wave Period
0.6	0.006	0.005	0.011	0.03	0.06	0.07	
0.75	0.009	0.0081	0.017	0.047	0.09	0.1	
1.75	0.05	0.044	0.094	0.24	0.48	0.54	
2.75	0.12	0.11	0.231	0.57	1.11	1.24	
3.75	0.23	0.2	0.424	1	1.92	2.12	
4.75	0.36	0.32	0.668	1.5	2.83	3.13	
5.75	0.52	0.46	0.96	2.07	3.81	4.21	
6.75	0.71	0.64	1.29	2.67	4.82	5.36	
7.75	0.92	0.83	1.66	3.31	6.23	7.09	
8.75	1.16	1.04	2.05	3.95	7.66	8.43	
9.75	1.41	1.27	2.47	4.62	8.77	9.42	
10.75	1.68	1.52	2.91	5.31	9.61	10.14	
11.75	1.97	1.78	3.36	6.41	10.21	10.81	
12.75	2.26	2.05	3.82	7.38	10.84	11.4	
13.75	2.57	2.34	4.28	8.21	11.39	11.88	
14.75	2.89	2.63	4.76	8.92	11.84	12.27	

401

FIG. 4(b)



402

FIG. 5(a)

501

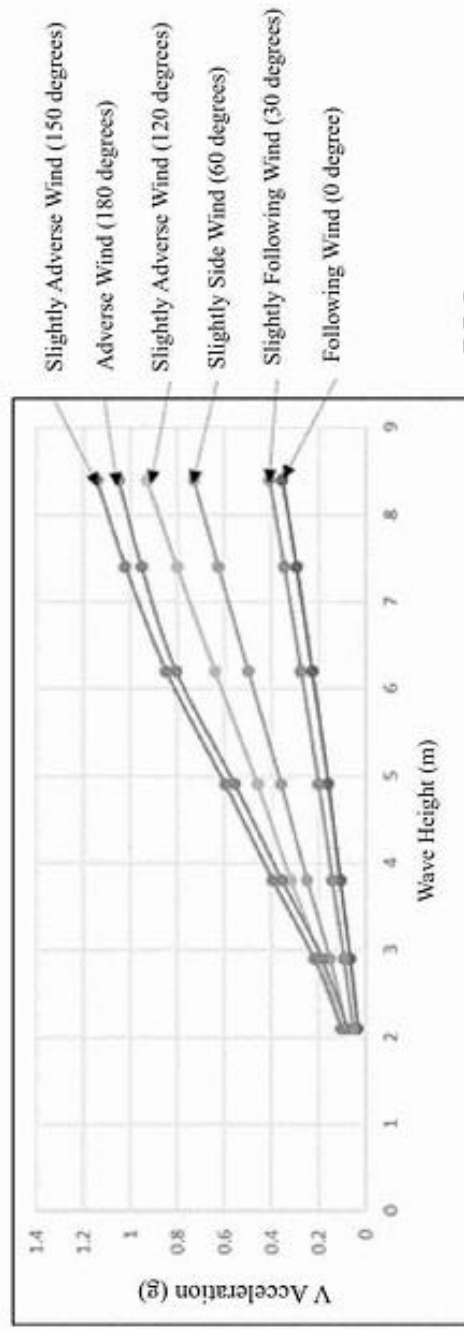


FIG. 5(b)

502

Wave Height (m)	2.1	2.9	3.8	4.9	6.2	7.4	8.4
V Acceleration (g)	0.034	0.066	0.109	0.159	0.228	0.295	0.355
	0.053	0.0925	0.142	0.2	0.275	0.347	0.41
	0.08	0.152	0.249	0.36	0.5	0.628	0.733
	0.104	0.194	0.318	0.461	0.642	0.804	0.933
	0.102	0.22	0.396	0.599	0.85	1.023	1.147
	0.081	0.185	0.357	0.557	0.808	0.955	1.053

FIG. 5(c)

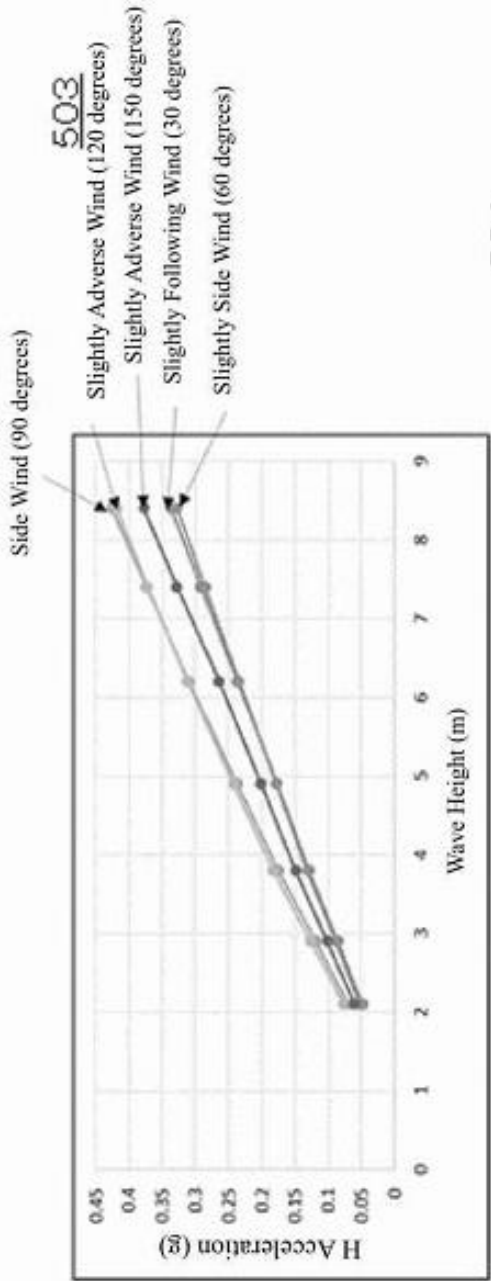


FIG. 5(d)

504

Wave Height (m)	2.1	2.9	3.8	4.9	6.2	7.4	8.4
H Acceleration (g)	0.049	0.086	0.129	0.177	0.238	0.292	0.337
	0.053	0.089	0.132	0.179	0.235	0.286	0.328
	0.07	0.119	0.175	0.237	0.31	0.374	0.426
	0.0768	0.127	0.183	0.243	0.312	0.373	0.419
	0.061	0.102	0.149	0.202	0.265	0.328	0.378
							Slightly Following Wind (30 degrees)
							Slightly Side Wind (60 degrees)
							Side Wind (90 degrees)
							Slightly Adverse Wind (120 degrees)
							Slightly Adverse Wind (150 degrees)

FIG. 6(a)

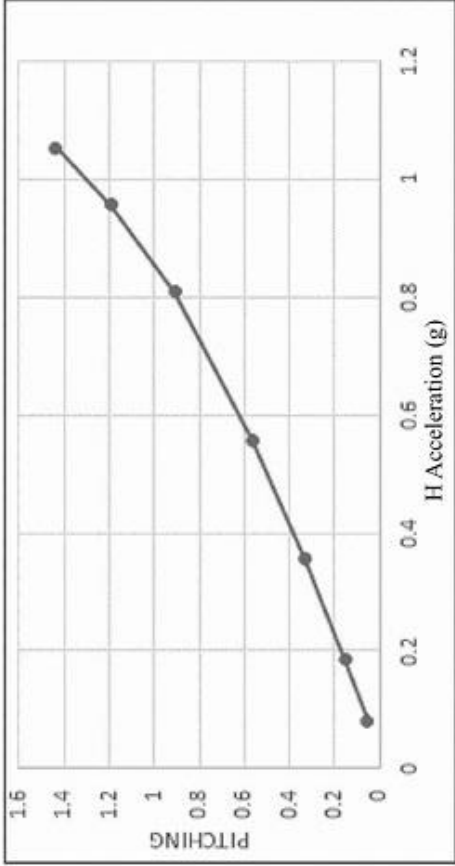


FIG. 6(b)

Wave Height (m)	2.1	2.9	3.8	4.9	6.2	7.4	8.4
H Acceleration (g)	0.081	0.185	0.357	0.557	0.808	0.955	1.053
PITCHING	0.057	0.156	0.336	0.568	0.909	1.193	1.437

FIG. 6(c)

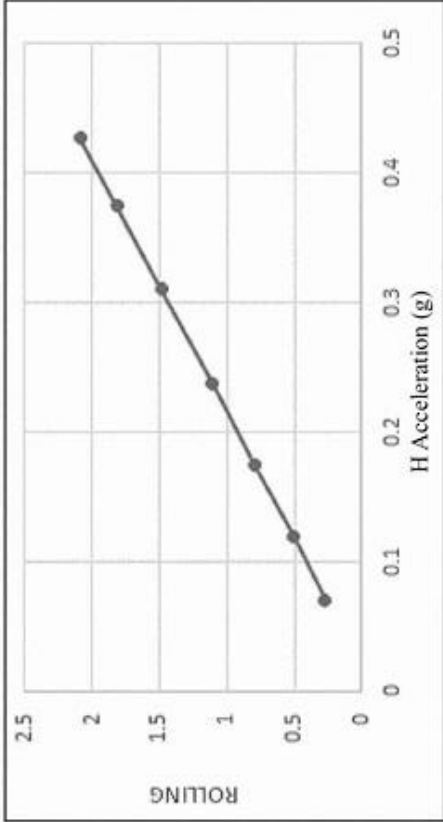


FIG. 6(d)

Wave Height (m)	2.1	2.9	3.8	4.9	6.2	7.4	8.4
H Acceleration (g)	0.07	0.119	0.175	0.237	0.31	0.374	0.426
ROLLING	0.272	0.508	0.798	1.11	1.487	1.82	2.093

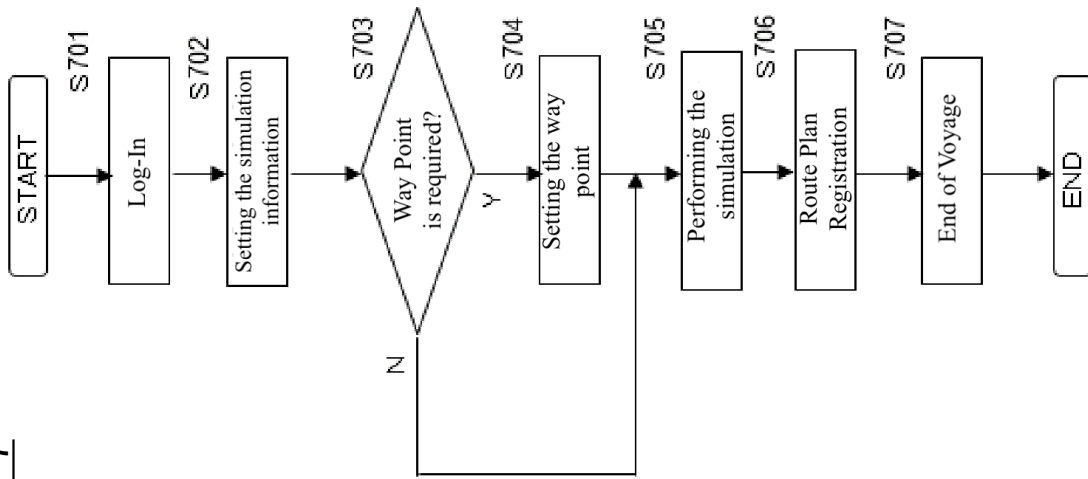
FIG. 7

FIG. 8

801

(Example)

Ship Name	XXX Ship	Remarks
FULL LOAD speed (kt)	15	No Sea-margin
FULL LOAD displacement (t)	300000	
FULL LOAD speed (kt)	16	No Sea-margin
HEAVY BALLAST displacement (t)	150000	
Horsepower (kw)	18000	
Fuel Consumption (ton/day)	75	
Engine Speed (rpm)	80	
Cargo Type	Coal	- Select the type of cargo from the list below 1: No Cargo 2: Coal 3: ORE 4: Steel Coil 5: Grain 6: Cement - Please select "storage factor" if you can't select from 1-6.
stowage factor(ft ³ /LT)	30	Not required to input if cargo type is filled.
Date of Manufacture	2015/7/3	
IMO No.	IMO00000000	

FIG. 9(a)

901

Simulation Run

Undo Redo Clear

☒ No Input
☐ Free Input
☐ Port Select
☐ WayPoint Select

Position Name

Voyage No. 0

Date 2017/06/14

Time 15:04

Basic Settings (circled)
 Optional Settings
 Conditions of simulation

Save to Server Load from Server

Run Simulation

Simulation Result Weather Hold Simulation Save Noon Report Saved data Voyage End Weekly Weather Storm

FIG. 9(b)

902

Basic Settings

*No Sea-margin:
 Speed of no external force(wind, wave, tide). Same speed in the calm sea.
 *In the case where the output of the engine is changed drastically (for example, changing from a regular output to 40% LOAD) It is more accurate to simulate by entering the target basic data (speed, rotation speed, fuel consumption, etc.) rather than using the support system.

Full Load Speed (No Sea-margin) (kt) 12

Full Load Displacement (ton) 30000

Ballast Speed (No Sea-margin) (kt) 12.5

Ballast Displacement (ton) 20000

Fuel Consumption (ton/day) 20

Fuel Consumption of ECA (ton/day) 20

Number of Rotation (rpm) 124

Ship Type: Bulk

OK Cancel

FIG. 10(a)

1001

Simulation Run	Simulation Result	Weather Hold	Simulation Save	Noon Report	Saved data	Voyage End	Weekly Weather	Storm
Undo Redo Clear	Position Name	Voyage No. 0 Dep Time(UTC) 2017/06/14 15:04 ~ 01 ~ Basic Settings Optional Settings Conditions of simulation Save to Server Load from Server Run Simulation						

FIG. 10(b)

1002

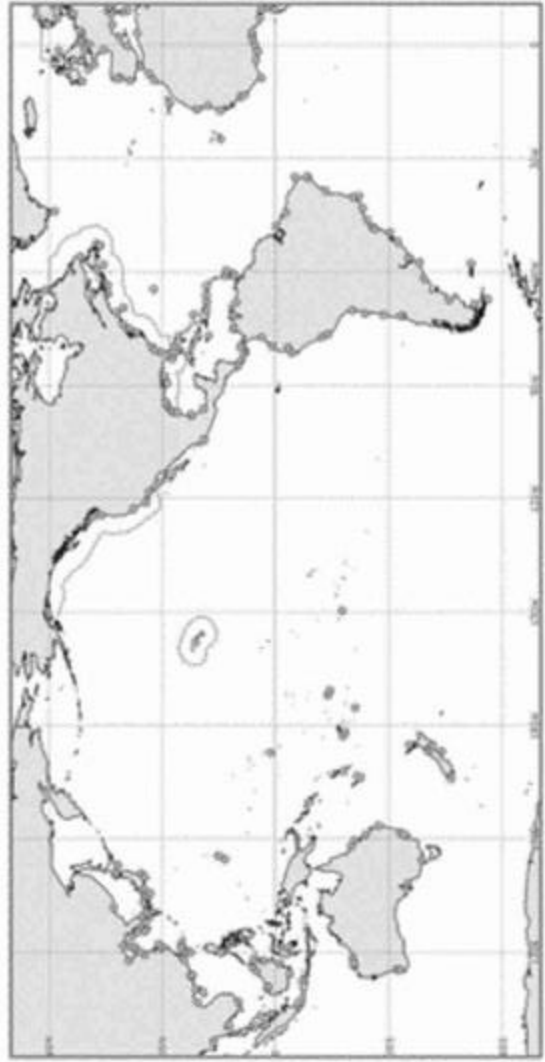


FIG. 11

1101

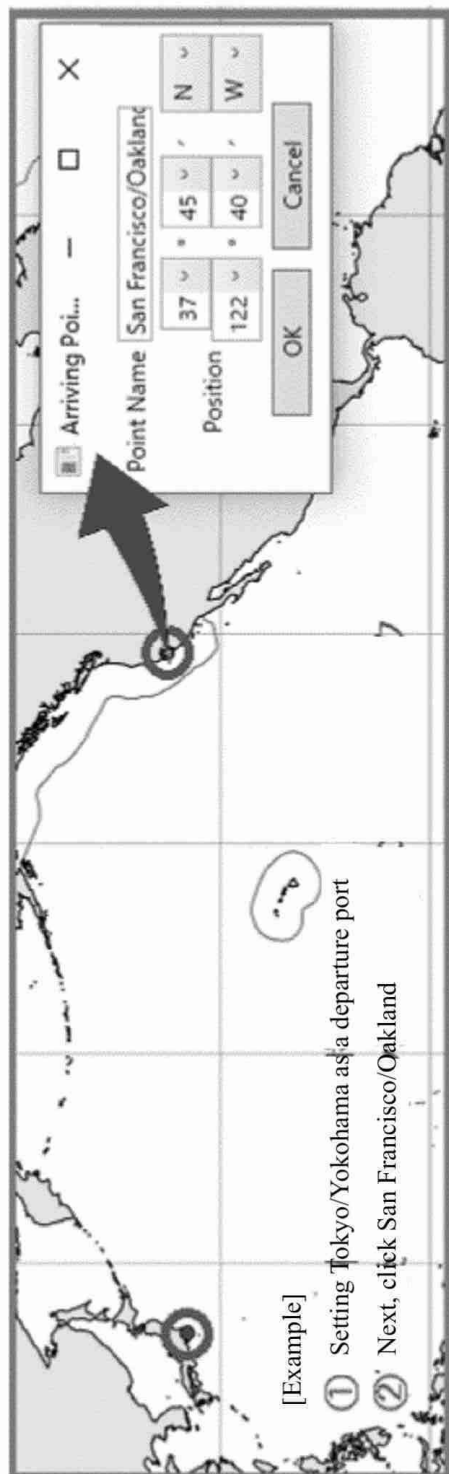


FIG. 12(a)

1201

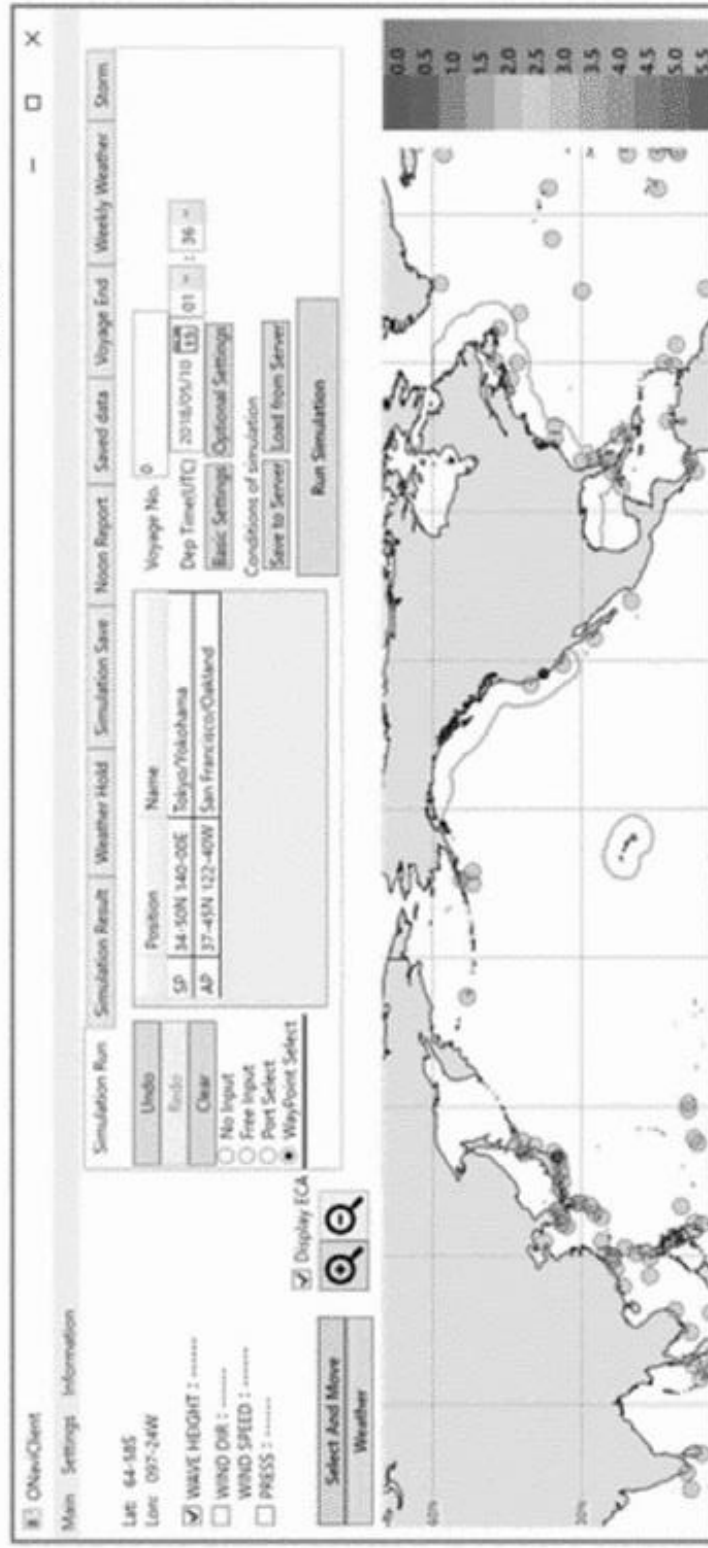


FIG. 12(b)

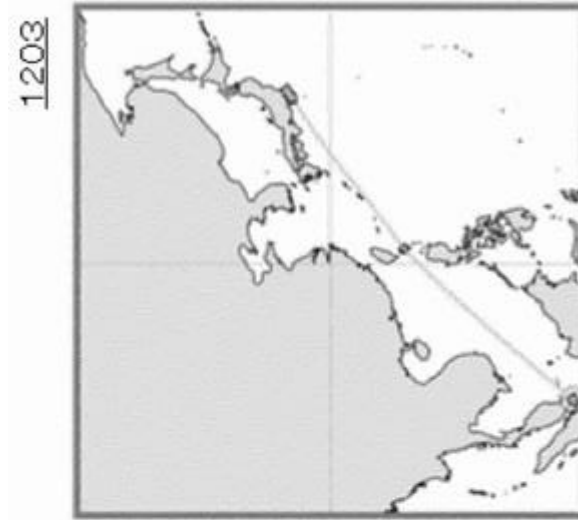
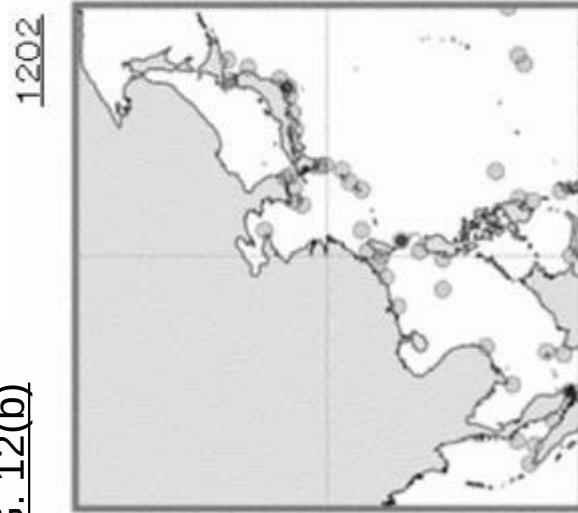


FIG. 13(a)

1301

Simulation Run	Simulation Result	Weather Hold	Simulation Save	Noon Report	Saved data	Voyage End	Weekly Weather	Storm												
Undo Redo Clear ☐ No Input ☐ Free Input ☒ Port Select ☐ WayPoint Select	<table border="1"> <thead> <tr> <th></th> <th>Position</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>SP</td> <td>34-50N 140-00E</td> <td>Tokyo/Yokohama</td> </tr> <tr> <td>1</td> <td>21-21N 157-57W</td> <td>Honolulu</td> </tr> <tr> <td>AP</td> <td>37-45N 122-40W</td> <td>San Francisco/Oakland</td> </tr> </tbody> </table>		Position	Name	SP	34-50N 140-00E	Tokyo/Yokohama	1	21-21N 157-57W	Honolulu	AP	37-45N 122-40W	San Francisco/Oakland							
	Position	Name																		
SP	34-50N 140-00E	Tokyo/Yokohama																		
1	21-21N 157-57W	Honolulu																		
AP	37-45N 122-40W	San Francisco/Oakland																		
Voyage No. 0 Dep Time(UTC) 2017/06/17 15:00 Basic Settings Optional Settings Conditions of simulation Save to Server Load from Server Run Simulation																				

FIG. 13(b)

1302

1303

1305



FIG. 14(a)

1401

Simulation Run		Simulation Result		Weather Hold		Simulation Save		Noon Report		Saved data		Voyage End		Weekly Weather		Storm	
Simulation		Fuel		Time		Dist				Simulation list				Simulation Clear All			
First Simulation		☒		☒		☒		☒		Comparison of simulation				Select Clear			
Re-Simulation1										Simulation Route List				Close all of the pop-up			
Re-Simulation2								☐ Point Display		Fuel Consumption				Print Screen			
Back		First day				Next		Point Split ORG		2018/05/16 00:45							
										Get weather from day							

WaveDisplay: ○ High ● Medium ○ Low

FIG. 14(b)

1402

1403

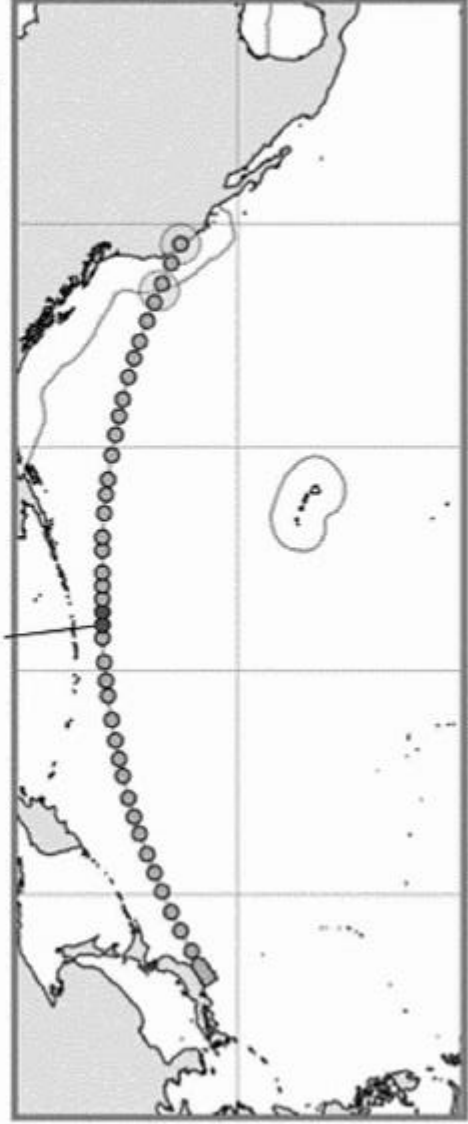
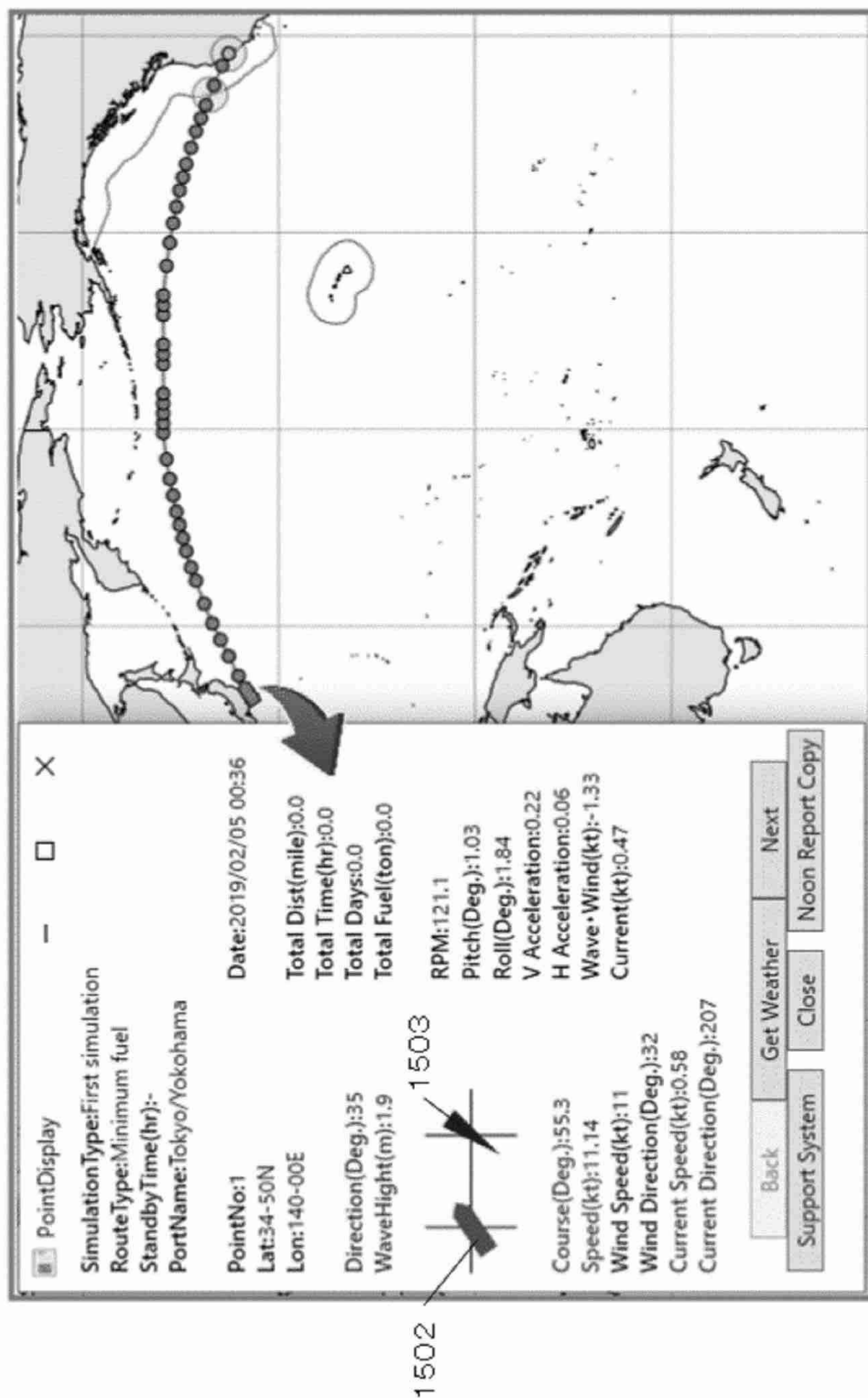


FIG. 15

1501



1502

1503

FIG. 16(a)

1601

Point No.	1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	60
Lat.	01-41S	04-45S	11-30S	17-45S	23-30S	28-30S	33-00S	37-00S	37-45S	38-45S	39-30S	21-45S	13-15S	03-45S	06-00N	01-12N
Lon.	043-49W	035-00W	025-15W	015-42W	004-00W	004-00E	014-30E	026-00E	034-30E	044-30E	054-00E	064-45E	074-45E	085-00E	095-20E	103-23E
Course(Deg.)	100.0	119.4	124.1	122.2	118.5	117.4	113.5	110.6	90.0	61.0	55.5	48.1	44.6	48.2	105.0	
Speed(kt)	11.17	10.20	9.91	11.55	12.10	12.10	11.56	11.29	11.08	12.12	11.54	9.97	11.01	12.17	12.11	
Day	0.3	2.6	5.7	8.3	10.5	12.6	14.7	16.9	18.3	20.1	22.2	25.1	28.4	31.1	31.8	
Dist.(mile)	80.3	97.3	159.7	168.4	156.3	152.7	150.4	127.7	108.9	154.7	158.5	194.0	272.5	291.4	154.2	
Fuel(ton)	14.9	20.4	35.7	30.2	26.6	27.8	28.5	24.8	21.4	26.3	27.9	43.3	53.6	33.8	22.9	
RPM	99.2	88.4	67.6	69.2	69.3	69.2	67.9	67.9	67.6	69.4	68.3	67.5	68.2	69.6	69.3	
PITCH(Deg.)	0.18	0.30	0.75	0.26	0.40	0.39	0.93	0.47	0.54	0.54	0.42	0.58	0.44	0.42	0.46	
ROLL(Deg.)	0.69	0.93	2.36	0.94	2.47	2.70	6.29	3.72	3.51	3.64	3.04	2.71	2.85	2.27	2.77	
V Acceleration	0.04	0.05	0.14	0.05	0.10	0.10	0.22	0.14	0.14	0.10	0.12	0.13	0.12	0.08	0.11	
H Acceleration	0.03	0.05	0.07	0.03	0.06	0.07	0.14	0.12	0.11	0.07	0.03	0.08	0.09	0.05	0.07	
Sea Margin	25.1	42.9	47.7	17.2	4.8	4.7	16.9	22.6	26.9	4.4	8.4	46.7	28.4	3.1	4.5	
Wave Wind(kt)	-0.85	-1.78	-2.35	-0.63	-0.13	-0.22	-0.79	-0.92	-1.51	-0.16	-0.37	-2.14	-1.14	-0.10	-0.20	
Current(kt)	-0.28	-0.33	-0.03	-0.07	-0.02	0.02	0.05	-0.09	0.29	-0.92	0.02	-0.19	-0.18	-0.03	0.01	
Wave Height(m)	1.6	2.6	3.2	1.3	2.6	2.5	5.7	3.7	3.7	3.4	2.9	3.2	3.0	2.6	2.9	
Period(s)	8.0	8.0	14.0	10.0	16.0	12.0	12.0	10.0	10.0	13.0	12.0	10.0	10.6	19.0	14.0	
Direction(Deg.)	30.0	140.0	170.0	170.0	230.0	230.0	240.0	210.0	170.0	200.0	160.0	110.0	130.0	180.0	220.0	

FIG. 16(b)

1602

Point No.	Point Number
Lat.	Latitude of the ship
Lon.	Longitude of the ship
Course(Deg.)	Course (Degree)
Speed(kt)	Estimated speed (knot) when sailing
Day	Day based on the voyage period
Dist.(mile)	Distance (mile)
Fuel(ton)	Fuel Consumption (ton)
RPM	Engine Speed (rpm)
PITCH(Deg.)	Pitch (Degree)
ROLL(Deg.)	Roll (Degree)
V Acceleration	Vertical Acceleration
H Acceleration	Horizontal Acceleration
Sea Margin	Sea Margin
Wave • Wind(kt)	Influences on ship speed by wave • wind (kt)
Current(kt)	Influences on ship by ocean current (kt)
Wave Height(m)	Average Wave Height (m)
Period(s)	Period
Direction(Deg.)	Direction of wave, wind from the ship side (Degree)

1701

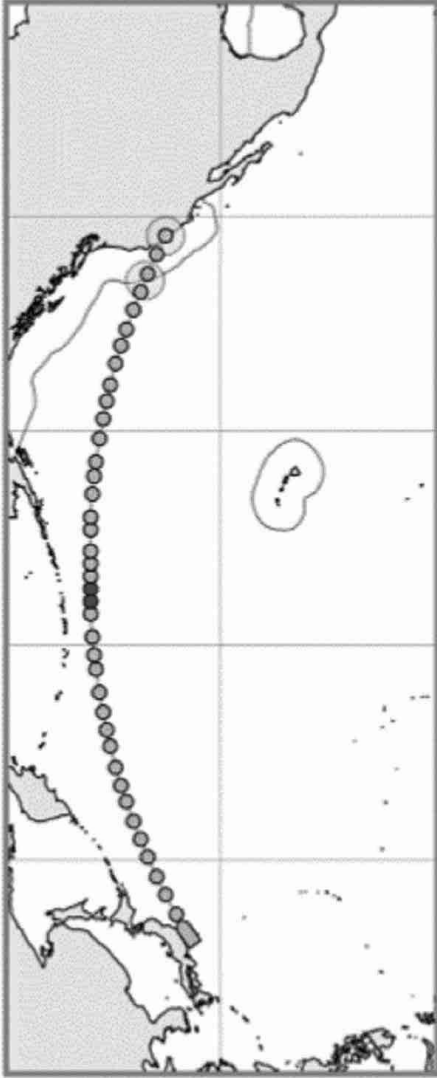


FIG. 17(a)

1702

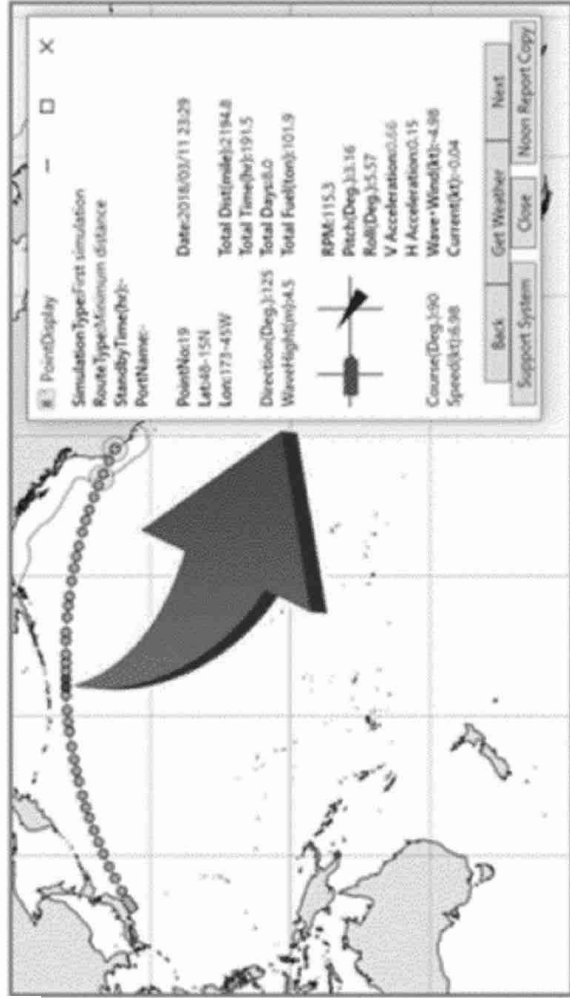


FIG. 17(b)

FIG. 18(a)

1801

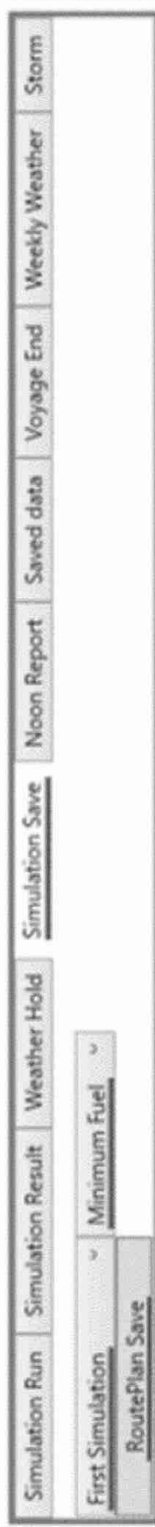


FIG. 18(b)

1802

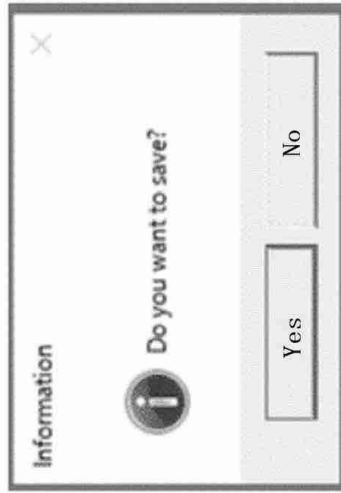


FIG. 19(a)

1901

Simulation Run	Simulation Result	Weather Hold	Simulation Save	Noon Report	Saved data	Voyage End	Weekly Weather	Storm
Noon report input								
Noon report Edit								
Noon report List								

FIG. 19(b)

1902

NoonReportInput

Date of Report (yyyymmdd)

Date of Time 12 : 00 (Local time)

Lat Lon 0 ° 00 ' N 0 ° 00 ' E

Time Difference from UTC +0000

Distance(mile) 0 (from previous Noon/Dep)

Speed(kt) 0

Running Time(hr) 0 (from previous Noon/Dep)

Main Engine Fuel(ton) 0 (from previous Noon/Dep consumption)

Diesel Fuel(ton) 0 (from previous Noon/Dep consumption)

RPM 0

Wind[Beaufort] 0

WaveHeight(m) 0

Is it a port? ☒ No ☐ Yes

OK Cancel

FIG. 20(a)

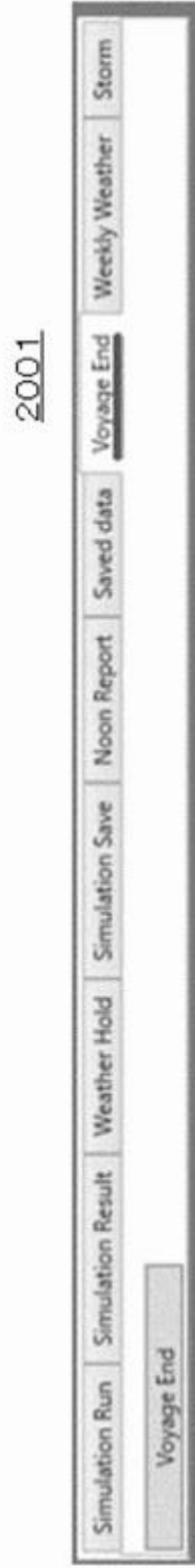


FIG. 20(b)

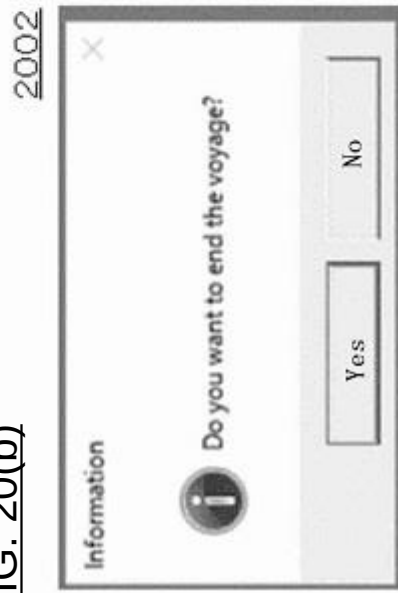


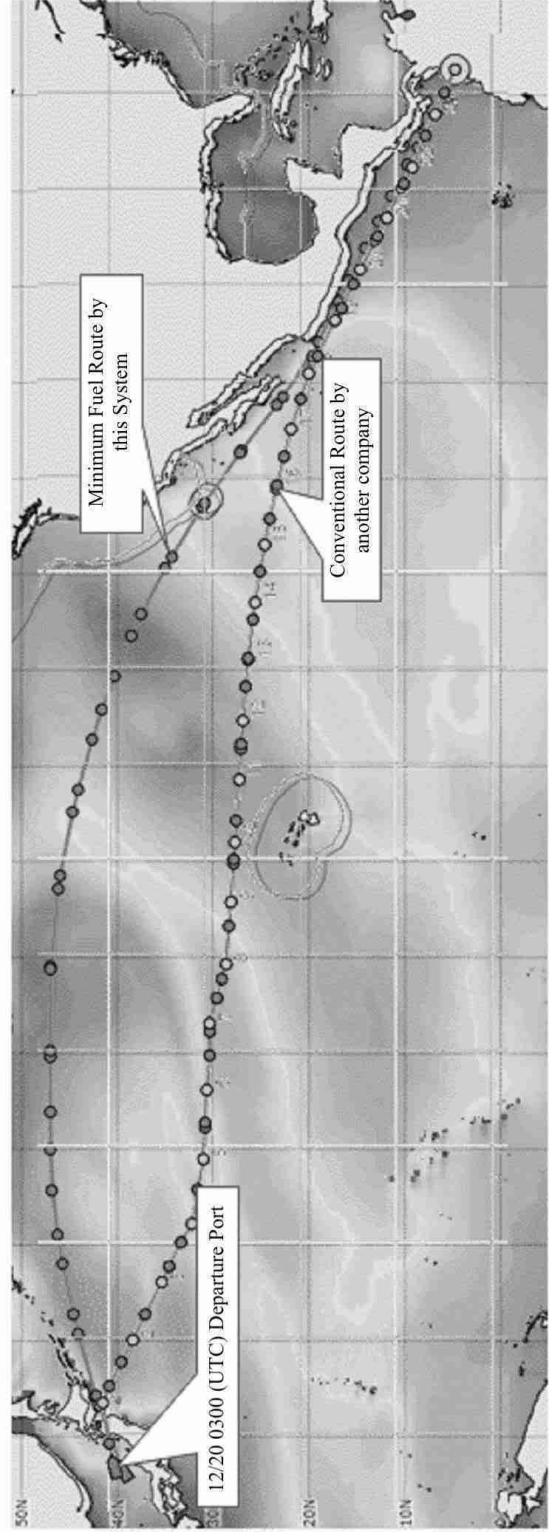
FIG. 21(a)

2101

Ship's Name	GOLDEN RAY
Full Load Speed (kt)	18
Full Load Displacement (t)	42428
Heavy Ballast Speed (kt)	-
Heavy Ballast Displacement (t)	-
Fuel Consumption (ton/day)	50
M/E Rotation (rpm)	77.2
Built Year	12/15/2017
IMO No.	9775816

FIG. 21(b)

2102



No	Lat	Lon	Time	Day	RunTime	Course	Speed	Dist	Fuel	SealPM	RPM	Pitch	Roll	Utkc	Hkrc	SealM	WwvM	Current	Wave	Wvht	
1	19-38N	136-18E	1:58	0.31	-	71.9	15.67	115.6	15.32	72.94	67.9	0.96	8.99	0.13	0.13	34	-1.4	0.27	2.4	9	500
2	40-00N	139-00E	0:53	0.89	-	78.1	13.86	98.49	23.96	72.94	67.9	1.12	10.84	0.14	0.13	31.8	-1.42	0.27	2.6	9	500
3	49-41N	139-14E	0.2	1.87	-	174.8	15.99	102.81	25.96	72.94	66	0.99	8.83	0.06	0.11	15	-1.43	0.21	2.6	9	500
4	40-20N	143-00E	0:59	1.45	-	122.8	15.38	118.56	16.9	72.94	64.8	1.11	10.26	0.05	0.12	37.6	-1.43	-0.05	3	9	305
5	38-45N	147-50E	6.4	1.8	-	132.8	15.53	131.01	16.19	72.94	66.7	1.23	10.26	0.09	0.13	35.7	-1.43	-0.05	3	9	320
6	38-45N	147-50E	6.4	2.19	-	132.6	16.03	151	19.99	72.94	67.2	1.23	10.38	0.11	0.13	28.5	-1.42	0.44	3	9	320
7	36-15N	152-10E	0:86	2.69	-	122.3	16.16	184.95	20.28	72.94	67.6	1.27	10.28	0.13	0.14	27.6	-1.42	0.58	3	9	325
8	34-25N	153-10E	0:11	2.84	-	118.5	15.85	93.66	12.21	72.94	66.1	1.51	11.4	0.13	0.14	31.8	-1.42	0.26	3.5	10	325
9	31-45N	157-20E	0:29	3.53	-	120.7	15.76	146.53	19.13	72.94	66.2	1.55	11.92	0.14	0.15	32.8	-1.42	0.18	3.5	10	325
10	32-50N	160-20E	0:27	3.65	-	124.9	15.58	120.56	16.04	72.94	67.9	1.62	12.22	0.16	0.16	35.2	-1.42	0.01	3.7	11	345
11	31-10N	161-50E	0:13	4.15	-	101.1	15.68	187.31	24.33	72.94	69	1.29	12.94	0.19	0.17	38.7	-1.43	-0.12	3.4	12	380
12	30-45N	168-10E	0:84	4.81	-	101.6	15.95	168.51	22.64	72.94	66.6	1.33	12.27	0.17	0.16	35.3	-1.38	-0.08	3.4	12	345
13	30-13N	168-41E	0:72	5.87	-	83.6	15.55	172.88	22.74	72.94	66.4	1.29	11.39	0.15	0.14	35.3	-1.37	-0.08	3.1	12	330
14	30-00N	172-00E	1:68	6.14	-	90	16.67	26.02	0.39	72.94	66.5	1.14	8.9	0.14	0.13	34	-1.34	0	2.6	12	320
15	30-00N	172-00E	13:9	6.41	-	90.5	15.49	176.53	22.54	72.94	66.5	1.16	8.58	0.13	0.13	35.8	-1.35	0.03	2.6	12	325
16	29-00N	176-10E	11:86	6.11	-	95.8	15.71	188.28	16.44	72.94	64.3	1.28	10.31	0.14	0.13	38.5	-1.36	0.07	3	12	325
17	29-30N	178-10E	0:33	6.48	-	90	15.7	193.78	17.06	72.94	66.3	1.18	8.41	0.12	0.12	33.2	-1.31	0.01	2.8	13	325
18	29-30N	178-10E	0:33	6.58	-	88.7	15.74	44.51	1.8	72.94	66.3	1.18	8.41	0.13	0.12	33.2	-1.31	0.06	2.8	13	325
19	29-31N	178-00E	0:34	6.97	-	109.2	15.7	146.61	19.36	72.94	68	1.38	8.66	0.11	0.12	33.7	-1.27	0.06	3.1	13	320
20	29-45N	174-00E	0:88	7.26	-	105.6	15.74	109.88	14.67	72.94	68	1.87	8.8	0.11	0.12	33.2	-1.26	0.08	3.5	13	320
21	28-15N	172-00E	0:43	7.48	-	108.5	15.68	164.82	11.27	72.94	67.8	1.79	10.2	0.12	0.14	33.9	-1.39	0.07	4.1	15	320
22	27-45N	179-25E	0:18	8.21	-	94.8	15.64	213	27.87	72.94	68.5	1.65	11.28	0.15	0.15	34.4	-1.38	0.03	4.1	16	320
23	27-30N	182-00E	0:16	8.41	-	95.5	15.63	115.03	17.76	72.94	66.2	1.62	10.84	0.14	0.15	34.5	-1.37	0	4	16	320
24	27-15N	184-20E	0:18	8.88	-	94.5	15.61	213.88	28.11	72.94	66.2	1.63	11.22	0.15	0.15	34.5	-1.37	0	4	16	330
25	27-00N	186-20E	0:17	9.05	-	90	15.61	26.77	1.49	72.94	66.3	1.48	11.08	0.16	0.16	33.5	-1.35	0.06	3.8	14	330
26	27-00N	186-20E	0:17	9.27	-	94.8	15.68	34.38	13.33	72.94	68.3	1.68	11.31	0.16	0.15	33.8	-1.35	0.03	3.8	14	330
27	26-45N	188-15E	0:11	9.47	-	93.3	15.69	120.89	15.77	72.94	66.4	1.58	10.87	0.15	0.14	33.8	-1.32	0	3.5	14	335
28	26-45N	188-15E	0:12	10.24	-	94.7	15.7	271.56	28.87	72.94	66.5	1.3	11.87	0.17	0.15	33.7	-1.37	0.06	3.2	12	335
29	26-25N	191-43E	0:18	10.26	-	93.6	13.82	173.73	24.49	72.94	66.7	0.87	10.43	0.22	0.14	53.7	-1.16	0.07	2.9	10	25
30	26-15N	148-20E	0:28	10.64	-	90	13.11	26.95	4.06	72.94	66.5	0.86	6.59	0.21	0.09	61.2	-1.88	-0.01	3	10	90
31	26-15N	148-20E	0:28	11.28	-	93.6	13.12	132.02	18.86	72.94	65.5	0.86	6.6	0.21	0.09	61.2	-1.88	0	3	10	90
32	25-55N	149-24E	0:17	11.87	-	93.3	13.13	193.73	29.11	72.94	65.5	0.85	6.58	0.21	0.09	61.2	-1.87	-0.01	3	10	90
33	25-45N	149-24E	0:17	12.36	-	99.6	13.95	152.58	27.05	72.94	68.6	0.78	6.34	0.21	0.09	61.2	-1.85	-0.01	2.7	9	80
34	25-35N	150-20E	0:18	12.39	-	90	13.81	10.85	1.53	72.94	68.7	0.66	6.36	0.19	0.09	55.8	-3.52	0.02	2.6	8	70
35	25-28N	150-20E	0:15	13.04	-	87.8	14.13	178.64	30.41	72.94	68.8	0.63	6.17	0.19	0.09	55.6	-3.8	0.02	2.6	7	70
36	25-20N	151-00E	0:15	13.04	-	98.2	13.88	97.39	14.27	72.94	68.8	0.63	6.77	0.19	0.11	59.3	-1.83	-0.02	2.6	9	45
37	24-45N	152-10E	0:04	13.89	-	99.9	13.78	179.62	25.35	72.94	70	0.6	8.18	0.21	0.13	55.2	-2.26	0.01	2.7	10	25
38	24-45N	152-10E	0:05	14.34	-	100.9	14.42	157.61	21.21	72.94	70	0.79	8.62	0.2	0.13	48.5	-2.61	0.03	2.7	10	25
39	24-45N	152-10E	0:06	14.78	-	101.4	14.39	150.98	26.67	72.94	68.9	0.89	0.95	0.2	0.12	44.8	-2.62	0	2.6	7	40
40	23-15N	144-20E	0:04	15.33	-	103.4	13.84	160.35	25.51	72.94	68.8	0.71	7.77	0.2	0.13	54.6	-3.15	-0.03	2.5	8	45
41	23-25N	147-20E	0:23	15.38	-	99.2	13.27	18.78	2.41	72.94	68.7	0.6	8.07	0.15	0.13	59.4	-1.72	-0.08	2	8	20
42	21-45N	121-00E	0:11	15.84	-	105	15.57	173.02	22.04	68.5	65.5	8.27	10.4	0.11	0.15	35.3	-1.39	-0.09	2	8	20
43	21-45N	121-00E	0:12	16.27	-	105.2	16.27	167.5	20.36	72.94	68.8	0.53	8.29	0.08	0.07	28.9	-0.82	0.52	1.7	14	9
44	21-15N	131-00E	0:16	16.28	-	108.3	15.81	186.76	21.64	72.94	68.7	0.7	8.86	0.04	0.06	30.8	-3.11	0.01	1.6	14	910
45	20-00N	112-00E	0:08	17.17	-	107.8	16.05	198.85	20.18	72.94	68.7	0.68	8.03	0.03	0.05	28.2	-3.11	0.15	1.5	14	285
46	20-15N	108-10E	0:13	17.48	-	118.3	16.03	117.54	20.84	68.1	65.1	5.37	3.32	0.04	0.05	28.4	-0.85	-0.03	1.3	14	285
47	18-15N	107-20E	0:16	18.09	-	116.9	16.06	240.19	28.89	72.94	68.1	0.55	3.26	0.04	0.05	27.6	-0.84	0.31	1.3	14	270
48	15-45N	102-20E	0:09	18.73	-	119.2	16.23	183.39	20.08	72.94	68.2	0.55	3.04	0.03	0.04	26.7	-0.84	0.36	1.2	14	275
49	14-10N	100-00E	0:19	18.99	-	118.3	16.08	99.53	12.21	72.94	68.6	0.42	2.41	0.04	0.05	28.7	-0.76	-0.15	1.2	14	285
50	14-10N	100-00E	0:19	19.59	-	117.5	15.99	228.03	27.39	72.94	70.3	0.32	2.41	0.04	0.05	29.8	-0.89	-0.12	1.3	13	130
51	13-45N	102-20E	0:08	19.82	-	117.5	15.83	147.22	18.53	72.94	70.4	0.33	3.73	0.08	0.05	30.7	-0.89	-0.08	1.4	12	130
52	13-15N	102-20E	0:08	20.54	-	116.5	15.87	206.84	28.55	72.94	70.5	0.37	3.1	0.1	0.06	31.4	-1.09	-0.09	1.4	12	130
53	12-15N	102-20E	0:08	20.85	-	117.8	15.39	173.96	14.22	72.94	70.3	0.5	3.98	0.13	0.06	38.9	-1.64	-0.18	1.8	9	150
54	10-15N	100-20E	0:44	20.95	-	112.4	13.84	213.77	25.82	72.94	70.3	0.43	4.43	0.12	0.06	31.8	-1.28	0.11	1.5	10	185
55	08-20N	104-20E	0:13	21.41	-	115.2	16.38	145.16	17.14	72.94	70.1	0.33	4.14	0.07	0.05	24.7	-0.67	0.04	1.1	10	200
56	07-45N	103-20E	0:18	22.16	-	112.6	16.36	149.23	17.83	72.94	70	0.33	3.62	0.06	0.05	28.4	-0.63	-0.12	1	12	250
57	05-00N	100-20E	0:05	22.58	-	114.5	15.73	198.11	21.05	72.94	67.6	0.23	3.2	0.04	0.04	33.2	-1.3	0.03	1.2	6	320
58	03-14N	107-20E	0:11	22.58	-	114.5	15.73	198.11	21.05	72.94	67.6	0.23	3.2	0.04	0.04	33.2	-1.3	0.03	1.2	6	320

FIG. 23

2301

	ETD(UTC)	ETA(UTC)	Speed(kt)	Time(hr)	Distance(mile)	Fuel(ton)
Abrog (Conventional Route)	2018/12/20 3:00	2019/1/11 16:59	15.33	542	8310.66	1091.41
Onavi (this system)	2018/12/20 3:00	2019/1/11 16:59	14.38	542	7794.86	892.1
Difference	-	-	0.95	0	515.8	199.31

FIG. 24

2401

Item	Average Speed	Total Hours	Total Distance	Total Fuel
Conventional Voyage Route	12.74	549.4	6998.0	479.3
Voyage Route by this System	11.45	545.7	6247.9	271.1

Reducing Fuel Rate
43.4%

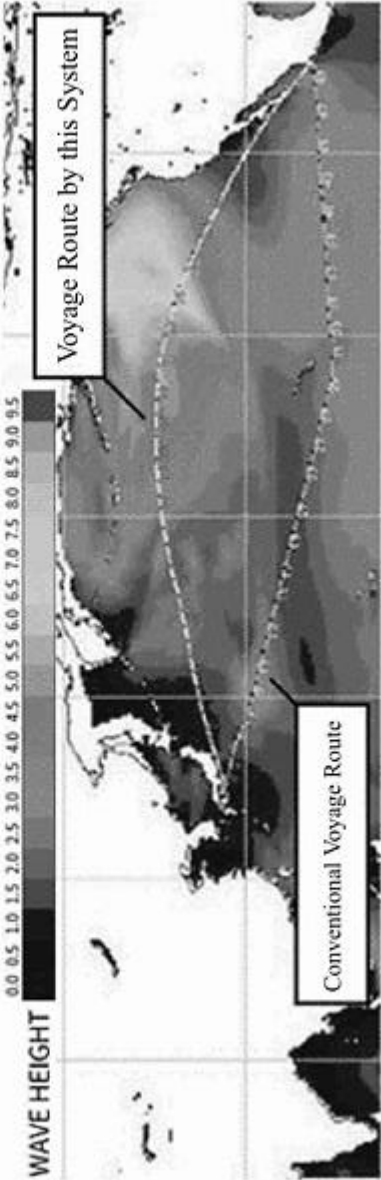


FIG. 25

2501

Items	Average Speed	Total Hours	Total Distance	Total Fuel
Conventional Voyage Route	11.63	846.5	9842.0	1981.5
Voyage Route by this System	11.49	845.4	9712.4	1787.0

Reducing Fuel Rate
9.8%

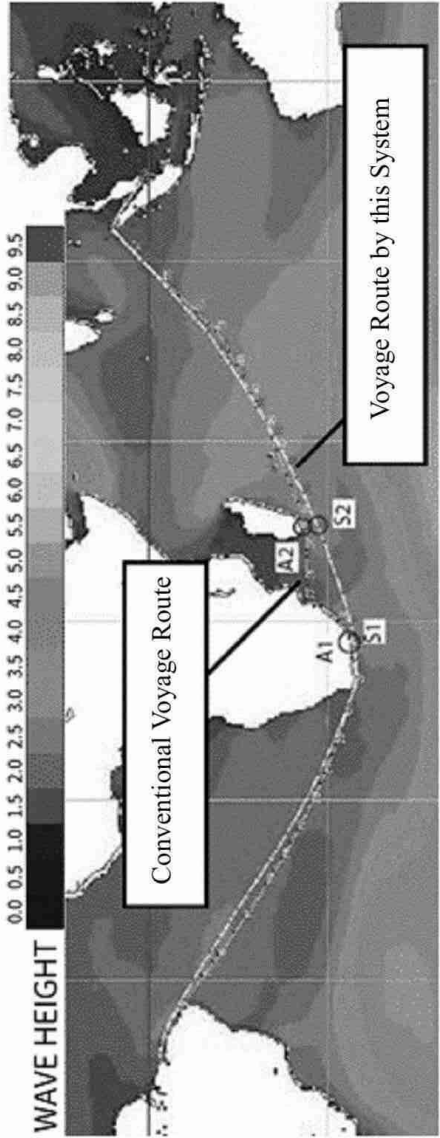


FIG. 26

2601

Items	Average Speed	Total Hours	Total Distance	Total Fuel
Conventional Voyage Route	10.33	444.3	4590.0	261.3
Voyage Route by this System	10.45	440.8	4604.1	200.0

Reducing Fuel Rate
23.5%

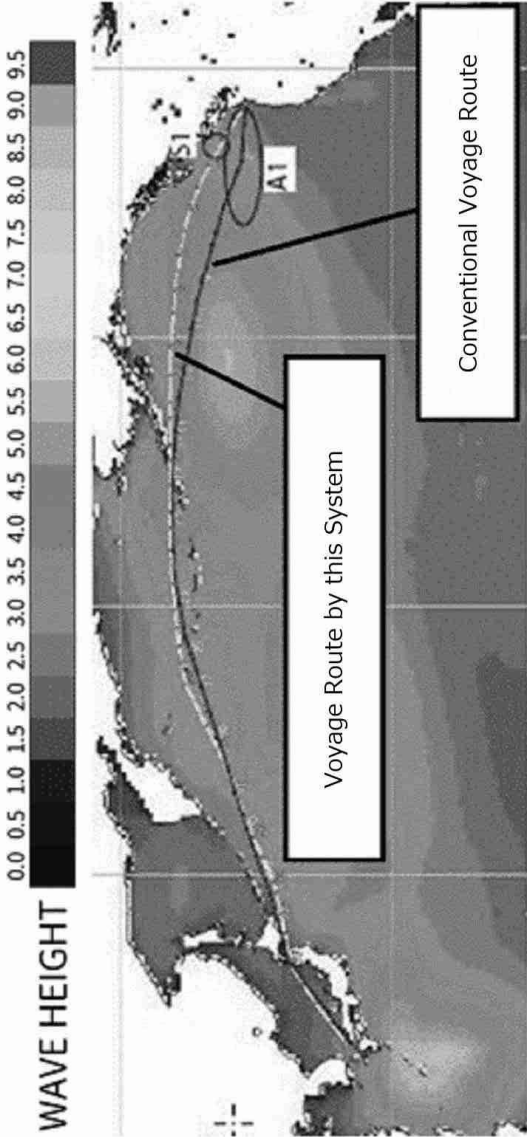


FIG. 27(a)

2701

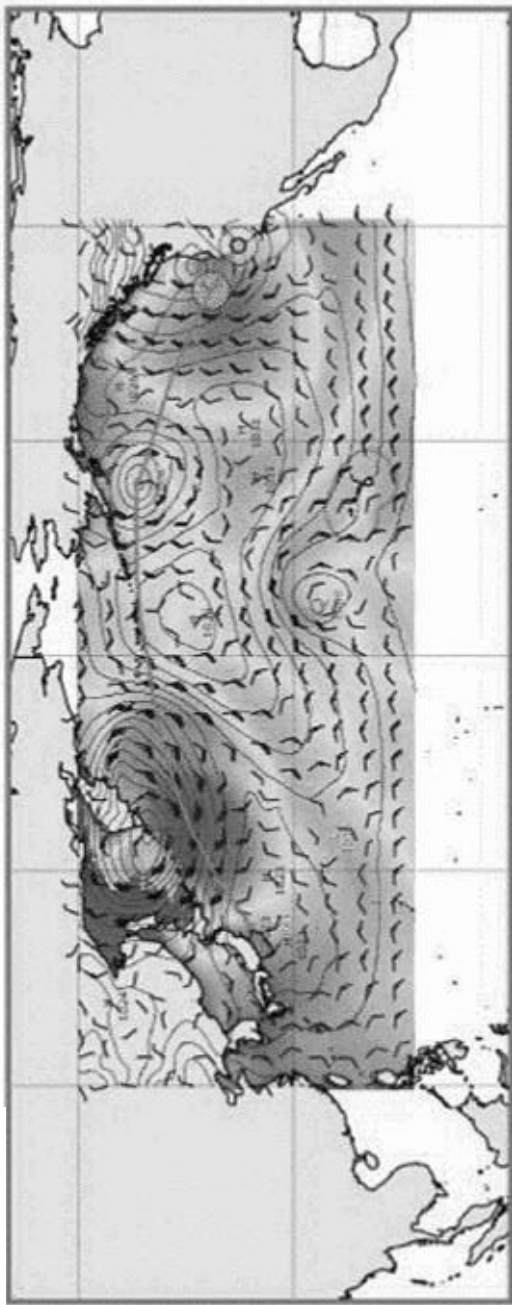


FIG. 27(b)

2702

Simulation Run	Simulation Result	Weather Hold	Simulation Save	Noon Report	Saved data	Voyage End	Weekly Weather	Storm	
Click the map or input position									
34	43	N							
139	58	E							
Get Weekly Weather									
Clear									
Forecast time(UTC)		6/17 Sat	6/18 Sun	6/19 Mon	6/20 Tue	6/21 Wed	6/22 Thu	6/23 Fri	6/24 Sat
Weather		00h 12h	00h 12h	00h 12h	00h 12h	00h 12h	00h 12h	00h 12h	00h 12h
Precipitation(mm)		11 9	18 7	20 21	23 22	23 23	23 23	22 22	22 23
Arrow Feathers									
Wind Speed(kt)		20 18	18 7	22 7	23 14	23 23	23 8	22 7	22 8
Temperature(°C)		21 20	20 21	22 22	23 22	23 23	23 23	22 22	22 23
Wave Direction									
Wave Height(m)		2 2	3 2	2 2	2 2	3 3	2 2	2 2	2 2

FIG. 28

