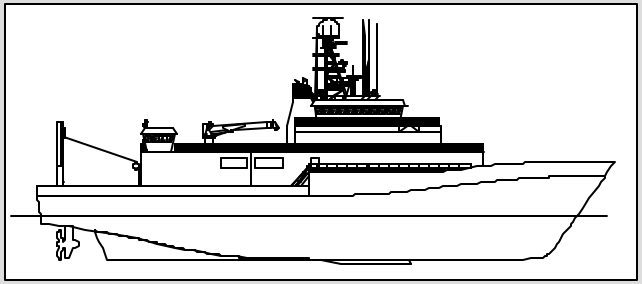
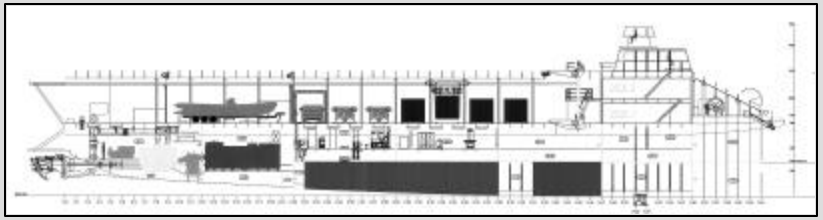
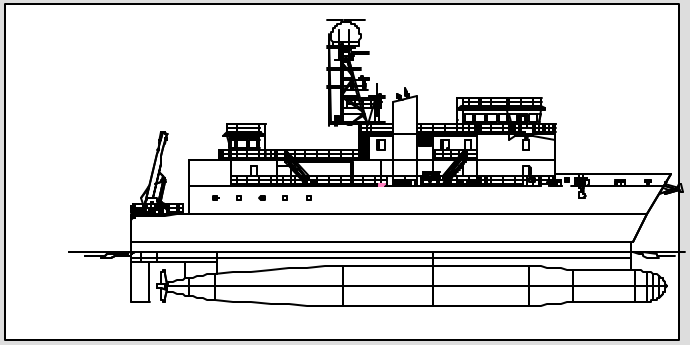
OCEAN Class AGOR
Concept Definition Task







4th Web Meeting

10 June 2004

OCEAN Class AGOR

Concept Definition

Status of OCEAN Class Concept Design Effort

Meeting Date	Monohull	SWATH	X Craft
02-Apr-04	Initial Concept Design - Hull Form - Arrangement - Seakeeping - Propulsion		Initial Concept Design - Hull Form - Arrangement - Propulsion
27-Apr-04	Revised Concept Design - Arrangement Revised to Reflect - PH Location sketch - fwd vs. - Fuel endurance calc revised	Initial Concept Design - Hull Form - Arrangement - Propulsion	Revised Concept Design - Z Drive Variant - Waterjet Variant
20-May-04	Revised Design IAW Comments Op Cost Calcs	Revised Design IAW Comments Op Cost Calcs Seakeeping Analysis	Revised Design IAW Comments Op Cost Calcs Additional ONR Investigation
10-Jun-04	Rev Op Cost Calcs	Rev Op Cost Calcs Seakeeping Analysis	Rev Op Cost Calcs Seakeeping Analysis
In Progress	Const. Cost Analysis Further refinement of design	Const. Cost Analysis Further refinement of design	Const. Cost Analysis Further refinement of design

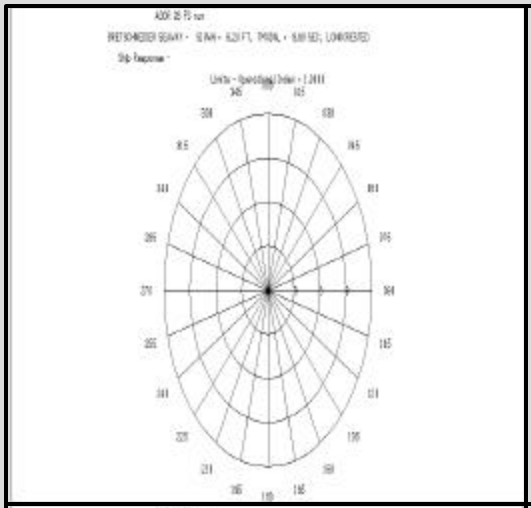
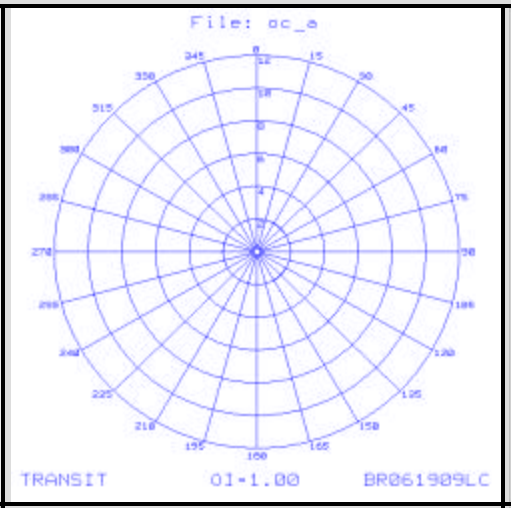
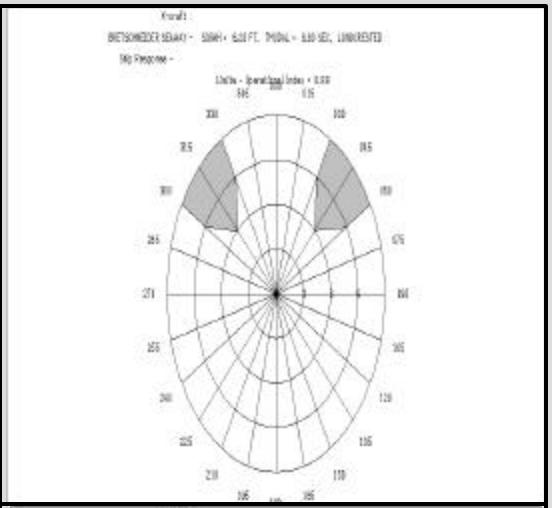
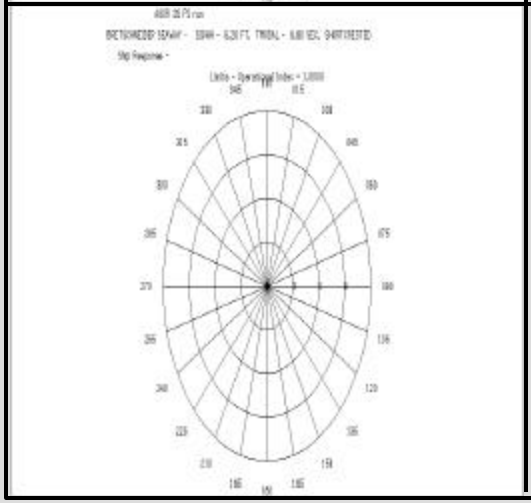
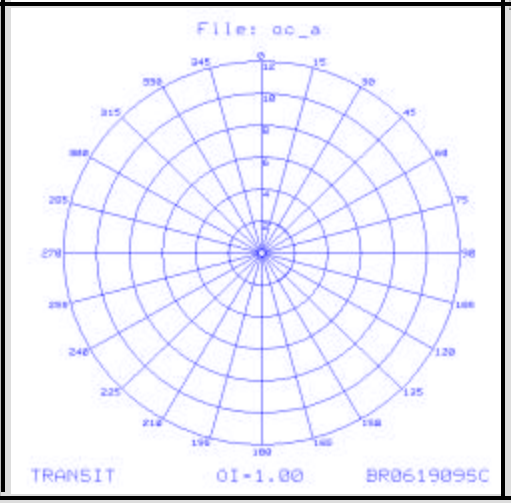
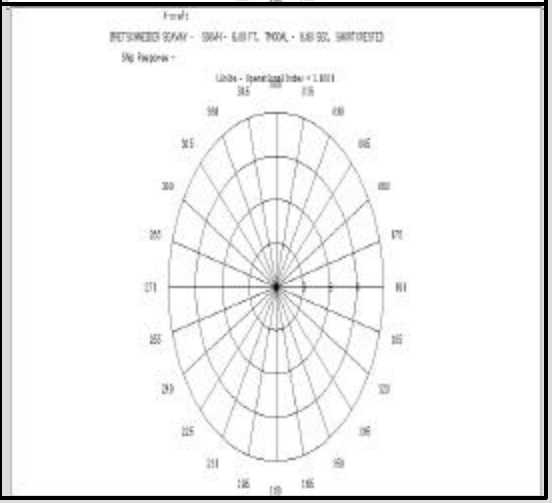
Seakeeping Analysis

OCEAN Class AGOR
Concept Definition

Seakeeping - SWATH and Monohull

Shaded Areas Exceed Motion Criteria

Transit N. Atl., MID SS4, Tm=8.8s

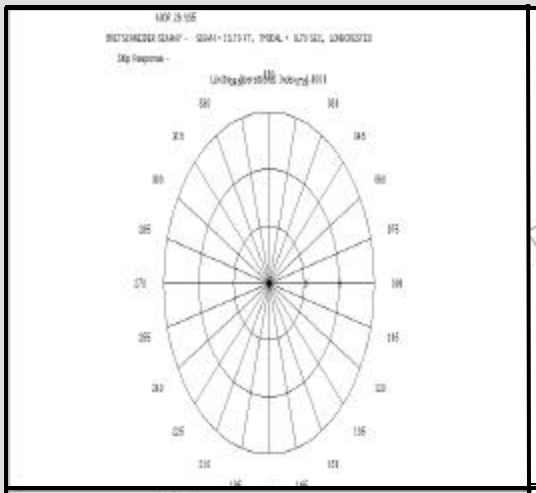
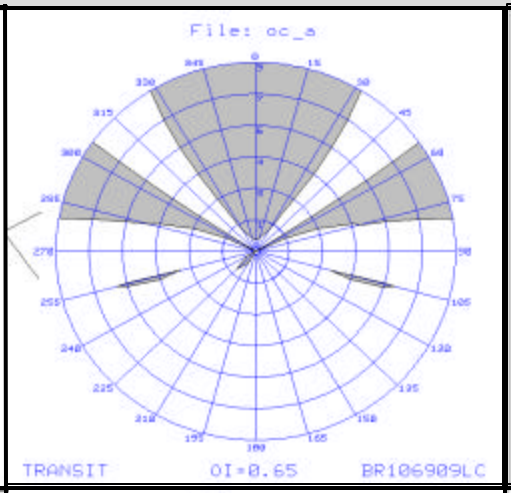
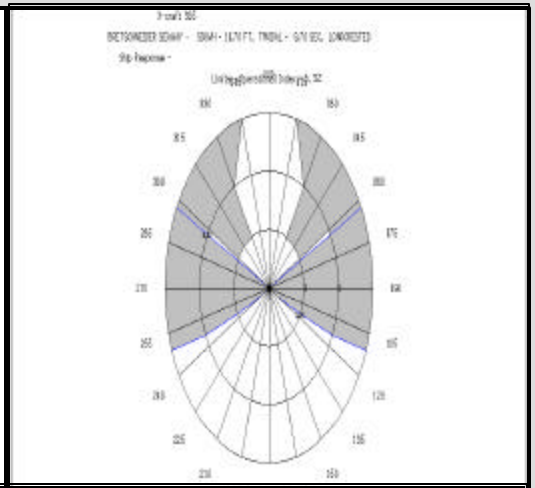
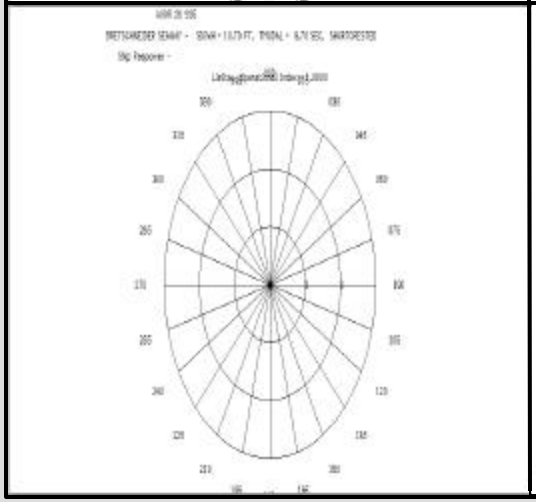
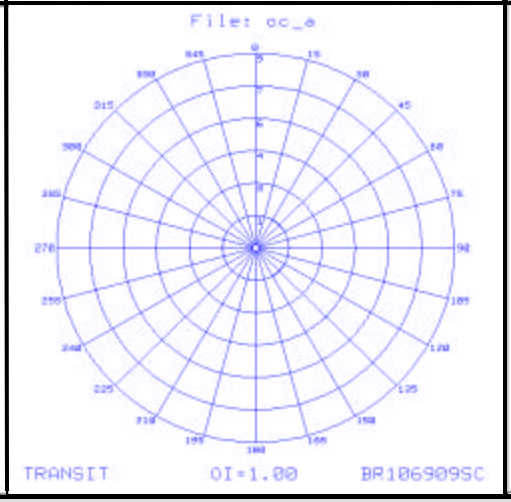
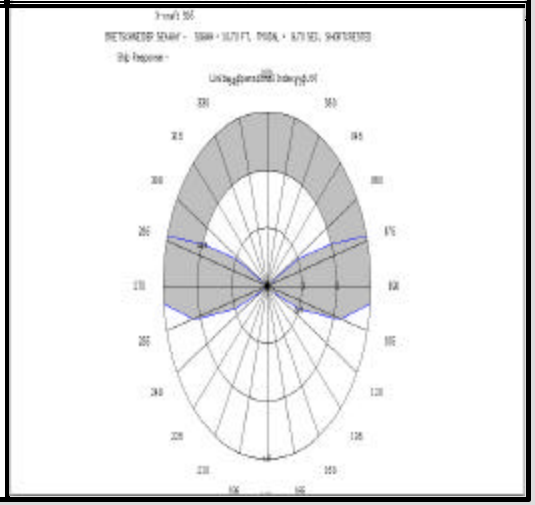
	SWATH	*Monohull*	*X-Craft*
Long-Crested Seas			
Short-Crested Seas			

OCEAN Class AGOR
Concept Definition

Seakeeping - SWATH and Monohull

Shaded Areas Exceed Motion Criteria

Transit N. Atl., MID SS5, Tm=9.7s

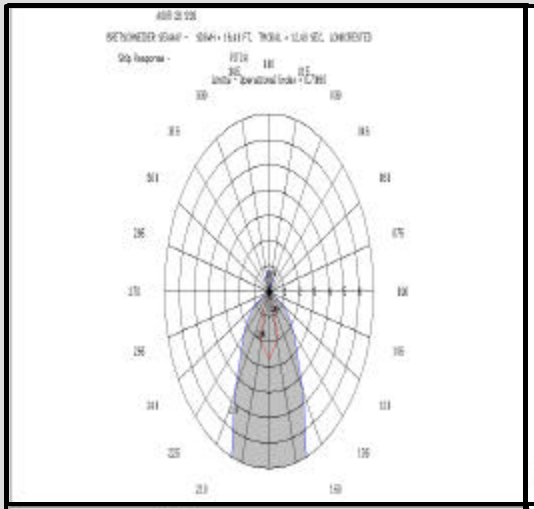
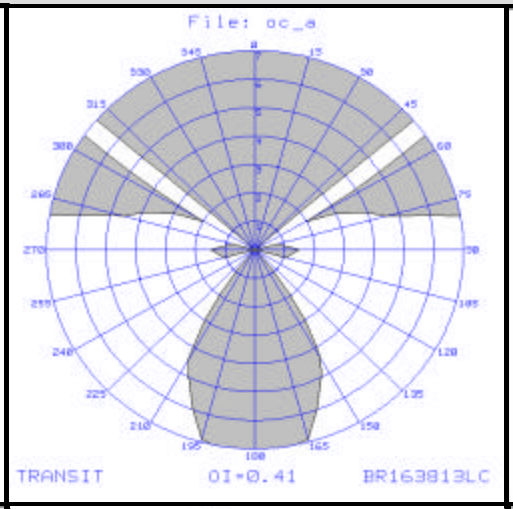
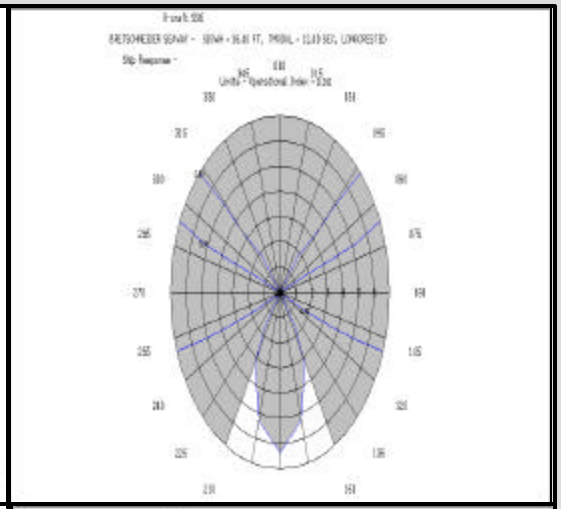
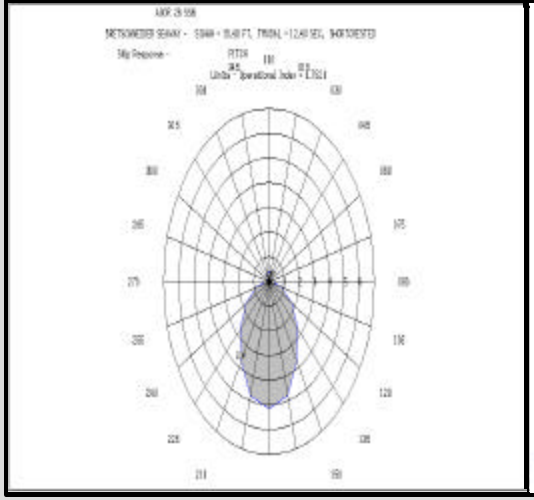
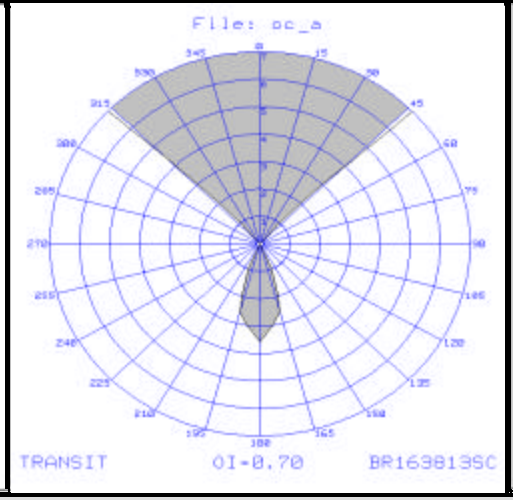
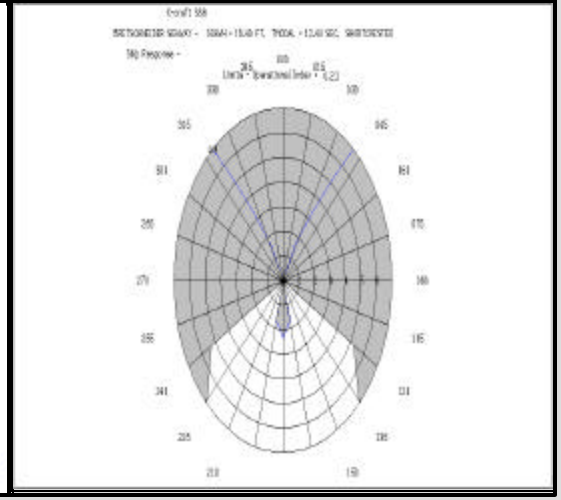
	SWATH	*Monohull*	*X-Craft*
Long-Crested Seas			
Short-Crested Seas			

OCEAN Class AGOR
Concept Definition

Seakeeping - SWATH and Monohull

Shaded Areas Exceed Motion Criteria

Transit N. Atl., MID SS6, Tm=12.4s

	SWATH	*Monohull*	*X-Craft*
Long-Crested Seas			
Short-Crested Seas			

X-Craft Seakeeping

- Seakeeping results depend largely on KG assumed
- X-Craft (SemiSWATH) KG assumed to be average ratio of AGOR 26 (SWATH,1.45) & Hayes (Catamaran,1.21) KG/Draft = 1.33
- Criteria based on SMRs:
  - Roll 3 deg RMS
  - Pitch 2 deg RMS
  - Lat accel. 0.05g RMS
  - Vert accel. 0.15g RMS
- Deck wetness at FP criteria is not applicable:
  - Foredeck is enclosed (human safety aspect of criteria)
  - No major equipment is installed at that location

OCEAN Class AGOR

Concept Definition

Table of Operabilities

						Short-Crested			Long-Crested		
Region	**Season**	**Perf. Index**	**Mission**	**Sea State**	**SMR**	**Mono Hull**	**SWATH**	**X-Craft**	**Mono Hull**	**SWATH**	**X-Craft**
Atlantic, N.	Annual	SPI-1	All	Spectrum	75% Winter	83%	86%	74%	76%	86%	68%
Pacific, N.	Annual	SPI-1	All	Spectrum	75% Winter	85%	83%	78%	77%	83%	68%
Atlantic, N.	Winter	PTO	On Station	SS4	100%	100%	100%	100%	100%	100%	93%
Atlantic, N.	Winter	PTO	On Station	SS5	80%	95%	99%	78%	83%	95%	64%
Atlantic, N.	Winter	PTO	On Station	SS6	50%	53%	63%	39%	34%	64%	10%
Atlantic, N.	Winter	PTO	Transit	SS4	100%	100%	100%	94%	100%	100%	85%
Atlantic, N.	Winter	PTO	Transit	SS5	80%	94%	99%	65%	81%	98%	54%
Atlantic, N.	Winter	PTO	Transit	SS6	50%	55%	80%	32%	37%	78%	12%
Pacific, NW	Winter	PTO	On Station	SS4	100%	100%	100%	100%	100%	100%	93%
Pacific, NW	Winter	PTO	On Station	SS5	80%	95%	95%	84%	83%	92%	70%
Pacific, NW	Winter	PTO	On Station	SS6	50%	81%	64%	83%	63%	64%	38%
Pacific, NW	Winter	PTO	Transit	SS4	100%	100%	100%	94%	100%	100%	85%
Pacific, NW	Winter	PTO	Transit	SS5	80%	94%	98%	72%	81%	97%	56%
Pacific, NW	Winter	PTO	Transit	SS6	50%	81%	83%	60%	63%	80%	32%

Notes:

1) PTO = Percent time operability in a given sea state; SPI-1 = Seakeeping performance index (probability weighted across sea spectrum)

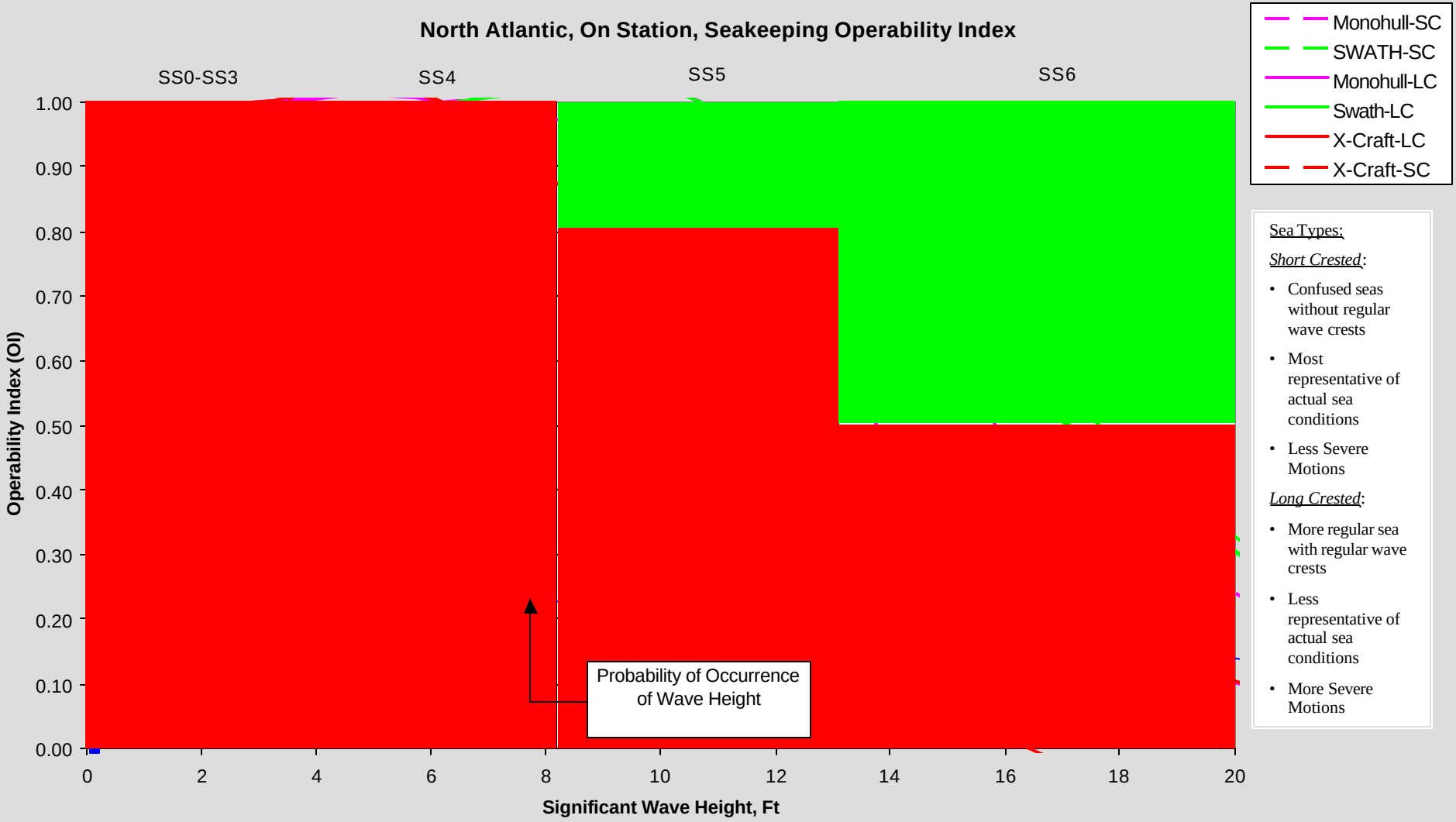
2) PTO analysis accounts for probability of significant wave heights for specific regions in Winter (January-March)

3) SPI-1 analysis assumes most probable modal wave periods for N. Atlantic and N. Pacific (Bales)

OCEAN Class AGOR

Concept Definition

Seakeeping - Operability vs. Wave Height



Operating Cost Analysis

OCEAN Class AGOR
Concept Definition

Operating Cost Analysis

Large AGOR Average Expenses for Last Four Years

Ships Included in Average:

- R/V ROGER REVELLE
- R/V MELVILLE
- R/V KNORR
- R/V ATLANTIS
- R/V KILO MOANA (03 and 04 only)

Years 2001, 2002, 2003 are actual.

Year 2004 is estimated.

Averages of Ship Characteristics:

- Displacement - 2,985 LT
- Crew Size - 21
- Science Party - 35
- Total Compl - 56

Year	2001	2002	2003	2004
Salaries & Wages				
A. Ship's company				
1. Salaries	$968,474	$1,006,119	$1,005,830	$1,010,798
2. Overtime	$586,163	$677,495	$553,898	$514,210
3. Shore Leave	$147,653	$177,615	$247,872	$451,044
4. Fringe Benefits	$283,241	$307,706	$321,329	$459,089
TOTAL	$1,985,532	$2,168,936	$2,128,929	$2,435,141
B. Marine Operations Staff				
1. Salaries	$226,602	$243,280	$248,220	$232,179
2. Overtime	$648	$877	$2,821	$0
3. Benefits	$56,051	$63,798	$71,597	$88,990
TOTAL	$283,301	$307,955	$322,637	$321,169
Repairs & Maintenance				
A. Normal Maint. & Repair	$261,787	$363,632	$260,971	$200,000
B. MOSA	$423,232	$555,250	$442,448	$589,600
TOTAL	$685,019	$918,882	$703,419	$789,600
Other Expenses				
A. Fuel & Lube Oil	$674,312	$643,821	$692,627	$833,741
B. Food	$122,728	$182,921	$162,179	$196,864
C. Insurance	$61,717	$75,796	$84,777	$107,148
D. Stores Minor Equip., & Supplies	$140,192	$177,756	$155,344	$137,440
E. Travel				
Domestic	$29,770	$44,778	$52,615	$58,494
Foreign	$134,414	$117,258	$77,486	$27,131
F. Shore Facilities Support	$94,579	$109,355	$139,566	$168,652
G. Miscellaneous	$229,409	$297,513	$195,684	$180,780
H. Amortization				
Total	$1,487,121	$1,649,197	$1,574,753	$1,730,807
Total Direct Costs	$4,440,974	$5,044,971	$4,729,738	$5,276,717
Indirect Costs	$596,378	$625,818	$606,888	$676,311
Total Operating Costs	$5,037,352	$5,670,789	$5,336,626	$5,953,028
VI. Miscellaneous Data				
A. Number of Cruises/Legs	15	18	16	18
B. Operating Days	283	297	266	293
C. Days at Sea	247	268	242	268
D. Maintenance Days	48	45	40	23
E. Days Out of Service	26	0	24	6
F. Daily Rate	$17,722	$19,193	$20,108	$20,282

OCEAN Class AGOR Concept Definition

Fuel Operating Cost Calculation

Monohull

	Cruise	Transit				Towing/Survey			On Station		Total Days	Avg Daily Fuel Cost	Cruise Fuel Cost	Yearly Fuel & Lube Cost
		Speed	Days	NM	$/day fuel	Speed	Days	$/day fuel	Days	$/day fuel				
1	2D,3D High Res Sonar	12	2	576	$5,043	5	30	$1,945	2	$2,226	34	$2,144	$72,894	FOY =
2	Piston Coring	12	4	1,152	$5,043				20	$2,226	24	$2,696	$64,697	240
3	Observatory Servicing	12	1	288	$5,043	10	7	$3,397	6	$2,226	14	$3,013	$42,179	days
4	Current Meter Moorings, etc.	12	3	864	$5,043	8	10	$2,518	14	$2,226	27	$2,647	$71,475	
5	Bio & Physical Survey	14	1	336	$8,485	12	2	$5,043	7	$2,226	10	$3,416	$34,155	
6	Deployment of Moorings	10	20	4,800	$3,397	10	1	$3,397	4	$2,226	25	$3,210	$80,241	
7	LaGrangian Float Studies	12	8	2,304	$5,043	10	27	$3,397			35	$3,773	$132,057	
8	Open Ocean Bio/Chem Int.	12	2	576	$5,043	6	26	$2,013			28	$2,229	$62,421	
9	Laying Cable for Observ.	12	5	1,440	$5,043	5	5	$1,945	10	$2,226	20	$2,860	$57,202	
10	Moving Ship Tomography	12	15	4,320	$5,043				15	$2,226	30			
			61				108		78		247	$2,887		$692,995

SWATH

	Cruise	Transit				Towing/Survey			On Station		Total Days	Avg Daily Fuel Cost	Cruise Fuel Cost	Yearly Fuel & Lube Cost
		Speed	Days	NM	$/day fuel	Speed	Days	$/day fuel	Days	$/day fuel				
1	2D,3D High Res Sonar	12	2	576	$5,828	5	30	$2,363	2	$2,800	34	$2,592	$88,130	FOY =
2	Piston Coring	12	4	1,152	$5,828				20	$2,800	24	$3,305	$79,310	240
3	Observatory Servicing	12	1	288	$5,828	10	7	$4,375	6	$2,800	14	$3,804	$53,253	days
4	Current Meter Moorings, etc.	12	3	864	$5,828	8	10	$3,238	14	$2,800	27	$3,298	$89,058	
5	Bio & Physical Survey	14	1	336	$7,840	12	2	$5,828	7	$2,800	10	$3,910	$39,095	
6	Deployment of Moorings	12	20	5,760	$5,828	10	1	$4,375	4	$2,800	25	$5,285	$132,125	
7	LaGrangian Float Studies	12	8	2,304	$5,828	10	27	$4,375			35	$4,707	$164,745	
8	Open Ocean Bio/Chem Int.	12	2	576	$5,828	6	26	$2,538			28	$2,773	$77,630	
9	Laying Cable for Observ.	12	5	1,440	$5,828	5	5	$2,363	10	$2,800	20	$3,448	$68,950	
10	Moving Ship Tomography	12	15	4,320	$5,828				15	$2,800	30			
			61				108		78		247	$3,680		$883,208

X Craft - Propeller Drive

	Cruise	Transit				Towing/Survey			On Station		Total Days	Avg Daily Fuel Cost	Cruise Fuel Cost	Yearly Fuel & Lube Cost
		Speed	Days	NM	$/day fuel	Speed	Days	$/day fuel	Days	$/day fuel				
1	2D,3D High Res Sonar	12	2	576	$7,028	5	30	$2,142	2	$2,887	34	$2,473	$84,093	FOY =
2	Piston Coring	12	4	1,152	$7,028				20	$2,887	24	$3,577	$85,858	240
3	Observatory Servicing	12	1	288	$7,028	10	7	$4,780	6	$2,887	14	$4,129	$57,812	days
4	Current Meter Moorings, etc.	12	3	864	$7,028	8	10	$3,388	14	$2,887	27	$3,533	$95,387	
5	Bio & Physical Survey	14	1	336	$10,179	12	2	$7,028	7	$2,887	10	$4,445	$44,446	
6	Deployment of Moorings	12	20	5,760	$7,028	10	1	$4,780	4	$2,887	25	$6,276	$156,896	
7	LaGrangian Float Studies	12	8	2,304	$7,028	10	27	$4,780			35	$5,294	$185,289	
8	Open Ocean Bio/Chem Int.	12	2	576	$7,028	6	26	$2,477			28	$2,802	$78,452	
9	Laying Cable for Observ.	12	5	1,440	$7,028	5	5	$2,142	10	$2,887	20	$3,736	$74,724	
10	Moving Ship Tomography	12	15	4,320	$7,028				15	$2,887	30	$4,958		
			61				108		78		247	$4,580		$1,099,288

X Craft - Waterjet Drive

	Cruise	Transit				Towing/Survey			On Station		Total Days	Avg Daily Fuel Cost	Cruise Fuel Cost	Yearly Fuel & Lube Cost
		Speed	Days	NM	$ fuel	Speed	Days	$/day fuel	Days	$/day fuel				
1	2D,3D High Res Sonar	12	2	576	$11,646	5	30	$2,480	2	$2,887	34	$3,043	$103,473	FOY =
2	Piston Coring	12	4	1,152	$11,646				20	$2,887	24	$4,347	$104,330	240
3	Observatory Servicing	12	1	288	$11,646	10	7	$7,826	6	$2,887	14	$5,982	$83,749	days
4	Current Meter Moorings, etc.	12	3	864	$11,646	8	10	$4,872	14	$2,887	27	$4,596	$124,082	
5	Bio & Physical Survey	14	1	336	$17,557	12	2	$11,646	7	$2,887	10	$6,106	$61,061	
6	Deployment of Moorings	12	20	5,760	$11,646	10	1	$7,826	4	$2,887	25	$10,092	$252,303	
7	LaGrangian Float Studies	12	8	2,304	$11,646	10	27	$7,826			35	$8,699	$304,463	
8	Open Ocean Bio/Chem Int.	12	2	576	$11,646	6	26	$3,082			28	$3,694	$103,435	
9	Laying Cable for Observ.	12	5	1,440	$11,646	5	5	$2,480	10	$2,887	20	$4,975	$99,505	
10	Moving Ship Tomography	12	15	4,320	$11,646				15	$2,887	30	$7,267	$218,005	
			61				108		78		247	$6,533		$1,568,039

Revision -

FOY reduced to 240 days which is approximate days at sea for 270 operating days.

OCEAN Class AGOR
Concept Definition

Operating Cost Analysis

	GLOBAL AGOR Averages					OCEAN Class Feasibility Designs			
Year	2001	2002	2003	2004	Ratio	Monohull	SWATH	X Craft - Z drive	X Craft - WJ
Salaries & Wages									
A. Ship's company									
1. Salaries	$968,474	$1,006,119	$1,005,830	$1,010,798					
2. Overtime	$586,163	$677,495	$553,898	$514,210					
3. Shore Leave	$147,653	$177,615	$247,872	$451,044					
4. Fringe Benefits	$283,241	$307,706	$321,329	$459,089					
TOTAL	$1,985,532	$2,168,936	$2,128,929	$2,435,141	Use 2004	$2,435,141	$2,435,141	$2,435,141	$2,435,141
B. Marine Operations Staff									
1. Salaries	$226,602	$243,280	$248,220	$232,179					
2. Overtime	$648	$877	$2,821	$0					
3. Benefits	$56,051	$63,798	$71,597	$88,990					
TOTAL	$283,301	$307,955	$322,637	$321,169	Use 2004	$321,169	$321,169	$321,169	$321,169
Repairs & Maintenance									
A. Normal Maint. & Repair	$261,787	$363,632	$260,971	$200,000	4 yr avg ratioed by disp	$227,438	$271,598	$271,598	$271,598
B. MOSA	$423,232	$555,250	$442,448	$589,600	2004 ratioed by disp	$493,736	$589,600	$589,600	$589,600
TOTAL	$685,019	$918,882	$703,419	$789,600		$721,174	$861,198	$861,198	$861,198
Other Expenses									
A. Fuel & Lube Oil	$674,312	$643,821	$692,627	$833,741	Calculated	$692,995	$883,208	$1,099,200	$1,568,039
B. Food	$122,728	$182,921	$162,179	$196,864	2004 ratioed by compl	$161,710	$161,710	$161,710	$161,710
C. Insurance	$61,717	$75,796	$84,777	$107,148	Use 2004	$107,148	$107,148	$107,148	$107,148
D. Stores Minor Equip., & Supplies	$140,192	$177,756	$155,344	$137,440	4 yr avg ratioed by compl	$125,418	$125,418	$125,418	$125,418
E. Travel									
Domestic	$29,770	$44,778	$52,615	$58,494	4 yr avg ratioed by crew	$46,414	$46,414	$46,414	$46,414
Foreign	$134,414	$117,258	$77,486	$27,131	4 yr avg ratioed by crew	$106,038	$106,038	$106,038	$106,038
F. Shore Facilities Support	$94,579	$109,355	$139,566	$168,652	Use 2004	$168,652	$168,652	$168,652	$168,652
G. Miscellaneous	$229,409	$297,513	$195,684	$180,780	4 yr avg ratioed by disp	$189,126	$196,691	$181,561	$196,691
H. Amortization									
Total	$1,487,121	$1,649,197	$1,560,277	$1,710,250		$1,597,501	$1,795,279	$1,996,141	$2,480,110
Total Direct Costs	$3,755,954	$4,126,089	$4,011,843	$5,256,160		$5,074,985	$5,412,787	$5,613,649	$6,097,618
Indirect Costs	$596,378	$625,818	$606,888	$676,311	13% of direct	$659,748	$703,662	$729,774	$792,690
Total Operating Costs	$4,352,332	$4,751,907	$4,618,731	$5,932,471		$5,734,734	$6,116,449	$6,343,423	$6,890,308
Miscellaneous Data									
A. Number of Cruises/Legs	15	18	16	18					
B. Operating Days	283	297	266	293	Avg	285	285	285	285
C. Days at Sea	247	268	242	268					
D. Maintenance Days	48	45	40	23					
E. Days Out of Service	26	0	24	6					
F. Daily Rate	$17,722	$19,193	$20,108	$20,282		$20,145	$21,486	$22,283	$24,204
Displacement, LT				2,985		2500	2600	2400	2600
Crew				21		21	21	21	21
Sci				35		25	25	25	25
Total Comp				56		46	46	46	46

X Craft Concept Development

OCEAN Class AGOR

Concept Definition

- X Craft box structure has sufficient volume to accommodate AGOR mission functions
- Existing X craft design has insufficient displacement to accommodate the weight of the AGOR mission functions without increasing hull volume
- Question - to what degree can the existing X craft hull form meet the SMRs without modification ?

OCEAN Class AGOR
Concept Definition

AGOR X-CRAFT

	ONR X-Craft	AGOR X-Craft, Waterjet, not change hullform	AGOR X-Craft, Z-Drive, not change hullform	AGOR X-Craft meet all SMRs, change hullform	
Length	240	240	240	240	ft
Beam, overall	72	72	72	72	ft
Beam, waterline	17	17	17	22	ft
Draft	11.8	11.8	12	15	ft
Displacement	1400	1400	1400	2400	Lt
Cb	0.52	0.52	0.52	0.52	
Speed, max	>50	15	15	15	knots
Range	4000@20 knots	Varied	Varied	10800@12 knots	n.miles
Endurance	40	Varied	Varied	40	days
Fuel	380	Varied	Varied	584	Ltons
Power					
GE LM2500 Gas Turbine	2 x 25	2 x 25			MW
MTU 16V 595 TE 90 Diesel	3 x 4.3	3 x 4.3			MW
Caterpillar 3412C			6 x 590	2 x 590	kW
Caterpillar 3508C				4 x 910	kW
Service Generators	4 x 250	4 x 250	690 kW, Integrated	690 kW, Integrated	kW
Lightship	918	1138	1110	1363	Lton
Stern Working Area	2000	2000	2000	2050	ft^2
Laboratories		2000	2000	2500	ft^2
Main (Dry) Lab		1000	1000	1100	ft^2
Wet Lab		400	400	400	ft^2
Electronics/Computer Lab		390	390	300	ft^2
Science (Pay) Load	100	200	200	200	Ltons
Work Boat		>16	>16	>16	ft
Crew	25	21	21	21	
Science Personnel	-	24	24	24	
Stern A-Frame	no	Varied	Varied	yes	
Static Load		30000	30000	30000	lbs
outboard reach		12	12	12	ft
Hydrographic Winches		10000/0.5"	10000/0.5"	10000/0.5"	meters
Heavy Winch Complex		12000/9/16"	12000/9/16"	12000/9/16"	meters
Cranes				20000	lbs
Towing		10000 lbs/6knots 25000 lbs/4knots	10000 lbs/6knots 25000 lbs/4knots	10000 lbs/6knots 25000 lbs/4knots	

Weight Impacts of AGOR X Craft

Weight Adds of the X-Craft AGOR Variants Compared to the ONR X-Craft

	ONR X-Craft Baseline	Weight Increments of the AGOR X-Craft, Waterjets	Weight Increments of the AGOR X-Craft, Z-Drive	Weight Increments of the 2400-ton AGOR X-Craft
1 HULL STRUCTURE	564	0.00	0.00	148.58
Lower Hull Structural Weight Increase		0.00	0.00	148.58
2 PROPULSION PLANT	142	0.00	-77.73	-67.60
Remove the Gas Turbines			-29.50	-29.50
Remove the MTU Diesels			-31.47	-31.47
Remove the Reduction Gears			-29.50	-29.50
Add the Propulsion Motors			17.66	24.04
Remove 4 waterjets			-39.33	-40.51
Add the Z-Drives			34.42	39.33
3 ELECTRIC PLANT	31	0.00	49.97	74.35
Ship Serv. Power Generation			25.55	41.10
Power Conversion Equip.			15.88	21.62
Switch Gear and Panels			8.54	11.63
4 COMMAND & SURVEILLENCE	22	3.95	3.95	3.95
5 AUXILIARY SYSTEMS	83	180.37	180.37	210.50
Compartment Heating System		0.25	0.25	0.36
Ventilation System		3.91	3.91	5.56
Air Conditioning System		6.25	6.25	8.88
Firemain & Flushing Sys				2.78
Aux. Seawater Sys				2.03
Plumbing Drainage		1.72	1.72	2.44
Distilling Plant		0.37	0.37	0.53
Fire Extinguishing Sys				0.86

Weight Impacts of AGOR X Craft

Hydraulic Fluid Sys				1.25
Maneuvering System		22.59	22.59	32.11
Cargo Handling System		18.05	18.05	18.05
Anchor Handling and Storage		2.00	2.00	6.00
Boats and Boat Handling System		2.74	2.74	2.74
Scientific and Ocean Eng. Sys.		109.51	109.51	111.73
Environ. Pollution CNTL		2.32	2.32	4.53
Aux Sys Operating Fluids		10.66	10.66	10.66
6 OUTFIT & FURNISHINGS	75	35.23	35.23	74.98
Non Structural Bulkhead				18.14
Ladders				1.11
Non Structural Closures				3.39
Painting				7.14
Cathodic Protection				0.23
Hull Insulation				7.64
Sheathing				1.26
Refrigerated Space		8.48	8.48	8.48
Berthing		12.88	12.88	12.88
Sanitary Spaces		1.69	1.69	1.69
Leisure & Comm. Spaces		0.43	0.43	0.43
Commissary Spaces		1.41	1.41	1.41
Medical Spaces		0.13	0.13	0.13
Laundry Spaces		0.10	0.10	0.10
Workshop and Lab Space		7.03	7.03	7.03

Weight Impacts of AGOR X Craft

LKRS & Special Storage		0.88	0.88	1.71	
STORMS & Issue RMS		2.20	2.20	2.20	
7 ARMAMENT	0.17	0.00	0.00	0.00	
LIGHTSHIP	918	220	192	445	
Margin				136.28	
Loads	520	-240.52	-240.52	357.78	
Ship Officers, Crews and Scients.		4.47	4.47	4.47	
Fuel		-380.00	-380.00	218.29	
Payload		100.00	100.00	100.00	
Prov. And Personnel Stores		5.11	5.11	5.11	
General Stores		2.60	2.60	2.60	
Sea Water		20.00	20.00	20.00	
Fresh Water		10.18	10.18	10.18	
Sanitary Tank Liquid		1.60	1.60	1.60	
Full Load Displacement	1438	1417	1390	2377	Ltons

X-Craft Variant Weight Summary By Major Group

Weight Summary	ONR X-Craft	AGOR X-Craft, Waterjet, no fuel	AGOR X-Craft,Z-drive, no fuel	AGOR X-Craft meet all SMRs, change hullform	
1 HULL STRUCTURE	564	564	564	713	Ltons
2 PROPULSION PLANT	142	142	64	74	Ltons
3 ELECTRIC PLANT	31	31	81	106	Ltons
4 COMMAND & SURVEILLENCE	22	26	26	26	Ltons
5 AUXILIARY SYSTEMS	83	264	264	294	Ltons
6 OUTFIT & FURNISHINGS	75	110	110	150	Ltons
7 ARMAMENT	0.17	0.17	0.17	0.17	Ltons
TOTAL LIGHTSHIP	918	1138	1110	1363	Ltons
Margin				136	Ltons
Loads	520	280	280	878	Ltons
Full Load Displacement	1438	1417	1390	2377	Ltons

Note: The full load displacements of the 1400-ton variants do not include any fuel.

SMR Weights and Fuel Loads of the 1400-ton Variants

- In order to carry fuel, some SMR items which could be removed from the ship are listed in the following table to explore the combinations of removing SMR items and fuel loads.
- One ton of any mission payload, crew or scientific person deduction, or ocean engineering system removed from the ship can yield one more ton of fuel to carry.

Weights	*AGOR X-Craft, Gas Turbine/Waterjet*	*AGOR X-Craft, Diesel/Z-Drive*	
Cargo Handling, Crane	18.05	18.05	
OE System	109.51	109.51	
A-Frame	44.39	44.39	
Winch and Cable	65.12	65.12	
Weight Items/Person	3.49	3.49	
Mission Payload	200	200	
Sea Water	20	20	
Full Load without Fuel	1417	1390	
Fuel/500 NM @12 knots	28.10	20.60	
Target F. Load Disp.	1400	1400	tons