TABLE 5

Comparison of Seakeeping Response With Alternate "Best Heading"

AGOR 23 COR, Existing AGOR 14/15, Modified AGOR 14/15, AGOR 9/10 and 212' MERV

Vessel	Sea State (Feet)	Ship Speed (Knots)	Heading (Deg.)	Roll (Deg.)	Pitch (Deg.)	Wetness (Num/Hr)	Slam (Num/Hr)	Lat'l Accel Bridge	Vertical Accel (g's) Bridge	Stern	Midship
(B) OPERATING CONDITION											
AGOR 23 COR	12.2'	6.0	Best	8.0°	3.0°	30	20	.2	.4	.4	.---
EXISTING AGOR 14/15			105°	6.81°	2.99°	0	0	.108	.123	.172	.141
MODIFIED AGOR 14/15			105°	5.18°	2.68°	0	0	.086	.123	.171	.124
MERV			180°	4.05°	3.45°	0	0	.052	.057	.085	.064

Best heading is chosen as the heading which maximizes the sum of the normalized margins for roll and pitch response.
Bold lettering indicates an exceedence of the AGOR 23 Circular of Requirements.

PRELIMINARY

AGOR 23 COR, Existing AGOR 14/15, Modified AGOR 14/15, AGOR 9/10 and 212' MERV

Vessel	Sea State (Feet)	Ship Speed (Knots)	Heading (Deg.)	Roll (Deg.)	Pitch (Deg.)	Wetness (Num/Hr)	Slam (Num/Hr)	Lat'l Accel Bridge	Vertical Accel (g's) Bridge	Stern	Midship
(A) TRANSIT CONDITION											
AGOR 23 COR	8.2'	12.0	All	8.0°	3.0°	30	20	.2	.4	.---	.---
EXISTING AGOR 14/15				4.78°	2.98°	0	0	.079	.152	.241	.152
MODIFIED AGOR 14/15				4.54°	2.63°	0	0	.064	.143	.216	.131
AGOR 9/10				**10.15°**	**4.09°**	2	0	.111	.338	.366	.21
MERV				5.91°	2.70°	0	0	.158	.169	.185	.20
(B) OPERATING CONDITION											
AGOR 23 COR	12.2'	6.0	Best	8.0°	3.0°	30	20	.2	.4	.4	.---
EXISTING AGOR 14/15			60°	5.69°	**3.63°**	0	0	.106	.151	.233	.156
MODIFIED AGOR 14/15			60°	4.28°	**3.23°**	0	0	.085	.150	.225	.142
AGOR 9/10			60°	**11.4°**	**4.57°**	0	0	.145	.283	.293	.206
MERV			150°	5.72°	**3.27°**	0	0	.090	.072	.096	.11
(C) OPERATING CONDITION [Note: not an AGOR 23 COR Condition]											
AGOR 23 COR	8.2'	6.0	Best	8.0°	3.0°	30	20	.2	.4	.4	.---
EXISTING AGOR 14/15			60°	4.04°	2.44°	0	0	.073	.117	.185	.119
MODIFIED AGOR 14/15			60°	3.08°	2.17°	0	0	.057	.114	.175	.108
AGOR 9/10			60°	**8.16°**	**3.35°**	0	0	.104	.238	.246	.16
MERV			150°	4.52°	2.20°	0	0	.084	.053	.07	.096
(D) ON STATION CONDITION											
AGOR 23 COR	11.0'	0.0	Best	5.0°	3.0°	5	5	.2	.4	.4	.4
EXISTING AGOR 14/15			135°	**6.10°**	**3.33°**	0	0	.081	.086	.178	.107
MODIFIED AGOR 14/15			135°	4.32°	2.88°	0	0	.061	.085	.168	.092
AGOR 9/10			135°	**11.0°**	**4.05°**	0	0	.107	.150	.221	.142
MERV			135°	**7.11°**	**3.01°**	0	0	.125	.096	.147	.16

Best heading is chosen as the heading which minimizes both normalized roll and normalized pitch response.
Bold lettering indicates an exceedence of the AGOR 23 Circular of Requirements.

PRELIMINARY

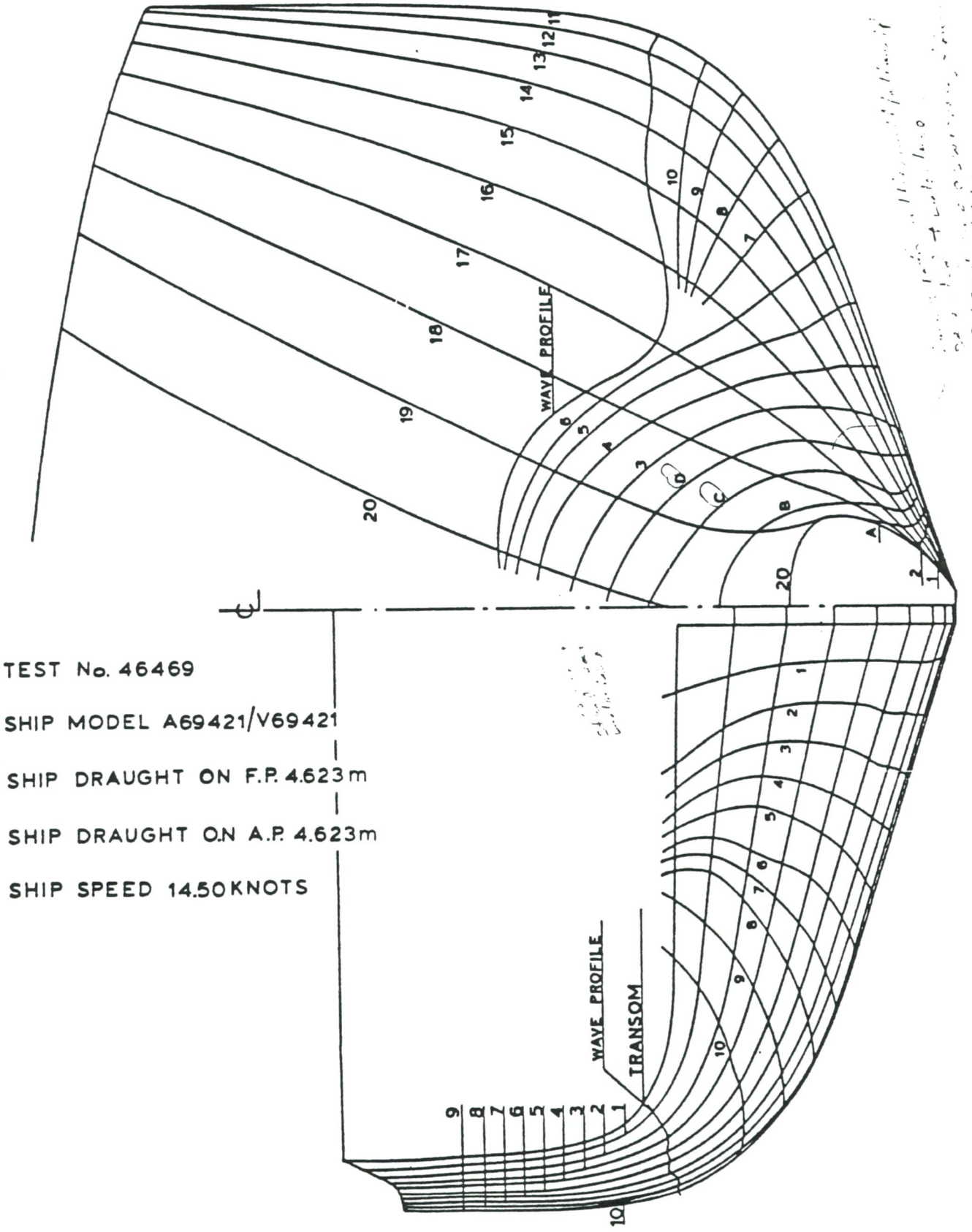
PERFORMANCE COMPARISON BETWEEN PROPOSED VESSEL AND MODIFIED AGOR 14/15

	Proposed Medium Endurance Vessel		Modified AGOR 14/15
SHIP PARTICULARS			
Length	212'-0"	268'	254'-0"
Beam	64'-0"	52 1/2	46'-0"
Draft	15'-2"	17	15'-6"
Displacement	2469 LTSW	2099	2685 LTSW
MISSION REQUIREMENTS			
Speed	14 knots in Sea State 4	15 ~ ?	14 knots in Calm Water 12 knots in Sea State 4
Seakeeping	12 knots in Sea State 5 8 knots in Sea State 6 6 knots in Sea State 7		12 knots in Sea State 4 6 knots in Sea State 5
Dynamic Positioning	0 knots in Sea State 5, 35 knot wind, 3 knot current		0 knots in Sea State 5 35 knot wind, 3 knot current
Precision Trackline	2 knots in Sea State 5 35 knot wind, 3 knot current		2 knots in Sea State 5 35 knot wind, 3 knot current
RESISTANCE			
14 knots in Calm Water	38 kips		34.5 kips
14 knots in Sea State 4	62 kips		57.9 kips
12 knots in Sea State 4	45 kips		43.1 kips
12 knots in Sea State 5	61 kips		—
8 knots in Sea State 6	47 kips		—
6 knots in Sea State 7	55 kips		—
PROPULSION			
EHP, 14 knots, Calm Water	1647 HP		1487 HP
EHP, 14 knots, Sea State 4	2648 HP		2489 HP
EHP, 12 knots, Sea State 4	1652 HP		1590 HP
EHP, 12 knots, Sea State 5	2237 HP		—
EHP, 8 knots, Sea State 6	1160 HP		—
EHP, 6 knots, Sea State 7	1018 HP		—
EHP Required	2648 HP		1590 HP
SHP Required	3968 HP		2314 HP
BHP Required	4467 HP		2786 HP
Installed BHP	3900 HP	5200	5100 HP
DYNAMIC POSITIONING			
Stationkeeping Force	23640 lbs		41025 lbs
Trackline Force	50000 lbs		45589 lbs
Bow Thruster	1000 HP		900 HP
Stern Thruster	750 HP		—
	Conventional rudder	Z-drive	Z drive

AGOR CAPACITY COMPARISON

VESSEL CLASS			GME/RV	AGOR 23	AGOR 14/15 MODIFIED	AGOR 14/15 ORIGINAL	AGOR 9/10
ACCOMMODATIONS	PERS	Officers	9	8	9	9	8
		Crew	14	12	18	14	18
		Scientists	25	30	36	30	15
		Total	48	50	63	53	41
	CABINS	Single Crew	6	8	10	8	6
		Double Crew	9	6	9	8	10
		Single Scientist	1	2	1	1	1
		Double Scientist	12	14	17	14	7
		Total	28	30	37	31	24
		Total Lab Area	4,180 ft.^{2}	3,730 ft.^{2}	2,980 ft.^{2}	1,740 ft.^{2}	1,400 ft.^{2}
		Total Hold Volume	+VAN SPACE 12,500 ft.^{3}	15,000 ft.^{3}	13,900 ft.^{3}	4,100 ft.^{3}	3,000 ft.^{3}
		Aft Deck Area	4,700 ft.^{2}	2,300 ft.^{2}	2,031 ft.^{2}	2,300 ft.^{2}	1,250 ft.^{2}
		Waist Work Area	1,560 ft.^{2}	1,200 ft.^{2}	1,426 ft.^{2}	1,370 ft.^{2}	---
		Science Dwt	172 LT	235 LT	142 LT	56 LT	46 LT
		Allowable KG of Science Dwt	100 ft.	---	34 ft.	85 ft.	30 ft.

KG = Keel to Center of Gravity



TEST No. 46469

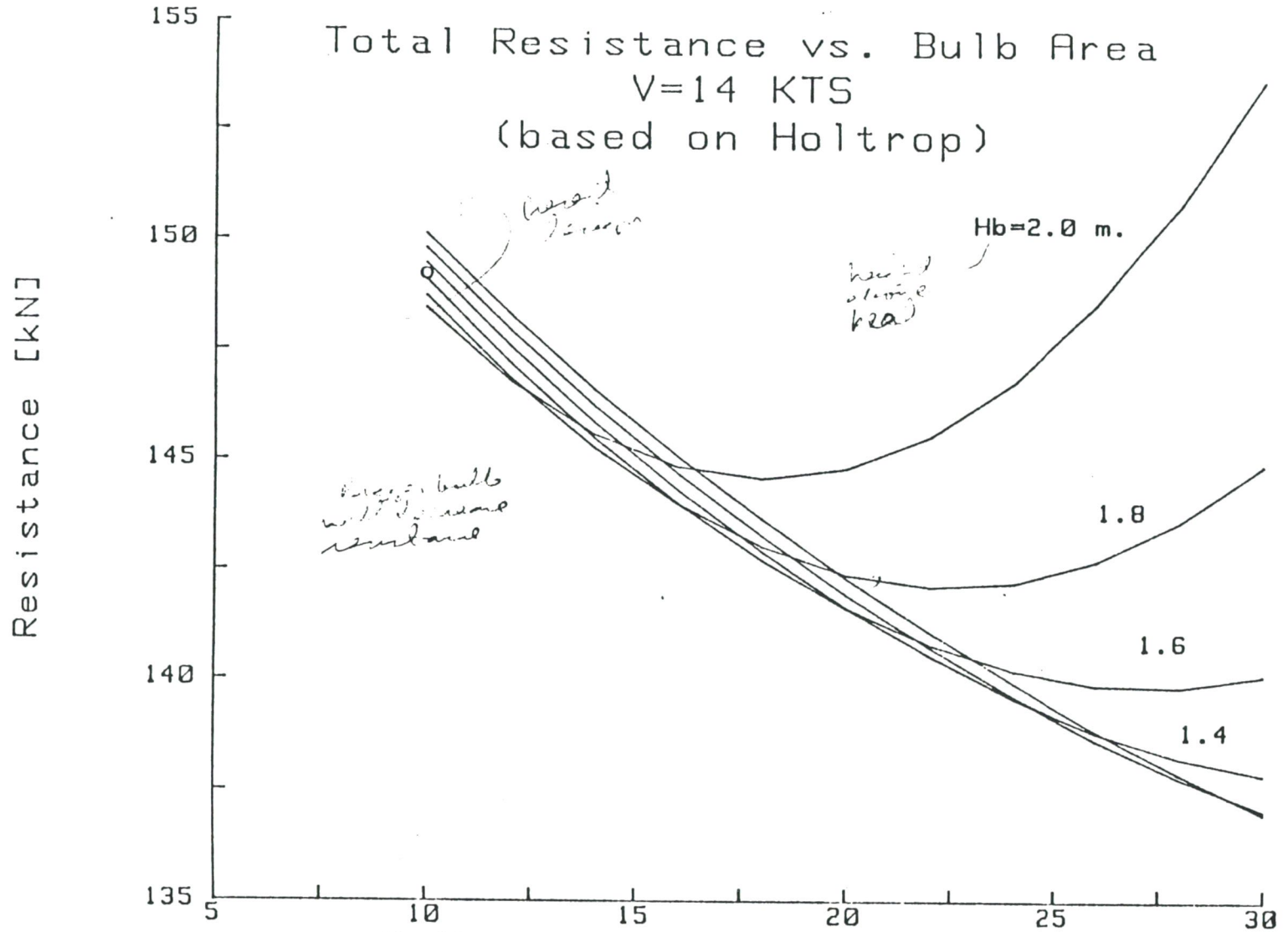
SHIP MODEL A69421/V69421

SHIP DRAUGHT ON F.P. 4.623m

SHIP DRAUGHT O.N A.P. 4.623m

SHIP SPEED 14.50KNOTS

STREAMLINES DERIVED FROM PAINT TEST



THE GLOSTEN ASSOCIATES, inc.	JOB NO. 8808	BY : JDD	DATE : July , 1988

Estimated Values of Total Resistance and Brake Horse Power for the MERV in Short Crested Seas

(Including Appendages)

(SI Units)

Speed kts.	CALM WATER Res.	CALM WATER Pow.	SEA STATE 4 Wind Res.	SEA STATE 4 Add. Res.	SEA STATE 4 Tot. Res.	SEA STATE 4 Tot. Pow.	SEA STATE 5 Wind Res.	SEA STATE 5 Add. Res.	SEA STATE 5 Tot. Res.	SEA STATE 5 Tot. Pow.	SEA STATE 6 Wind Res.	SEA STATE 6 Add. Res.	SEA STATE 6 Tot. Res.	SEA STATE 6 Tot. Pow.	SEA STATE 7 Wind Res.	SEA STATE 7 Add. Res.	SEA STATE 7 Tot. Res.	SEA STATE 7 Tot. Pow.
6	20	106	19	49	89	463	30	86	137	712	63	92	175	911	104	121	246	1230
8	32	221	23	55	109	757	34	98	154	1142	69	109	210	1459	112	149	293	2035
10	57	492	26	59	143	1237	39	110	206	1785	75	127	259	2245	120	177	354	3070
12	105	1093	30	65	200	2078	43	122	270	2814	81	145	331	3445	128	205	438	4559
14	171	2072	34	70	274	3331	47	134	353	4284	87	163	420	5109	136	233	539	6555

Resistance With Appendages in kiloNewtons.
Effective Power required in kiloWatts.
Calm Water and Added Power in Waves Based on Model Tests.
Wind Load Based on Theoretical Estimate.
Shaft Power Based on : Nh=0.944, No=0.702, Nr=1.007
Brake Power Based on : Ns=0.99 , Nc=0.97 , Nde=0.925

installed BHP

There — no IHP installed which includes margin of ...

Estimated Values of Total Resistance and Brake Horse Power for the MERV in Short Crested Seas

(Including Appendages)

(English Units)

Speed kts.	CALM WATER Res.	CALM WATER Pow.	SEA STATE 4 Wind Res.	SEA STATE 4 Add. Res.	SEA STATE 4 Tot. Res.	SEA STATE 4 Tot. Pow.	SEA STATE 5 Wind Res.	SEA STATE 5 Add. Res.	SEA STATE 5 Tot. Res.	SEA STATE 5 Tot. Pow.	SEA STATE 6 Wind Res.	SEA STATE 6 Add. Res.	SEA STATE 6 Tot. Res.	SEA STATE 6 Tot. Pow.	SEA STATE 7 Wind Res.	SEA STATE 7 Add. Res.	SEA STATE 7 Tot. Res.	SEA STATE 7 Tot. Pow.
6	5	143	4	11	20	621	7	19	31	954	14	20	39	1221	23	27	55	1717
8	7	297	5	12	25	1015	8	22	37	1531	15	24	47	1957	25	33	66	2729
10	13	660	6	13	32	1659	9	25	46	2393	17	28	58	3011	27	40	80	4117
12	23	1466	7	14	45	2786	10	27	61	3774	18	32	74	4619	29	46	98	6114
14	38	2778	8	16	62	4467	11	30	79	5745	19	35	95	6951	30	52	121	87[illegible]

Resistance With Appendages in kips.
Effective Power required in horsepower.
Calm Water and Added Power in Waves Based on Model Tests.
Wind Load Based on Theoretical Estimate.
Shaft Power Based on : Nh=0.944, No=0.702, Nr=1.007
Brake Power Based on : Ns=0.99 , Nc=0.97 , Nde=0.925

BHP of Thompson = ? again??

Estimated Values of Total Resistance and Power Required for the MERV in Calm Water

(Including Appendages)
(SI Units)

Speed	GLOSTEN Res.	GLOSTEN EHP	GLOSTEN SHP	GLOSTEN BHP	MARIN Res.	MARIN EHP	MARIN SHP	MARIN BHP
6	20	62	93	104				
8	35	144	216	243				
10	55	283	424	477				
12	85	525	786	885	105	648	971	1093
14	149	1073	1608	1810	171	1229	1840	2072

Resistance is in kiloNewtons.
EHP is effective power in kiloWatts
SHP is shaft power in kiloWatts; Nh=0.944, No=0.702, Nr=1.007
BHP is brake power in kiloWatts; Ns=0.99, Nc=0.97, Nde=0.925

Estimated Values of Total Resistance and Power Required for the MERV in Calm Water

(Including Appendages)
(English Units)

Tests

Speed	GLOSTEN Res.	GLOSTEN EHP	GLOSTEN SHP	GLOSTEN BHP	MARIN Res.	MARIN EHP	MARIN SHP	MARIN BHP
6	4	83	124	140				
8	8	193	289	326				
10	12	379	569	640				
12	19	704	1054	1187	23	869	1303	1466
14	33	1439	2155	2428	38	1647	2463	2773

Resistance is in kips.
EHP is effective power in horsepower. resistance x velocity
SHP is shaft power in horsepower; Nh=0.944, No=0.702, Nr=1.007
BHP is brake power in horsepower; Ns=0.99, Nc=0.97, Nce=0.925
installed horsepower for calm water
add wave resistance to this
[illegible] hp greater than [illegible]

Speed control - to as slow as 2 knots with 45° maximum heading deviation from trackline in 35 knot wind and 3 knot current. Speed control to ±0.1 knot with 150 ft maximum lateral excursions from tracklines.

The trackline requirements are not as severe for the Agor 23 design. The heading requirement (45°) requires lots of power but the committee decided this was important so the power will be re-designed to be adequate. The speed control requirement (0.1 knot) can be averaged over a 5 minute time period and that should make it easier to reach. Glosten's work in this area is continuing.

5. Comparisons

See tables that show performance comparison between MERV and modified Agor 14/15 and the Agor capacity comparison.

Lateral accelerations compare well especially in science work areas.

Transverse accelerations not as good as hoped but there may be an error in the calculations. Glosten is reviewing this now.

Vertical acceleration - MERV best of the four designs. This is the most important aspect for human comfort.

6. Summary

1) The attractiveness of this design is the abundance of space with lots of versatility. You get a big load capability without paying a price.
2) Seakeeping is not especially better or worse than other designs.
3) The trackline requirements can be made with sufficient power.

Jobs in progress include:
1) rework the dynamic trackline
2) rework the presentation of the roll motions
3) how much penalty for removing bulb
4) preliminary design of power and space arrangements

A final report will be presented at the March FIC meeting in Washington, D.C.

Project Review - Medium Endurance Research Vessel (MERV)
12 September 1988 at Glosten Associates, Seattle, WA

Model Tests Completed by Marin

1. Resistance and Propulsion

Glosten and Marin estimates of hull resistance agreed well but both used a regression model using historical data that is really not for a comparable hull. The model tests indicate about 12% more resistance than predicted. See table summarizing calculations and tests in calm water. Waves and wind add to this. See table summarizing brake horsepower. The Glosten MERV has 3900 of total installed HP as originally designed. This will be increased to meet the needs for 14 knots in SS4.

There is a little more resistance than Glosten would like. The resistance can be reduced by about 5.8% by increasing the bulb area from 10 to 20% and by moving it down from 2.0 m to 1.8 m above the keel. Because of the bubble generation, however, we recommended to proceed for now without a bulb. This will increase the power requirement by about 10%. Glosten will propose to do a more systematic study of bulb design and advantages/disadvantages.

2. Seakeeping

Flow lines - See the figure showing streamlines derived from print tests. Lines C and D probably show the path of bubbles generated at the water line. These streamlines are sweeping down more than Glosten would like. They represent a potential problem for acoustic work.

Heave, Pitch and Roll - Comparisons of predictions and model tests are pretty good at high wave frequencies. The comparisons are not too good at the peak response frequency. No tank test data were obtained at low frequency. The heave and pitch motions were typical for a vessel of this size and there was a little more pitch than predicted. The roll was better than predicted especially in longer period waves. The design also does well on lateral motion. In summary it looks like we can predict the motion of the ship pretty well.

Bubbles - The flat top of the bulb, as presently designed, generates bubbles during pitching. Marin though the shape should be redesigned. It was originally put in the design for pitch damping but it doesn't appear to be very effective at this. The main advantage of the bulb may be to improve resistance.

The options are to eliminate the bulb or redesign a larger bulb. Eliminating the bulb will cure the bubble problem and will increase resistance and power requirements by about 10%.

3. Maneuvering

This was a bright spot. The design appears to be directionally stable, very maneuverable, responsive and can make good turning circles.

4. Dynamic Positioning

Precision trackline requirements are strict. Their origin is based primarily on wire angle requirements when towing over the bottom.

• Stable platforms. E. Hartwig of ONR requested UNOLS to consider the long-term science needs for quality laboratory facilities on stable seagoing platforms. G. Keller accepted, with FIC as the action group. Hartwig has been asked to provide names of experts who can work with FIC on this study. The target date for completion is early spring 1989. The committee must set the terms of reference for the study and select membership. As background, a copy of the report on "Stable Research Platform Workshop" (June, 1987) was distributed to the FIC.

• Small vessels of less than general-purpose capability. Dinsmore agreed to draft a statement of needs and desirable capabilities for these vessels, which are usually somewhat specialized day boats. This would eventually be included in FIC's Scienctific Mission Requirements report. Dinsmore has prepared a draft for consideration by the Committee.

• Status of Melville and Knorr refits. A progress report is hoped for. (Kaulum)

• Status of AGOR 23 construction. A progress report is hoped for. (Kaulum, Murray)

• SWATH ships as research vessels. Dinsmore and Robison agreed to begin compiling data on experience with SWATH ships as research vessels, and their general capabilities for this purpose. Dinsmore agreed to compile experiences with KAIMALINO; Robison was to contact other scientific users for their opinions. Because Dinsmore and Robison will be unable to attend, a status report will be deferred until the next meeting.

• Possible improvements to CAPE-class ships. T. Johnson will convene a workshop on 25 October in Washington to consider these problems. He has been provided with a copy of the scientific mission requirements for small, monohull research vessels, and the workshop will also consider these.

• Scientific mission requirements for small SWATH vessel. Dinsmore agreed to approach SWATH Ocean concerning their interest in performing a concept design for this class. A progress report will be given at the next meeting.

• Research submarine. Robison has provided a draft of scientific mission requirements for a research submarine, which has been sent to FIC members for review. He also wished consultants to consider preliminary ideas. He has agreed to convene a meeting of his subcommittee.

• Scientific Mission Requirements for Oceanographic Research Vessels. This looseleaf report has been printed. It contains requirements for seven classes of ships: large high-endurance, large medium-endurance, large high-performance, intermediate, intermediate SWATH, small, and small SWATH. Scientific mission requirements for other classes will be added as they are completed.

11 Oct 1988

UNOLS Fleet Improvement Committee Meeting
13-14 October 1988
8:30 am, Small Conference Rm
Geological Sciences Building
University of Southern California
Tentative Agenda Items

• Antarctic icebreaking research vessel specifications. NSF/DPP intends to charter a research vessel with icebreaking capability for antarctic service. The FIC is asked to review and comment on the draft technical specifications for that vessel. Copies were sent to FIC members with a note flagging potential problem sections. Comments are due at NSF on the week of October 17.

• Preliminary design of large, medium-endurance general-purpose research vessel. Murray and Spiess met with Glosten Associates to provide guidance. Murray's initial telemail report indicated that he would provide a more complete report at the meeting (Murray)

• Concept design for intermediate SWATH. Dinsmore prepared an abridged version of the SEACO report and distributed to UNOLS schedulers for comments. The final SEACO report has been printed. SEACO submitted a proposal for follow-up studies, and this has been sent to FIC members for review. Committee members should be prepared to recommend needed additional studies. NSF and ONR endorsement then will be sought.

• Intermediate research vessel refit/ improvement workshop. The workshop to consider improvements and refits for existing intermediate-size research vessels, convened by Barber in Washington in July seemed to be quite successful. Barber promised a draft report and recommendations for improvements for each vessel.

• Scientific mission requirements for small, ice-capable research vessel. T. Royer convened a meeting 12 August to develop scientific mission requirements for this class vessel. He has reported that it went well, with good agreement as to requirements and vessel characteristics, and has prepared a report with scientific mission requirements.This report will be discussed, scientific mission requirements reviewed and revised, and follow-up actions recommended. (Is a concept design desirable?)

• MCS capability on medium- and high-endurance large research vessels. There was quite specific language in the scientific mission requirements for these vessels concerning multi-channel seismic (MCS) equipment. It was felt that it might be better to change this to require adequate space, and "best available capability". Comments received were not unanimous, but favored the more open-ended wording. The Scientific mission requirements was changed to reflect this. (No action) Marcus Langseth has promised draft recommendations on general MCS needs in the UNOLS fleet. Status? (Langseth)

• FIC Budget status and revised needs for 1989. A listing of possible revised FIC activities and needs was provided as Table 1 of the minutes of the July FIC meeting. Actual expenditures were estimated and sent via telemail to FIC members so that projections can be made for various scenarios. An updated projection will be available at the meeting. The FIC must decide on the potential studies to be undertaken so that any additional funding needed can be requested. (Nowlin)

Seakeeping requirements. The committee members present recommended changes in the scientific mission requirements to clarify stationkeeping and dynamic position requirements. Suggested changes will be reviewed by the entire FIC and selected community representatives, and revised requirements will be circulated as replacements.

Future FIC Meetings. The next FIC meeting is tentatively scheduled for 22-24 February 1989 in New Orleans. Three full days are allowed so that the committee may be able to visit construction/conversion sites for large UNOLS vessels. The thrust of this meeting will be discussion of a draft, revised UNOLS Fleet Improvement Report that will be prepared in advance by Nowlin and Treadwell. The following meeting is tentatively scheduled for May or June. The chairman suggests Dallas as a convenient site.

Table 1: Costs and projected costs ($K) of special FIC studies to be carried out in calendar 1988 and 1989.

	Orig. Prop.	Present		Revised	
	(Total)	88	89	88	89
Concept design, Small monohull	50	-	50	-	0 (After wkshp)
Concept design, Small SWATH	0	-	-	-	-
Concept design, Intermediate SWATH	50	50	-	70	50
Concept design, Deep-ocean stable platform	50	-	-	-	-
Concept design, Small ice-capable	50	-	50	-	50
Concept design, Intermediate monohull	50	-	-	-	-
Study, CAPE-class	20	10	-	10	-
Study, Intermediates	20	-	20	-	40
Study, Research submarine	0	-	-	-	10
Totals by year		60	120	80	150
Biannual Totals	290	180		230	

For C ships:

Only the 1st paragraph above to be included.

For D ships:

Remove reference.

In addition, in order to illustrate needs in terms of deck space, storage, and loads which must be accommodated, an appendix to the scientific mission requirements was suggested dealing with special geophysical and geological sampling equipment. This appendix should include the following statement:
"Major components of an advanced multichannel seismic system for academic research are:
Streamer — A 3600-6000 m seismic streamer with reel. The reel is mounted near the stern, is 5 m high, has 6 m x 6 m footprint, and weighs 15-20 tons.
Acoustic sources — An array of up to 24 airguns towed from booms or paravanes mounted on the stern. Deck equipment for handling airgun arrays and a close-by shop for maintenance are required.
Compressors — Compressors that can supply up to 3000 SCFM at 2500 psi. Some of the compressors could be in vans.
Storage space — Ample storage space for streamer accessories such as tail buoys and spare sections is required."

Workshop on intermediate research vessel refits/improvements. Because no workshop report was yet available, no specific recommendations for improvements were considered. The FIC felt that a 1989 budgetary allowance should be maintained for studies of intermediate refits and improvements.

Small research vessels. The FIC had agreed in July that a statement regarding small, less-than-general-purpose research vessels would be a useful addition to the UNOLS Scientific Mission Requirements. Dinsmore had envisioned a rather detailed compendium of small research vessels and prepared an outline of material which might be included (Appendix IV). The committee was unsure of the value of such an undertaking. Gorsline was asked to survey a representative set of small vessel operators to determine their interest in a compendium of topics such as suggested by Dinsmore.

ALVIN Tender. It was suggested that consideration be given to stating in the revised fleet plan that a second UNOLS vessel should have the capability of handling ALVIN.

Visit to VALERO IV. The FIC members were taken on a tour of the OSPREY which is being converted by U. Southern California with private funds from a tuna clipper to a general purpose research vessel. Most funds are in hand for phase one of the conversion scheduled for completion in summer 1989. An impressive amount of space for research will be available aboard this vessel when completed.

Future FIC studies. The committee considered special studies which should be initiated or augmented with 1989 calendar year funding. Table 1 presents costs of such studies as originally proposed, as planned in existing grant budgets, and as now recommended (revised). There will be approximately $18K carryover from calendar 1988 to calendar 1989 assuming that a follow-up study of the intermediate SWATH is funded at $20K in 1988. Thus, the level to be requested for 1989 will not be much greater than previously agreed upon. The chairman was charged with preparing a 1989 budget request for submission to NSF.

is well documented by 25 years of use. Fred Fisher and Fred Spiess will be asked to draft a set of scientific mission requirements for a "FLIP-2", based on the Stable Research Platform Workshop (SIO Reference 87-29) held in San Diego on 29-30 June 1987. These requirements will be reviewed by the community, revised and included in the growing set of UNOLS Scientific Mission Requirements. It is assumed that participants at that workshop will follow up with concept design for such a vessel at the appropriate time.

Ice-capable arctic research vessel. The small, ice-capable research vessel subcommittee of FIC met in late summer in Seattle to discuss potential uses and needs of such a vessel and draft appropriate scientific mission requirements. They then produced a report, "Science mission requirements for an intermediate, ice-capable research vessel" which Tom Royer transmitted to the FIC by letter dated October 5. A copy of the letter and report are given as Appendix III.

The FIC accepted with thanks the report of the subcommittee. It was noted that the vessel described by the scientific mission requirements attached to the report is in the 150-199' LOA size range — an intermediate rather than a small vessel. Even so, it seemed to the FIC members that some of the called for requirements likely could not be met by a vessel of this size. The committee instructed the chairman to thank Royer and his subcommittee for the report, but to ask them to reconsider some of the mission requirements that the FIC felt could be downscaled to ensure their being met by a vessel of intermediate size while still being adequate for the mission described in the report. Once adjustments have been made, the FIC will ask for community review of the requirements.

Multichannel seismic capabilities. For the past year the FIC has been considering the UNOLS fleet needs for multichannel seismic capabilities in general and revisions to the draft scientific mission requirements for large vessels dealing with multichannel seismic capabilities in particular. The following statements were proposed for inclusion in the revised fleet improvement plan:

- Science needs do not now justify a full-time multichannel seismic vessel in the UNOLS fleet.

- Multichannel seismic capability is needed on some research vessels in the UNOLS fleet; it is suggested that built-in compressor capability (2 to 3 compressors in a dedicated space) be provided on at least two vessels of the UNOLS fleet.

- True state-of-the-art multichannel seismic capability probably cannot be maintained by the community for part-time use; it is suggested that such capability be leased as needed.

Specific rewording was suggested for the multichannel seismic capabilities now appearing in the scientific mission requirements.

For A & B ships:

"All vessels shall have the capability to carry out multichannel seismic surveys using large sound sources (airguns) and long streamers (3-6 km).

Selected vessels shall have compressors capable of generating 2000 SCFM of air at 2500 psi permanently installed. The compressors and associated high pressure plumbing should be installed in or adjoining below-deck machinery spaces.

Refer to the appendix on special geophysical and geological sampling equipment for example systems to be accommodated."

File: Fleet Improvement mtng Oct 13,14,19 (need a folder)

3 January 1989

UNOLS Fleet Improvement Committee
Minutes of Meeting 13-14 October 1988
University of Southern California

Attending the meeting of the UNOLS Fleet Improvement Committee on 13-14 October 1988 in Los Angeles were D. Gorsline, G. Keller, M. Langseth, J. Murray, W. Nowlin, S. Pappas, and T.K. Treadwell. Committee members R. Barber, R. Dinsmore, B. Robison, and F. Spiess were absent.

The tentative agenda (attached as Appendix I) was discussed and adopted with the addition of two items: a report on the proposed configuration and capabilities of M/V BERNIER and a review of statements regarding the stationkeeping and dynamic positioning that appear in the scientific mission requirements.

Icebreaking, antarctic research vessel. The meeting began with a review of technical specifications for an icebreaking research vessel that the NSF Division of Polar Programs (DPP) hopes to obtain on long-term lease for support of its antarctic research programs. Treadwell had drafted comments as preparation for the discussion. A set of comments was agreed on to be transmitted to Tom Forhan at DPP who requested them during the week of 17 October. FIC members not present at the meeting were invited to submit comments directly to DPP.

Preliminary design of large medium-endurance research ship. The FIC subcommittee maintaining oversight of the preliminary design of a large medium-endurance, general purpose research vessel recently met with the designer, Glosten Associates, to review progress. Jim Murray reported on that meeting. He had prepared a handout containing excerpts from Glosten's interim progress report and comparisons between this vessel, the AGORs 9 and 10, the AGORs 14 and 15 before and after refit, and the AGOR 23 specifications. (Murray's summary report is attached as Appendix II.) The design still holds promise. Based on tank test results the hull will be modified to relocate, reshape, or remove the bulb. A final report is expected in March 1989.

Intermediate SWATH. The final report of phase I of SEACO's preliminary design of an intermediate, general purpose SWATH research ship has been distributed as a FIC report. SEACO has submitted a proposal for selected follow-up studies. The FIC will approve support for a modest study by SEACO to consider modifications to the tandem strut design aimed at improving seakeeping performance above the initial concept design with minimum sacrifice in performance in other characteristics.

The committee recommendation is to undertake in 1989 a separate concept design study of an intermediate SWATH with one strut per side. Proposals from several bidders will be considered. Special consideration will be given to good acoustic performance.

Stable deep-sea platforms. After considerable discussion of stable platforms, the FIC recommended to George Keller, UNOLS Chairman, that FIC not undertake at this time a study of large moveable platforms which would provide laboratory facilities comparable to those ashore and the ability to undertake very long time series by scientists. An assessment of the community requirement for such platforms should precede facility studies, and the FIC does not seem the best group for that assessment.

On the other hand, the FIC noted that the need for a stable platform for physical oceanography, acoustics, air-sea exchanges, and marine meteorology in the genre of FLIP,