

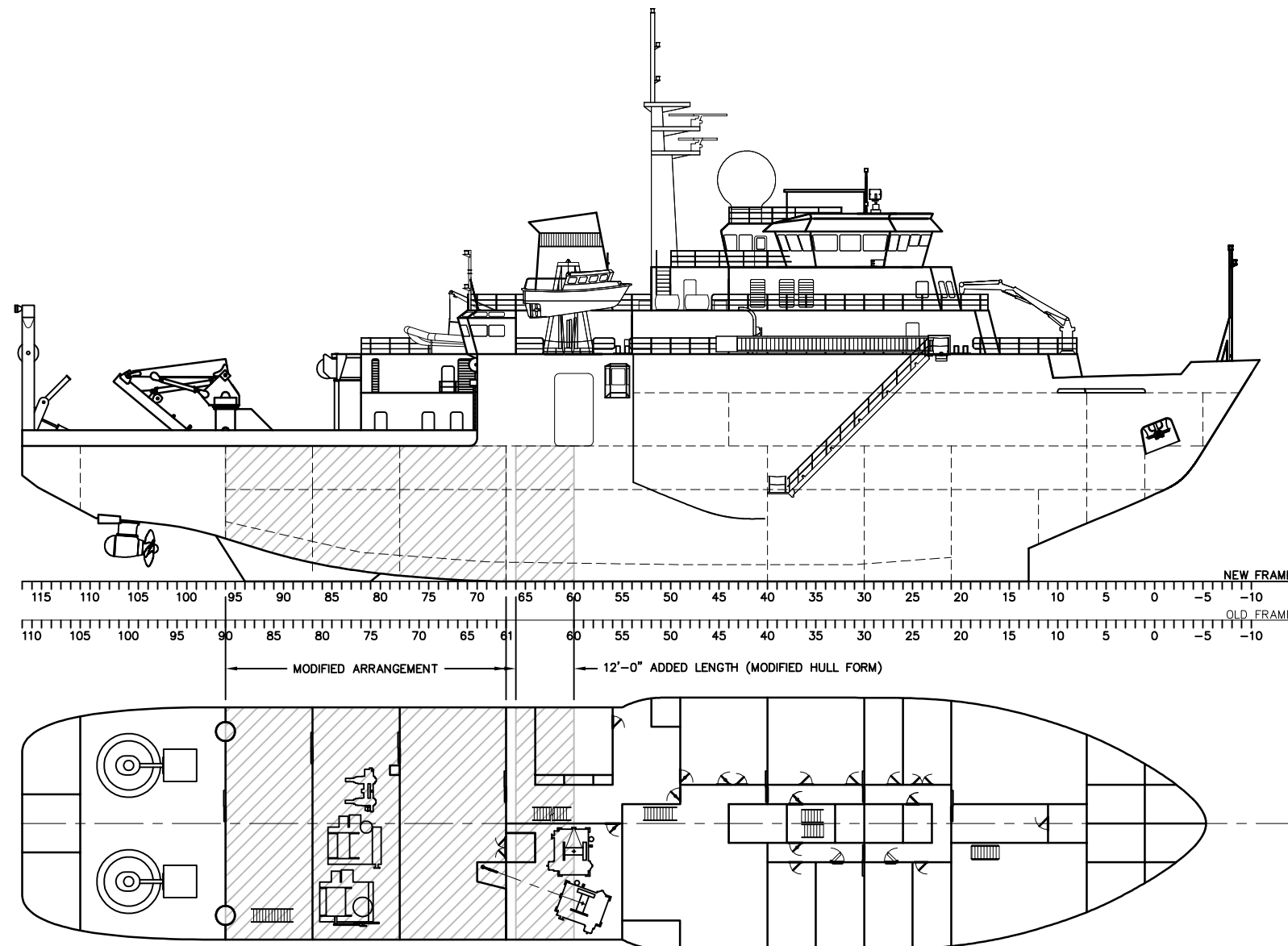
# Alaska Region Research Vessel

## Changes to Support Lengthening Option

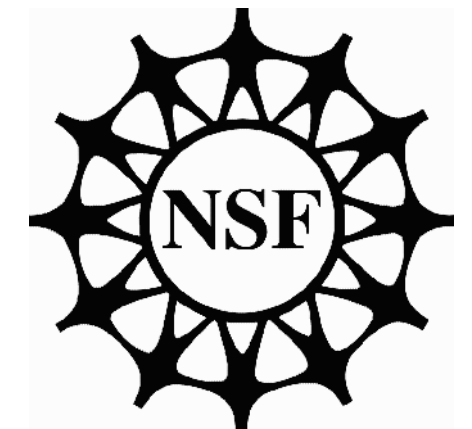
12 August 2009

### Drawings Showing Changes To Support Lengthening Option:

<u>Drawing No.</u>	<u>Rev</u>	<u>Title</u>
07096-070-01AC	-	General Arrangement (Complete)
07096-070-01A	-	Partial General Arrangement
07096-070-02A	-	Lines Plan
07096-100-02A	-	Structure 01 Level & Below
07096-200-01A	-	Machinery Arrangement
07096-320-01A	-	Electrical One-Line
07096-511-01A	-	HVAC Diagram - Supply
07096-511-02A	-	HVAC Diagram - Exhaust
07096-529-01A	-	Bilge and Ballast System Diagram
07096-537-01A	-	Waste Heat Recovery & HW Heating System
07096-541-01A	-	Fuel Oil Systems Diagrams
07096-630-01A	-	Fire Zone Diagram and Boundaries



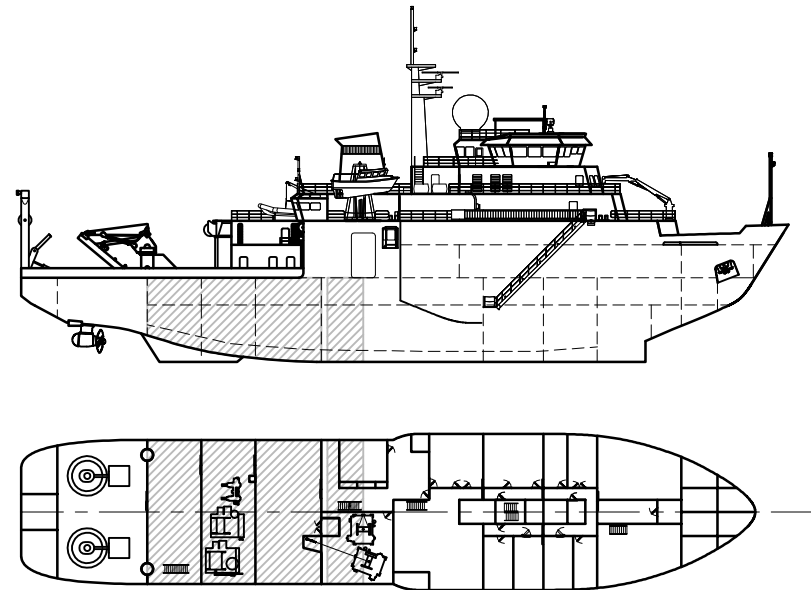
Prepared For:



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## Changes to Support Lengthening Option

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### Tank And Space Changes Aft of Frame 60

	Existing Space Designations	New Space Designations	Notes:
1st Platform	2-67-0 SCIENCE HOLD	Same SCIENCE HOLD	Space widened
	2-79-0 WINCH ROOM	2-78-0 WINCH ROOM	Space widened
	2-67-2 BOSUN'S WORKSHOP	2-87-0 BOSUN'S WORKSHOP & STORES	Spaces combined
	2-79-2 BOSUN'S STORES		
	2nd Platform	3-67-1 F.O.	3-67-01 ANTI-ROLL TANK
3-67-2 F.O.		3-67-0 ANTI-ROLL TANK EQUIPMENT	
3-67-3 F.O.		3-67-1 F.O.	
3-67-4 F.O.		3-67-2 F.O.	
3-77-2 F.O. OVERFLOW TANK		3-78-4 F.O. OVERFLOW TANK	
3-79-1 F.O.		3-76-0 F.O.	
3-79-2 F.O.		3-76-1 F.O.	
3-79-3 F.O.		3-76-2 F.O.	
3-79-4 F.O.		3-87-0 F.O.	
		3-87-1 F.O.	
	3-87-2 F.O.		
	3-90-0 THRUSTER ROOM	3-96-0 THRUSTER ROOM	
	3-105-0 VOID	3-11-0 VOID	
	3-105-1 LINE LOCKER	3-11-1 LINE LOCKER	
	3-105-2 LINE LOCKER	3-11-1 LINE LOCKER	
Inner Bottom	4-67-0 TRANSDUCER WELL	4-67-0 TRANSDUCER WELL	
	4-67-0 SWB	4-67-1 SWB	
	4-67-1 VOID	4-67-2 SWB	
	4-67-2 VOID		
	4-79-0 SWB	4-78-1 SWB	
	4-79-1 SWB	4-78-2 SWB	
	4-79-2 SWB		
		4-87-1 SWB	
		4-87-2 SWB	

### Description of Optional Vessel Lengthening

The main modifications with the option are: lengthen the vessel by 12 feet and incorporate a controlled passive anti-roll tank.

The 12 foot lengthening is accomplished by adding 12 feet of parallel mid-body, main deck and below, aft of frame 60. The machinery space remains the same length with the aft bulkhead at frame 67. Spaces aft of frame 67 and forward of frame 96 have a revised configuration.

A U-shaped anti-roll tank is located between the 1st platform and innerbottom, from frame 67 to frame 78, inboard of the wing bulkheads. Space for the anti-roll tank equipment is provided between the 1st and 2nd platforms from frame 67 to frame 73 and from centerline to 13 feet port of centerline.

This drawing package, together with the specifications for the option, illustrates the changes associated with the lengthening to support development of cost proposals.

### Description of Changes to Support Lengthening by SWBS Number (In Addition To Those Shown On The Drawings Listed On Sheet 1):

All systems in way of the lengthened portion of the hull will require additional piping, cabling, insulation, hangers and outfit associated with the increased length/volume of the hull. These increases include, but are not limited to, the items noted below.

#### Section 000 - General Provisions

043 - Design Verification: Modify contract drawings and specifications to incorporate option.

072-Training: Add training for anti-roll tank system.

092 - Testing: Add anti-roll tank test to the test procedures for all stages of testing.

#### Section 100 - Structure

160 - Sheave Tower and Doghouse: Add sheave tower and doghouse as shown on drawing 100-02A.

#### Section 300 - Electrical Plant

304 - Electric Cable: Additional electrical power, control and lighting cabling and science cableways will be required through the new length of the vessel to serve both new loads in the new areas and existing loads.

320 - Power Distribution: The new anti-roll system will require electrical power and controls. The revised crane capacity will result in a change in the electrical feeder circuit powering and controlling the crane.

325 - Heat Tracing: Additional heat tracing will be required for piping systems extending through the new length of the vessel.

332 - Lighting System Fixtures: Additional lighting and emergency lighting fixtures, switches and cabling will be required for the additional interior and exterior spaces on the vessel. Additional floodlights and cabling required for aft working deck.

#### Section 400 - Command and Surveillance

410 - Vessel Control and Maneuvering: All vessel control and maneuvering cabling leading to the stern thrusters will be increased in length due to the additional vessel length.

420 - Navigation Systems and Integrated Bridge System: The cabling leading to the stern navigation lights will be increased in length due to the additional vessel length.

430 - Interior Communications: Additional interior communications systems components will be required to provide coverage to the extended and additional areas of the vessel, i.e. additional fire detection equipment, level alarms, public address speakers, etc. All vessel wide interior communication systems cabling will be increased in length due to the additional system components and the additional vessel length.

490 - Special Purpose Systems: The LAN system cabling leading to the after compartments (including winch rooms & aft seachest) on the vessel will be increased in length due to the additional vessel length.

#### Section 500 - Machinery (General)

508 - Insulation and Lagging for Piping, Equipment and Machinery: Additional insulation and lagging for piping will be required to insulate piping systems extending through the additional vessel length.

509 - Thermal Insulation and Acoustic Treatment for Ducts and Trunks: Additional thermal and acoustic insulation for ductwork will be required to insulate ventilation systems extending through the additional vessel length.

510 - Climate Control Systems: Increase the size of the heating and ventilation systems serving spaces impacted by lengthening. Additional ductwork will be required for ventilation systems extending through the additional vessel length.

520 - Seawater Systems: New fire stations will be required to serve the extended area of the vessel. Additional firemain piping will be required to serve the new fire stations and to extend the firemain through the additional vessel length. The ballast system will be modified to fill/drain the new anti-roll tank. Additional weather deck drains and piping will be required through the new length of the vessel. Additional ballast system piping will be required through the new length of the vessel to extend the piping to serve the after ballast tanks. Additional bilge system piping will be required through the new length of the vessel to extend the piping to serve the after compartments and voids. Additional uncontaminated seawater and incubator piping will be required.

530 - Fresh Water Systems: Additional fresh water cooling system piping will be required through the new length of the vessel to extend the piping to serve the propulsion motors, propulsion motor drives and stern thrusters. Additional potable water system piping will be required to extend the piping through the new length of the vessel. Expand the deck heating system to serve the additional after main deck created by the lengthening.

540 - Fuel and Lube Oil Systems: Additional fuel oil transfer system piping will be required through the new length of the vessel to extend the piping to serve the after fuel tanks. Additional clean lube oil system piping will be required to extend the piping through the new length of the vessel. Additional waste oil system piping will be required to extend the piping through the new length of the vessel.

550 - Compressed Air and Fire Fighting Systems: Additional compressed air system piping will be required to extend the piping through the new length of the vessel.

570 - Vents, Fills and Sounds: Add tank vents and sound tubes for the new anti-roll tank.

580 - Anchor Systems, Boat Handling and Life Rafts: Still waiting on new equipment number

#### Section 600 - Outfit

610-Hull Fittings: Provide additional bolt down fittings and unistrut system channels in areas modified/enlarged.

632 - Anodes: Modified tankage arrangements will require different anode configuration based on method described in Reference 1.

633 - Cathodic Protection: Submerged hull area is increased, a larger capacity impressed cathodic protection system will be required.

635-Insulation: Additional insulation required in areas modified and enlarged.

660 - Work Spaces: Larger Bosun's workshop will require different arrangements.

#### Section 790 - Noise Control Treatments

Table 700-9 now includes Anti-Roll Tank Compressor. The Anti-Roll Tank Compressor requires vibration isolation and is noted as Noise Critical subject to such requirements as noted in Section 790 for critical equipment.

