Science Technical Systems

The technical support for Healy science systems has evolved significantly since Healy's first science cruise in 2001. In addition to USCG personnel, currently the science systems on Healy are supported by ESU and STARC.

Science Instrumentation & Sensors

Information on ADCP, CTD, Knudsen 3260 Chirp, Konsberg Multibeam and more of the science instruments and sensors

Bow Tower

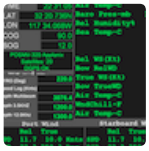
View photos and specs on the Bow Tower

Coring System

Details on the JPC coring system

Cranes

Information about the 5 cranes onboard



Data Acquisition

About the METacq system for MET sensor acquisition and display

Dive Support

Learn about the U.S. Navy trained dive team

Electrical Power

Recommended power protector devices for electrical power on the Healy

Labs & Equipment

Learn about the six primary laboratories, refrigerated science spaces, two climate control spaces and a number of assembly and staging areas

Navigation Equipment

About the Sperry Marine's Voyage Management System (VMS)

Baseline Coordinates

View Healy baseline coordinate surveys

Science Network

A brief overview of the Shipboard Science Network computing systems capabilities on board USCGC Healy to aid in cruise planning

Small Boat Support

Learn about the 38 foot aluminum hull cargo boat (LCVP)

Underway Science Seawater System

Learn about the requirements, installation and more for science sampling of seawater

Vans

Information about Healy's capability to accommodate six standard 20 foot long ISO container type science vans

Winches

Details on the integrated science winch and wire handling systems which provide support of science operations on the cutter

Science Instrumentation & Sensors

HEALY is outfitted with six primary laboratories, refrigerated science spaces, two climate control spaces, and a number of assembly and staging areas. The spaces listed below are diagramed in the following links depicting the main deck science spaces and the 01 deck spaces.

The following sensitive power type is provided to the science labs: 120 VAC, 60 Hz, Type I 230 VAC, 60 Hz, Type I 120 VAC, 60 Hz, Type I with surge & spike suppression.

Acoustic Doppler Current Profiler (ADCP)

Healy was delivered with Broadband ADCPs, a 300kHz and 150kHz. The 300kHz instrument never really worked, and in 2002, it was replaced with 75kHz phased array "Ocean Surveyor" ADCP. During the winter inport period of 2010, the 150kHz Broadband ADCP was replaced with a 150kHz phased array "Ocean Surveyor" (loaned by Univ Alaska, Fairbanks). These are referred to as OS75 and OS150, respectively.

Efforts to improve data quality are discussed in the reports (below). These reports also contain the most up-to-date information about computer and serial port configuration, messages acquired, and a detailed evaluation of the performance of the two instruments.

In summary, both instruments suffer from reduced range and bias in the broadband mode. They still function in narrowband mode. Serial heading is acquired from two Sperry gyro-compasses, the Ashtech ADU5, and the POSMV. The latter two and a PCode GPS all provide positions.

ADCP Data acquisition and processing are handled by a linux computer running UHDAS software (University of Hawaii). UHDAS is a system designed to support scientists at sea, with the goal of getting the data product (ocean velocities) as close to science-ready as is practical in an autonomous installation. On many ships, there is only a little touch-up necessary (editing and calibration) after a cruise. For those steps or to completely reprocess the data, the core processing code "CODAS" is available to download and install.

- **UHDAS+CODAS documentation**
- **A short introduction to UHDAS**
- **RDI Ocean Surveyor Specifications**

Reports

- July 2013- **Healy 2013 UHDAS installation** (Dr. Julia Hummon)
- *May 2011* - **Healy 2011 ADCP evaluation** (Dr. Julia Hummon)
- *May 2011* - **Healy HLY11TA data report** (Dr. Julia Hummon)
- *May 2011* - **Healy 2011 UHDAS installation** (Dr. Julia Hummon)
- *Jul 2010* - **Healy 2010 ADCP evaluation** (Dr. Julia Hummon)
- *Jul 2010* - **Healy HLY10TC data report** (Dr. Julia Hummon)
- *Jul 2010* - **Healy 2010 UHDAS installation** (Dr. Julia Hummon)
- *Jul 2010* - **OS150 installation** (2010 Dry Dock)

- *Nov 2003* - **Preliminary report on HLY-03-03 ADCP data collection** (Dr.Andreas Münchow)
- *Jul 2010* - **OS75 installation Photos** (2003 Dry Dock)
- *Jun 2002* - **SBI HLY0201 ADCP data collection and AutoADCP** (Dr. Charles Flagg)
- *Jun 2002* - **SBI ADCP data quality HLY0201** (Dr. Charles Flagg)
- *Jun 2002* - **AutoADCP Introduction** (Dr. Charles Flagg)
- *Jul 2002* - **USCGC Healy Commissioning Report** (Scott Idle)
- *Mar 2002* - **RD Instruments Inc. Ocean Surveyor 75 kHz** (Ron Hippe)
- *Jul 2000* - **Original Science Trials (BB150, BB300)** (Dr. Julia Hummon)

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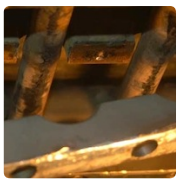
Konsberg Multibeam Sounder




- **EM122 Datasheet**
- **Guidelines for multibeam sensor survey**

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Knudsen 320B/R

The Knudsen 320B/R has two transceivers and is capable of operating as a subbottom profiler (CW at 3.5 KHz or frequency modulated chirp from 2kHz to 6 kHz) and a conventional single beam echo sounder at 12 KHz. The transceiver and computer are installed in IC/Gryo with the display, keyboard and mouse remoted to the Science Watch Standers Workstation in the Computer Lab. It is possible to run both modes simultaneously. Heave correction from the POS/MV is applied. Position data comes directly from a GPS receiver.

During normal operation on the Healy, the 12 KHz mode is not used as it interferes with operation of the swath mapping (multibeam) system. The subbottom transducer array consists of sixteen Ocean Data Equipment Corp. TR-109 elements configured in a four by four array wired in a series-parallel arrangement and mounted in a transducer well inside the ship.

Like the multibeam array, the transducers are protected from the sea ice by a thick polyurethane ("SeaBeam Orange") windows. The 12 kHz transducer is a Ocean Data Equipment Corp. TC-1234. By prior arrangement, this transducer may also be used for interrogating acoustic transponders and releases with an appropriate user-supplied deck unit.

Knudsen data is not corrected for sound speed, it is collected using a uniform sound speed of 1,500 meters per second. Knudsen data is heave compensated with input from the POS/MV. Data files are routinely logged in KEA, KEB and SEG-Y formats. Click here for a review of Sub-Bottom profiler processing.

- **A review of Sub-Bottom profiler processing**
- **Specs for Knudsen 320 B/R**
- **2005 HLY0503 operational notes**
- **Digital Signal Processing on the KEL 320 B/R**
- **Knudsen 320 B/R Science System Configurations**

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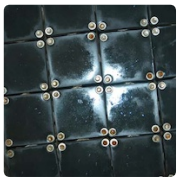
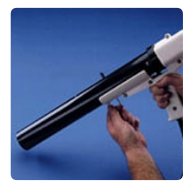
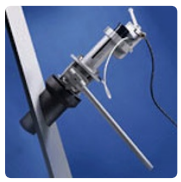
Transducer Wells




Seabeam Orange Acoustic Test Results

HEALY has a **Sippican** expendable oceanographic probe **MK21 Windows based data acquisition system** on board. Expendable probes can be launched from inside the transom of HEALY using a LM-4A thru-hull launcher (located in the bosns stores compartment 2-154-2-A) or from anywhere on the fantail deck using the Hand-Held Launcher (LM-3A), which has 150' of cable.

Thru-Hull Launcher (LM-4A)

The LM-4A is the standard launcher for all military vessels and employs the same basic assembly as the LM-2A. However, the LM-4A is installed below deck for improved safety and increased convenience under heavy weather conditions.

Hand-Held Launcher (LM-#A)

The LM-3A provides portability, allows more flexibility in selecting launcher position, and educes interference with other equipment.

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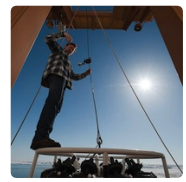
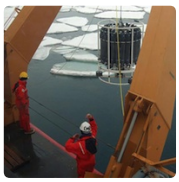
CTD




The Sea Bird 911 CTD deck units have GPS input from POSMV GPS. Data is transferred directly to the network for later use. The system is run from the Science Conning station.

- **Healy 2006 CTD Report**
- **Healy 2004 CTD Report**
- **Healy 2003 CTD Report**
- **CTD Specs**
- **CTD Science System Configurations**

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Weather Data

Air Temperature

Air temperature is provided via a R. M. Young platinum air temperature sensor enshrouded with an gill aspirated radiation shield. This sensor is located on the 06 deck flying bridge. This data is saved to the science net via serial interface.

Wind Speed and Direction

Wind Data is provided via R.M. Young wind vanes located on the port and starboard sides of the mast (furthest outboard position). This data is saved to the science net.

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Terrascan Data Receiving System

Real-time satellite imagery of weather and sea ice conditions is provided by an onboard SeaSpace Terascan system. The system is configured to receive real-time data from the Defense Meteorological Satellite Program (DMSP), NOAA and the Chinese Feng Yun(FY-1) polar-orbiting meteorological satellites. The system can process digital OLS, HRPT and CHRPT data for visible and infrared imagery and

DMSP SSM/I for passive microwave. The resolution of the NOAA and FY-1 visible/IR sensors are 1.1km and the DMSP is 0.5km. A list of products that can be generated from this data include:

- Brightness Temperature
- Radiance
- Skin Temperature
- Surface Temperature
- Cloud Products
- Snow and Ice Products
- Land Processes (fire, vegetation, soil)
- Ocean Products (STT)
- Atmosphere profiles and winds
- Precipitation Products
- Water Vapor, Dew Point, Fog

The SeaSpace Terascan System consists of:

- 1.5m full motion LEO L/S band Antenna
- satellite receiver
- Crypto, KG-44/TSEC (Post Delivery)
- Linux data acquisition and processing workstation
- High resolution color printer

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Gravimeters

Healy currently sails with two Bell BGM3 Gravimeters (one belongs to the Sikuliaq).

- May 2011 - **2011 Service visit report** (Randy Herr and James Kinsey)
- March 1988 - **Seattle Pier Gravity Stations**

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Vans

Winches

ICEBREAKERS

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Healy

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Medical Policy

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Foreign Clearances

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Native Communities

Northern Sea Route

Russian Federation

Port Information

Scheduling

SCIENCE SUPPORT

Baseline Coordinates

- Consolidated Survey Data.pdf
- Consolidated Survey Data.xls
- Survey003__0_1 Model (1).pdf
- Survey003__0_1.DWG
- Survey004__0_1 Model (1).pdf
- Survey004__0_1.DWG
- Survey005__0_1 Model (1).pdf
- Survey005__0_1.DWG

Consolidated Survey Data

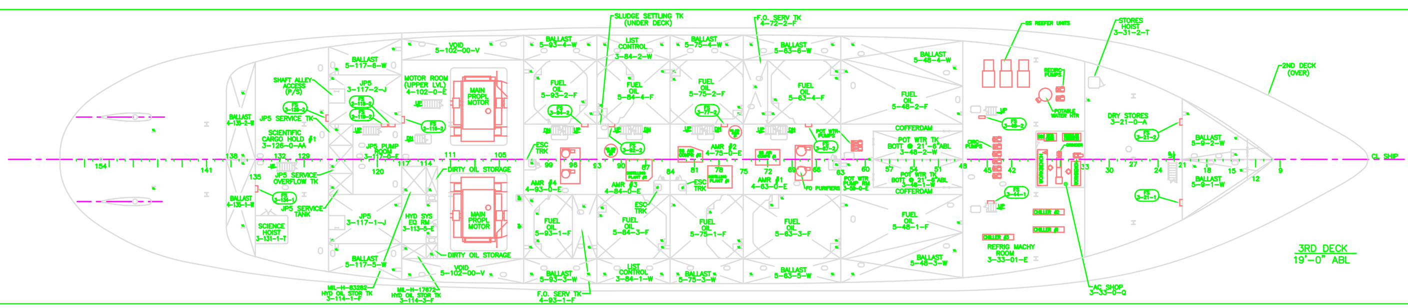
Elements of:

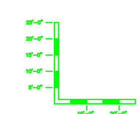
Avondale Survey
Wesrtlake Survey
Lamont Survey

All Measurements in Meters relative to MRP unless otherwise stated

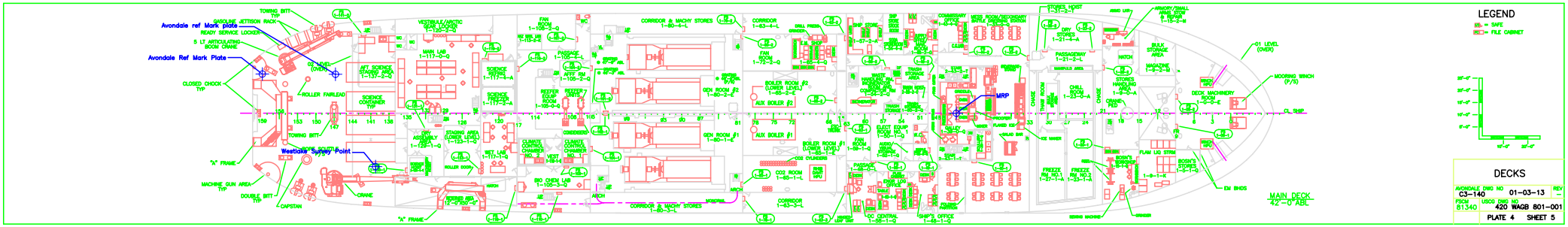
X = fore & aft with + foreward
Y = port & starboard with + to statboard
Z= vertical with + upwards

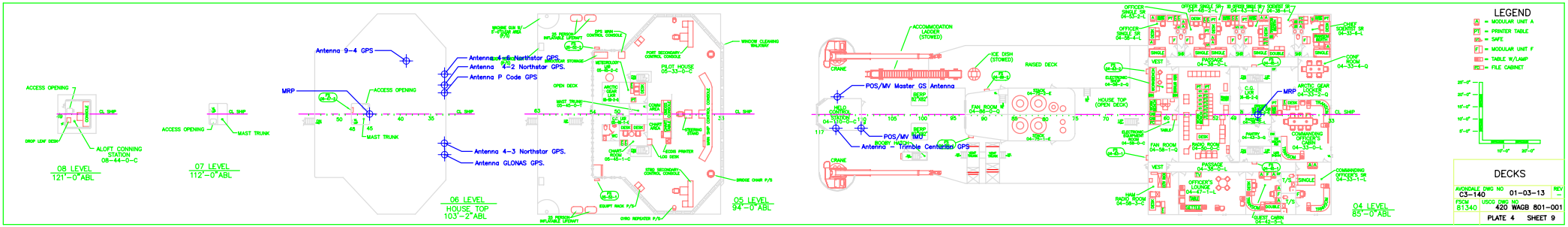
Item	Survey	Description			X Northing	Y Easting	Z Elevation
1	Avondale	***MRP***	See discussion Westlake Final Report		34.30	0.00	9.15
2	Westlake	***MRP***	by Definition		0.00	0.00	0.00
3	Westlake	***Seabeam 2112***					
		- Transverse Array		**Centerline**	**-7.679**	**0.030**	**9.242**
		- Longitudinal Array		**Centerline**	**-4.386**	**0.711**	**9.238**
4	Westlake	***Transducers***					
		Starboard - Forward to Aft					
		Transducer - Bathy 2000 3.5 kHz			-10.252	1.362	9.243
		Transducer - Bathy 1500 34 kHz *			-11.866	1.559	9.245
		Transducer - Doppler Speed Log			-12.168	0.414	9.245
		Transducer - Spare Transducer Well			-13.081	1.449	9.237
5	Westlake	Port - Forward to Aft					
		Transducer - VM 150			-9.726	-1.395	9.230
		Transducer - Ocean Surveyor 75 kHz			-10.819	-1.290	9.230
		Transducer - Bathy 2000 12 kHz			-11.859	-1.492	9.234
		Transducer - Spare Transducer Well			-13.078	-1.394	9.235
6	Westlake	***Gyros***					
		Starboard Gyro	Centerline		4.741	0.207	-19.604
		Port Gyro	Centerline		4.746	-0.207	-19.609
7	Westlake	***Antennas***					
		REF DWG TBD	Antenna 9-4 * - GPS Antenna (4.1.5)		4.587	-6.622	-24.000
			Antenna 4-6 * - Northstar GPS (4.1.1)		9.374	-4.970	-23.406
			Antenna 4-2 * - Northstar (4.1.2)		9.362	-3.617	-23.451
			P CODE GPS Antenna *		9.368	-2.645	-23.609
			Antenna 4-3 * - Northstar (4.1.4)		9.355	3.638	-23.363
			GLONAS GPS Antenna *		9.379	5.066	-23.515
			Antenna base (4A)		-53.872	-0.011	-22.025
			Antenna base (4B)		-49.758	0.038	-22.010
			Antenna base (4C)		-49.785	1.629	-22.020
			Antenna base (4D)		-49.771	-1.546	-22.008
			Trimble Centurion**		-52.726	-1.717	-21.113
			Time Server **		-52.671	1.838	-21.115
8	Westlake	***Vertical Ref***					
			MRV-M-MV - Measured at Top of mounting bracket				
			Center (mid-point) - calculated		*-2.100*	*0.291*	*-0.775*
			TSS 333B - Marine Motion Sensor - scribe atop mounting plate				
			Center of TSS 333B		1.210	0.329	-0.013
9	LDEO	***POS/MV***					
		From	**TO**		**X**	**Y**	**Z**
		IMU	Port Antenna (Master)		-2.9719	-3.9140	-5.5310
		MRP	**IMU**		**-49.5710**	**1.7110**	**-16.7990**
		MRP	Transmit array		-4.3860	0.7110	9.2380
		MRP	**Port Antenna (Master)**		-52.5429	-2.2030	-22.3300
10	Westlake Raw	**Fan Tail**					
			Aft/Port		-86.737	-4.906	-3.617
			Forward/Port		-77.600	-4.881	-3.589
			Forward/Starboard		-72.590	6.676	-3.653



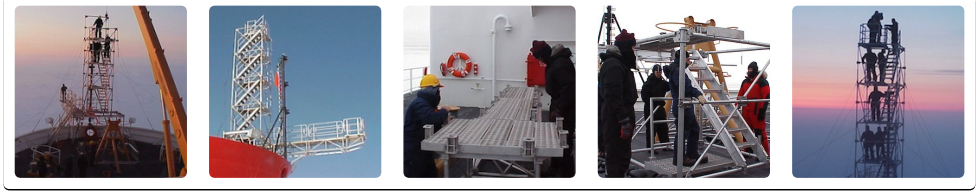


DECKS		
AVONDALE DWG NO C3-140	01-03-13	REV –
FSCM 81340	USCG DWG NO 420 WAGB 801-001	
	PLATE 4	SHEET 3


LEGEND
SAFE
FILE CABINET
DECKS
MAIN DECK
4'-2" ABL
Avondale ref Mark plate
Avondale Ref Mark Plate
Westlake Survey Point
MRP
TOWING BITT
GASOLINE JETTISON RACK
READY SERVICE LOCKER
5 LT ARTICULATING BOOM CRANE
CLOSED CHOCK TYP
ROLLER FAIRLEAD
"A" FRAME
MACHINE GUN AREA TYP
DOUBLE BITT TYP
CAPSTAN
CRANE
MOORING WINCH (P/S)
CL SHIP
EM BHDS
AVONDALE DWG NO
C3-140
01-03-13
REV
FSCM 81340
USCG DWG NO
420 WAGB 801-001
PLATE 4
SHEET 5


08 LEVEL
121'-0" ABL
07 LEVEL
112'-0" ABL
06 LEVEL
HOUSE TOP
103'-2" ABL
05 LEVEL
94'-0" ABL
04 LEVEL
85'-0" ABL
ACCESS OPENING
ALOFT CONNING STATION
08-44-0-C
DROP LEW DESK
CL SHIP
MAST TRUNK
MRP
Antenna 9-4 GPS
Antenna 4-6 Northstar GPS.
Antenna 4-2 Northstar GPS.
Antenna P Code GPS
Antenna 4-3 Northstar GPS.
Antenna GLONAS GPS.
OPEN DECK
PILOT HOUSE
05-33-0-C
WINDOW CLEANING GALLERY
BRIDGE CHAIR P/S
CRANE
ACCOMMODATION LADDER (STOWED)
ICE DISH (STOWED)
RAISED DECK
POS/MV Master GS Antenna
POS/MV IMU
Antenna - Trimble Centerpoint GPS
HELO CONTROL STATION
04-71-0-C
HOUSE TOP (OPEN DECK)
MRP
LEGEND
A = MODULAR UNIT A
PT = PRINTER TABLE
S = SAFE
F = MODULAR UNIT F
T = TABLE W/LAMP
FC = FILE CABINET
DECKS
AVONDALE DWG NO
C3-140
01-03-13
REV
FSCM
81340
USCG DWG NO
420 WAGB 801-001
PLATE 4
SHEET 9

Bow Tower

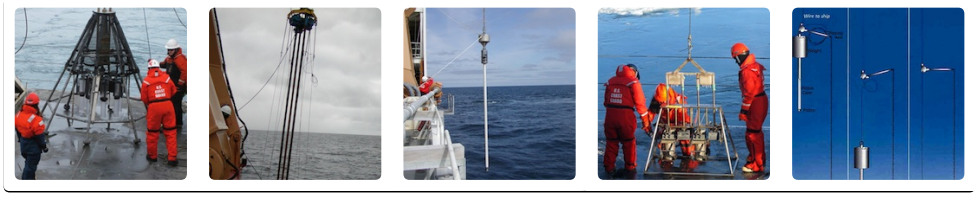


The bow tower sampling system provides for access, via a horizontal bow boom, to undisturbed water forward of the bow wake, for sample taking. The horizontal platform extends 15 feet forward of the bow. A vertical tower extending 30 feet above the bulwark provides for atmospheric sampling. The bow boom and tower assembly is of a modular design for ease of assembly, disassembly, and storage. The boom and tower can support 200 pounds of science equipment, along with two 250 pound persons in sea state 2. The bow tower requires considerable time and appropriate environmental conditions to erect, so potential use of the system should be addressed in the cruise planning process. Stuffing tubes are provided for transmission of wire from the boom or tower through the weatherdeck to a connection box that allows for data to be transmitted to the Main Lab. The transmission cables are as follows:

- 1 - 4 fiber fiber optic cable
- 6 - rg-58 coax cables
- 6 - rg-59 coax cables
- 1 - 19 shield pairs cable

Overview
STARC & ESU
Science Systems
Science Instrumentations & Sensors
Baseline Coordinates
Bow Tower
Coring System
Cranes
Data Acquisition
Dive Support
Electrical Power
Labs & Equipment
Navigation Equipment
Science Network
Small Boat Support

Coring Systems



Healy is equipped with a JPC coring system for taking deep sediment cores up to 25 meters. The JPC core is deployed from the Starboard A-Frame using the 9/16 wire. The pivoting core bucket is bolted to the deck under the A-Frame (this can only be done in port). CTD operations can be carried out when the core bucket is installed, however the CTD must be lifted over the core bucket. Healy provides 4 core barrels and science users provide core liner. Healy typically has at least one 4,000 lb core head and one 5,000 lb core head in inventory. Healy also maintains a Gravity core system on board. Other coring operations on Healy have included multicore and vibricore.

- JPC equipment inventory (OSU in Oregon)

USCGC Healy Piston Coring Equipment
Oregon State NORCOR Inventory

1/10/2006

Box #	Description
1	Gravity Core Cutters – White Box
2	3 - Old Used PC Core Cutters / 1 WHOI Piston Stop
3	Core Extruder Brackets – White Box
4	4 - Pistons
5	Weak Links – White Box
6	3 - Lifting Collars
7	6 – New PC Core Cutters
8	Extruder Spare Parts – White Box (minus pusher rods !)
9	6 – New PC Core Cutters
10	General Spare Parts – Large White Box
11	Fiege Spare Parts / Shackles – Grey Box
12	2 – Quick Releases / 1 – Trigger Arm Spare Parts
13	3 – Used Regular WHOI Couplers
14	2 - Used Regular WHOI Couplers
15	2 – BAD (Unaligned) Regular Couplers
16	2 - Used Regular WHOI Couplers / 1 – New Regular WHOI Coupler
17	3 – Questionably BAD Used Regular WHOI Couplers
18	1 – Tabbed WHOI Head Coupler / 2 - New Regular WHOI Couplers
19	3 - New Regular WHOI Couplers
20	Empty WHOI Coupler Box
21	2 – Tabbed WHOI Head Couplers / 1 - New Regular WHOI Coupler
22	3 - New Regular WHOI Couplers

Unlabelled Large Wooden Box	-	One New Trigger Arm / no hydrostatic pin
Unlabelled White Box	-	Core Catchers

LARGE DECK GEAR

Two loose trigger arms with clamps / no hydrostatic pins
Two 4,000LB Piston Core Weights
Two 5,000LB Piston Core Weights
One WHOI Deck Core Cradle with OSU Blue Coring Bucket Attached
One WHOI Tan Coring Bucket
One Starboard HERO Platform
SEVEN - ten ft lengths of galvanized core pipe - loose

Cranes

Five onboard cranes provide overlapping working circles that cover all areas of the working decks. All five cranes are hydraulically operated, with individual hydraulic power units. The Forward and 04 Level Cranes have telescoping booms. The aft main deck cranes have articulating booms. All cranes will handle rated loads at a minimum of 20 feet beyond the ship's maximum beam. The Forward Crane will service the entire forecastle at rated load. The 04 Level, Aft-Starboard and Aft Cranes handle cargo transfer between the flight deck, aft working deck and over the side handling Area.

Load capacity charts

- **Forecastle crane** 3 Tons (6,000 LBS)
- **04 Level Cargo cranes** 15 Tons (30,000 LBS)
- **Stbd Articulated aft working deck crane**15 Tons (30,000 LBS)
- **Port Articulated aft working deck crane**5 Tons

2011 Crane testing Condition Found Reports

- **Allied Systems Crane Reports**
- **Todd Shipyard Operational testing report using water weights**
- **Waterweight certificates**

A-FRAMES

HEALY is equipped with two A-frames, one aft on the stern and one located on the starboard over-the-side handling area. Both are used to launch and recover oceanographic equipment and support running wire or cable from oceanographic winches. The A-Frames have a reach of 10 feet, both inboard and outboard of the deck edge. They have three attachment points, with the following rated working loads:

- Aft A-frame: 46,240 lbs. (center point)
- Starboard A-frame: 12,000 lbs. (center point)
- Intermediate attachment points on either side: 6,000 lbs
- **2011 Todd Pacific shipyard operational testing**

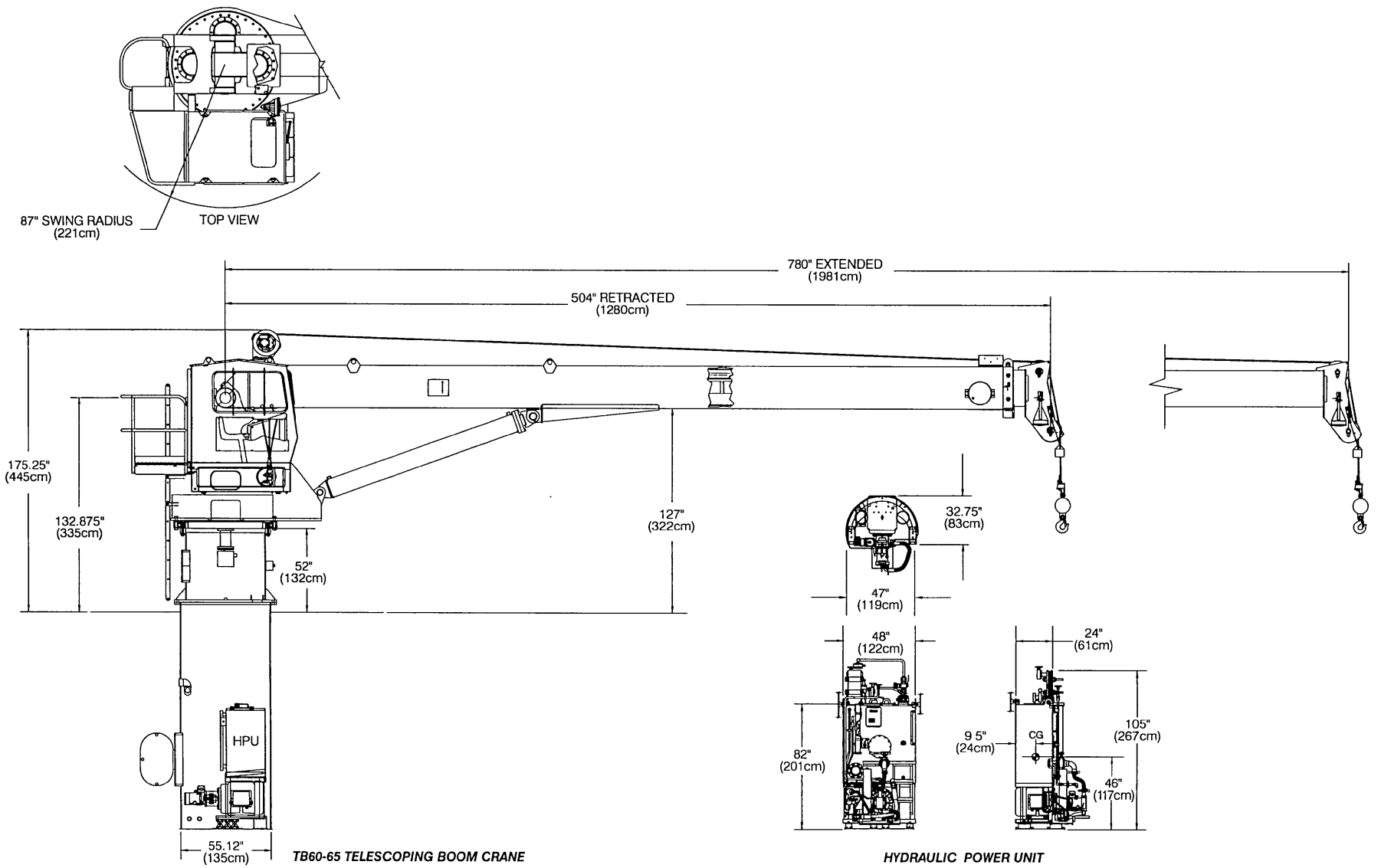


Figure 1-4 Dimensional Data

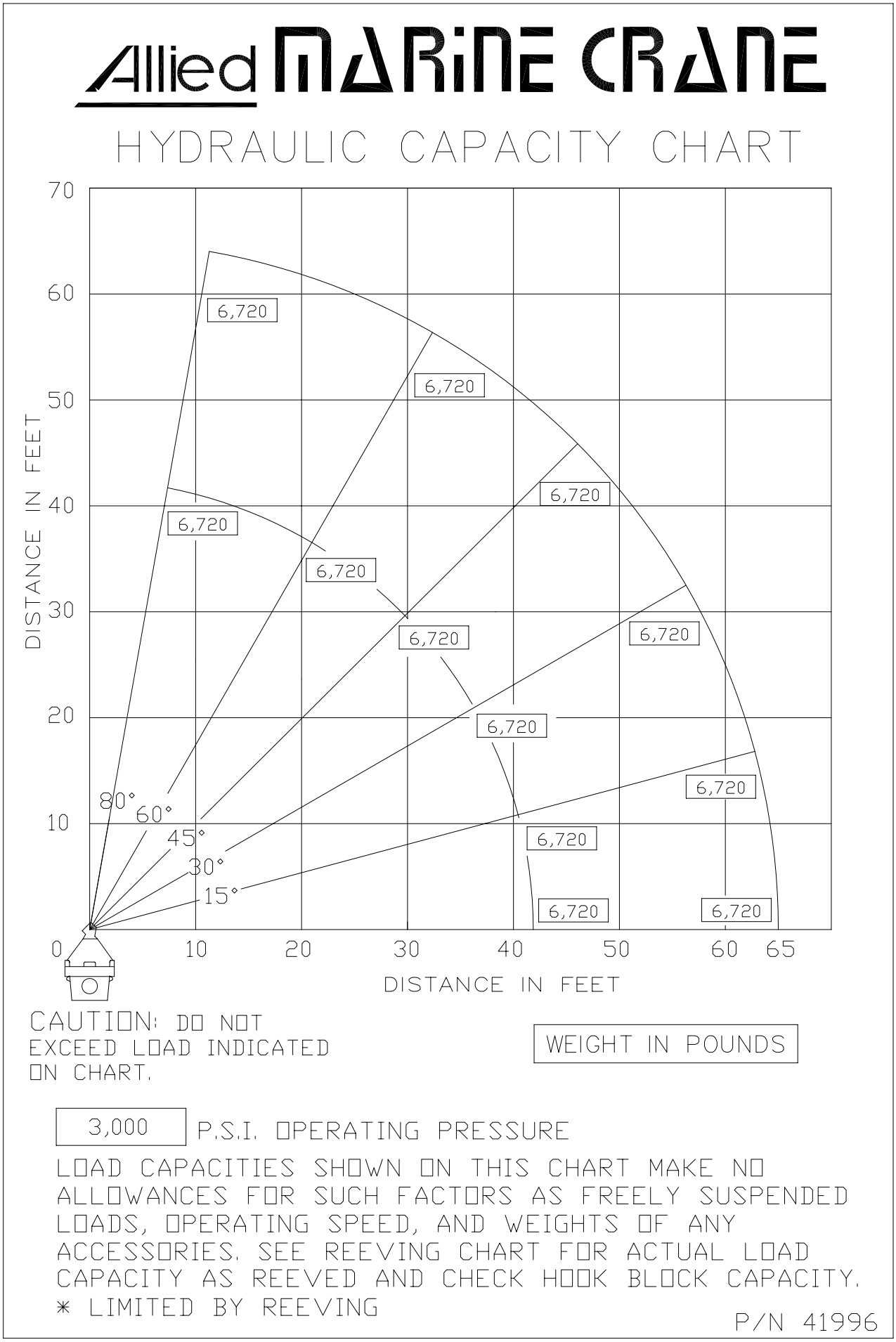
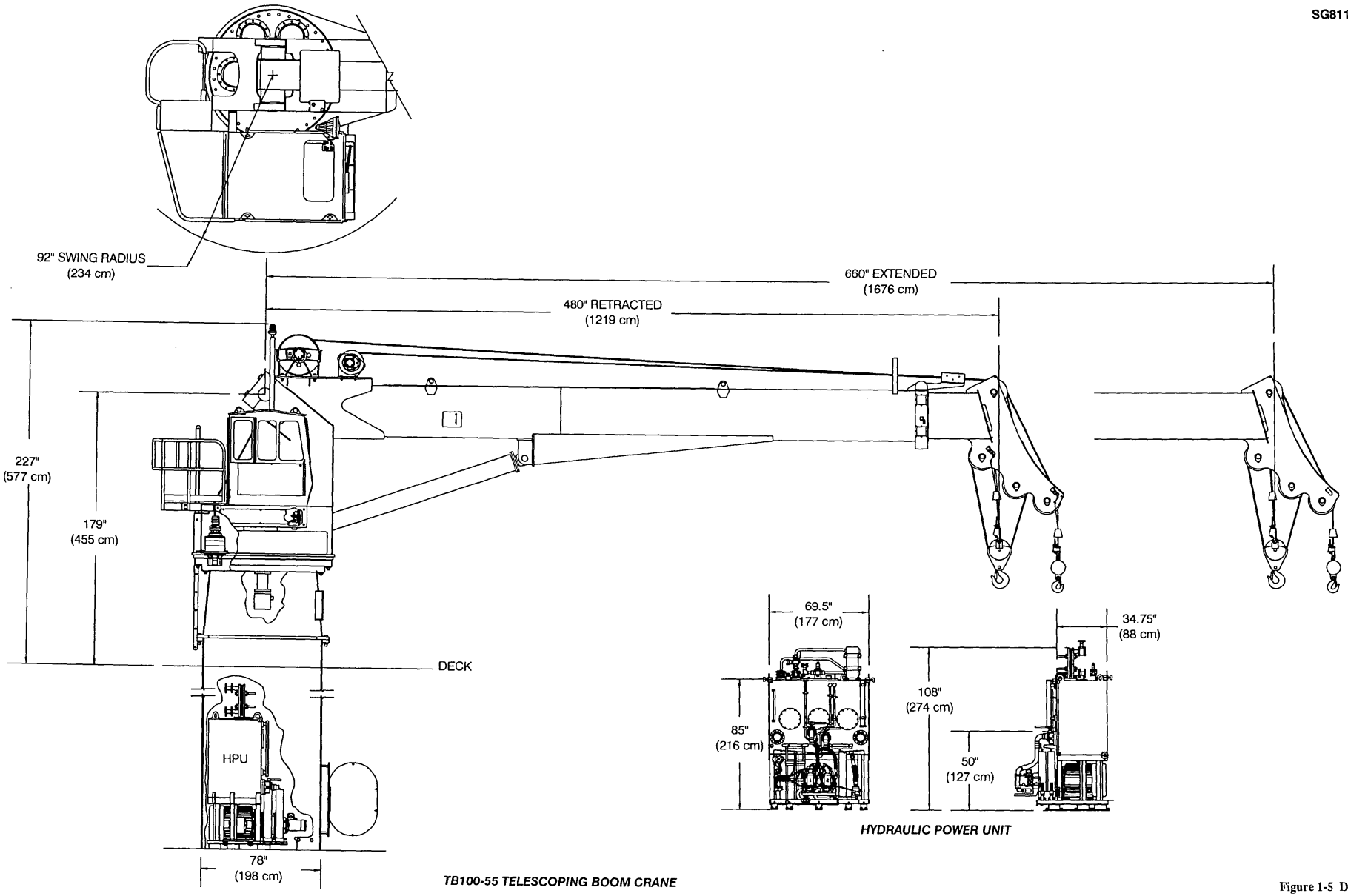


Figure 1-5 Load Chart



TB100-55 TELESCOPING BOOM CRANE

HYDRAULIC POWER UNIT

C42030D

AMC071

Figure 1-5 Dimensional Data

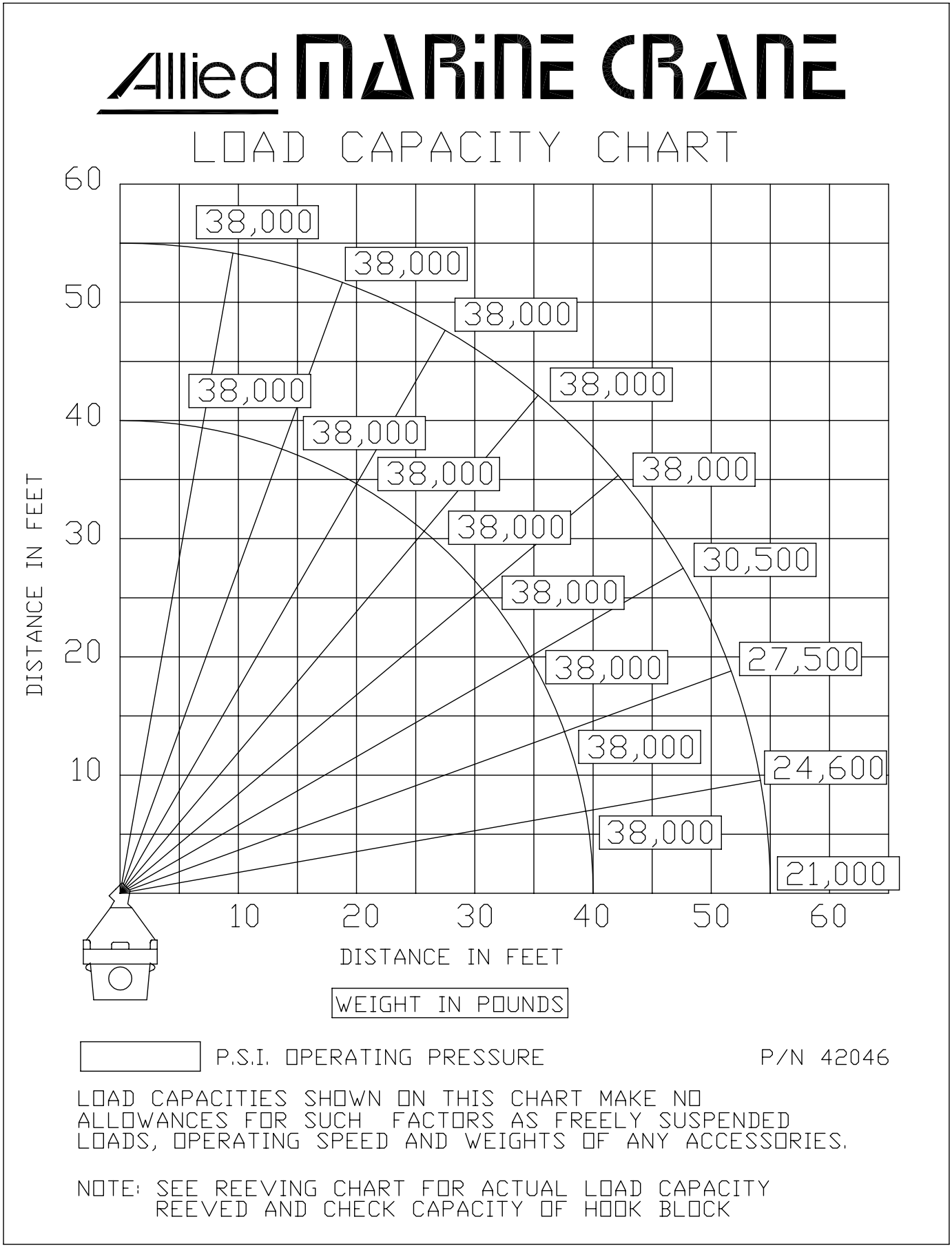


Figure 1-6 Load Chart

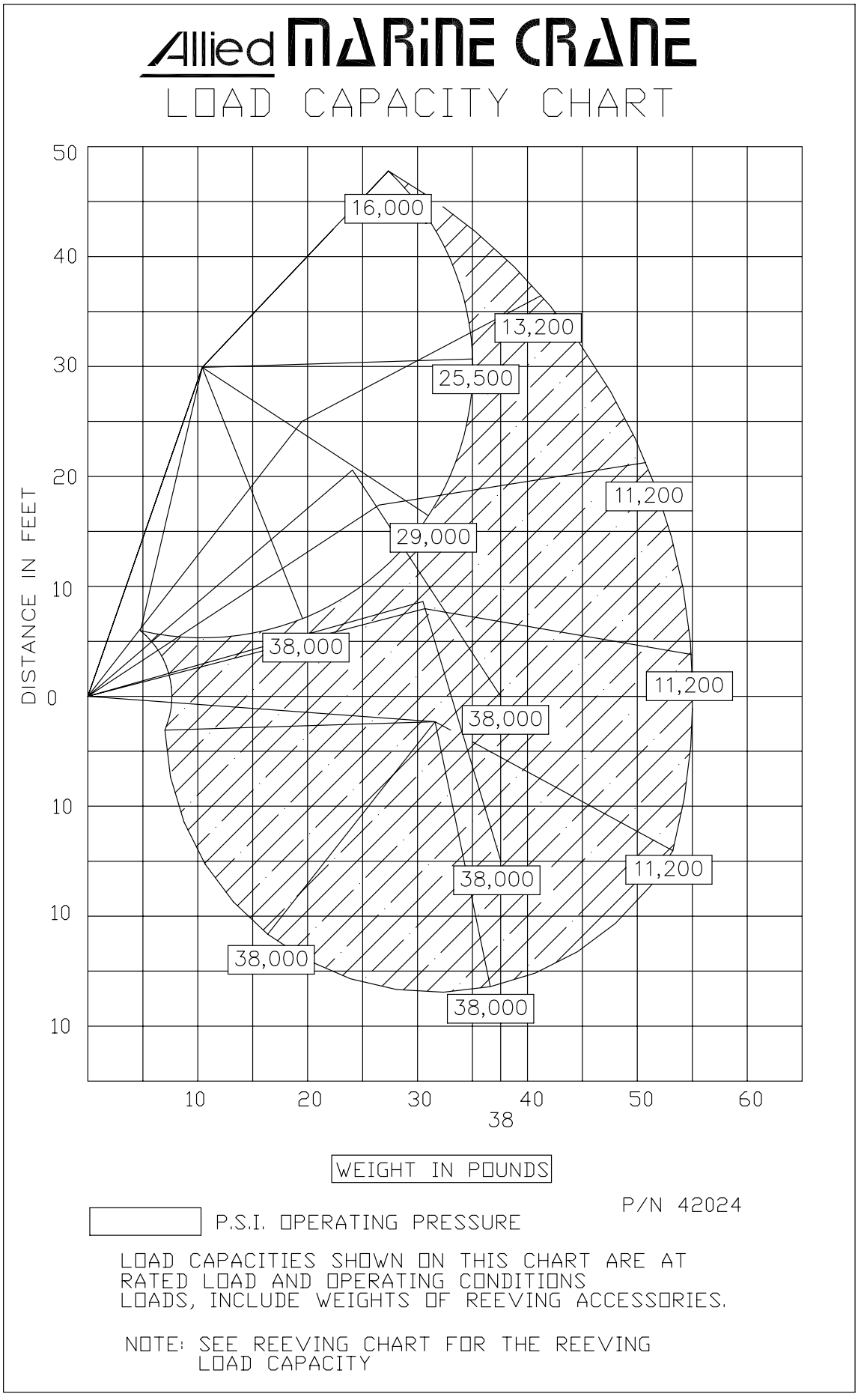


Figure 1-6 Load Chart - Main

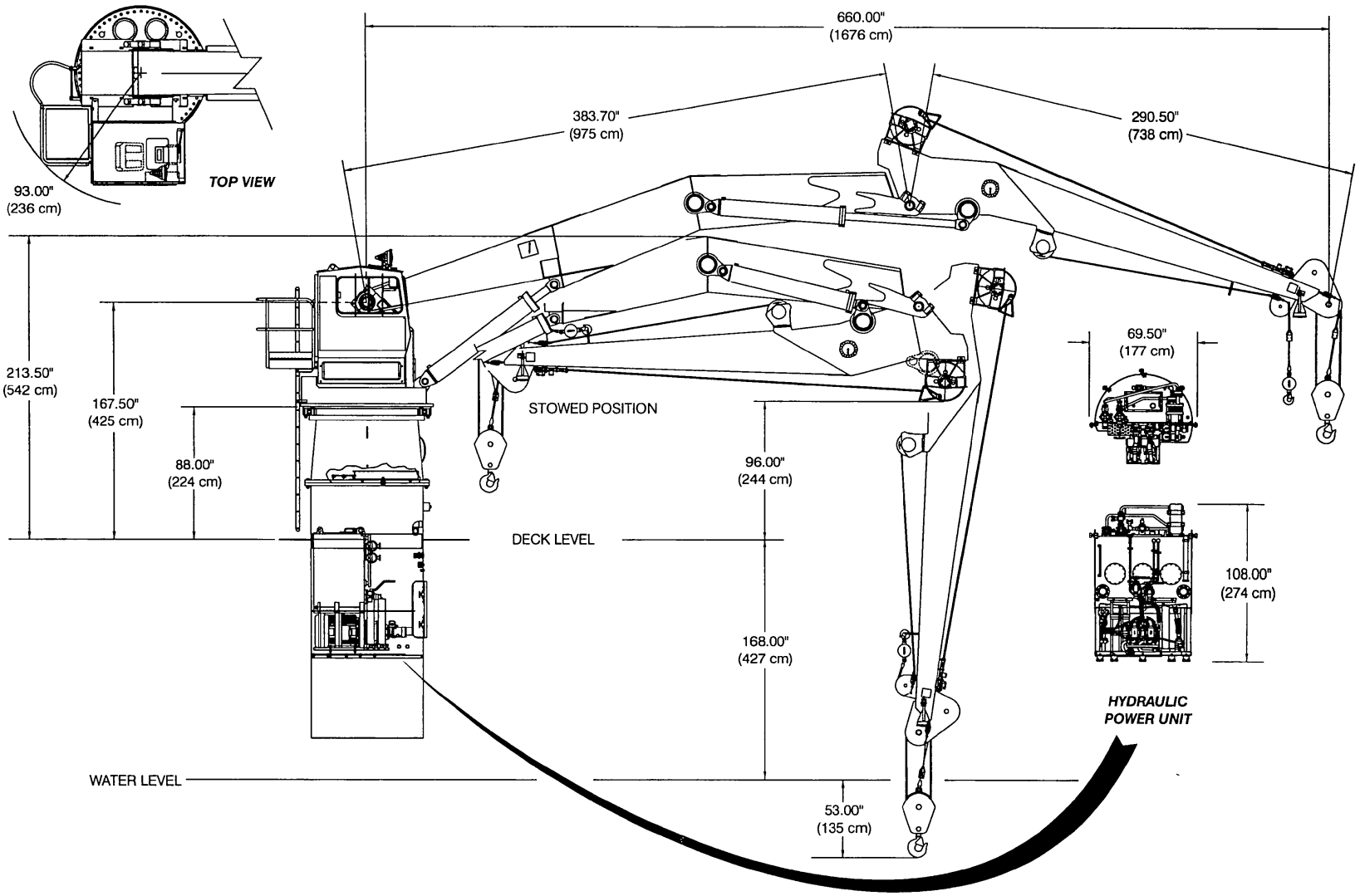


Figure 1-5 Dimensional Data

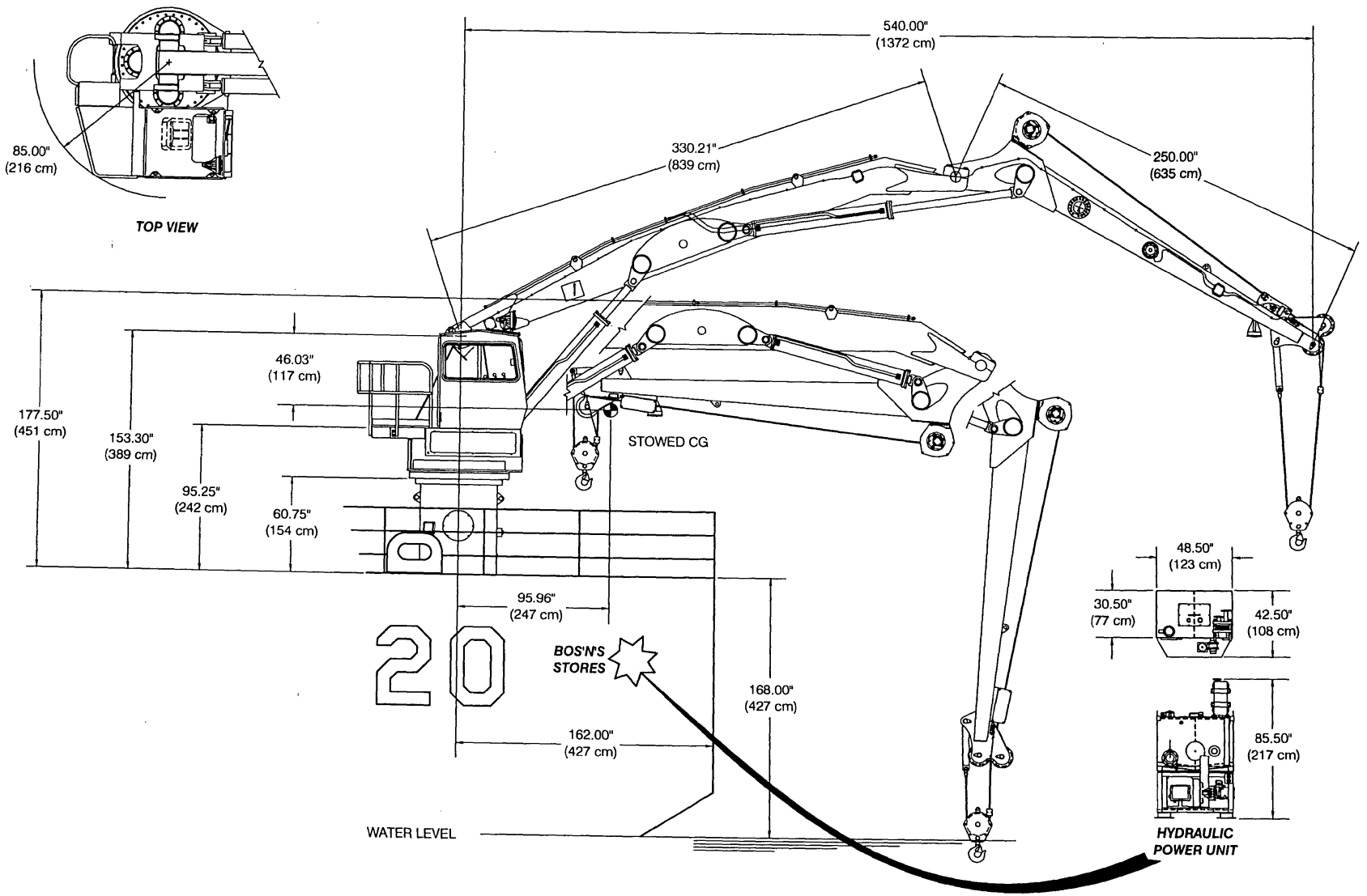


Figure 1-4 Dimensional Data

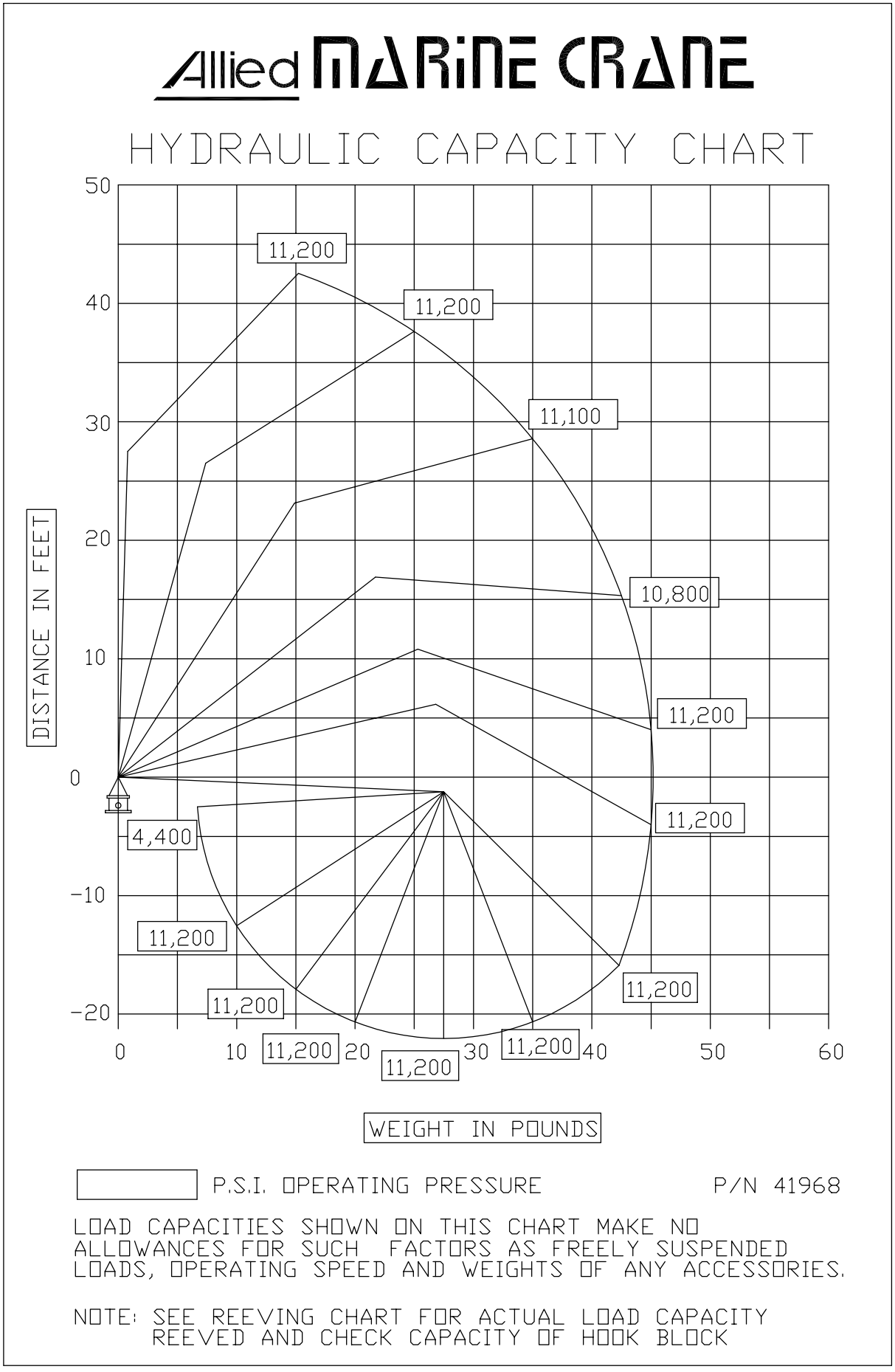


Figure 1-5 Load Chart

Healy FY11 PMA CLIN 0004
CONDITION FOUND REPORT
Todd Project No. 4015

Project CFR No.	Craft CFR No.	Activity No.	Definite No. / Option No.	Paragraph No.
4015-057	CIR-006	58901	D-45	3.2.1

Component or Location:	Drawing No.
As Listed	N/A

CFR Title: Allied System Crane Reports

Statement of Condition Found:

After performing initial operational test and inspection allied crane reports and TODD sheave inspections are attached below:

Port Knuckle Crane, Serial #1867

Condition Found Report 1867 Healy.xl

4206_001.pdf

Bow Crane, Serial #1868

Condition Found Report 1868 Healy Bc

4209_001.pdf

Port 04 Deck Crane, Serial #1869

Condition Found Report 1869 Healy.xl

4207_001.pdf

Stbd 04 Deck Crane, Serial #1870

Condition Found Report 1870 Healy.xl

4227_001.pdf

Stbd Knuckle Crane, Serial #1871

Condition Found Report 1871 Healy.xl

4208_001.pdf

Recommended Action:

Below recommendations based on Allied reports attached above, item numbers correspond to associated report:

Port Knuckle Crane, Serial #1867

2.0, 3.4: Troubleshoot and repair overhead cab fan and slewing horn
2.3: Corrected by USCG, no further action required.
4.6: Corrected by USCG, no further action required.
5.0: Replace missing and rusted pedestal access cover bolts.
6.1: Repair/replace mechanical boom angle indicator
8.1: Repair small oil leak at HPU diverter manifold
4.2.1, 4.2.2, 5.1, 6.3, 8.1.1, 8.1.2: Recommend annual oil and filter change, not currently in spec.

Bow Crane, Serial #1868
1.0, 1.2: Prep, prime and paint rust affected areas on exterior surfaces of crane
2.0, 2.2: Troubleshoot and repair cause of HPU failure alarm
3.0, 3.2: Dry out swivel enclosure, conduct megger testing of all wires to verify condition for further use.
2.3, 2.3.3, 3.4: Troubleshoot and repair crane cab heater, crane horn and slewing horn
2.3.1: Properly mount cab transformer.
2.3.2: Repair/replace rusted and inoperable crane door latch
3.5, 7.0: Troubleshoot and repair LMI cable reel and unit.
4.0: Repair oil leak inside turret at tube fitting
4.2, 4.4, 8.1: Replace broken HPU return filter gauge on top of tank.
5.0: Identify cause of excessive water in pedestal and provide repair recommendation.
7.6: Repair or replace emergency lowering manifold with Allied developed kit.
4.2.1, 4.2.2, 4.5, 5.1, 6.3, 8.1.1 thru 9.0: Recommend annual oil and filter change, not currently in spec.

Note: OEM recommends discontinue use of crane until electrical swivel has been dried and tested by electrician; and transformer in cab electrical box is securely mounted.

Port 04 Deck Crane, Serial #1869
1.0, 1.2: Prep, prime and paint rust affected areas on exterior surfaces of crane
3.3: Troubleshoot and repair inoperable boom tip floodlight.
7.6: Repair or replace emergency lowering manifold with Allied developed kit.
8.1: Repair minor oil leak at HPU pump inlet
4.2.1, 4.2.2, 6.3, 8.1.1, 8.1.2: Recommend annual oil and filter change, not currently in spec.

Stbd 04 Deck Crane, Serial #1870
1.0: Prep, prime and paint rust affected areas on exterior surfaces of crane
2.3, 2.3.1: Purchase and install cab fan
3.0: No action required, submitted for documentation.
4.0, 6.0: Repair oil leak at top of hydraulic swivel in turret.
4.1: Replace missing pump coupling guard
6.2.2: Replace fast line haul ball safety catch
7.6: Repair or replace emergency lowering manifold with Allied developed kit
8.1: Repair or replace electrical box in HPU enclosure.
5.1, 8.1.1, 8.1.2, 8.2.1: Recommend annual oil and filter change, not currently in spec

Note: OEM recommends discontinue use of crane until oil leak and safety catch are repaired.

Stbd Knuckle Crane, Serial #1871
1.0: Prep, prime and paint rust affected areas on exterior surfaces of crane
2.0, 2.2, 3.3, 3.4: Troubleshoot and repair slewing horn and cab mounted floodlight inoperability.
3.0: Corrected by USCG, no further action required.
4.6: Repair oil leak at right lifting cylinder counterbalance valve.
7.6: Repair or replace emergency lowering manifold with Allied developed kit
8.1: Repair or replace electrical box in HPU enclosure.
5.1, 8.1.1, 8.1.2, 8.2.1: Recommend annual oil and filter change, not currently in spec

PC Note: Part availability and lead time for materials is unknown at this time; repairs may extend beyond the current end date.

Pricing available upon request

Required Report

Prepared By:		Ship Manager:		Response Requested By:
K Guinn	263	L. Saisslin	2/10/11	2/14/11
Name	Phone Ext	Name	Date	Date

Work Request (WR) Information: *Does this CFR require a WR (Yes / No):___Yes___*

	Expiration Date of Cost & Schd. Data Above		Date of WR Execution
	WR No.		Signature for CG
	WR Agreed Price		Signature for Todd

Customer's Reply:

Rcvd: 2/10/11. Report reviewed and accepted. Request WR-025 proposal to correct the following deficiencies to the Bow Crane:

1) 2.0, 2.2: Troubleshoot and repair cause of HPU failure alarm.
2) 3.0, 3.2: Dry out swivel enclosure, conduct megger testing of all wires to verify condition for further use.
3) 2.3, 2.3.3, 3.4: Troubleshoot and repair crane cab heater, crane horn and slewing horn
4) 2.3.1: Properly mount cab transformer.

All other crane discrepancies are noted. No further action is requested.

Customer Signature & Date David Socci, LCDR, USCG, COTR 2/11/11

Healy FY11 PMA CLIN 0004
CONDITION FOUND REPORT
Todd Project No. 4015

Project CFR No.	Craft CFR No.	Activity No.	Definite No. / Option No.	Paragraph No.
4015-223	131-029A	58901	D-45	3.2.3

Component or Location:	Drawing No.
Deck Cranes	N/A

CFR Title: Deck Crane Operational Testing

Statement of Condition Found:

Deck Cranes tested per attached TS-649, weight certification data also:

4727_001.pdf

Recommended Action:

Review and accept report.

PC Note: Stbd 15 Ton Main will be tested under 4017/58901B.

Required Report

Prepared By:		Ship Manager:		Response Requested By:
K Guinn	263	L. Saisslin	3/24/11	3/26/11
Name	Phone Ext	Name	Date	Date

Work Request (WR) Information: *Does this CFR require a WR (Yes / No):__No___*

	Expiration Date of Cost & Schd. Data Above		Date of WR Execution
	WR No.		Signature for CG
	WR Agreed Price		Signature for Todd

Customer's Reply:

Rcvd: 03/24/11. Report reviewed and accepted.

Customer Signature & Date. Marvin Dunmeyer, USCG, CWO *03/24/11*

Healy FY11 PMA CLIN 0004
CONDITION FOUND REPORT
Todd Project No. 4015

Project CFR No.	Craft CFR No.	Activity No.	Definite No. / Option No.	Paragraph No.
4015-232	KEG-018	58901	D-45	N/A

Component or Location:	Drawing No.
Various	N/A

CFR Title: Waterweights Test Certificates

Statement of Condition Found:

Attached are the water weights test bags certifications:

4754_001.pdf

PC Note: These certificates apply to all weight testing evolutions.

Recommended Action:

Submitted for documentation.

Information Only

Prepared By:		Ship Manager:		Response Requested By:
K Guinn	263	L. Saisslin	3/25/11	3/29/11
Name	Phone Ext	Name	Date	Date

Work Request (WR) Information: *Does this CFR require a WR (Yes / No):__No __*

	Expiration Date of Cost & Schd. Data Above		Date of WR Execution
	WR No.		Signature for CG
	WR Agreed Price		Signature for Todd

Customer's Reply:

Recvd: 03/25/11. Report reviewed and accepted.

Customer Signature & Date. Marvin Dunmeyer, USCG, CWO *03/25/11*

Healy FY11 PMA CLIN 0004
CONDITION FOUND REPORT
Todd Project No. 4015

Project CFR No.	Craft CFR No.	Activity No.	Definite No. / Option No.	Paragraph No.
4015-251	131-032	57301	D-41	3.2.3, 5

Component or Location:	Drawing No.
Stbd and Aft A-Frame	N/A

CFR Title: A-Frame Testing and Closure

Statement of Condition Found:

A-Frames tested per attached TS-649, weight and flow meter certificates also attached:

4779_001.pdf 4780_001.pdf

All work associated with this item complete.

Recommended Action:

Review and accept report, close item 57301.

Required Report

Prepared By:		Ship Manager:		Response Requested By:
K Guinn	263	L. Saisslin	3/28/11	3/30/11
Name	Phone Ext	Name	Date	Date

Work Request (WR) Information: *Does this CFR require a WR (Yes / No):__No___*

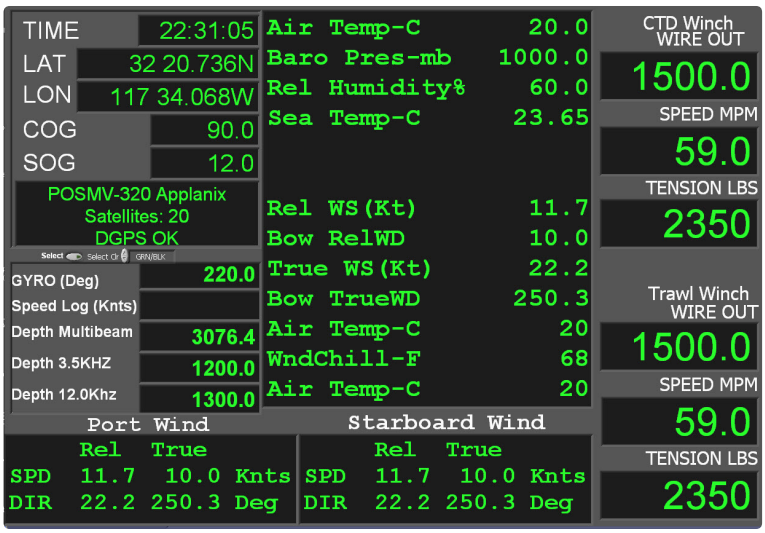
	Expiration Date of Cost & Schd. Data Above		Date of WR Execution
	WR No.		Signature for CG
	WR Agreed Price		Signature for Todd

Customer's Reply:

Rcvd: 03/28/11. Report reviewed and accepted. All work associated with this item are completed.

Customer Signature & Date. Marvin Dunmeyer, USCG, CWO *03/28/11*

Science Data Acquisition



MET data acquisition and display has changed this year. SCS is no longer on the Healy and STARC is providing a system called METacq for MET sensor acquisition and display. The METacq computer has been installed in the Computer Lab and all the met feeds from different sensors on the ship have been run to this new data acquisition computer. The monitor, keyboard and mouse for the METacq computer is on the same bench as the Knudsen and EM122 control and display area in the Computer Lab.

The METacq system is a Labview program running on WinXP.

There is also a computer located on the Bridge that is running the same version of the labview METacq software. The METacq computer on the Bridge is set up to receive a realtime UDP data stream from the main METacq computer in the Computer Lab. The METacq computer on the Bridge displays MET data on the Bridge console in realtime from the UDP data sent out on UDP Port 40119.

The main METacq computer in the Computer Lab also supplies a RS-232 serial output to both Scoreboards on the main deck (Stbd and Aft). The output data is controlled by a toggle switch on the METacq WINCH display page.

The current version of METacq software is V2.10M (METacq.exe) and the current text configuration file for METacq is HLY12C.acq (the .ACQ file sets up all the comm ports and calibration coefficients associated with each sensor attached to the METacq computer).

Dive Support

HEALY normally sails with a dive team consisting of one dive officer and four dive team members. All are U.S. Navy trained. They are tasked with supporting science operations and conducting underwater inspections and carrying out a limited level of work on the ship's hull and underwater appendages, if required.

The dive locker is located on the 02 level, port side, as part of the Hangar complex. It has a gross deck area of approximately 210 square feet. The dive locker is equipped with a shower, water closet, wet suit drying rack, six lockers, desk, stowage for 12 air bottles, bench, and a diving air compressor.

The ship carries a portable decompression unit located in the Medical complex. Diving in the Arctic environment is an unforgiving and potentially dangerous situation. However, with PRIOR arrangements and certification of the physical and technical capabilities of persons temporarily embarked on the ship, civilian diving from HEALY can be considered on a case by case basis. Diving needs should be expressed as part of the cruise planning process.

Electrical Power

Electrical power on Healy is different than what you are used to on shore. If you are bringing your own power strip to supply power to your equipment, the power strip must be able to isolate both legs of the 120VAC. If you have any concerns or questions about shipboard power, please contact STARC (**shiller@ucsd.edu**).

Approved UPS Information

APC makes **several types** of uninterruptible power supplies (700, 1500, and 3000 VA) for shipboard use. Only units that are marked for shipboard use are acceptable as these are *ungrounded and equipped with switching to break both L1 and L2*. The larger units are rack mounted. There may be other suitable vendors, but this is the one that I recall being quoted by MLCP(t) for backing up WHEC navigational electronics.

Approved Shipboard Surge Protectors

Surge protectors approved for shipboard use are identified as: Brooks Power Systems Model Z6(62P) and HFS, Inc. Both are listed under the same NSN: 6150-01-362-7192. Other approved surge protectors listed include: DSK, Inc., Model 5000 (no NSN), EFI Electronics Corp. Model MPS 453 EFI-120A (no NSN) and EFI Electronics Corp. Model MPS-6 (NSN: 6150-01-362-7192). All shipboard surge protectors must interrupt both line leads to prevent equipment damage during a surge. **Click here to view the April 8, 2013 US Coast Guard Marine Safety Alert** about Surge Protective Devices (SPDs) on board Vessels.

Labs & Equipment

HEALY is outfitted with six primary laboratories, refrigerated science spaces, two climate control spaces, and a number of assembly and staging areas. The spaces listed below are diagramed in the following links depicting the main deck science spaces and the 01 deck spaces.

The following sensitive power type is provided to the science labs: 120 VAC, 60 Hz, Type I 230 VAC, 60 Hz, Type I 120 VAC, 60 Hz, Type I with surge & spike suppression.

Aft Science Staging Area

The aft science staging area is located portside aft of the Main Science Lab. It has a 10-foot by 17 foot opening equipped with a roller curtain door on one side. It provides for the interior storage (all but small part of van end) an ISO 20-foot van. The area has an upper level grated platform that opens onto the 01 level. The deck is provided with deck socket tie down fittings. Access to Main Lab is via weather deck.

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Starboard Science Staging Area

The science staging area, compartment number 1-123-1-Q, is a bay encompassing two deck levels, providing a clear vertical height of 23 feet and approximately 325 square feet of deck area. It is equipped with an overhead traveling/bridge crane, capable of handling arrays 12 feet high and 7 feet in diameter. It has direct access to the starboard working deck and "A" frame, and both the wet lab and the dry assembly area through 72" wide by 78" high openings, which are free of coamings. Access to the grating associated with the overhead bridge crane on the upper level of the bay is available through the science conning station and lab expansion space ("future lab") on the 01 level. The science staging area is equipped with drains for washing down of equipment, and a roller curtain door (10 feet wide by 17 feet high) to the over-the-side handling area and "A" frame. It is also equipped with one worktop with steel sink and a gas bottle storage rack (ten bottles).

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Science Wet Lab

The Science Wet Lab, compartment number 1-117-1-Q, has a deck area of approximately 390 square feet. The Wet Lab has access to the Science Freezer, Science Refrigerator, Biological/Chemical Analysis Lab (through a vestibule), over-the-side Handling Area, Science Staging Area and the Main Lab. It is provided with deck drains for wash down and has the following furniture, cabinets and equipment:

- 1 - 72" worktop with steel tub sink, with outlets for hot/cold potable water, science sea water and distilled water
- 1 - 96" worktop with double steel sink, with outlets for hot/cold potable water and science sea water
- 1 - Upright 20 cuft freezer (available on request)
- 1 - Upright 20 cuft refrigerator (available on request)
- 1 - Ventilator Hood, over one worktop
- 1 - Storage boxes for Citrate bottles
- 1 - Book rack
- Bulkhead storage cabinets (available on request)

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Biological / Chemical Analysis Lab

The biological/chemical analysis lab, compartment number 1-105-3-Q, has approximately 310 square feet of deck area. The lab is provided with hot/cold potable water, distilled water, filtered oil-free air, uncontaminated seawater and seawater. Access to the climate controlled chambers, wet lab and weatherdeck is provided through vestibules. Furniture and equipment include:

- 1 - Liquid Scintillation Counter
- 1 - Automatic Salinometer
- 1 - Desk
- 1 - Worktop, with sink
- 1 - File cabinet, type B
- 1 - Flourometer
- 1 - ThermoSalinograph
- 1 - Vortex de-Bubbler
- 1 - Water Purifier/De-ionizer
- 1 - Fume Hood

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Main Science Lab

The Main Science Lab, compartment number 1-117-0-Q, has a deck area of approximately 1233 square feet. It features unistrut fixtures in counters and racks for maximum flexibility. All counter tops are made of one inch plywood. From the Main Lab, immediate access is available to the hazardous materials locker, wet lab, dry assembly area, aft working deck and three science working vans. The Main Lab is equipped with:

- 1 - 72" worktop with steel tub sink, with outlets for hot/cold potable water, science sea water, and distilled water.
- 1 - Book rack
- 3 - File cabinets
- Bulkhead storage cabinets

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Climate Controlled Chambers (2)

Climate Controlled Chambers No. 1 (1-105-1-Q) and No. 2 (1-113-1-Q), each have 103 square feet of deck area. Entry to both chambers is through a 75 square foot vestibule located between them, which is accessed from the biological/chemical analysis Lab.

Both chambers are independently capable of operating as either a cold room or warm room. The temperature range for both chambers is from -10 degrees to +35 degrees Celsius, with a tolerance of ±1 degree Celsius.

Humidity is controlled over the range of 20 percent to 95 percent relative humidity, with a tolerance of ±5 percent, when chamber temperatures are above 40 degrees Fahrenheit.

The HVAC control system for the chambers provides filtered air and includes alarms for abnormal conditions. Temperature and humidity data is fed to the science data network

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Science Freezer

The Science Freezer, compartment number 1-117-2-A, shown in Figures 5-2 and 5-3, has approximately 266 square feet of deck area and

is used to store core samples of various sizes, at a constant temperature of -18 degrees Celsius.

Nominally set to min -17.8, max -16.1 degC (Alarm -4F low and +5F in MPCMS)

The freezer is accessed from the Wet Lab and is capable of storing cores in one of the following configurations:

- *200 cores* - 15 feet long, 3.5 inches in diameter, 105 pounds each, stored horizontally
- *240 cores* - 5 feet long, 6 inches in diameter, 115 pounds each, stored vertically, on end
- *20 cores* - 1 foot by 1 foot by 3 feet long, 115 pounds each, stored vertically, on end.

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Science Refrigerator

The science refrigerator, compartment number 1-114-0-A, has approximately 169 square feet of deck area. It is accessed from the Main Lab.

Nominally set to min 0.5, max 1.6 degC (33-35F) (Alarm +/-10F (Low 25C and High 45C) Alarms can be set)

Caution - Both of these boxes have coil defrost cycles that require coils to be heated to melt any frost. Any time the coils are heated to melt the ice, there will be heat admitted to the space which will raise the temp.

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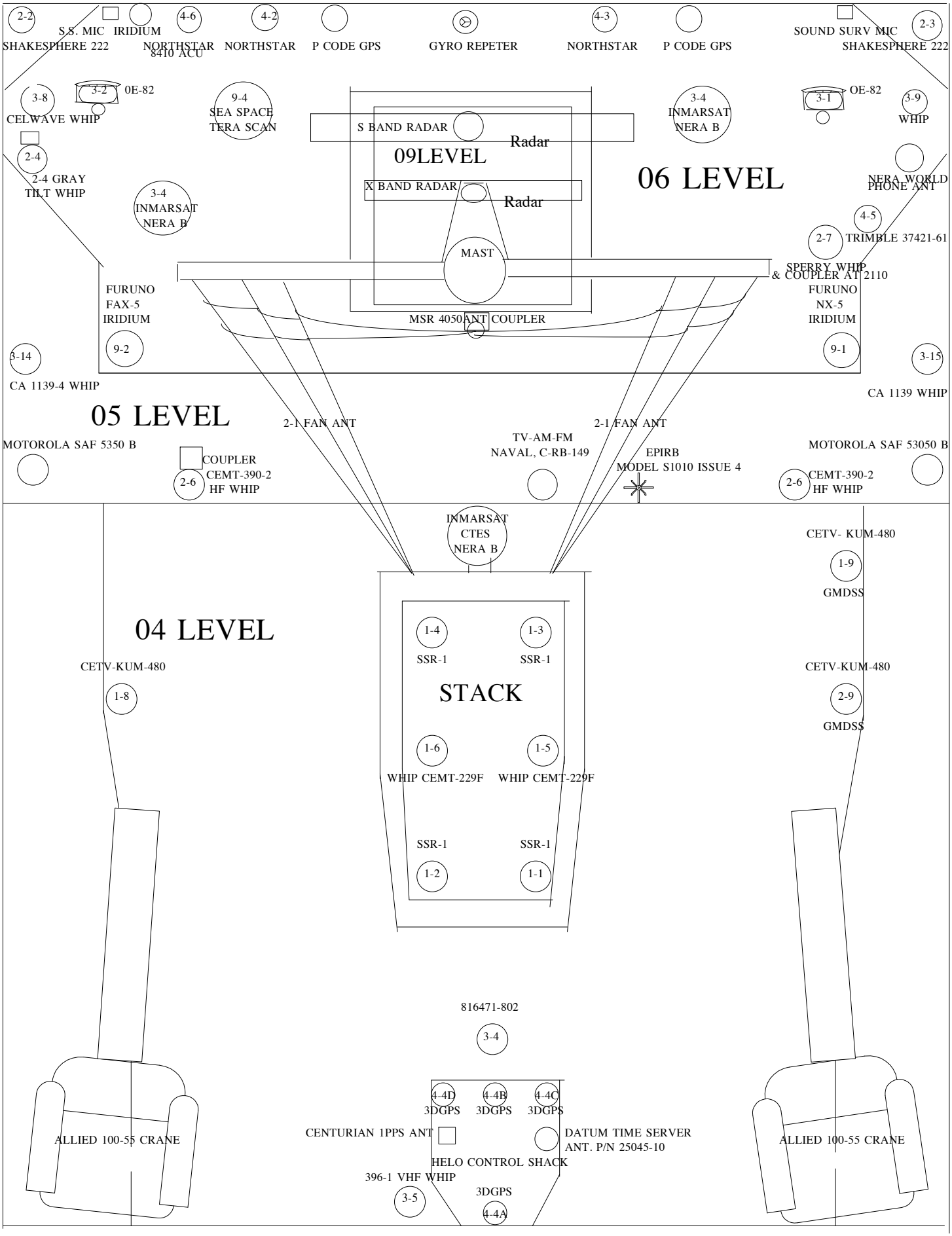
Navigation Equipment

HEALY is outfitted with Sperry Marine's Voyage Management System (VMS). This system utilizes multiple heading, position, environmental, and navigation inputs to steer the ship along a desired course. Currently, HEALY has the following GPS receivers: GPS, DGPS, P-Code GPS, and 3-D GPS. Heading inputs include two gyrocompasses and the 3-D GPS heading information.

The ship is also outfitted with an electronic magnetic compass. A Dynamic Positioning System (DPS) is available for station keeping and slow speed transits (towing, dredging). HEALY's DPS attempts to do with props and a bowthruster what smaller ships do with fore and aft thrusters, so it has limitations. It was designed and built by ALSTOM and integrates the use of propellers, rudders, and the bow thruster to accomplish ship movement. DPS Limitations: At best heading in openwater, in a 20 kt wind, seas with a significant wave height of 4.0 feet and a 1 knot currents, HEALY shall be capable of maintaining a position of +/- 150 feet or 3% of water depth (whichever is greater) from a point or trackline and maintain a heading of +/- 5 degrees. The seas and wind shall be from the same direction, with the current from less the 45 degrees off the wind.

- Antenna Layout Top View PDF


2-2
S.S. MIC IRIDIUM
SHAKESPHERE 222
4-6
NORTHSTAR
8410 ACU
4-2
NORTHSTAR
P CODE GPS
GYRO REPETER
4-3
NORTHSTAR
P CODE GPS
SOUND SURV MIC
SHAKESPHERE 222
2-3
3-8
CELWAVE WHIP
3-2
0E-82
9-4
SEA SPACE
TERA SCAN
S BAND RADAR
Radar
09LEVEL
X BAND RADAR
Radar
3-4
INMARSAT
NERA B
06 LEVEL
3-1
OE-82
3-9
WHIP
2-4
2-4 GRAY
TILT WHIP
3-4
INMARSAT
NERA B
NERA WORLD
PHONE ANT
4-5
2-7
TRIMBLE 37421-61
MAST
SPERRY WHIP
& COUPLER AT 2110
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FAX-5
IRIDIUM
MSR 4050ANT COUPLER
FURUNO
NX-5
IRIDIUM
9-2
9-1
3-14
CA 1139-4 WHIP
3-15
CA 1139 WHIP
05 LEVEL
2-1 FAN ANT
2-1 FAN ANT
TV-AM-FM
NAVAL, C-RB-149
EPIRB
MODEL S1010 ISSUE 4
MOTOROLA SAF 5350 B
COUPLER
2-6
CEMT-390-2
HF WHIP
2-6
CEMT-390-2
HF WHIP
MOTOROLA SAF 53050 B
INMARSAT
CTES
NERA B
CETV- KUM-480
1-9
GMDSS
04 LEVEL
1-4
SSR-1
1-3
SSR-1
CETV-KUM-480
1-8
STACK
CETV-KUM-480
2-9
GMDSS
1-6
WHIP CEMT-229F
1-5
WHIP CEMT-229F
SSR-1
SSR-1
1-2
1-1
816471-802
3-4
4-4D
3DGPS
4-4B
3DGPS
4-4C
3DGPS
CENTURIAN 1PPS ANT
DATUM TIME SERVER
ANT. P/N 25045-10
HELO CONTROL SHACK
396-1 VHF WHIP
3-5
3DGPS
4-4A
ALLIED 100-55 CRANE
ALLIED 100-55 CRANE

Computer Resources & Science Network

This is a brief overview of the Shipboard Science Network computing systems capabilities on board USCGC Healy to aid in cruise planning. The Healy's science network infrastructure is composed of wired connections to the science lab and work spaces. Wireless access is also supported in science living areas as well as science lab spaces and the bridge.

Contact the ESU Polar Science Support Branch prior to your cruise to ensure that any additional resources that you will be bringing, or may need can be accommodated on the network. You can reach the shore side support staff at **ESUSeattleScience@uscg.mil**

Internet

The Healy's Internet connection while at sea is via Ku band satellites. This is an expensive and limited resource, and can be rendered useless to everyone if not managed appropriately. Our bandwidth has a guaranteed rate of 256 Kb/sec with the ability to burst for short periods to 512Kb (compare with a typical home broadband connection of 1.2-5Mbs). This shared Internet connection is generally available to the science party as long as Healy is operating below 75N latitude. Between 75N and 80N, usability can suffer and degrade, and above 80N it is generally not available at all. Due to this limited bandwidth, Internet access is restricted on board Healy to shared use General Purpose workstations. Individual laptops will have access to local intranet resources, but not the Internet.

Email is restricted to 3Mb per message when operating with Ku band VSAT. When Healy is beyond the reach of Ku band satellite coverage email is still supported via Iridium but the size restriction is reduced to 400Kb.

For guidance on the use of the Healy Shipboard Science Network see the **Acceptable Use Policy** The following general usage statements shall govern the internet usage on board Healy by Science party members. The Healy Shipboard Science Network provides 11 general purpose (GP) workstations for Science party use. These machines have filtered Internet access. The Healy firewall is set to restrict access to gambling, hate sites, pornography, etc. We can add legitimate sites as exclusions to the filter database should you encounter a legitimate website that is being blocked. Bring it to the attention of the on board technician.

Location	Type	Operating System	Quantity
Chief Scientist Stateroom	Apple iMac	Windows 7	1
Future Lab	Apple iMac	Windows 7	4
Main Lab	Apple iMac	Windows 7	1
Science Library	Apple iMac	Windows 7	5

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E-mail

The Healy Shipboard Science Network provides 7x24 email delivery with your shipboard account. Your email address while on Healy will be in the form of *firstname.lastname(at)healy.polarscience.net* (e.g.**paul.smith(at)healy.polarscience.net**). The "first name [dot] last name" for your e-mail address is derived from the cruise planning form submitted by the Chief Scientist (**http://www.icefloe.net/forms/submitted.php**). Please make sure that your name has been spelled correctly on this form. Any changes will need to be made by the Chief Scientist prior to the creation of your email account. Email accounts will be activated one week prior to the leg sailing date.

You are encouraged to set an "Out of Office" notification before you leave your home institution to let people know your temporary email address. Please do not auto-forward your office or personal e-mail accounts to your Healy account. We can generally tell if this occurs and we will ask you to turn it off or we may block it at our shore server.

An example is: *"I am presently at sea on the Coast Guard Cutter Healy. I will be away from my desk from mm/dd/yy to mm/dd/yy. During this time you may address email to me at the following address: "first.last(at)healy.polarscience.net." While on board Healy my e-mail has a size restriction of 400KB including any text, attachments, and email headers. Please limit e-mail sent to this address to necessary correspondence which must be seen before I return." The size limitation may be set as low as 400Kb at high latitudes.*

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Network Availability

The Healy Shipboard Science Network provides multiple network drops in science workspaces for Science party users to connect personal laptops and other visiting equipment. Please ensure your laptop software and antivirus clients are updated before you leave home. Consider buying and bringing an external USB drive to backup your machine while you're here. Please do not plan on using any internet based disk drives, iDisks or similar network storage solutions to synchronize data between your laptop and shore. There is also 802.11b/g wireless access to the Shipboard Science Network in berthing and Science workspaces so plan on bringing your wireless enabled laptop or pc card

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File Transfers

We can move files between the ship and shore by FTP if necessary. File transfer is allowed from the public workstations while we have Internet connectivity. At high latitudes we make provisions for file transfers via our shore facility using Iridium. Due to the very limited bandwidth over Iridium this must be coordinated with the on board network technician. Should you need to transfer files to, or pickup files from the Healy, you may contact **ESUSeattleScience@uscg.mil** for instructions. Persons on board Healy should contact the on board systems administrator for instructions.

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Authorization for User Accounts

Science Network user accounts may be created after being authorized by one the following:

- Commanding Officer of the Coast Guard icebreaker
- Coast Guard Pacific Area icebreaker Program Manager
- Chief Scientist of the current Science mission

User accounts requests may be made by the following methods:

- Science planning form on IceFloe.net
- E-mail to embarked ESU admin, with CC to ESU Science Branch Chief

User accounts will be removed at the end of the cruise year. Files and email will not be saved.

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Printing

The Healy Shipboard Science Network has several HP M475 printers on the network which print in color, scan, and copy. There is also one large format printer in the Computer Lab. Toner supplies are limited so please do not plan on printing large documents.

Printer Location	Printer Name	Capability
Chief Scientist Stateroom	ChiefSciMFP	Print, Scan, Copy
Computer Lab	CLabPlotter	Large Format printing
Computer Lab	ComputerLabMFP	Print, Scan, Copy
Future Lab	FutureLabMFP	Print, Scan, Copy
Main Lab	MainLabMFP	Print, Scan, Copy
Science Library	SciLibMFP	Print, Scan, Copy

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Small Boat Support

Scientist planning to routinely use the small boat for science sampling from Healy are required to bring and wear an **MSD 900** or equivalent dry suit.

HEALY carries one 38 foot aluminum hull cargo boat (LCVP) as part of normal outfit. If a mission requires, HEALY can carry a second cargo boat or 38 foot arctic survey boat (ASB) based on the same design but with a cabin to accommodate counter space and power for limited science operations independent of the ship. These boats are launched by crane and require good environmental conditions for launch and recovery. HEALY also carries two rigid hull inflatable boats (RHIB) that are seven meters in length. Each RHIB is launched with Miranda type launch and recovery system, which can be used in a wide variety of weather/sea conditions and can accommodate up to 9 passengers. Ice and weather conditions will dictate whether small boats can be safely operated in support of scientific operations. Small boat support needs should be addressed as part of the cruise planning process.

- **LCVP Specifications**
- **ABS Specifications**

LCVP & ABS Specifications (Healy)

LCVP Specifications

LCVP Specifications	
LOA:	38 Feet
Beam:	12 feet
Displacement:	19,000 pounds maximum including hull, machinery, outfit, personnel, fuel, and embarked cargo and equipment.
Crew:	Normally 3 persons
Endurance:	6 Hours
Speed:	Smooth water - Top speed of approximately 22 knots 3 to 4 ft. seas - 17 knots with 15 knot winds and a load of 3 to 9 passengers. *Note: Vessel shall be able to operate safely in average seas of 6 feet in height at appropriate speed.*
Capacity:	3,000 pounds of cargo or equipment.
Hull:	No less than ¼" welded nonheatreatable marine aluminum alloy (5083 or 5086).
Decks:	No less than 3/16" welded nonheatreatable marine aluminum alloy (5083 or 5086).
Wheelhouse:	54" wide x 60" long.
Propulsion machinery:	Two Volva-Penta KAD43P/DP 230 horsepower diesel inboard/outboard drives with counterotating propellers sized for the projected speed of the LCVP at maximum load condition.
Outfitting:	12 VDC winshield wiper, 12 VDC window defrosters, fold-out dive platform, Furuno GPS Navigator GP31, DS30 Standard depth sounder, ICOM IC-M59 VHF radio, Standard Horizon LH% with PA/60 horn and deck speaker, Ritchie 5 " lighted compass, 12 VDC horn, bow-ramp anchor roller, Marithane stern roller with 12 VDC vertical axis windlass chain wildcat w/gypsy head rated at 1200 lbs of pull,Group 24 batteries, 8 breaker DC power panel, Statpower True-charge 40 batterey charger, 02 marine cigarette-plug style power outlets, 30 amp 110 VAC shore power system, engine compartment and wheelhouse heaters, lighting,12 VDC bilge blowers, two 2000 GPM 12 VDC bilge pumps,250 gallon fuel tank, lever controlled searchlight.

ABS Specification

The ASB shall be exactly like the LCVP's with the following exceptions:

ABS Specifications	
Wheelhouse:	122" wide x 144 inch long.
Machinery:	8 KW Northern Lights generator
Outfitting:	3 person cushioned seat, 2 person leaning post/folding seat, 60" x 24" science workbench, Galley sink, microwave oven, 72 quart ice chest with seat cushion, portable toilet with 6 gallon holding tank, privacy curtain, 3" heavy duty davit with 12 VDC Rule Model 500 winch, two 10 gallon portable water tanks. Optional Item D-90-32 Spare LCVP Replacements. Requires contractor to provide two additional LCVP's exactly like those listed above. Two additional cradles shall also be provided.

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LCVP & ABS Specifications (Healy)

LCVP Specifications

LCVP Specifications	
LOA:	38 Feet
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- Uncontaminated Seawater Science Trials test report

Science Incubator Seawater

- Uncontaminated seawater Incubator science trials test report
- HEALY AWS 2002 Ambient Seawater supply solution description
- AWS 2002 science summary of Ambient seawater supply
- JJMA Healy Science Seawater Modification Plan
- Sea chest Design
- Centrifugal Separator
- Seawater pump
- www.monoflo.com

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Original Specs for Healy Science Seawater System

503-2 Selection of Equipment

Exerpt Source

2.9 Recirculation

Centrifugal pumps that will operate at or near shutoff during a service condition shall have means for recirculation. As a minimum, fire pumps, main sea water pumps, and the science seawater pump shall be furnished with recirculation. The amount of recirculation shall be sufficient to prevent overheating of the pump when operating at shutoff and to REV 03, 09-30-94 prevent vaporization of the liquid being pumped. For additional recirculating piping details, see the specifications for the piping system served by the pump.

503-4 Centrifugal Pumps 4.12

All centrifugal pumps except for the science seawater pump shall be designed and built in accordance with ASTM F998.

503-4 Centrifugal Pumps 4.13

The science seawater pump shall be of all titanium or GRP construction. If a titanium pump is used it shall be provided with ASTM B367 titanium casing, impeller and wearing rings and a stainless steel shaft. If a GRP pump is used it shall be built to ANSI/ASME B73.1M standards for chemical process pump with all wetted parts corrosion resistant and nonmetallic.

521 Seawater Service Systems

Exerpt Source

521-5 Uncontaminated Science Seawater Supply 5.1

A science seawater pump rated at 50 gpm shall supply seawater to three manifolds in the Main Lab, two manifolds in the Wet Lab, two manifolds in the Bio/Chem Analysis Lab, and to sinks in the Science Staging Area, Climate Control Chamber and each van position. The science seawater pump shall also supply flow to a scintillation counter and an automatic salinometer. The science seawater pump shall take suction from a seachest which is as far forward as possible but not less than 30 percent of the ship's length aft of the forward perpendicular. MOD A00023 (FMR-7) REV 03, 09-30-94 MOD A00109 (FMR-29) REV 12, 10-31-97 MOD A00112 (FMR-31) MOD A00114 (FMR-30) An all-titanium or GRP simplex strainer with 3/16-inch basket perforations shall be installed at the pump suction. Total clear area of the basket perforations shall be not less than four times the area of the strainer discharge connection.

521-5 Uncontaminated Science Seawater Supply 5.2

The science seawater pump and its associated piping shall be arranged and insulated so that the seawater temperature does not change by more than 0.3 degrees F when being pumped from the sea chest to any service. An overboard bleed line with automatic pressure control valve located in the vicinity of the wet labs shall be provided to permit maintaining supply main sea water velocity at not less than eight feet per second to prevent marine growth in the supply main under all seawater demand conditions. Drains shall be provided to permit draining the entire system, as well as individual branches when not in use, to prevent marine growth.

521-5 Uncontaminated Science Seawater Supply 5.3

The science seawater pump shall have a local start-stop control and remote start-stop control from one wet lab.

521-5 Uncontaminated Science Seawater Supply 5.4

"Pump running" indicator lights shall be provided at both sets of controls.

521-5 Uncontaminated Science Seawater Supply 5.5

Suction vacuum/pressure and discharge pressure gauges shall be installed at the pump.

521-5 Uncontaminated Science Seawater Supply 5.6

A digital temperature sensing device, with display in ECC (see section 202), shall be installed to obtain seawater temperature that is not affected by cutter generated heat. This information shall be supplied to the Science Data Network.

SECTION 503

PUMPS

LIST OF TABLES

503-1 SCOPE

1.1 This section contains the general requirements for pumps. Specific requirements for systems are contained in other sections.

503-2 SELECTION OF EQUIPMENT

2.1 The Contractor shall develop a pump table giving pump characteristic data as illustrated by Table 503-1. During the design, the Contractor shall provide pump head, flow, and Net Positive Suction Head (NPSH) calculations together with pump curves.

2.2 After the development of pump suction and discharge piping, and after pump locations are selected, the Contractor shall verify that all pump performance characteristics are suitable for the intended service and compatible with the hydraulic characteristics of the system served.

2.3 The number of different kinds of pumps shall be minimized. Pumps for the same service and capacity shall be identical.

2.4 Pumps of identical design shall have the same rotation and be to the same hand.

2.5 To the maximum extent practicable, pumps installed in the cutter shall be fitted with mechanical seals.

2.6 Pumps shall be sized to serve connected systems, machinery and equipment during all specified service conditions.

2.7. Where centrifugal pumps are required to operate in parallel, or take suction from different sources and discharge into a common line, their characteristics shall be such that each pump will carry its appropriate share of the load.

2.8. Fire pumps shall be capable of parallel operation. Each pump shall have a characteristic curve such that at constant rated speed the total head at shutoff is not less than 10 percent and not more than 20 percent above rated total head at rated capacity.

2.9. Recirculation - Centrifugal pumps that will operate at or near shutoff during a service condition shall have means for recirculation. As a minimum, fire pumps, main sea water pumps, and the science seawater pump shall be furnished with recirculation. The amount of recirculation shall be sufficient to prevent overheating of the pump when operating at shutoff and to

prevent vaporization of the liquid being pumped. For additional recirculating piping details, see the specifications for the piping system served by the pump.

2.10 Suction and discharge nozzles shall be at least equal to ANSI standards for flange diameter and thickness and shall have ANSI standard drilling. All connections 1-1/2 inches and above shall be flanged.

503-3 INSTALLATION

3.1 Location of pumps, together with piping design and arrangement, shall provide the highest practicable NPSH available for the pumps.

3.2 Each pump shall have a pressure gauge connected between the pump and the stop valve in the discharge pipe. The gauge shall be mounted on a nearby gauge board; see 504. A test connection (with valve) shall be provided on the suction side of each pump. Fuel oil transfer, lube oil transfer, and hydraulic oil transfer pumps shall be furnished with suction side vacuum-pressure gauges.

3.3 To prevent distortion caused by relative movement between vertical and horizontal structures, vertical pumps shall be supported either by a horizontal foundation or from a vertical structure, but they shall not be jointly supported by a horizontal foundation and a vertical structure. On horizontal units, the pump and its driver shall be mounted on a common base of rugged construction arranged with suitable driplip or drain pan construction.

3.4 Bases for pumps shall be provided with troughs with screwed plugs arranged to permit draining the trough to a three gallon pail.

3.5 Relief valves for positive displacement pump discharges shall be located to protect both pump and system from overpressure. In addition to general requirements in 505 relative to sizing and setting, the relief valve shall be sized to pass full rated pump capacity at a pressure not exceeding 125 percent of the pump rated discharge pressure.

503-4 CENTRIFUGAL PUMPS

4.1 Centrifugal pumps shall be selected to operate at or near the maximum efficiency point on the head-capacity curve and shall have non-overloading power characteristics. The motor horsepower rating shall at least equal the maximum power requirement of the pump at rated speed. The Contractor shall prepare characteristic curves and other data, such as suction limits and net positive suction heads, that show the designed performance of the pumps throughout their operating ranges in accordance with CDRL seq. no. 503-1.

4.2 All coupled pumps shall be directly connected to drivers through flexible couplings for horizontal units and flexible or rigid couplings for vertical units.

4.3 Dowels or fitted bolts shall be installed where necessary to maintain proper alignment between the pumps and associated drivers when mounted on a bed or skid.

4.4 Close coupled motor driven pumps shall be suitable for either horizontal or vertical installation with thrust bearings provided to take the thrust load and the weight of all moving parts. Pump and motor shall be mounted on a common shaft, fully protected against wear and corrosion. Suction piping connected to this type of pump shall be arranged so the impeller can be removed without disturbing the suction cutout valve.

4.5 Each pump nozzle 3 inches nps or larger shall be provided with a boss for a pressure gauge connection. Casings shall have openings of adequate size at the top for venting and shall have a low point drain.

4.6 Mechanical seals and sleeves shall not be positioned by use of set screws.

4.7 Mechanical seal internals for seawater pumps shall be constructed of monel. Elastomers such as bellows and 'O' rings shall be made of fluorocarbon (viton) material.

4.8 Seawater pumps shall be provided with cyclone abrasive separators. Fittings for the separators and pump casings shall be of the straight thread type adapter with "0" ring seal.

4.9 Pumps handling black and gray water shall have double mechanical seals with pressurized sealing oil chamber. Progressive cavity pumps

may be furnished in lieu of centrifugal pumps for black/gray water transfer services.

4.10 Where water is piped to a mechanical seal, a root valve shall be provided at the source.

4.11 Vertical units fitted with rigid couplings shall be designed so that the thrust load and the entire weight of all moving parts shall be carried by a thrust bearing located in the motor. Pumps that require bearings shall be equipped with sealed, deep-grooved ball bearings contained in housings and removable as a unit with the pump shaft.

4.12 All centrifugal pumps except for the science seawater pump shall be designed and built in accordance with ASTM F998.

4.13 The science seawater pump shall be of all titanium or GRP construction. If a titanium pump is used it shall be provided with ASTM B367 titanium casing, impeller and wearing rings and a stainless steel shaft. If a GRP pump is used it shall be built to ANSI/ASME B73.1M standards for chemical process pump with all wetted parts corrosion resistant and nonmetallic.

503-5 POSITIVE DISPLACEMENT PUMPS

5.1 Preferably, pumps shall be direct coupled to motors. However, where necessary, they may be provided with reduction gears, flexible couplings and supports for drives. The entire unit shall be a rigid assembly to ensure close and permanent alignment. Where the pump is internally lubricated by the fluid pumped, wearing parts shall be of design and materials so that the pump may be operated safely when pumping liquids without lubricating characteristics. Rotary pumps shall be of the following types:

a. Gear (Internal or External) or Lobe.

b. Screw (With or Without Timing Gears).

c. Sliding vane.

d. Any other type currently used on U.S. Navy ships or Coast Guard cutters.

5.2 Bearings shall be of the single row ball or roller type. Internal bearings of pumps may be of the sleeve type. Thrust bearings shall be provided where required to take residual end thrust on horizontal units and end thrust and weight of rotating parts on vertical units. Bearings shall be provided with oil seals except where bearings are lubricated by the fluid pumped.

5.3 Timing gears, when fitted, shall be of the helical or Herringbone type and machine cut. Rotors and timing gears shall be

accurately machined and positively secured in position to maintain the required clearance and prevent unnecessary wear.

5.4 Casings shall not be constructed of cast iron. Casings shall be designed so that operating parts may be dismantled without disturbing the suction or discharge connections. All connecting suction parts requiring alignment shall be doweled. Suction and discharge nozzles shall be provided with bosses drilled and tapped for 1/4 inch pressure gauge connections.

5.5 Shafts shall be designed to transmit the full motor output. Shafts shall be of corrosion resistant material or carbon steel, suitable for the liquid pumped. The shaft for the emergency fuel oil booster pump may be ductile iron.

5.6 The JP-5 service and transfer pumps shall be of bronze construction.

5.6.1The air operated helicopter defueling pump wetted parts shall be constructed of 316 stainless steel with compatible materials for diaphragms, valves, and valve seats suitable for pumping JP-5.

5.7 Materials for all other positive displacement pumps shall be of the following quality. Materials offering better performance may be provided:

a. Casings - Steel or nodular (ductile) cast iron.

b. Timing Gears (if required) - steel.

c. Rotors - Steel, bronze (Comp. G or M) or High Tensile Cast Iron having a minimum of 20,000 psi tensile strength.

d. Shafts - Corrosion Resistant Steel or carbon steel. The shaft for the emergency fuel oil booster pump may be ductile iron.

e. Glands and Gland Studs - Steel.

f. Gland Nuts - Brass.

g. Stuffing Box Bushings - Bronze (Comp. M).

503-6 ATTACHED PUMPS

6.1 Attached pumps furnished with diesel engines shall be of the manufacturer's standard marine model, suitable for the service intended.

503-7 NOISE AND VIBRATION

7.1 The noise and vibration characteristics of pumps shall be considered in pump selection to meet requirements of 073.

503-8 SPECIAL TOOLS

8.1 Special tools and equipment shall be provided, to meet the requirements of 083 for the inspection, maintenance, and repair of all pumps. These shall include noncommercial tools, wrenches, packing hooks, babbitting fixtures, bearing pullers, and similar items. Bolts and nuts shall be American Standard.

503-9 SPARE PUMPS

9.1 Arrangements shall be made for stowing the following spare pumps in the following locations:

P00017(HMR-001) REV 01, 04-04-94
DEV CD050 REV 02, 06-30-94
DEV CD051R1 REV 03, 09-30-94
DEV CD166 REV 06, 09-30-95
DEV CD420 (MOD A00099, FMR-26.2) REV 11, 04-30-97
DEV CD457 (MOD A00108, FMR-26.3) REV 12, 10-31-97

a. 1 main diesel engine attached lube oil pump, complete with drive gears; see 233. Pump to be stowed in the Ship's Stores.

b. 1 main diesel engine pre-lube pump. Pump to be stowed in the Corridor & Machy Stores area on the Main Deck, starboard.

c. 1 main engine jacket water cooling pump. Pump to be stowed in AMR No. 6.

d. 1 main engine jacket water warmup pump. Pump to be stowed in AMR No. 6.

503-10 EXTERNAL REFERENCES

REFERENCE	TITLE	PARAGRAPH
ASTM F998	Centrifugal Pumps, Shipboard Use	503-4.12
ASTM B367	Titanium & Titanium Alloy Castings, Spec. For	503-4.13
ASTM B348	Titanium & Titanium Alloy Bars & Billets	503-4.13

503-11 CROSS REFERENCES

SECT/PARA	REFERENCE

503-3.2 504
503-3.5 505
503-7.1 073
503-8.1 083
503-9.1a 233

TABLE 503-1
SAMPLE PUMP TABLE

ITEM NO.	NO. OF UNITS	SERVICE	TYPE	CAPACITY	HEAD	DRIVE	HORIZ/VERT	MOTOR HP	PUMP RPM	REMARKS
1	2	MAIN SEA WATER COOLING	CENT	45 GMP	60 FT	MOTOR	V	150	3550	SINGLE STAGE

SECTION 521

SEAWATER SERVICE SYSTEMS

521-1 SCOPE

1.1 This section contains the requirements for the firemain, seawater sprinkling, anchor washing and the science seawater systems.

521-2 FIREMAIN

2.1 The firemain shall comprise all piping from the suction valves of the fire pumps to the hose valves of the hose stations and the branch root or cutout valves of other services.

2.2 General - The firemain shall be installed on the damage control deck. A single service riser shall be provided to supply firefighting hose stations in the same watertight subdivision. The installed AFFF proportioning station and each sea water sprinkling system shall be supplied by separate dedicated service risers. Non-vital services, such as ballast tank filling connections, within the same watertight subdivision shall be supplied by a single common service riser. Connections for vital services (see 521-2.5) shall be made so that the closing of cutout valves to non-vital services will not deprive the vital services of water. Service risers shall not penetrate main subdivisional watertight bulkheads. If the main, from which a service riser receives supply, is a horizontal run of piping, the connection shall be taken from the upper portion of the main.

2.3 Cutout valves - Cutout valves shall be installed to permit isolation of segments of the system for damage control and maintenance purposes. Cutout valves shall be installed in the following locations:

a. In main(s) on each side of their junction with pump risers.

b. In the main midway between the pump riser, unless no vital service riser connections are located between the pump risers.

c. If the water in the main can flow from only one direction a cut out valve shall be located in the main downstream of a junction with a vital service riser. Where this would require cut out valves in the main to be located with 10 feet of each other, only 1 valve is required.

d. In pump risers and service risers at their junction with the main.

e. In pump suction and discharge piping.

2.4 Flow and pressure requirements - The size of the fire main shall be such that when the main is supplying any combination of services having a demand equivalent to 100 percent of the total capacity of the fire

pumps at rated pressure, all services shall receive water at no less than their designed pressure.

2.5 Services - The firemain shall directly supply the following:

a. Firefighting hose stations (vital).

b. Seawater sprinkling systems (vital).

c. AFFF systems (vital).

d. Tank fill connections (non-vital).

e. Dewatering eductors (vital).

f. Anchor washdown (non-vital).

2.5.1 The firemain shall serve as a backup or emergency supply for the auxiliary seawater system, the auxiliary diesel generator seawater cooling system, and the propulsion motor cooling system.

2.6 Fire pumps.

a. There shall be three identical fire pumps supplying the firemain. Each pump shall be 1200 GPM.

b. The pumps shall be located below the waterline in separate watertight subdivisions and not in adjacent subdivisions. Fire pumps shall take suction from the sea bay or sea chest as described in section 256. Each pump shall be provided with a recirculation line, check valve, stop valve and hose valves in accordance with NAVSHIPS Dwg. 804-1385916 except the hydraulically operated valve at the sea chest is not required. The recirculation line shall be sized to pass three percent of pump rated capacity or in accordance with the manufacturer's recommendation. The two aft fire pumps shall recirculate into the recirculation/overboard main specified in Section 256. The forward fire pump shall recirculate into the fire pump sea chest suction. The fire pumps, including their suction lines, power sources, electric cables, space lighting, and space ventilation, shall be arranged so that a fire in any one compartment will not render more than one fire pump inoperable.

2.7 Hose stations.

a. Location and quantity - Hose stations shall be installed in quantity and location to permit reaching any weather deck area and below deck area (except machinery spaces) from at least two hose valves with 50 feet of hose. For the superstructure, hose stations shall be installed to permit reaching any area from two hose valves, at least one of which has only 50 feet of hose and the other shall have no more than 100 feet of hose. Hose stations intended for use on weather decks, flight deck and hangar to meet coverage requirements shall not be counted or used as interior hose stations. Interior hose station coverage shall be determined independently. In machinery spaces, hose stations shall be installed within the spaces to provide coverage of all areas with 50 feet of hose from at least two hose valves. Machinery space hose stations shall not be considered in meeting coverage requirements of other areas. In determining the reach of hose lines, allowance shall be made for line handling interferences, the rigidity of the hose under pressure, and an effective nozzle range of 25 feet. Hose stations shall not be installed within radio, radar, sonar or similar electronic spaces. Interior hose stations shall be installed in sufficient

number and location so that those lays will not cross watertight bulkheads or fire zones.

b. Equipment.

(1) Hose valves - Valves shall be globe or angle valves in accordance with NAVSHIPS drawings 803-1385711 and 803-1385712 as

applicable. Hose valves shall be 2 1/2-inch outside of machinery spaces and 1 1/2-inch inside machinery spaces. Fire plug outlets shall be located not more than 60 inches above the deck to allow for attachment of an in-line eductor with 60 inch suction hose.

(2) Wye gate - Each hose station outside of machinery spaces shall be provided with a wye gate. The inlet shall be 2 1/2-inch NH. The two outlets shall be 1 1/2-inch NPSH. The wye gate shall contain a ball valve for each branch. The wye gate shall be brass.

(3) Hoses - Hoses shall be 50 foot lengths of 1 1/2-inch hose in accordance with MIL-H-24606. Hose stations intended for use in the superstructure shall have two 50 foot hoses coupled together. Hose stations with wye gates shall have enough hose for both outlets (two lengths of 50 foot hose for each 50 foot hose station and four lengths for each 100 foot hose station).

(4) Hose racks - Hose racks shall be in accordance with Avondale Standard MS-16-HR-01. Stations with wye gates shall have two hose racks. Hose racks may be side-by-side or stacked vertically.

(5) Nozzles - Nozzles shall be 1 1/2-inch 95GPM Vari-pattern nozzles in accordance with MIL-N-24408. To prevent nozzles from banging against bulkheads, nozzles shall be secured in a manner which does not require any tools for removal. Stations with wye gates shall have two nozzles. The hose station protecting the deep fat fryer shall be provided with an additional 1-1/2 inch Coast Guard all purpose nozzle and a 4-foot applicator.

(6) Spanner wrenches - Two wrenches shall be secured to the bulkhead in a way that does not require any tools for removal.

2.7.1 Weather deck hose stations - Weathertight enclosures shall be provided for hose stations exposed to the weather. The enclosures shall be constructed of type 316L stainless steel. Cutout valves and drain cocks shall be provided upstream of the weather deck fire plugs and shall be located within the ship as close as practicable to the bulkhead penetration to prevent freeze damage to the external piping and fire plug. Enclosures shall be fitted with corrosion resistant latches to prevent swinging when enclosure doors are opened or when hoses are in use.

2.8 Shore connections and hose outlets

a. Hose valves shall be installed on the discharge side of each fire pump between the pump and the first stop valve. One 2-1/2-inch NH valve shall be installed for each 200-gal/min pump capacity, with a maximum of four valves. The pump riser shall continue beyond the main and terminate on the 01 Level in a manifold having the same number of hose valves as installed for the pump. One of the manifolds shall be on the port side and the other shall be on the starboard side. Hose valves shall be 2-1/2-inch

NH.

b. A drain valve shall be provided to prevent manifolds on weather deck from freezing.

c. International Shore Connections (Ship) in accordance with 46 CFR subpart 162.034 shall be provided. Two shall be stowed in each repair locker.

2.9 Monitoring and control.

2.9.1 Local monitoring and control of each fire pump shall be provided at the pump and shall include the following:

a. Fire pump discharge pressure gauge.

b. Fire pump suction compound gauge.

c. Start/stop push buttons.

d. Power available light (white).

e. Pump running light (green).

f. Local/remote selector switch.

2.9.2 Remote monitoring and control for each pump shall be provided as follows:

a. The control panels for the DCC and repair party lockers shall contain the following for each fire pump:

(1) Discharge pressure gauge.

(2) Start/stop push buttons.

(3) Power available light (white).

(4) Pump running light (green).

(5) Associated firemain sector pressure gauge.

b. The following parameters of each fire pump shall be independently controlled and monitored in ECC via VDT from the MPCMS; see section 202:

(1) Fire pump discharge pressure.

(2) Fire pump start/stop control and pump running indication.

(3) Associated firemain sector pressure.

(4) Fire pump suction pressure.

c. The AFFF hose stations within machinery spaces, the flight deck hose reels and the sprinkling controls for the Hangar and flight deck shall have start control for fire pumps and the AFFF proportioning station.

2.9.3 Local pressure gauges shall be in accordance with section 504. Electric transducers shall be provided for remote pressure indication.

2.9.4 The "power available" lights shall remain lit as long as the start buttons adjacent to them are capable of starting the fire pump(s).

2.9.5 The local/remote switch for a fire pump shall disable the remote start controls and darken the power available lights for that pump at the remote control panels when switched to local.

2.9.6 All push buttons shall have either "start" or "stop" written on or below the button.

521-3 SEAWATER SPRINKLING SYSTEMS

3.1 All control valves shall be located outside the protected compartment.

3.2 Local control for all seawater sprinkling systems shall be provided outside and adjacent to the entrance to the compartment protected.

Remote control for all seawater sprinkling systems shall be provided from the damage control deck. If the protected compartment is on damage control deck, the remote control shall be in adjacent watertight compartment on the damage control deck.

3.4 Operating instructions, which shall be photostatically engraved on a sheet aluminum plate in accordance with 602, shall be provided at each control station. The instructions shall identify the space being protected, give precise operating sequence, identify the specific boundary closures which must be secured and give precise instructions for reset of the system control and alarms.

3.5 Cargo sprinkling.

a. Cargo spaces larger than 900 square feet with the exception of the Flammable Liquid Stores, Refrigerated Stores and Frozen Stores shall be provided with dry type seawater sprinkler system in accordance with 505, NVIC 6-72 and 46 CFR 76.23. Storerooms and cargo holds which are divided by open archways or expanded metal shall be treated as one compartment. Sprinkler heads for the cargo spaces shall be in accordance with MIL-H-24686(SH).

3.6 Magazine sprinkling.

a. Dry type seawater sprinkling systems shall be provided to ammunition and explosives magazines.

b. The sprinkling rate for the magazines shall be 0.8 gpm/square foot of magazine overhead area where the height of overhead is eight feet or less. Where the height of the overhead exceeds eight feet, an allowance of 0.1 gpm/ft3 of additional gross volume shall be made.

c. Drain valves shall be provided at the lowest points of the supply piping and sprinkler piping. Compressed are connections shall be provided downstream of the sprinkler control valve.

d. Sprinkler heads for the magazine shall be in accordance with MIL-S-24660.

(1) Sprinklers shall be mounted in the upright

position using 360 degrees dispersion sprinklers and sidewall deflector types as required to achieve complete coverage.

(2) Sprinklers shall have 1/2-inch NPT connections and shall use orifice sizes necessary to achieve the required sprinkling rate and uniform coverage.

(3) Sprinklers shall be mounted with deflectors one inch form the overhead, where practicable. A minimum distance of 4 inches shall be kept between the sprinkler deflectors and any stored material.

521-4 ANCHOR WASHDOWN

4.1 Fixed nozzles supplied from the fire main shall be provided in the hawsepipes for washing down anchor chains. The nozzles shall be arranged so as not to interfere with the chain.

521-5 UNCONTAMINATED SCIENCE SEAWATER SUPPLY

5.1 A science seawater pump rated at 50 gpm shall supply seawater to three manifolds in the Main Lab, two manifolds in the Wet Lab, two manifolds in the Bio/Chem Analysis Lab, and to sinks in the Science Staging Area, Climate Control Chamber and each van position. The science seawater pump shall also supply flow to a scintillation counter and an automatic salinometer. The science seawater pump shall take suction from a seachest which is as far forward as possible but not less than 30 percent of the ship's length aft of the forward perpendicular.

MOD A00023 (FMR-7) REV 03, 09-30-94
MOD A00109 (FMR-29) REV 12, 10-31-97
MOD A00112 (FMR-31)
MOD A00114 (FMR-30)An all-titanium or GRP simplex strainer with 3/16-inch basket perforations
shall be installed at the pump suction. Total clear area of the basket perforations shall be not less than four times the area of the strainer discharge connection.

5.2 The science seawater pump and its associated piping shall be arranged and insulated so that the seawater temperature does not change by more than 0.3 degrees F when being pumped from the sea chest to any service. An overboard bleed line with automatic pressure control valve located in the vicinity of the wet labs shall be provided to permit maintaining supply main sea water velocity at not less than eight feet per second to prevent marine growth in the supply main under all seawater demand conditions. Drains shall be provided to permit draining the entire system, as well as individual branches when not in use, to prevent marine growth.

5.3 The science seawater pump shall have a local start-stop control and remote start-stop control from one wet lab.

5.4 "Pump running" indicator lights shall be provided at both sets of controls.

5.5 Suction vacuum/pressure and discharge pressure gauges shall be installed at the pump.

5.6 A digital temperature sensing device, with display in ECC (see section 202), shall be installed to obtain seawater temperature that is not affected by cutter generated heat. This information shall be supplied to the Science Data Network.

521-6 EXTERNAL REFERENCES

REFERENCE	TITLE	PARAGRAPH
NAVSHIPS Dwg. 804-1385916	Piping Diagram for Motor and Turbine Driven Fire Pumps	521-2.6b
NAVSHIPS Dwg. 803-1385712	Valve, Hose, Globe, Angle 2 1/2-inch, 250 psi	521-2.7b.(1)
NAVSHIPS Dwg. 803-1385711	Valve, Hose, Globe, Angle 1 1/2-inch, 150 psi	521-2.7b.(1)
MIL-H-24606	Hose Assy, Chlorosulfonated Polyethylene Impregnated	521-2.7b.(3)
NAVSHIPS Dwg. 805-860089	Rack, Hose, Assy & Dets, Metal	521-2.7b.(4)
MIL-N-24408	Nozzles, Fire Hose, Combination Aqueous Film Forming Foam, Water Spray, Adjustable Pattern	521-2.7b.(5)
46 CFR 162.034	International Shore Connection (Ship)	521-2.8c
NVIC 6-72	Guide to Fixed Firefighting Equipment Aboard Merchant Vessels	521-3.5
46 CFR 76.23	Manual Sprinkling System Details	521-3.5
MIL-S-24660	Heads, Sprinkler & Washdown	521-3.6d
MIL-H-24686(SH)	Sprinkler, Automatic, Thermo-Sensitive	521-3.5a

521-7 CROSS REFERENCES

SECT/PARA	REFERENCE
521-2.6b	256
521-2.9.2b	202
521-2.9.3	504
521-3.4	602
521-3.5	505
521-5.6	202

FLOW THROUGH and UNDERWAY DAQ SYSTEMS
aboard USCGC HEALY

Report on work accomplished during Leg2, Science Ice Trials

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INTRODUCTION

Our task during Leg2 of the Science Ice Trials aboard Healy was to test 1) The Uncontaminated Science Seawater System (USSS), that supplies 2) the Sea-Bird model 21 Thermosalinograph (TSG) instrument and 3) the Turner Designs model 10 AU Fluorometer. In addition, we were tasked with testing the flow to the on-deck incubator (not yet installed) which we did in collaboration with Terry Whitledge (see separate report). The test protocols (Test Description Sheets) were not supplied to the UTMSI team until after we debarked from St. Johns at the start of Leg 2, hence we were not aware of some of the test requirements, especially for the Fluorometer, until sailing time. Consequently there were certain supplies and equipment not available to us to complete the tests as in the test specifications. However, we have used the test protocols as guidelines to do the work, but have also drawn on our experience with flow through systems to modify the procedures and comment in this report on deficiencies and make appropriate suggestions. Formal test numbers are as follows

1) 8C521D541 Proper operation of the USSS system
2) 8C666D542 Operational readiness of the TSG in a cold weather environment
3) 8C666D541 Operational readiness of the Fluorometer, Model 10-AU-005 in a cold weather environment.
4) 8C666D544 Demonstrate Healy's capabilities of the Uncontaminated Science Seawater Incubator.

We also came prepared to work on a software system that Amos has devised to acquire data from the various environmental sensors, including the TSG and Fluorometer. Interest in having such a software system for Healy had been expressed by participants at various Research Vessel Technical Enhancement (RVTEC) meetings by Coast Guard attendees. A preliminary version of the software was sent to the USCG following the International Marine Technical (INMARTECH) meeting held at Scripps Institution of Oceanography in October 1998 but no follow-up ensued. The Amos system was modified during Leg2 and is currently up and running in a prototype version (see Appendix).

1) The Uncontaminated Science Sea Water System supply (8C521D541).

There are several critical aspects of any USSS that must be met:

- By definition, that the water supply be uncontaminated by ship-generated chemicals and oils (not part of this test).
- That there be adequate flow rate.
- That the temperature of the supply at any point where available for use match that of the ambient sea-surface water. This is particularly important in a vessel like Healy that operates in a cold water environment.
- That the USSS intake must not be blocked by ice while the vessel is in the ice pack.
- That the supply not be infused with air bubbles during operation of thrusters and the Dynamic Positioning System (DPS). If this is unavoidable, that a de-bubbling unit be installed in those lines where cavitation would give false readings.

Test Procedure

We first located all of the USSS outlets. Some location had two outlets on the same lines (table 1). We tested all of these. There are a total of 21 individual outlet points (Fig 1) in the USSS, of which we tested 20 (one was capped off and unavailable). The interior outlets had spigots and hose attachments that facilitated the performance of the tests. Many of these had thermistors permanently inserted with a data logger and printout available (see report by John Freitag). None had flow

meters in-line, nor was there a flow meter available for the test as required by 8C521D541. To measure flow rates, we made up a hose that was long enough to reach available sinks (many of the interior outlets are located above spaces that should be kept dry). A 2-gallon bucket was found and calibrated using a measuring container borrowed from the galley. A digital immersion thermometer measuring to the nearest 0.1C, as required by the test protocol, was borrowed from Jim Arias. The range of this instrument (-50 to +350C) was too wide to provide accuracy of the degree desired.

The measuring method employed was to attach the hose and lead the end to a sink, open the spigot fully, and allow the water to run with the immersion thermometer inserted into the hose end until an equilibrium was reached. Then the bucket was filled to the calibration mark and the elapsed time noted using a digital watch. Data were entered in a log sheet (included in the attachments to this report). The thermistor data logger was set to 30-second intervals during these tests and the underway logging system recorded the TSG temperature throughout. There is no way measure the flow at the sea chest as required in 8C521D541. Two thermistors are inserted in the USSS line close to the intake. These record on a separate data logger that was set to record at once per minute. The data loggers seemed to be overly complicated and it took John Freitag and Jim Arias a long time to get them to record the temperatures properly. There was an RS232 data port but they were not able to configure, so we recorded all data on the "Grocery Tape" printer. Later these data were transferred to a spread sheet by hand entry.

None of the outlets on the weather decks were equipped with spigots or hose bibs. These had been secured with flange caps that were removed by the MSTs before we performed the tests. Essentially the same procedure was used as with interior locations, but the water from each outlet had to be discharged on to the deck Here we had to rely solely on the digital thermometer for discharge temperature measurements. Unfortunately, moisture got inside the thermometer electronics and, although the instrument was still functioning, reading the faint display was difficult and prone to error (only the top half of each digit was displayed).

Results (with reference to 8C521D541Demonstration Procedure page2 where appropriate

1 UNCONTAMINATED SCIENCE SEAWATER SUPPLY FLOW TEST

1.1 The PUMP RUNNING indicator light at local start/stop control point is working .

1.2 Cannot verify that there is 50 GPM flow at the sea water pump. It is doubtful that 50GPM is available, nor is it desirable for most USSS applications.

.

1.3 Sea water temperature at pump measured successfully. Figure 2 graphs the data at one-minute intervals throughout the duration of the test (1030 to 1420 local time, 06 June 2000, blue trace). It was fortuitous that during this interval we traversed from open water with sea surface temperatures of >4C to the ice and the required 8/10 cover at <-1C.

1.4 Table 2 lists the flow rates (last column) measured at the locations specified. Rates vary from 0.9 to 6.5GPM. The low rates are in the climate control chambers and are due to the small diameter delivery spigots available there. Highest flow rates are on the 02 level science van supply outlets that do not have spigots installed yet. The mean flow for all supply outlets is 4.3 GPM. In Table 2, the temperature at each outlet is listed as measured by the thermistor at those locations where they are installed, by the digital thermometer, and by the supply thermistors at the time the flow rates were measured.. The data are also graphed in Figure 2. Note that degree of warming in the pipes as indicated by this test varies from -0.1 to +1.4C, depending on location. The mean is +0.6C. The mean difference between the two temperature measuring devices is 0.0C, although the standard deviation is quite high. However, we believe that the mean of the two thermistors at the pump intake is within 0.1C of the actual temperature at the intake depth of 8m. An important outlet is C4 in the biochemical laboratory. This supplies the Fluorometer with its flow through supply. The temperature difference here is +0.4C and the flow rate 4.5GPM, perfectly adequate for the Fluorometer operation. Perhaps the most important of all in respect to knowing the degree of warming in the pipes is the Thermosalinograph supply. This is plumbed in such a fashion that its temperature and flow rate cannot be measured directly. Flow to the TSG must be turned off before one can externally monitor the flow rate and temperature (see the next section).

2 SHUTDOWN PROCEDURES

2.1 Pump was secured at entrance to Nuuk harbor.

2.2 Entire system not drained as it will be used on Leg 3

Problems and Recommendations will be listed at the end of this report.

1) The Thermosalinograph or TSG (8C666D542)

The protocol called for a testing time of 2 hours but we felt that it would be much more instructive to run the TSG throughout the cruise. Measurement was required at a sea water temperature of 27.5F (-2.5C). There is no normal temperature in the world ocean that is -2.5C. The temperature range throughout the cruise was from -1.1 to +4.8C (30.3F to 40.6F), most of which was encountered during the testing phase above.

Test Procedure for Thermosalinograph with reference to 8C666D542 (page 2)where necessary

1 PREREQUISITES

1.1 We have no knowledge of previous testing of the TSG before Leg2

2 TEST CONDITIONS

2.1 The vessel was in a cold water environment throughout the test.

2.2 As noted above, the sea water temperature requirements are not attainable, except at the upper limit.

3 TEST INITIALIZATION

3.1 System Configuration

1. There was no figure 1 in the test description sheet but we confirm that the TSG is properly configured.

3.2 Initializing communications

The TSG was turned on as per 1 through 5 in the Test Description Sheet and operated normally. We consider that the prime test for the veracity of the TSG operation is to compare the TSG output both in temperature and salinity with that obtained at the same time by a CTD cast with accurate sensors measuring at the depth of the USSS intake (8m). Additional data may be collected by drawing water from the USSS line and running the salinity on the Guildline Salinometer. We noted that the TSG frequently showed considerable noise on the trace as displayed on the data acquisition computer. This was obviously due to bubbles in the line. When noise occurred, It could sometimes be quieted by adjusting the flow rate to the TSG using the valve on the port side forward bulkhead in the biochemical laboratory. Bubbles can be heard coursing through the pipe. The adjustment is not always successful. We noted that the problem was frequently exacerbated by the operation of the thrusters and the DPS. We noted no particular increase in the noise when Healy was in the ice during Leg2. The appearance of noise, other than when thrusters were on was random. A de-bubbling device has been delivered to the ship but we could not plumb this in to the line due to lack of appropriate hose and plumbing fittings. It is expected that the noise problem will be minimized when the de-bubbler is installed.

Table 3 shows the differences encountered between CTD and TSG. In these tests, the temperature difference can be considered to be warming in the pipe as both CTD and TSG sensors are essentially the same. The mean warming is 0.43 C and a correction of -0.43 applied to the TSG would correct the output to within +- 0.1C. It is interesting to note, and almost counter-intuitive to observe, that the colder the sea temperature at the intake, the greater the degree of warming. This can also be seen by examination of Figure2. The degree of warming, around 0.4C, is in agreement with that obtained during the flow through tests.

The salinity comparisons are not so encouraging. Two outliers of -0.224 and +0.296ppt are unacceptable (Table 3). Normally, we don't expect salinity differences of consequence between the CTD and the Thermosalinograph. It should be noted that there are problems with one or both CTD conductivity sensors, but these test were conducted using samples from the Carousel, run on the Salinometer and hence independent of CTD data. We have complete confidence in these results We have asked Rich Findley if he would collect some more samples to run on the Guildline Salinometer during leg 3.

Test Procedure for model 10-AU-005 Fluorometer (8C666D541).

We did not perform the detailed test procedures outlined in this test description sheet. These were mostly involved with setting up and calibrating the Fluorometer using samples and blanks. Healy has no material or equipment necessary for performing such tests. Although a discrete sample cuvette and holder is available, the Fluorometer is set up to be used in flow through mode with a flow through cell. It is our experience that scientists coming aboard to use the Fluorometer in this mode would wish to do their own calibrations and would do this by filtering samples collected at intervals and doing chlorophyll extractions. The extractions would be run on a separate Fluorometer set up for discrete sampling (it is not practicable to alternate between flow through and discrete sampling with the same Fluorometer during a cruise. The procedure would mean taking the flow through instrument off line and losing data in the process.

We did set up the Fluorometer with hoses to the sink in the biochemical laboratory and followed the usual procedures of setting up the 10 AU using the menu as described in the test procedure. The Fluorometer was operated continuously throughout the cruise and the values appeared to be reasonable and varied as expected in the cruise area. There was not much of a change in the surface Chl-a in this region at this season and no phytoplankton blooms were observed..

PROBLEMS AND RECOMMENDATIONS (not listed in any particular order)

- The sinks in the science laboratories must be provided with proper drains. Presently they overflow onto the lab floors.
- The Fluorometer needs to be re-plumbed to avoid having hoses snaked along the floors and draining into the sink.
- The de-bubbler should be installed in-line with the Fluorometer and TSG to reduce the noise on the record caused by air bubbles in the USSS.
- The Thermosalinograph is capable of outputting three decimal digits yet the data string on the Shipboard Data Network (SDN) contains only two. Perhaps the TSG output should be sent directly to the (SDN) rather than through a dedicated computer (although the monitor display is useful to have in the lab).
- Some data losses seem to occur when perhaps stray RF fields from equipment start ups cause RS232 lines to drop out. This occurred with the air temperature sensor data line. A dropout of GPS data also occurred earlier in the cruise but this might have been due to other problems.
- We recommend that an electronic barometer and relative humidity sensor be added to the suite of meteorological equipment.
- Other equipment that would be useful additions to the underway system are solar radiation for the meteorological system and a transmissometer for the flow through.
- We would like to have the NMEA string BWC (waypoints) added to the data available on the SDN.
- Spigots and hose-bibs must be attached to the weather deck outlets of the USSS. Until this can be done, the protective flages removed for our tests should be re-installed

In general, the Healy is a fine ship and she is an excellent scientific platform for work in the Arctic. Although we did not experience rough weather on this leg, her sea-keeping capabilities are first rate. The problems described are generally minor

and mostly “growing pains. We enjoyed our brief stay aboard and are glad that we were able to contribute to Healy’s growth as a research vessel. The officers and crew were friendly and most capable. We hope to be back on board soon.

APPENDIX

I (Tony Amos) was pleased to be able to contribute a modified version of my underway software to the ship. I had hoped to write a detailed description of the system and further modifications that could be made to the programs. This appendix contains daily log sheets and plots acquired through the underway program (with the exception of the first two and the final day). Note how the data density improved dramatically after the program was compiled and shifted to another computer. Most of the gaps before then were due to conflicts of running the program on my laptop while trying to develop the Healy version and do other tasks at the same time. I will communicate with the ship after returning to Texas and will be available electronically, so to speak, if you have problems.

Uncontaminated Science Seawater Incubator Testing
USCGC Healy
Science Sea Trials, Phase IV, Leg 2

A preliminary test of the uncontaminated science seawater incubator was undertaken. This unit has several obvious problems that will require changes before and/or during the first scientific uses of the incubator system. This preliminary test is intended to document the present state of the incubator system and to offer some suggestions for changes that may meet some of the operational requirements. It should be noted that it is a rare ship that can fulfill all of the stated requirements. Normally the most important requirements are optimized. For instance, some zooplankton incubations do not require sunlight but must maintain surface seawater temperatures while others have a critical need for direct sunlight without shadows as well as the ambient seawater temperatures.

Incubator Requirements (in approximate rank order):

1. Full sunlight with no shadows from vessel structures
2. Cooling water at sea surface temperatures
3. Incubator drainage that does not present safety hazard
4. Direct access to incubator location from lower weather decks
5. Electrical power to operate lights and mixing devices
6. Clean air and water to minimize contamination of samples
   A. Normal seawater system for temperature regulation only
   B. Uncontaminated science seawater
7. Low vibration environment

Day 5 report (Thursday 8 June 2000)

Uncontaminated Science Seawater Incubator Status:

An incubator was not available for testing purposes, however several known deficiencies would make a total incubator test impractical and a waste of time. The major problem with the existing incubator system is the warm cooling water that is several degrees above ambient surface seawater temperatures. This is caused by using the fire control water source which has waste heat added to it. It was decided that a check of the flow rate and temperature of the existing system was needed and a quick check of the distribution manifold if possible. The hose connecting the fire main to the distribution valve could not be located so only flow rate and temperature measurements were collected from the main valve. It should be noted for the record that the only access to the incubator site requires passage through interior passageways. Carrying bottles of water through the interior is not advisable or practical.

Summary:

The flow rate test was conducted with a bucket and stopwatch with the valve fully open. Two gallons of water were collected in 3.6 sec at a temperature of 11.8 °C. This is roughly a flow rate of 33 gallons/ minute and well below the test criteria of 50 GPM. The temperature of the uncontaminated scientific seawater was 1.86 °C for a differential of approximately 9.4 °C. The incubation area was not fully assessed with regard to sunlight because there are serious shadow problems with the nearby exhaust stacks. See the recommendations below for suggested alternatives. The gang distribution manifold could possibly be operational but it was not tested. The probable flow rate from the five manifold valves should be about 6 GPM from each valve.

It should be noted that piping for uncontaminated scientific seawater system does not extend to the 04 deck where the incubation system is located. Even if the piping were present there would not be enough pressure to reach the 04 level thus requiring the installation of a larger pump. The lack of access to the incubator site from the weather decks below is a big issue that cannot be satisfactorily remedied with cranes or hoists. Many of the incubations require multiple trips between the incubators and the scientific

laboratories for rapid processing of the samples. The present area is simply too far removed from the scientific laboratories to be useful. While an extensive search was not undertaken it was also noted that electrical power was not available nearby at the present location. Lastly, it was noted that there were considerable amounts of fumes from the exhaust stacks and the aft portion of the nearby stack was discolored by soot. Since several severe problems exist for this system in the present location, recommendations below will concentrate on other locations that offer more options.

Recommendations:

There is no ideal site that will fully satisfy incubation needs. There are some options near present outlets of the uncontaminated scientific seawater system on the weather decks. The most likely site is probably on the 02 deck at a van location on the port side not too far from the helicopter shed. The flow rates of the two spigots (6.4 and 6.1 GPM) from the uncontaminated seawater system at this site are quite good and the temperature was only about +0.49 °C above ambient over the range of –1.0 to +4 °C (See uncontaminated scientific sea water system report for details). Incubators near the rail would also enjoy mostly sunlight without shadows during hours of peak radiation input. Depending on other scientific programs there may be places on the main deck fantail that could be used although some shadows will be present at all locations. These locations offer uncontaminated science seawater for those incubations that require continuous flow feed water for chemostat or turbidistat phytoplankton growth experiments.

Summary - SBI Ambient Seawater for Incubation

Utilized a system where a forward ballast tank (3-E-0-W – capacity 95K gallons, but filled to 80K to maintain proper trim) was filled with ambient salt water by one of two methods:

a. During heavy ice conditions of 1st SBI phase an electrical submersible pump was rigged over the side from the 01 Deck Starboard (about 25 feet of freeboard) which pumped water at 150 gpm to the ballast tank. This could only be done while the ship was at a science station. It would take about 9 hours to fill the tank to 80,000 gallons using this method.

b. For the minimal ice conditions of the 2nd phase the forward fire pump was used to pump water into the ballast tank when the ship was hove to or during open water transits. The fire pump would fill the tank at 1,000 gpm. It would normally take about one hour and 20 minutes to refill the tank.

Seawater was then provided to the incubators on the Foc'sle via two air operated pumps (taking suction from the tank's sounding tube) located in the Deck Machinery Room at the tank top level through two distribution manifolds (one port and one starboard) that were built by the ship's DCs and installed on the bow. A total flow rate of -35 gpm was available from each of the two distribution manifolds on the 01 level bow Foc'sle. Garden hoses (provided by the science parties) were used for the seawater supplies to the incubators.

The science party would measure the ambient seawater temperature, the incubator seawater feed temperature, and the incubator seawater outlet temperature to determine whether temps remained cold enough to replicate ambient conditions. When the ambient-incubator inlet temp difference exceeded one (1) degree C the scientists usually requested a "tank dump" which required the emptying of the 3-E-0-W tank via firemain and installed eductor. This could not be done during water work at science stations due to concerns about effects on the water column. The eductor would empty the tank at a rate of 565 gal/min.

On sunny days the hull would absorb solar energy and heat up usually resulting in the need to empty and refill the 3-E-0-W tank. During cloudy days a full ballast tank of cooling water was usually good for 12 hours before refilling the tank was necessary (this varied by scientist and status of science ops). However, note that this frequency could only be maintained when refilling via the No. 1 firepump in the minimal ice conditions of the summer mission.

Due to the cold temps in the tank, the air operated pumps would periodically freeze up. Engineering watchstanders were tasked with hourly rounds to check the pumps to ensure continuous flow was provided to the incubators. Oncoming Officers of the Deck would also check the pumps as part of their pre-watch round (once every 4 hours).

HEALY's engineers expended 450 hours supporting the science seawater needs for SBI (both spring and summer phases).

APPENDIX 1. Ballast Tank Filling and Refilling Recommendations (by Glenn Cota)

Goal: Dump and pump up as frequently as needed to maintain inflow temps within 1.0 C of ambient surface water temp.

Monitoring: David Ruble and Zhi-Ping Mei will continue to monitor temperatures (air, inflow and outflow) and PAR continuously for the phyto incubators to help evaluate trends and diagnose problems. Other groups need to monitor their incubators as frequently as possible. David can incorporate other data into plots.

Observational summary: There is an initial warming of 0.5 to 1.2 C and a gradual increase (~1-2 C) over several days with diel temperature fluctuations (~1-2 C) tracking solar radiation and air temperature There seems to be a trade off between ballast tank fill level and flow rates, with decreased flows as the tank drops to levels approaching the minimum, 30K gal. There is a transient spike of colder water (~0.5 to1.5 C decrease for <3 h) when the tanks have been "topped up".

Constraints: Dumping (~2 h) and pumping up (6+ h) requires ~ 8 h minimum, and must be done either coming on to a station or on a not-to-interfere basis on station. Pumping can only be done on station, and does not interfere with other nonmoving science activities.

Timing: The Chief Scientist needs to be notified daily in the AM, in event of problems, and by ~18:00 before meeting with CG. Chief Scientist shall assume no news is good news, requiring no action. Strongly recommend all incubator teams convene briefly at ~17:30 in galley daily for updates.

Operational scenarios: (~in order of preference – SEE TABLE BELOW)

1) Dump and refill on any "cold" (~ambient surface or supply temp) nights possible.
2) Pump up to near maximum operational levels anytime on station.
3) Top up to buy time . SEE BELOW

Action guide

Supply Temp	Air Temp (~night differential)	On Station	Transit	Arrival – departure time
<1.0 C above ambient	Cold (~ambient surface water or supply)	*Top up*	*N/A*	Any
<1.0 C above ambient	Warm (>ambient surface water or supply)	*Top up*	*N/A*	Any
>1.0 C above ambient	Cold (~ambient surface water or supply)	*Dump or lower if poss.& top up*	*Dump & top up asap*	Night
>1.0 C above ambient	Warm (>ambient surface water or supply)	*Top up*	*Dump & top up asap*	Night

`1 SCOPE

The intent of this item is to install a new seachest, new pumps, a centrifugal separator, and new piping connecting to the existing uncontaminated science seawater system. Additionally, piping from approximately frame 110 to the forecastle is replaced with larger diameter piping and forecastle piping connections are added. The Contractor shall note that most of the uncontaminated science seawater system uses Hastelloy C and glass reinforced plastic (GRP) to minimize the chance of seawater contamination.

3.1 The Contractor shall note that the impressed cathodic protection system mastic extends aft to approximately frame 103 on the port side. The existence and location of this system shall be noted by the Contractor. It is not expected that this will be a work interference. The cathodic protection system mastic is shown on reference 2.rr.

3.2 The Contractor shall accomplish the following:

3.2.1 The Contractor shall install a seachest similar to that shown in figure 1. The seachest shall be fabricated from ½" thick AH 36 steel. This will require removing interferences as required to gain access and install the new seachest in the Void. The seachest shall be vented in a similar manner to the forward science seawater seachest (shown in reference 2.qq sheet 11, detail 13-B), except that the vent piping material shall be Hastelloy C, XXS wall thickness. The vent piping shall be mounted as far aft in the seachest as practicable. The slots for seachest inlet shall be 1 1/2 inches by 6 inches. The vertical centers of the slots shall be 4 inches apart., similar to the science seawater seachest slots shown on reference 2.ss. The slots shall be aligned with the long axis fore and aft. There shall be a minimum of 40 slots installed. The Contractor shall install 15" x 23" bolted watertight access plates with backing rings in the top of each side of the seachest to facilitate future access and maintenance. Reference 2.tt shows the existing structure in the area of the new seachest.

(See Separate File)

Figure 1

New Science Seawater Seachest

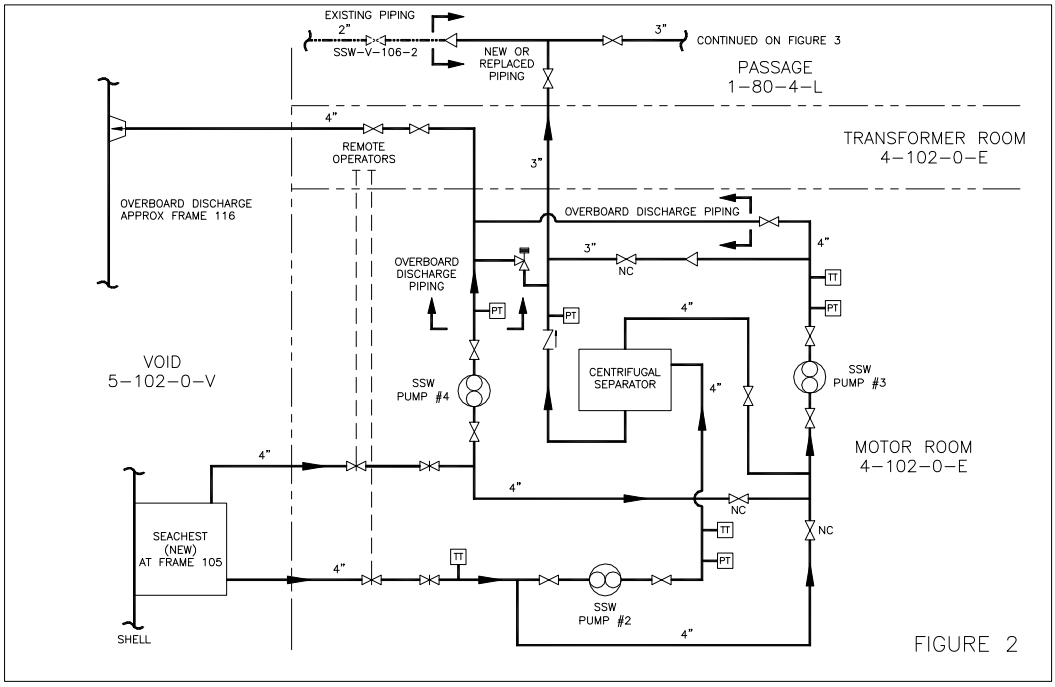


Figure 2
Science Seawater Piping (Aft)

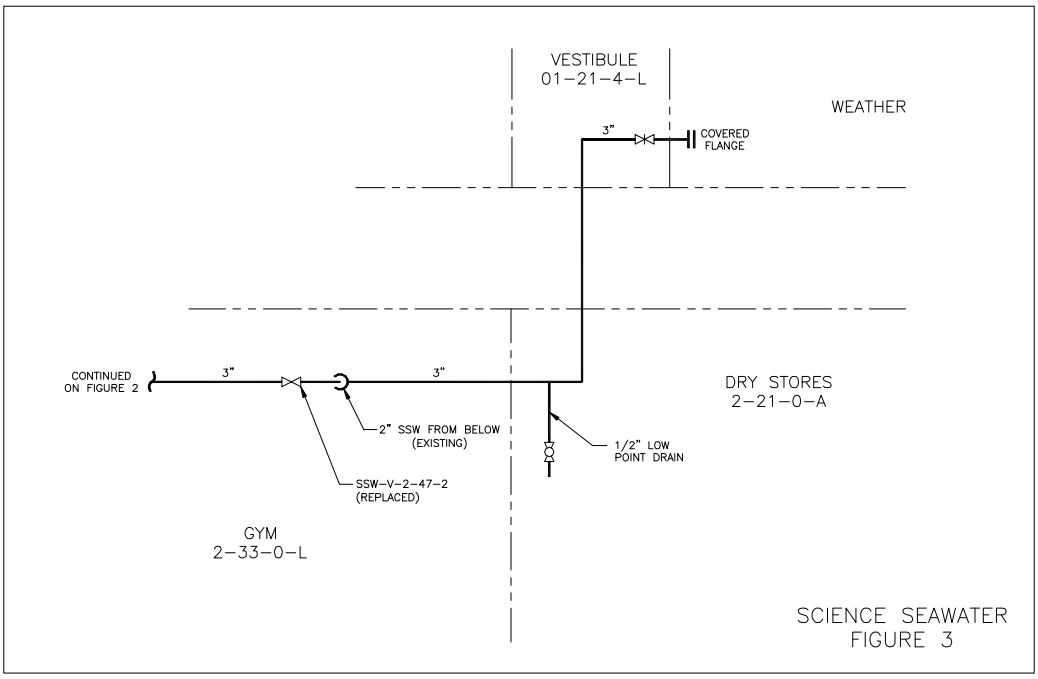


Figure 3
Piping Arrangement (Forward)

3.2.2 The Contractor shall fabricate and install pump foundations for the new Government furnished Monoflo TE071SS1R5/E (Hastelloy C) science seawater pumps. A suggested location is bulkhead mounted on the port side of the lower Motor Room (4-102-0-E) as shown in figure 5. Additionally, the Contractor shall fabricate and install foundations for the centrifugal separator and the pump variable speed drives.

3.2.3 The Contractor shall fabricate and install a centrifugal separator. A suggested design for the centrifugal separator is shown in figure 4. The centrifugal separator shall be fabricated from Hastelloy C.

(see separate file)
Figure 4
Centrifugal Separator

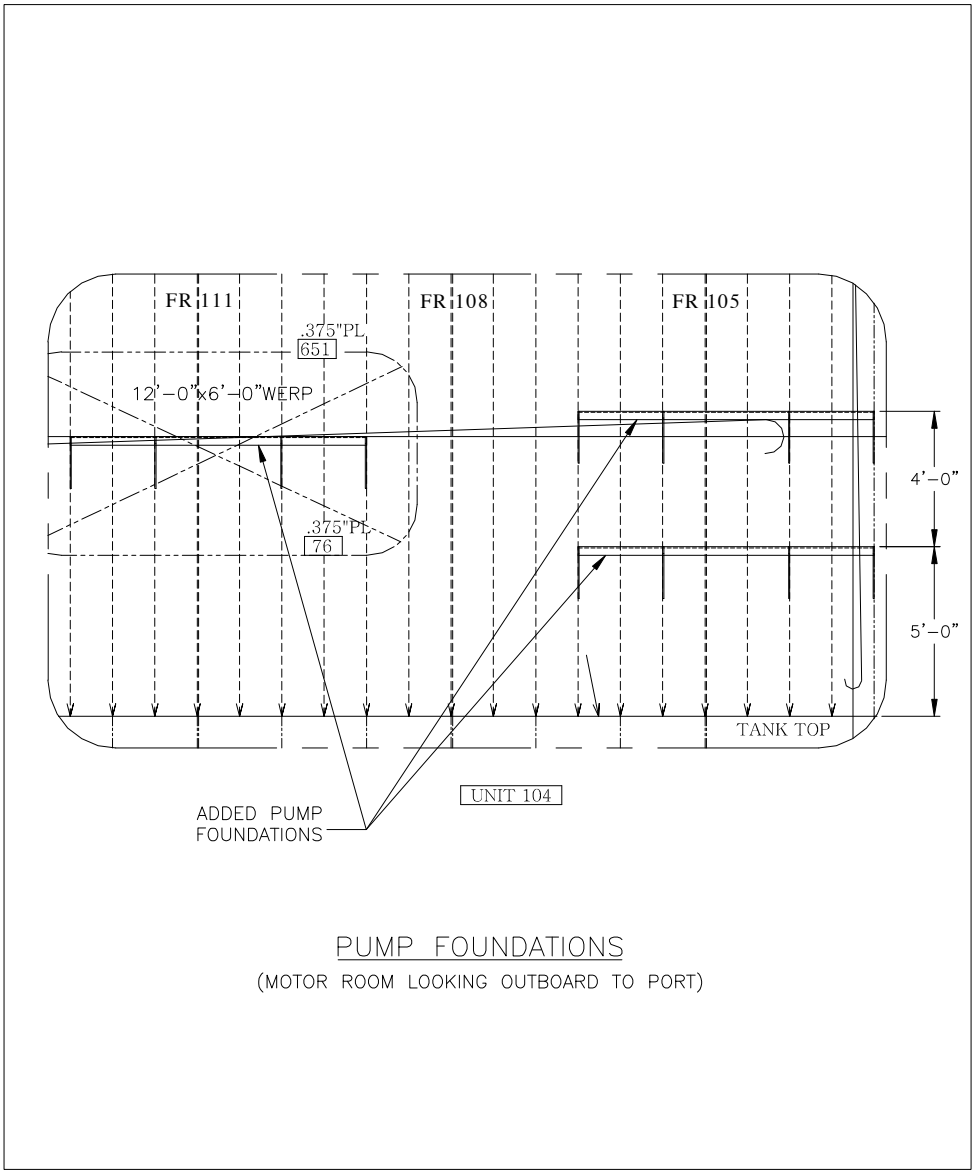


Figure 5a
Pump Foundations

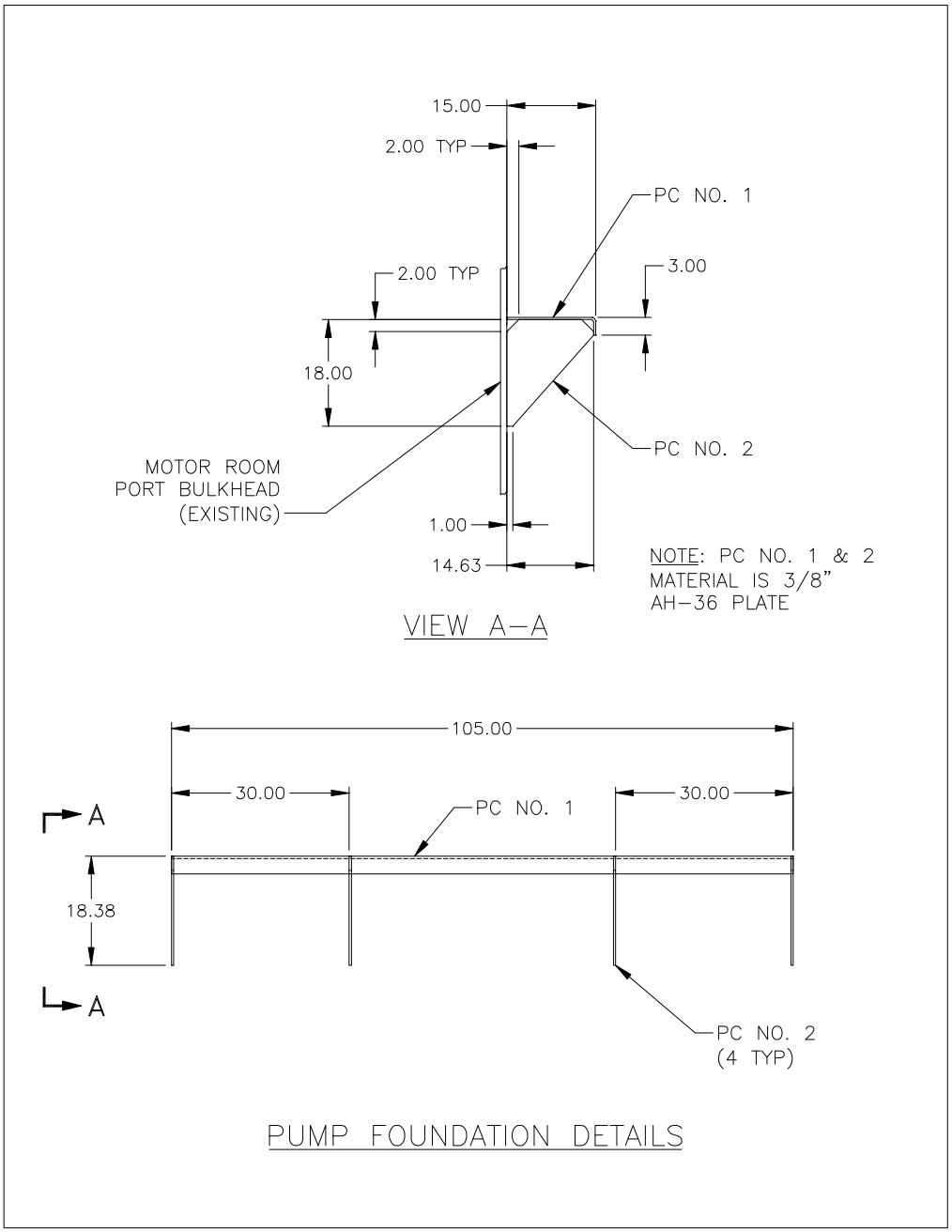


Figure 5b
Pump Foundations

3.2.4 The Contractor shall install piping, pumps, valving, hangers, and overboard discharges as shown in figures 1 and 3. Long radius elbows and long turn sweep tees shall be used to reduce the chance of ice blockage. The number of elbows shall be minimized, again to reduce the chance of ice blockage. Materials shall be in accordance with reference 2.a, except that Hastelloy C shall be used instead of titanium. The Hastelloy C valves and variable speed pumps for the installation are Government furnished. Piping from the seachest to the watertight penetration through the Void inboard bulkhead shall be fabricated from Hastelloy C XXS wall thickness pipe. **No GRP piping shall be used between the seachest and the pump discharge valves**. All dissimilar materials shall be electrically isolated from each other. Overboard discharge piping may be fabricated from 90-10 copper nickel IAW MIL-T-16420K Type I class 200, ASTM B466 or ASTM B467. Overboard discharge piping is labeled in figure 2. The Contractor shall install remote operating gear for the valves as shown in figure 2. The remotely operated valves shall be capable of operation from Transformer Room 2-102-2-E

3.2.5 The Contractor shall replace the existing 2-inch diameter piping from the new pump riser connection on the main deck at approximately frame 110 to a new 3"x3"x2" tee at the 2" forward pump riser on the 2nd deck at approximately frame 45 with 3-inch pipe. Valve SSW-V-2-47-2 shall be replaced with a 3-inch valve. The new GRP piping and fittings shall meet the material requirements of reference 2.a. The Contractor shall add a 3 inch line from the new tee at the forward science seawater pump riser to a new port weather connection near the existing science seawater connection on the 01 level serving the forecastle. The forecastle piping connection shall be 3-inches in diameter. A piping sketch of this area is shown in figure 3.

3.2.6 Piping instrumentation shall be installed downstream of each new science seawater pump, and at the seachest outlet as shown in figure 2. The instrumentation includes temperature and pressure transmitters. The sensors shall be arranged to minimize the chance of ice damaging the sensors. The sensors as a minimum shall be angled away from the direction of flow by at least 45 degrees. The temperature sensors shall be of the RTD type similar to that used on the forward science seawater pump.

3.2.7 The Contractor shall install electrical controllers and wiring to the new science seawater pumps. The pumps are variable speed and reversing. The variable speed shall be controlled locally near the pump.

3.2.8 The Contractor shall install heat tracing tape on the overboard discharge piping in Void 5-102-0-V to prevent the overboard discharge from freezing. The heat tracing tape shall be Grainger 4E516 or equal. The heat tracing tape shall be insulated in accordance with reference 2.oo.

3.3 The Contractor shall accomplish all electrical equipment installation and relocation in accordance with references 2.y, 2.jj as modified by reference 2.nn and 2.ee, 2.kk, and manufacturer instruction manuals. General guidance for installation of ship service power circuits for the pressure and temperature sensors are shown in Figure 5. Unless otherwise specified in the installation drawings, cable installation requirements for wireways, cable penetration, cable tags, wire markers, etc., shall be in accordance with references 2.y and 2.jj as modified by 2.nn and 2.kk.

(To be added)
Electrical Sketch
Figure 6

3.4 The Coast Guard Inspector shall approve the exact location of new and relocated equipment. It is the responsibility of the Contractor to remove and reinstall all interferences necessary to complete the required work for this item. . The Contractor shall ensure that there is adequate maintenance access for all new, relocated and adjacent equipment.

3.5 The Contractor shall establish a subcontract with Alstom Drives and Controls, the MPCMS supplier, to integrate the seawater system monitoring functions and sensor calibration into the MPCMS. The contractor shall work with the MPCMS sub-contractor to establish remote monitoring connection points for new pressure and temperature signals to MPCMS. The present MPCMS configuration is provided in references 2.t and 2.u. General guidance for required MPCMS installations is shown in Figure 6. The 4-20 mA output from the pressure gauges shall be connected to the MPCMS using the MPCMS type AI.1 I/O STND interface. The 4-20 mA output from the temperature controller shall be connected to the MPCMS using the MPCMS type AI.3 I/O STND interface.

3.6 The Contractor shall run all required cabling required for this installation. Where practical, all MPCMS control cabling shall be routed using existing Sensitive Power wireways. References 2.k through 2.r provide details on the present wireways. The contractor shall make all necessary cable terminations except for the MPCMS terminations. MPCMS cables at RTU connection points shall be coiled neatly with sufficient length for the MPCMS sub-contractor t make the necessary connections.

3.7 Alstom Drives and Controls, the supplier of the MPCMS shall provide all MPCMS hardware and all MPCMS programming changes. All MPCMS cable terminations to MPCMS hardware shall be made by Alstom Drives and Controls. The MPCMS sub-contractor shall integrate the new remote monitoring signals to the MPCMS. This effort shall include:

- The Contractor and Alstom shall interface into MPCMS remote start, remote stop, run indication, and pump direction for each pump. Additionally temperature and pressure indication as shown in figure 1 shall be interfaced into the science seawater mimic.

- Work with prime contractor to establish monitoring connection points to MPCMS. General guidance for the MPCMS interfaces is shown in Figure 6.

- Provide any required MPCMS hardware, such as RTU analogue input boards, circuit card chassis, I/O Expansion Cabinets, I/O Extender Cables as necessary to connect the science seawater monitoring functions.

- Terminate MPCMS cables at RTU or RTU Terminal Connection Boxes, as required.

- Calibrate the science seawater gage 4-20 mA output signals for proper operation at MPCMS.

- Develop, program, and test all software changes to the affected RTU.

- Develop, program, and test all software changes to the affected MPCMS Processors.

- Develop, program, and test all software changes to the MPCMS Operator Workstation software including:

- Integrate the pressure and temperature sensors into the existing auxiliary seawater system mimic to clearly show the pressure and temperature values, as well as pump status. The new science seawater pumps shall be capable of remote starting, stopping, and reversing from ECC.

- Program MPCMS alarm setpoints for these parameters.

- Operator Workstation software changes shall be made and tested on all workstations, including portable units as necessary.

- Modify and test CTES configuration data and mimics to incorporate new MPCMS signals.

- Modify and test SPTE Simulation and Instructor Workstation software as required to incorporate the new MPCMS signals.

- Update the MPCMS Technical Manual, reference 2.ll, with required change pages.

4 NOTES

None

5 GOVERNMENT FURNISHED MATERIAL (GFM)

Science Seawater Pumps, Monoflo FE071SS1R5/E, Hastelloy C, with mechanical seals and 10 horsepower motor (3 total)
ABB variable speed drive, model ACH401600932 + AOAE0000 (3 total)
4 inch Hastelloy C gate valves, 150# flanged, with Hastelloy C trim (14 total)
4-inch bronze gate valves (2)
4-inch Hastelloy C relief valve, 150# flanged
3-inch Hastelloy C check valve (1)

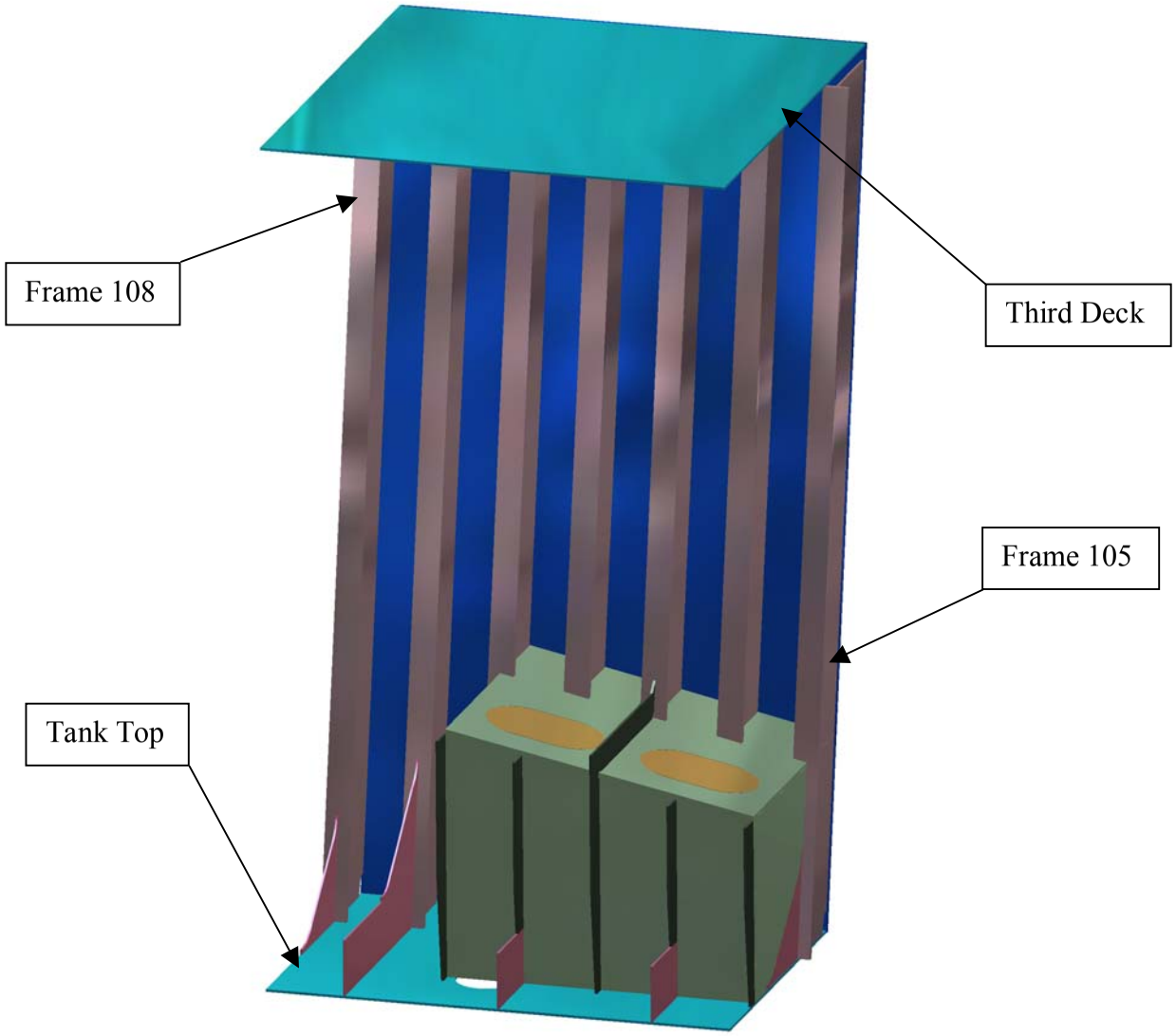


Figure 1a – Seachest Elevation View

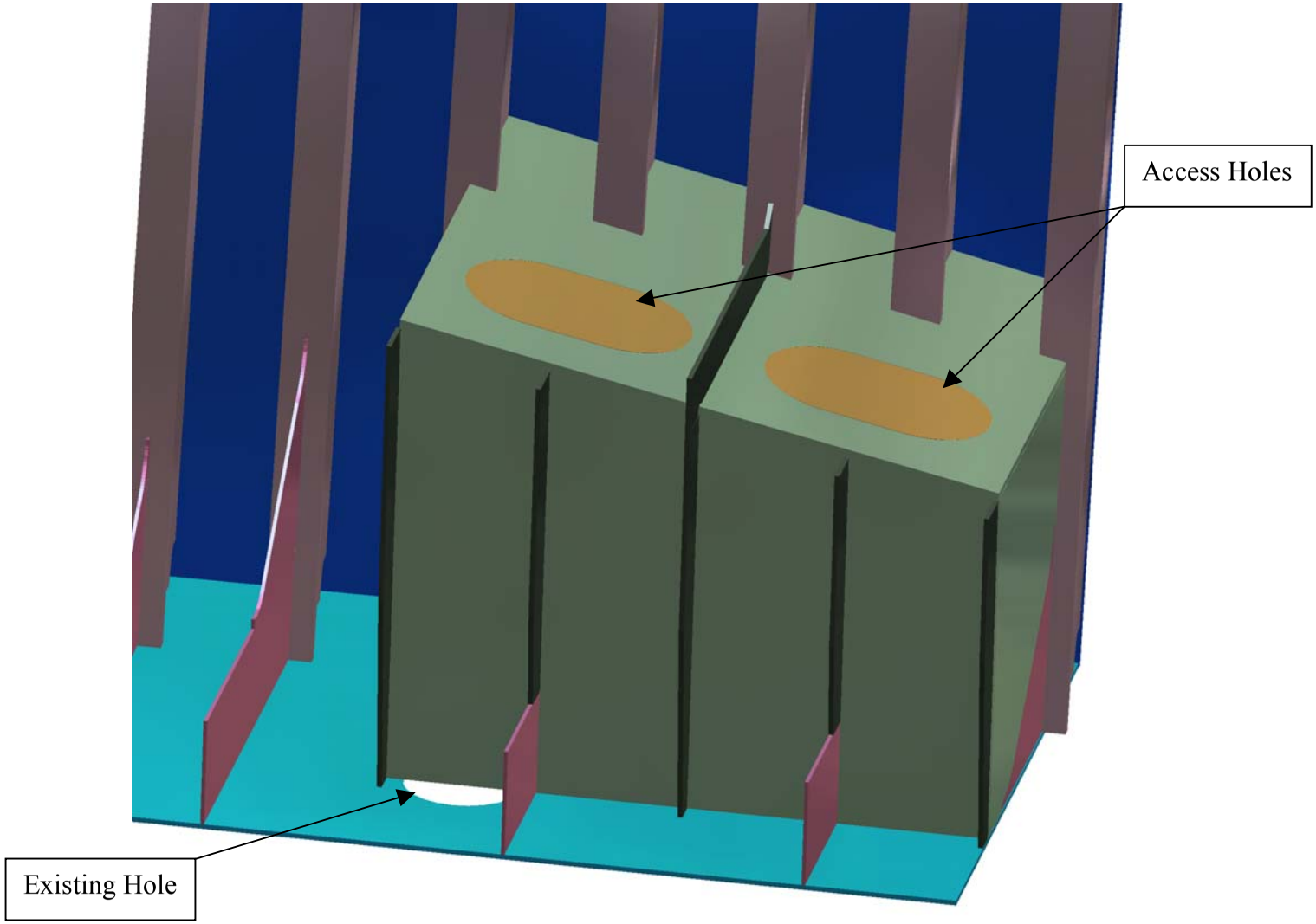


Figure 1b – Seachest with Access Hole Covers On

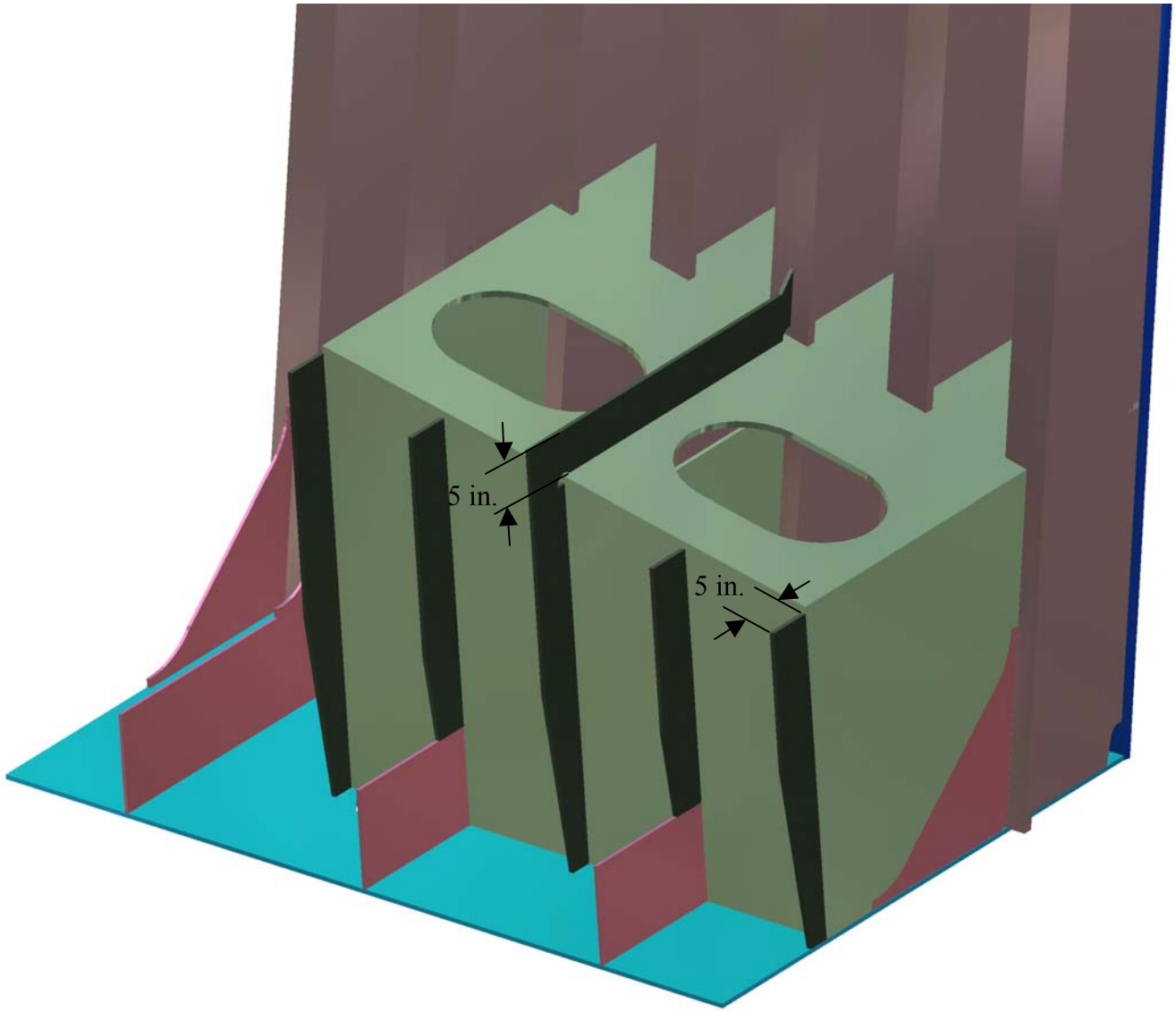


Figure 1c – Seachest with Access Hole Covers Off

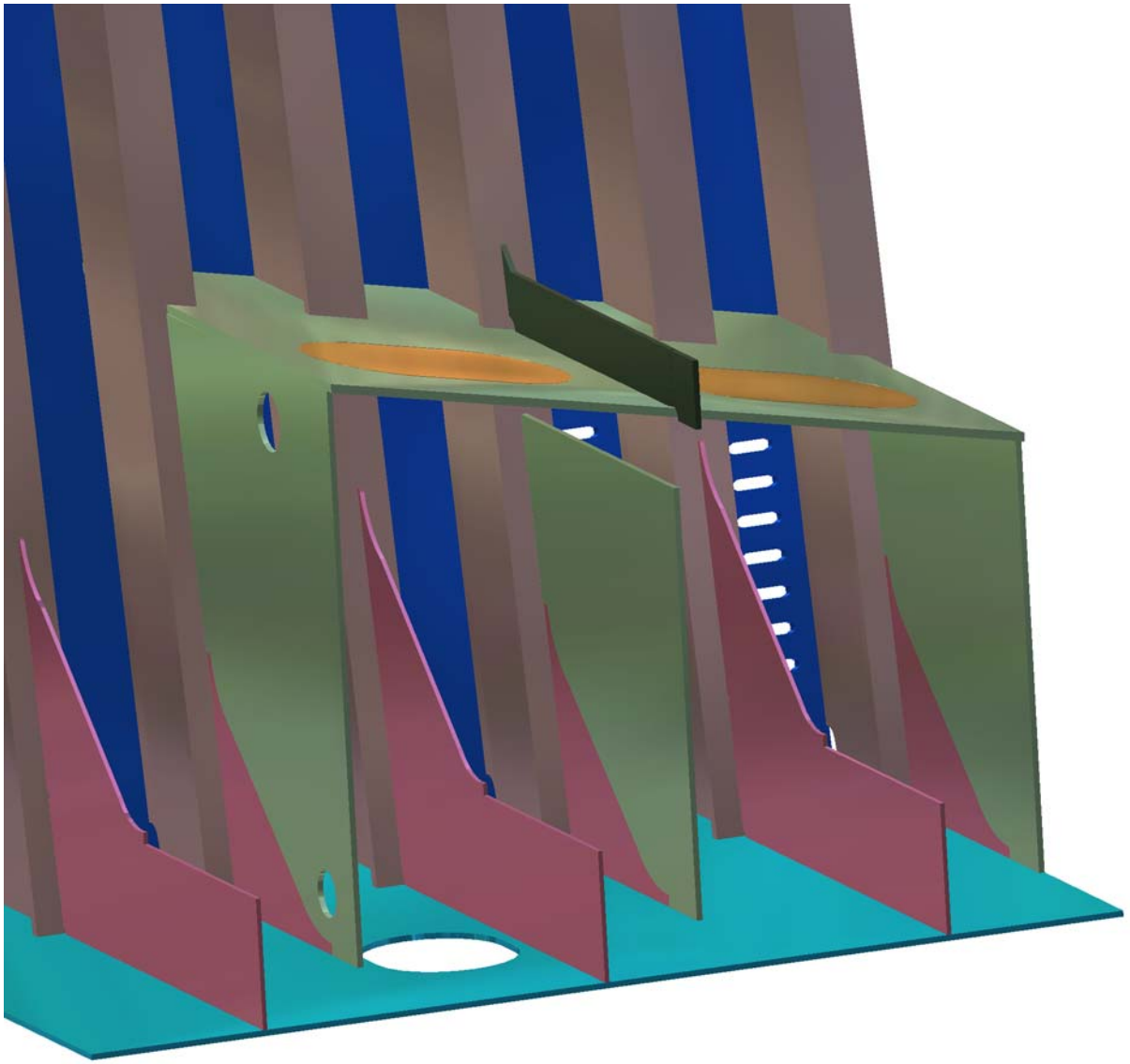


Figure 1d – Seachest Looking Outboard and Forward with Inboard Plate Removed

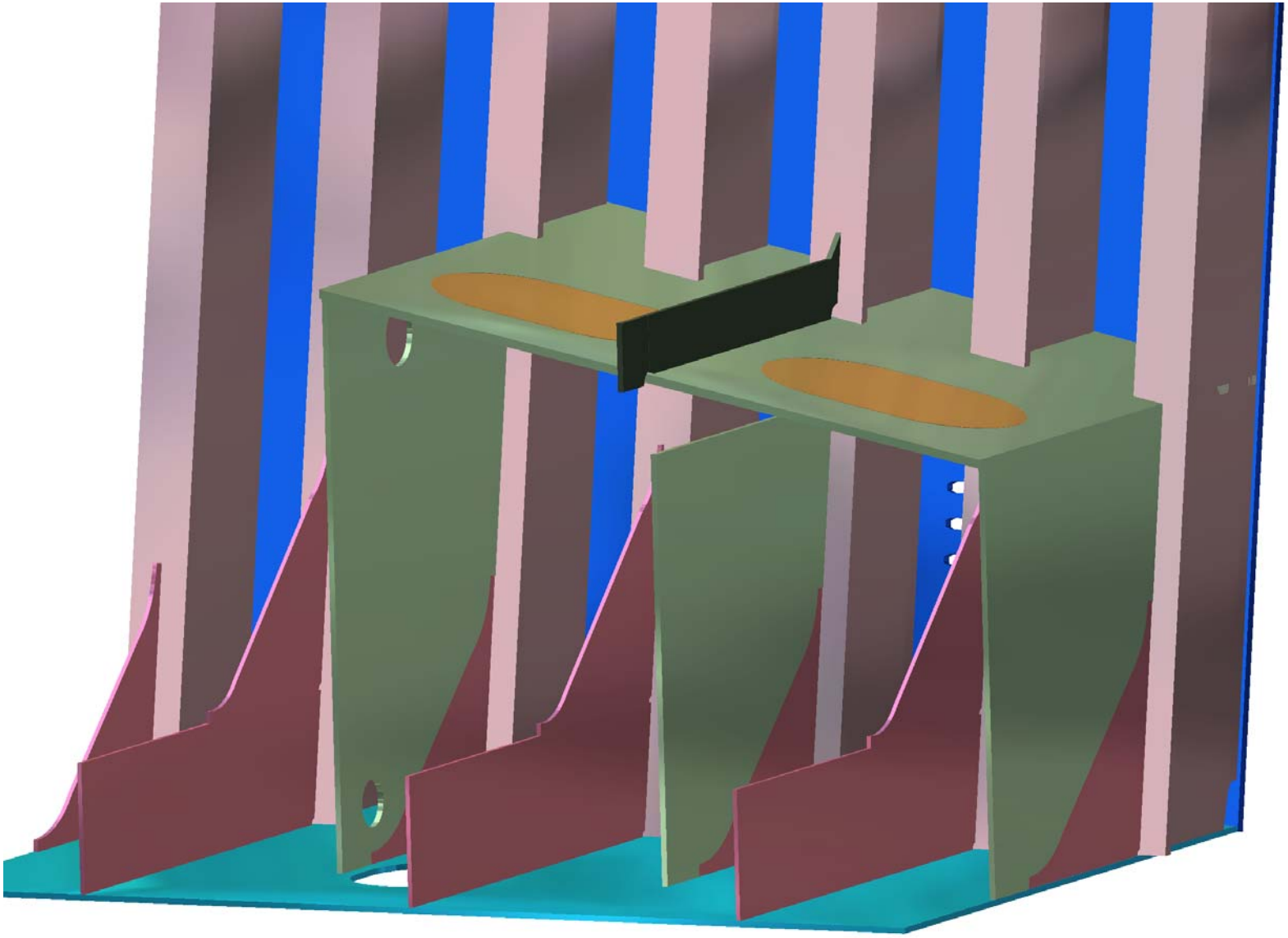


Figure 1e – Seachest Looking Outboard and Aft with Inboard Plate Removed

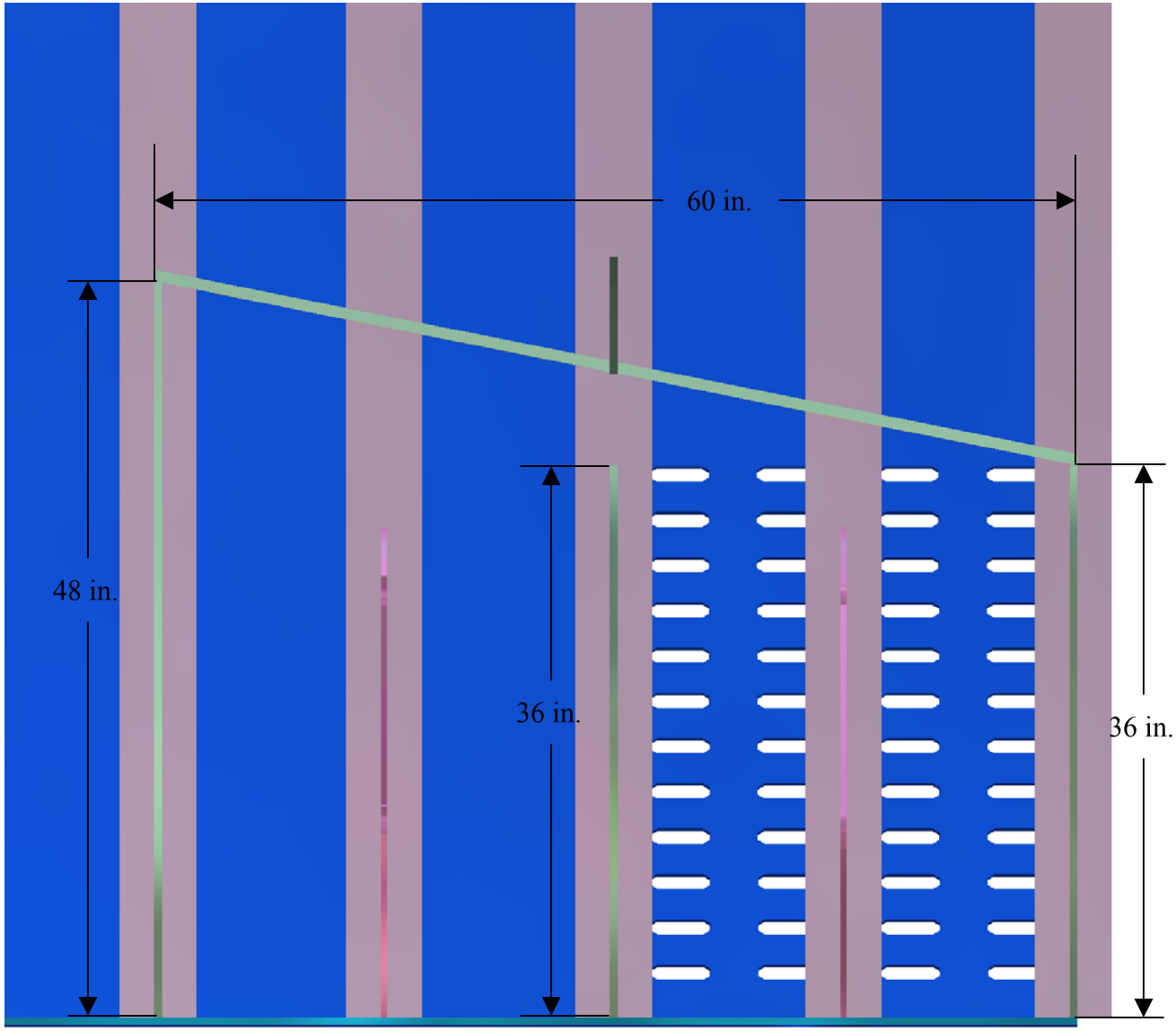


Figure 1f – Seachest Looking Outboard with Inboard Plate Removed

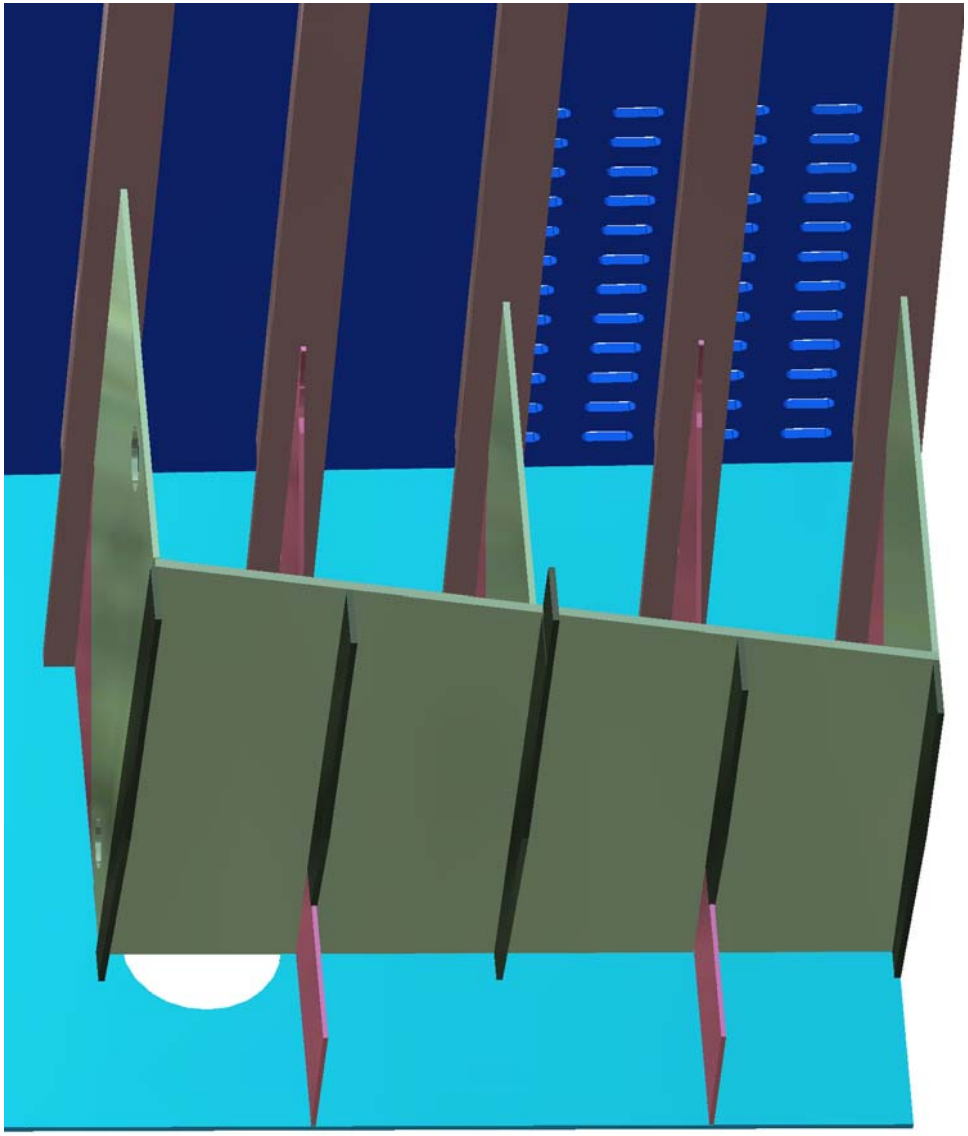


Figure 1g – Seachest Looking Outboard and Down with Top Plate Removed

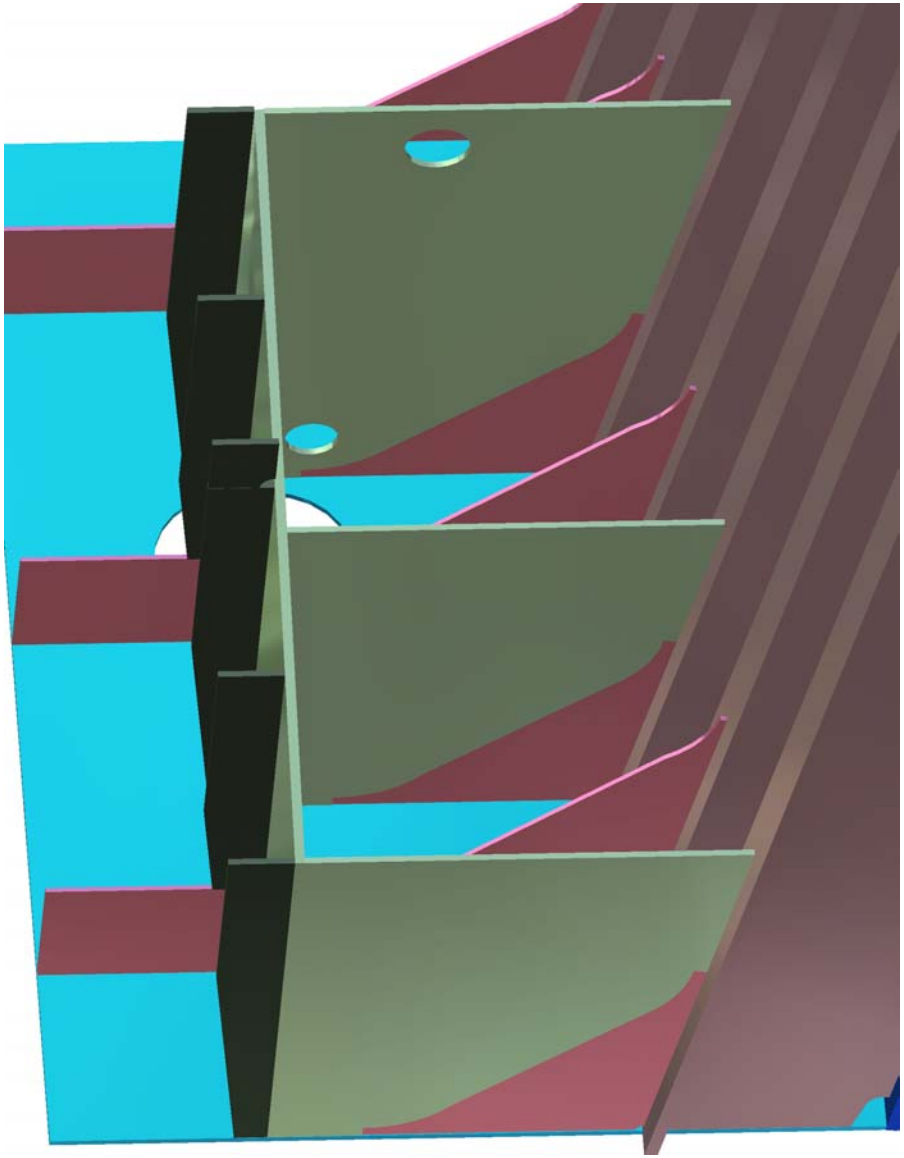


Figure 1h – Seachest Looking Aft and Down with Top Plate Removed

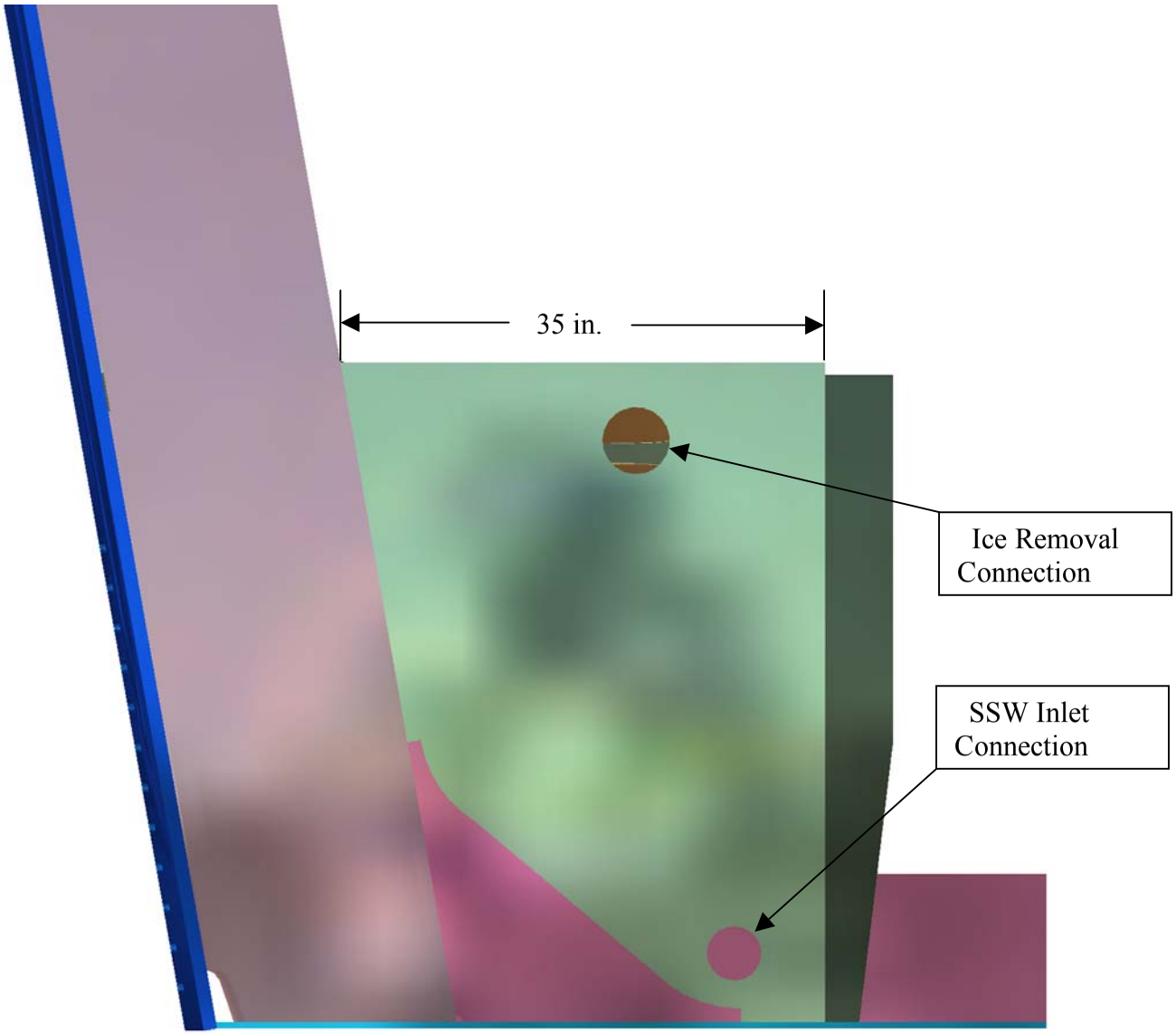


Figure 1i – Seachest Looking Forward

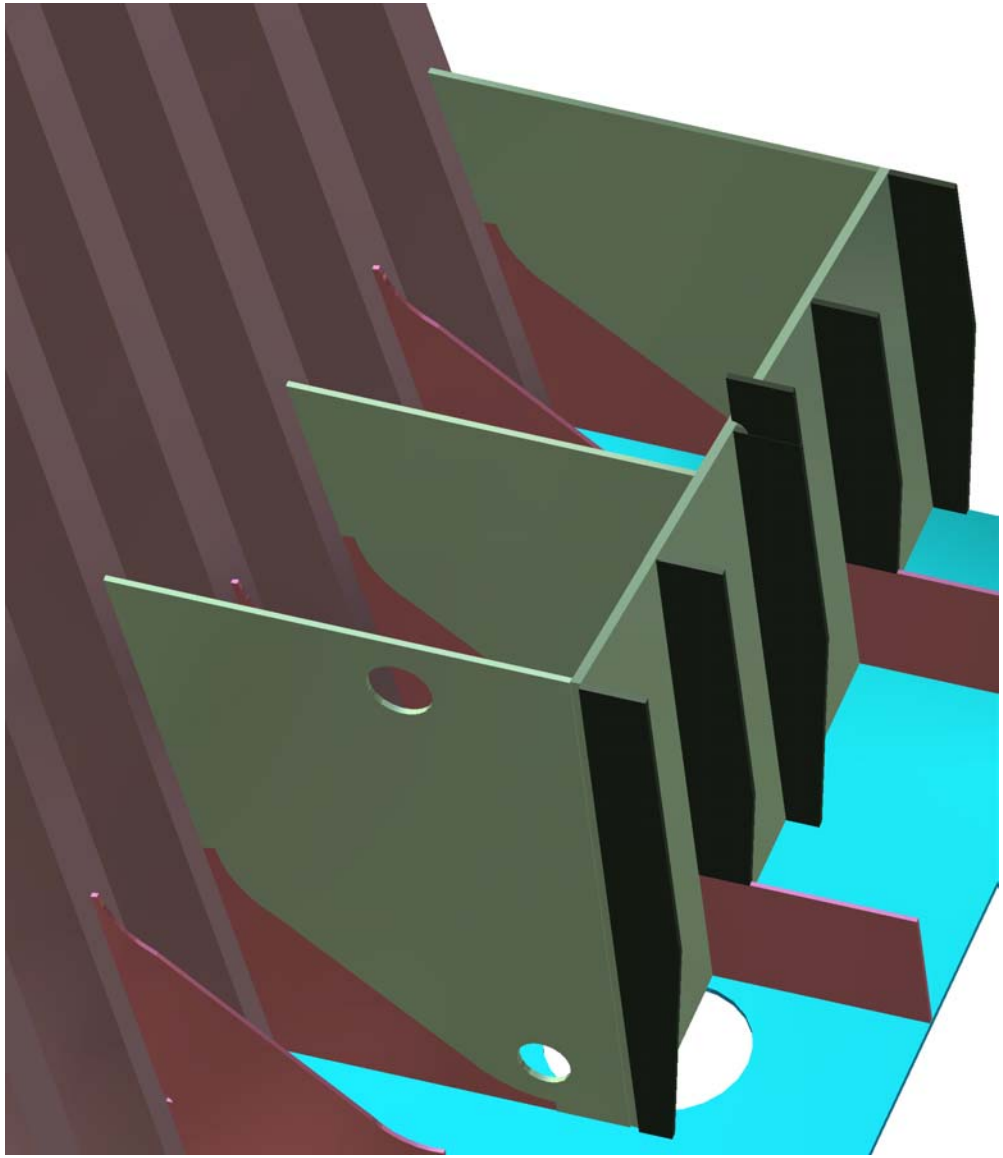


Figure 1j – Seachest Looking Forward and Down with Top Plate Removed

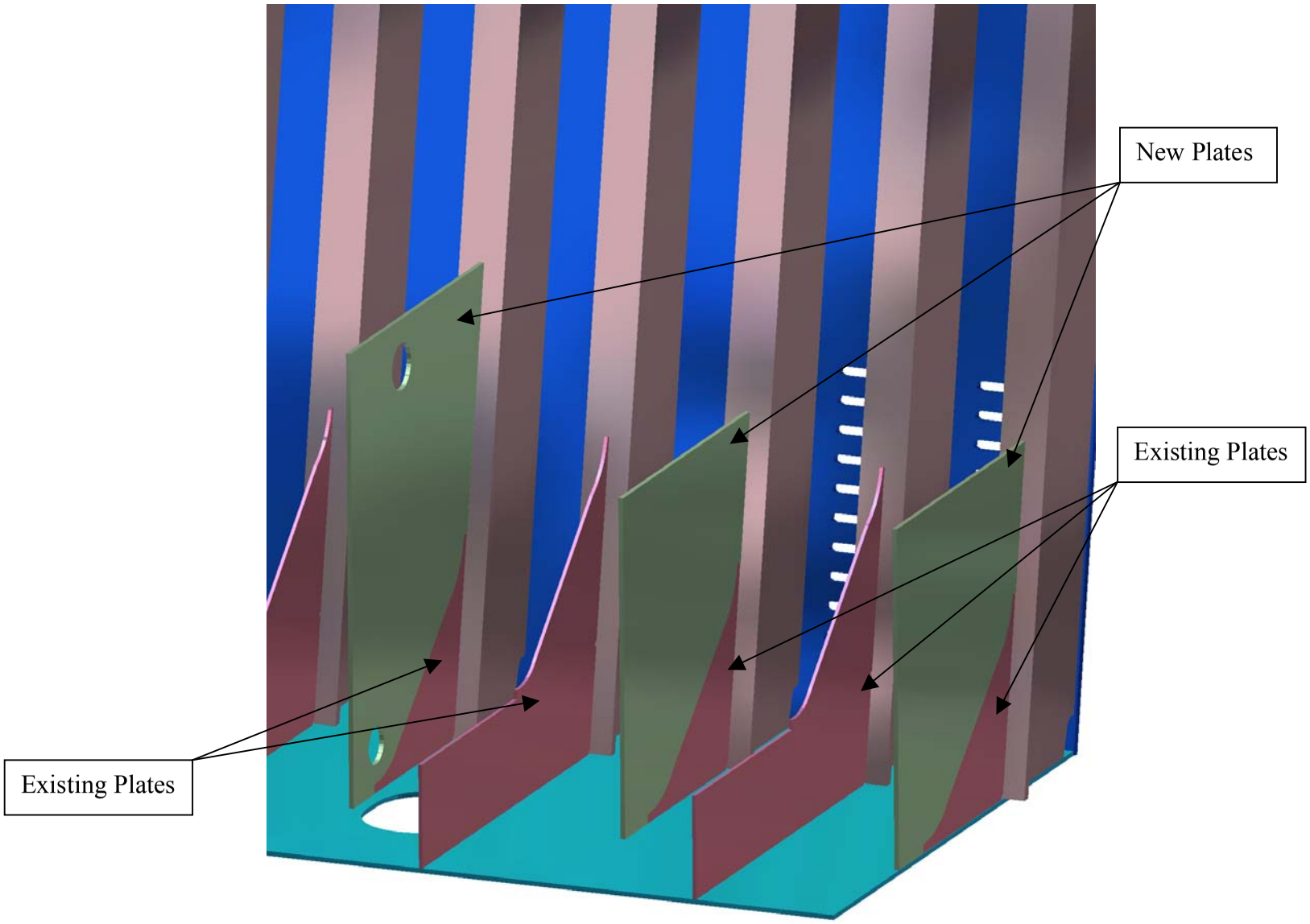


Figure 1k – Seachest with Top and Inboard Plates Removed

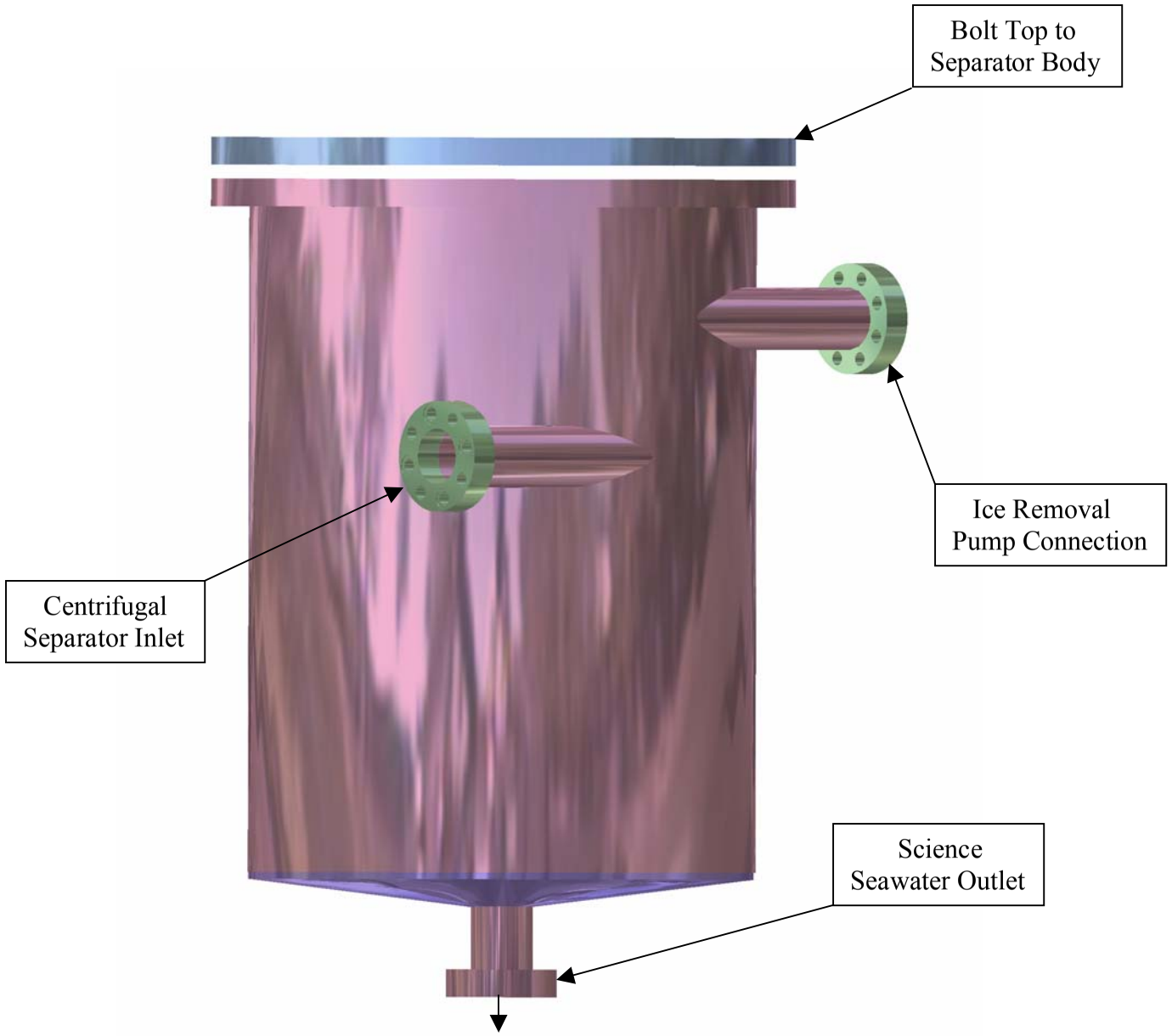

Bolt Top to
Separator Body
Ice Removal
Pump Connection
Centrifugal
Separator Inlet
Science
Seawater Outlet

Figure 4a

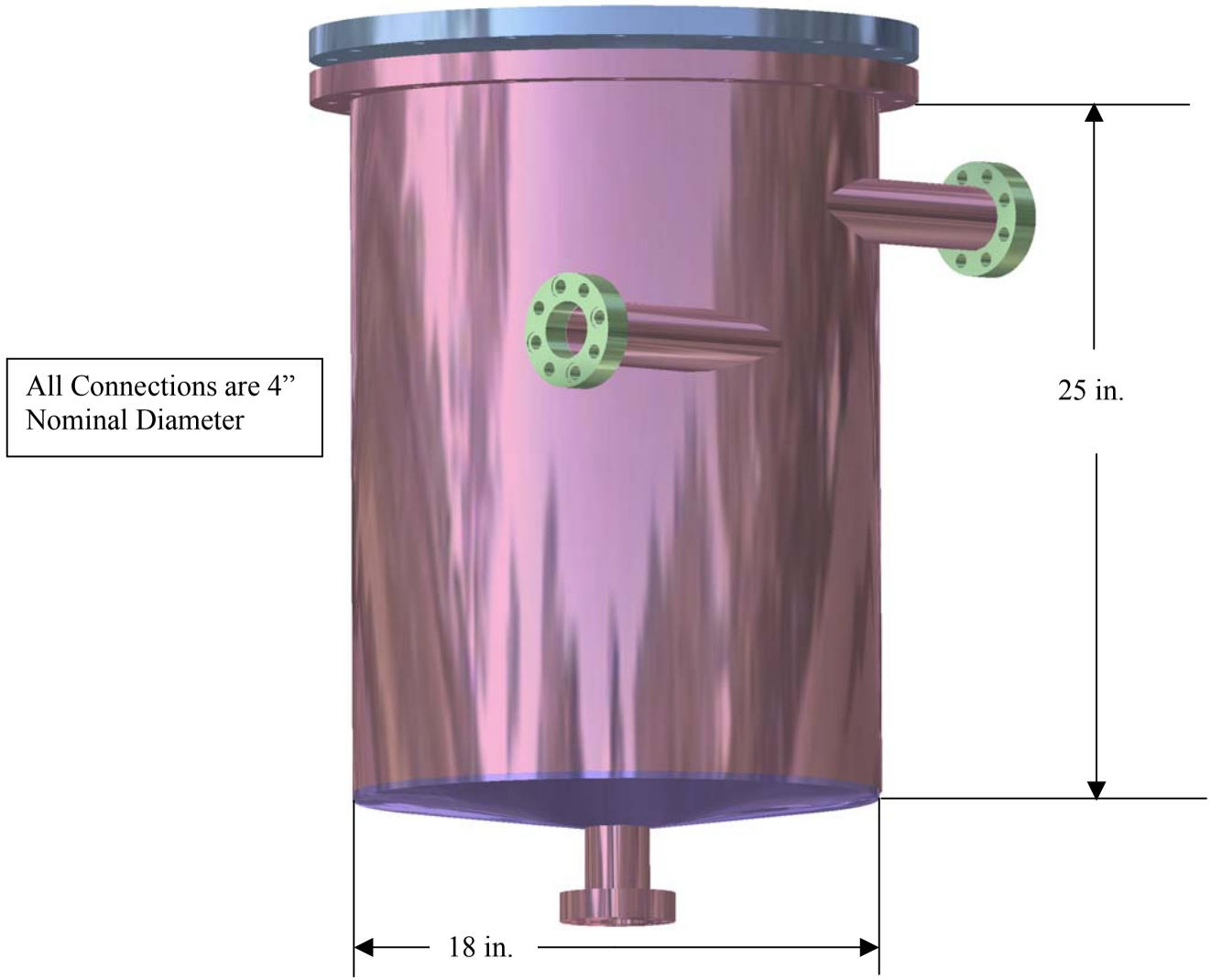


Figure 4b

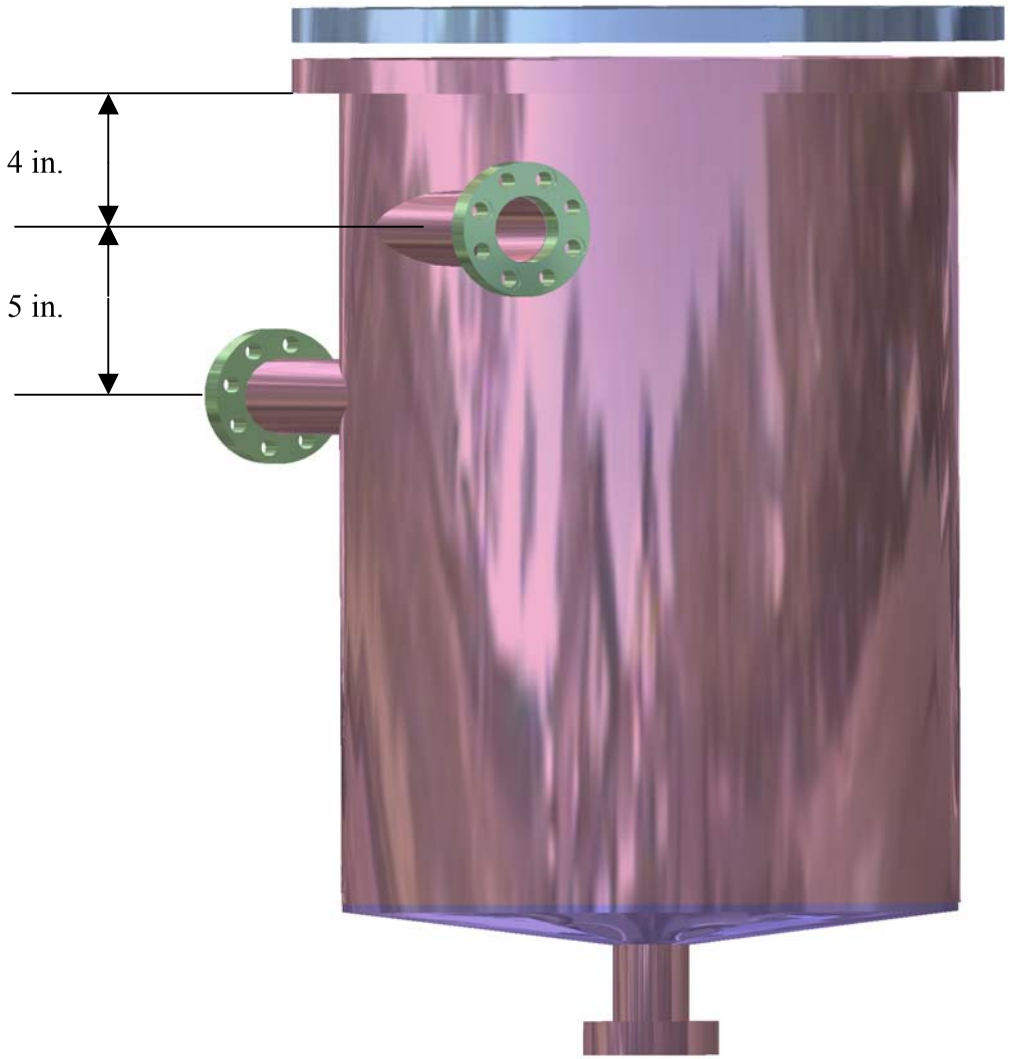


Figure 4c

Figure 4d

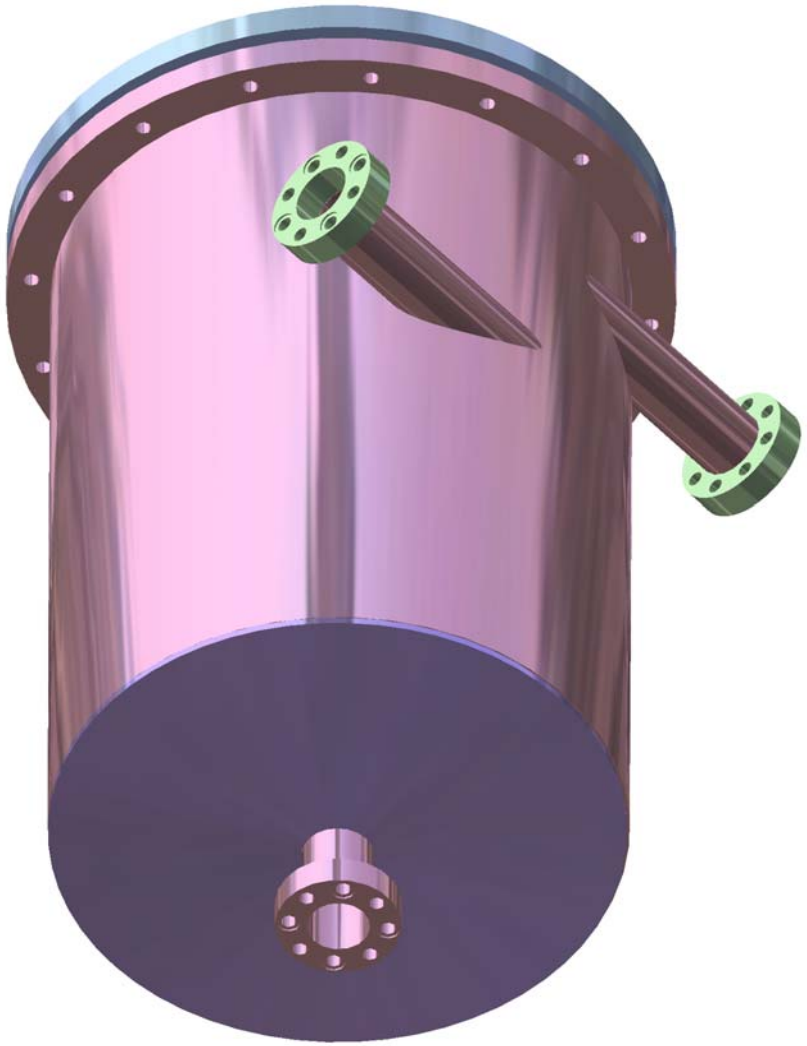


Figure 4e

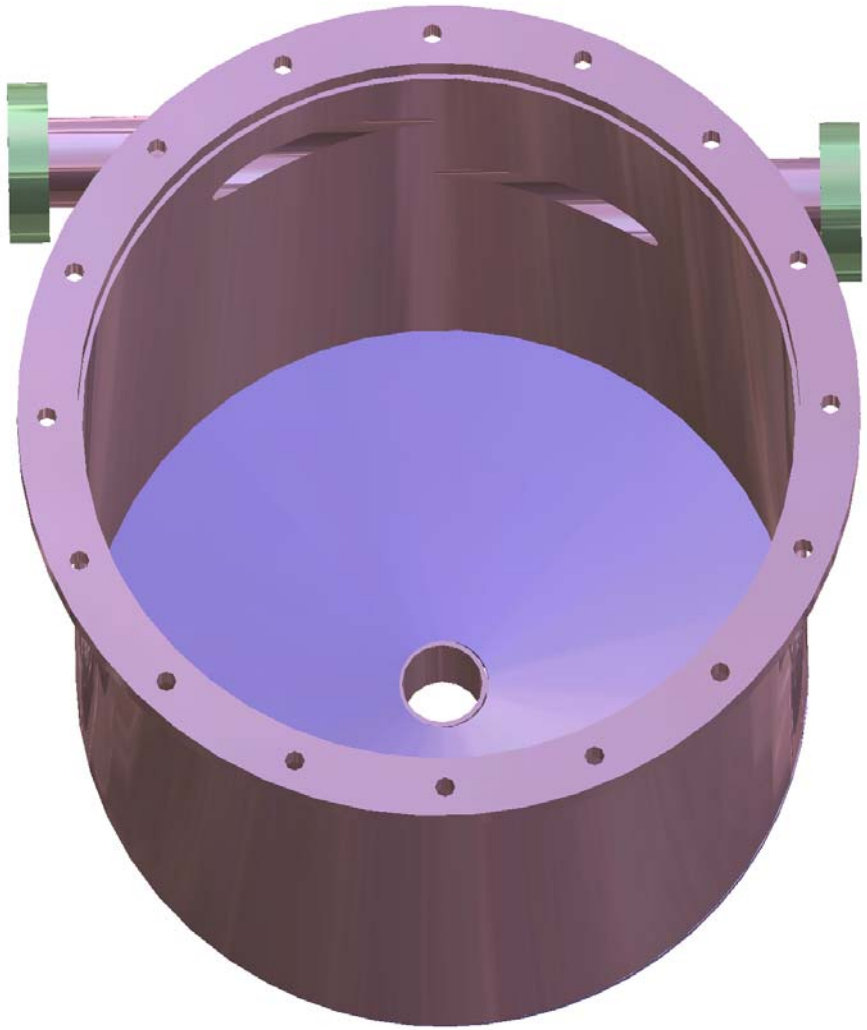


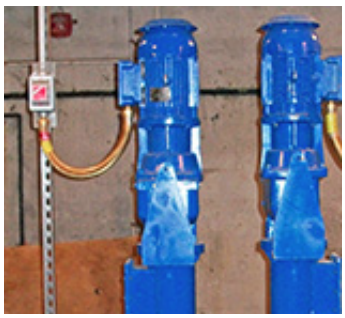
Figure 4f

Applications We Serve

- Water/Wastewater
- Chemical
- Oil & Gas
- Mineral Processing
- Food & Beverage
- Pulp & Paper
- Other Applications
- Application Testing

- **Moyno Munche**

reased efficiency with progressing cavity pumps.A pair of Moyno Series A



1. 1
2. 2
3. 3
4. 4

- Distributor Locator

- Pump Selector Tool
- Parts & Service
- Literature & Media

Products We Offer

Small Pumps
Designed for dosing and metering applications.
Large Pumps
Designed for maximum performance, value and application versatility with minimal maintenance.
EZstrip™ Family
Maintain-in-place line of products providing cost savings solutions.
Packaged Systems
Moyno can offer a range of packaged systems suitable for your application.
Grinders & Screens
Designed for industries requiring solids reduction or waste conditioning.
Sanitary Pumps
Designed to meet FDA requirements in a variety of food and chemical applications.

Vans

HEALY is capable of accommodating six standard 20-foot long ISO container type Science vans. Three van positions are located on the main deck aft and positioned such that two can open into the vessel's interior and provide access to the Main Lab. The other van can be positioned to open to the aft working deck. Two vans can be located port and starboard of centerline on the forecastle and an additional van can be located on the starboard side of the 02 level directly aft of the RHIB.

The vans on the forecastle are subject to heavy weather exposure and should be limited to all steel cargo container type. Maximum weight of each van and contents is 15 tons. Also, depending on van weight and location, a commercial crane (sometimes a barge crane) may need to be hired by the Science Party to put it on and take it off the ship. Ship crane limitations to support van on load are 5 tons aft and 3 tons forward.

For missions planning to utilize vans as manned work spaces, it is imperative that the climate be considered & vans with adequate heating and insulation are acquired to ensure personnel are working in safe conditions. Air temperature is often well below freezing. The ship does not have the ability to provide direct heating to science vans. Service options to the vans may include: various electrical power configurations (110 VAC to 440 VAC), compressed air, uncontaminated seawater, hot/cold potable water, auxiliary seawater, SDN port, and intercom. Van requirements need to be identified early.

Science programs on Healy requiring a general purpose lab van or an isotope lab van are advised to contact the **Healy Marine Science Coordinator** to ensure that a UNOLS van pool request is initiated as soon as possible. In 2009 NSF funded the construction of a UNOLS general purpose van and an isotope van which are intended for Arctic use and Healy has the first right of refusal. Other vans are first come first serve so it is advised to identify the need early in the cruise planning process. The ultimate responsibility for obtaining a van is with the PI of the project itself.

The Chief scientist and PIs are encouraged to review the **UNOLS Van Shared-use Agreement**. In the case of deploying a UNOLS shared use van on Healy> the "User" is defined as: the Principal Investigator and his/her science project itself.

It is important to note that stable isotope laboratory work is not permitted inside the skin of the ship and therefore a UNOLS isotope van, or equivalent, will be required.

UNOLS van pool schedules

- **West Coast Van pool**
- **East Coast Van pool**

Overview
STARC & ESU
Science Systems
Science Instrumentations & Sensors

OSU Oregon State University

College of Oceanic and Atmospheric Sciences

NSF/UNOLS WEST COAST VAN POOL

NSF/UNOLS Isotope Van - Rad 1

- Schedules: 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
- Photos
- Drawing
- Estimated Tare weight of van: 11,900 lbs
- SN: 625.1.04

NSF/UNOLS Isotope Van - Rad 2

- Schedules: 2012 2013 2014
- Photos
- Drawing
- Estimated Tare weight of van: 11,900 lbs
- SN: 625.1.01-5
- TEXU225609-5

NSF/UNOLS General Purpose Lab Van

- Schedules: 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
- Photos
- Drawing
- Estimated Tare weight of van: 8,000 lbs
- SN: 625.4.03

NSF/UNOLS Cold Van-1

- Schedules: 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
- Photos
- Drawing
- Estimated Tare weight of van: 14,500 lbs
- SN: 625.2.01-4

NSF/UNOLS Cold Van-2

- Schedules: 2014
- Photos (not available yet)
- Drawings (see cold van-1)
- Estimated Tare weight of van: 14,500 lbs
- SN: 625.2.01-3

OPP Isotope Lab Van

- Schedules: 2009 2010 2011 2012 2013 2014
- Photos
- Drawing
- Estimated Tare weight of van: 8,000 lbs
- SN: 240.8.01

OPP General Purpose Lab Van

- Schedules: 2009 2010 2011 2012 2013 2014
- Photos
- Drawing
- Estimated Tare weight of van: 6,200 lbs
- SN: 240.8.05

AccommodationsVan

- *This van currently is unavailable for use*.
- Schedules: 2012 2013
- Photos
- Drawing
- Estimated Tare weight of van: 10,500 lbs
- SN: SSL-913-01

Lab Van

- Schedules:
- Photos
- Drawing
- Estimated Tare weight of van:
- SN:

OSU - COAS Isotope Lab Van - for OCEANUS

- Schedules: 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
- Photos
- Drawing
- Estimated Tare weight of van:
- SN: 645.1.01-2

To schedule a lab from the West Coast Van Pool, contact the Marine Superintendent.

For the East Coast Van Pool, go to UECVP.

West Coast Van Pool Electrical Requirements

UNOLS Portable Scientific Vans Manual

Dry Lab #1
Dry Lab #2
Dry Lab #3
Wet Lab #1
Isotope Lab #1
Isotope Lab #2
Isotope Lab #3
Isotope Lab #4
Cold Lab #2
Cold Lab #3
Clean Lab #1
Clean Lab GEOTRACES
Clean Lab #3
Documents
Van Pool Projects

UNOLS EAST COAST PORTABLE LABORATORY POOL

The UECPLP was developed to support the Oceanographic Research Vessels of the **UNOLS** organization. This support is defined as providing portable laboratory meeting specific guidelines, which enable these labs to be used on all of the UNOLS vessels. There are two pools, one located on the east coast, one on the west coast. Funding for operating these two pools comes mainly from the **National Science Foundation**.

Types Of Portable Laboratories

- Dry Labs
  This type of lab is set up to fill most extra laboratory space requirements. The labs include modular lab benches. The benches include a sink module and a fume hood module. These can be arranged to meet the mission requirements.
- Isotope Labs
  This type of lab focuses on the need for isotope laboratory requirements. To support the isotope requirements each Isotope lab includes a LSC module. The remainder of the lab is setup similar to the Dry Labss.
- Cold Labs
  This type of lab meets the specialized needs for a cold laboratory. There are two refrigerator units to provide cool for both the lab space and makeup air for the fume hood. Due to the large equipment require performing this task, there is less laboratory bench space. The unit includes a sink bench, a fume hood bench, one large bench, and two small benches.
- Clean Labs
  This type of lab meets the specialized needs for a clean laboratory. There is a air filtration unit to provide clean air for the clean lab space. Due to the large equipment require performing this task, there is less laboratory bench space. The unit includes a sink bench, and four large clean benches.

How to Schedule a Portable Laboratory

Determine if you will use the UNOLS East Coast Portable Laboratory Pool or the UNOLS West Coast Van Pool. If you will use the UNOLS West Coast Van Pool use this link **UNOLS West Coast Van Pool** to see their Schedules. If you are using a UNOLS East Coast Portable Laboratory Pool lab, select the lab you require from the sidebar. On the lab page you will find schedules select the "Schedule CY" for the current year and "Schedule CY+1" for the next year. Check dates on the selected schedule for availability. After determining availability or if you have any questions contact **Timothy W. Deering** for the UECPLP and **Monita Cheever** for the UNOLS West Coast Van Pool

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Winches

An integrated science winch and wire handling systems provide support of science operations on the cutter. The systems consist of two (2) Oceanographic Winches, a side-by-side double drum trawl/core winch, instrumentation sheaves, turning and over-boarding type sheaves. The oceanographic winches provide a multipurpose capability to support general oceanographic research over the stern or side of the vessel via weight handling frames. The two oceanographic winches provide drum interchangeability to handle 10,000 meters of 3/8 inch diameter torque balanced wire rope, 12,000 meters of 0.322 inch diameter Electro-mechanical cable and 14,000 meters of ¼ inch diameter wire rope. Two additional drums are provided with spooled cables for at-sea or dockside transfer from either storage or between winches.

While at sea transfers are possible, systems will be configured inport whenever possible. An additional feature of the drums is that the LeBus sleeves (a component that aids in efficient spooling of the cable onto the drum) may be interchanged within all drums. This allows any diameter cable to be installed on any drum, which in turn may be installed on either oceanographic winch.

The side-by-side double drum trawl/core winch provides multipurpose general oceanographic research, trawling and coring operations over the stern or side of the cutter via weight handling frames. The winch has the capability of handling, on either drum with interchangeability, 12,000 meters of 0.680 inch diameter EM cable and 14,000 meters of 9/16 inch diameter torque balanced wire rope. Interchangeability of cables on the drums is accomplished by relocating the LeBus sleeves between drums.

A CTD/Carousel System; Data Acquisition Terminal at the winch control station in the science conning station area interfaces with a deck unit to profile the conductivity, temperature, density and depth of the water.

Winch Groom Reports

- Apr 2011 - **Life Cycle Engineering winch groom report**
- Feb 2006 - **InterOcean winch groom report**
- Mar 2004 - **InterOcean winch groom report**

Overview
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Science Systems
Science Instrumentations & Sensors
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Labs & Equipment
Navigation Equipment
Science Network

Small Boat Support

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Winches

ICEBREAKERS

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HazMat Policy

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Medical Policy

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Radiation Policy

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Northern Sea Route

Russian Federation

Assessment Report

Prepared for

USCG Surface Forces Logistics Center

CGC HEALY

(WAGB-20)

4/4/2011-4/8/2011

Science Winch System Assessment

Submitted by:

LCE LIFE CYCLE ENGINEERING

CGC Healy:

April 4, 2011

Arrived onboard the vessel at 0730. After signing in and talking to the EOW, we were shown the winch room and the main science lab, where we set up our computers and researched the proper procedures to static test the winch foundations and the sheave foundations. There were conflicting ways of performing the tests. We then searched for the materials needed to perform the tests referenced in the statement of work.

April 5, 2011.

After setting up and starting the inspection of the three (3) science winches. Our inspection included all that was reported in the CFR's, and the normal groom inspections.

Oil levels, oil quality, and roller chain lubrication and tension were checked. We also inspected brake bands, surfaces, pivot points, and air fittings on the brake cylinders. The winches were operated to ensure the direction control, speed, brake functions, and level wind tracking which were all sat. We inspected all the roller bearings and pillow blocks.

The winches all are in good condition. They will require some minor maintenance items to be taken care of before static testing.

The work of static testing the foundations and mounted sheaves is being arranged for as soon as the proper procedures are received from the Coast Guard.

April 6, 2011

Removed covers off all winches and inspected lubrication and tension on all roller chains.

Disassembled the level wind carriages to check the wear on the shuttles, and the automatic lubrication system.

Searched the warehouse and located the correct sheave inserts for the static test. Changed all the O/C sheaves to proof test sheave inserts.

Noted that the computer program to run the system was corrupt and was in need of reload. The ships force was correcting the problem, and was preventing the system from running.

April 7, 2011

Ships force continued working on the download. The winches were lit off and operated at the local stations. Testing continued on the speed control, the level wind tracking, E-Brake, and the couplings. Then control was transferred to the aft conning tower. The controls were tested from there. The sheave inserts were changed back to the original sizes and positions. We compiled a short list of conditions found and departed the ship.

April 8, 2011

We departed Seattle earlier than planned.

Draft reports were e-mailed to Lt. jg. Chris Skapin.

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Condition Found Report

Report Number	**Healy-001**
Date:	**4/4/2011**
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**O/C 1 and 2, Trawl/Core**
Location:	**Winch Room**

Condition Found:	**Upon reporting onboard on Monday morning, the EOW directed us to the winch**
	room and directed us to all the controls. We started to inspect and direct what
	we would need for the week. We were informed the prior contractor used a synthetic
	rope to test the Trawl/Core winch, and the ship has a coil of 9/16" test wire for the
	O/C winches. Tech pub procedures requires 300 meter x 1" test wire for the T/C winch.
	No synthetic rope was located onboard Healy and the coil of 9/16" is only 100 feet long.
	Nor did we find any 1" wire for testing.
Recommendation:	
Signed:	

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Condition Found Report

Report Number	**Healy-002**
Date:	**4/5/2011**
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**O/C 1 and 2, Trawl/Core**
Location:	**Winch Room**

Condition Found:	**All the Level wind Shuttles were removed cleaned and checked for wear.**
	All the shuttles were found to be in good shape.
	All were cleaned again, greased and reinstalled.
Recommendation:	
Signed:	

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Condition Found Report

Report Number	**Healy-003**
Date:	**4/5/2011**
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**Trawl/Core**
Location:	**Winch Room**

Condition Found:	**The automatic lubricator on the core winch, the bowl is full of water and sludge.**
	It also shows signs that it may be cracked.
Recommendation:	**Remove the bowl on the lubricator, disassemble the hoses and connections and**
	clean them all of the sludge and old hard grease.
	If the bowl is cracked and broken it should be replaced.
	Trawl/Core Winch Automatic Grease Lubricator System
	Grease Ram Pump MFG. P/N 82886-H
Signed:	

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Condition Found Report

Report Number	**Healy-004**
Date:	**4/5/2011**
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**Trawl/Core**
Location:	**Winch Room**

Condition Found:	**The air fitting on the air brake is broken and leaks, not allowing the brake to hold.**
Recommendation:	
	Check all the fitting for tightness and test, if it is still leaking then replace the fittings to the brake cylinder.
Signed:	

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Condition Found Report

Report Number	**Healy-005**
Date:	**4/5/2011**
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**Trawl/Core Winch Motor**
Location:	**Winch Room**

Condition Found:	**It was found that the electrical connection enclosure on the main motor on the Trawl/Core winch has been exposed to salt water. The box is corroded and the surface paint has peeled off.**
Recommendation:	**After Tag-Out and Lock-Out of the Trawl/Core winch controller and power supply. Disassemble the whole enclosure and inspect it. It may only have to be cleaned and preserved. Or replacement of the enclosure may be needed.**
Signed:	

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Condition Found Report

Report Number	**Healy-006**
Date:	**4/4/2011**
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**O/C 420 LPR Flag block**
Location:	**Winch Room**

Condition Found:	**The flag block off of the O/C winch has a coating failure on the interior.**
Recommendation:	
	Preservation has failed on the flag block. Power tool old coating and preserve with approved coating IAW with Coating and Color Manual (COMDTINST M10360.3 series)
Signed:	

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Condition Found Report

Report Number	**Healy-007**
Date:	**4/5/2011**
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**Sheave Centers**
Location:	**Winch Room**

Condition Found:	
	Sheave centers where the inserts are attached have excess corrosion.
Recommendation:	
	Remove all the inserts and wire brush or power tool clean all flaking rust. Coat all bolts and nuts with an anti seize compound to prevent the corrosion of the bolts. Also coat all unprotected surfaces.
Signed:	

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Condition Found Report

Report Number	**Healy-008**
Date:	
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**All Controllers**
Location:	**Winch Room**

Condition Found:	**Upon operational testing of the three winches, it was found that the winches could only be operated in local control. Ship's force corrected the problem and the controls were transferred and all winches operated in remote control. All winches operated satisfactory.**
Recommendation:	
Signed:	

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Condition Found Report

Report Number	**Healy-009**
Date:	
Vessel:	**CGC Healy**
Contract Number:	**HSCG85-11-P-P30BX4**
Equipment Affected:	**Decks under O/C #2 and**
	Trawel/Core Winch
Location:	**Winch Room**

Condition Found:	
	The deck plating is corroading and rusting under the T/C and O/C #2 winch
Recommendation:	
	Recommend power tool cleaning and preserving deck IAW
	COMDTINST M10360.3 (series)
Signed:	








055421-002