Introduction

This document is intended to serve as a concise compendium of policies and procedures regarding the operation and maintenance of OSU’s Research Vessel ELAKHA. The policies and procedures are intended to:

- Optimize the scheduling and use of the vessel to support OSU research and education activities.
- Establish and emphasize the safe operation of the vessel including the safety of embarked personnel.
- Assure that the vessel is well suited, within funding realities, to meeting known operational requirements.
- Assure that the vessel is maintained in a manner that will provide a long service life.
- Keep vessel operation costs, and therefore the cost charged users, as low as consistent with the safe and effective operation.

This document will be maintained onboard the vessel and posted on the ELAKHA’s web page. The Marine Superintendent will be responsible for determining the contents but additions, corrections, and updates from the operators of the vessel or scientists using the vessel are welcome.
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1. **Vessel Description and Capabilities**

**Description**

The R/V ELAKHA is a documented and designated as an oceanographic research vessel by the U.S. Coast Guard (the original document is in an envelope in the log book and the original letter of designation is posted in a frame in the pilot house). The vessel is a “Class III Motorboat” under 46 CFR and is subject to the Federal Motorboat Act of 1940 and the Federal Boat Safety Act of 1971.

The vessel’s structure is welded aluminum (alloy 5086) and is diesel powered (both main engine and generator). The hailing port is Newport, OR and the vessel normally ties up at the small craft float at the OSU pier at the Hatfield Marine Science Center.

<table>
<thead>
<tr>
<th>Vessel Name:</th>
<th>ELAKHA (“Sea Otter” in the Chinook jargon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Official Number:</td>
<td>1100178 (USCG Document No.)</td>
</tr>
<tr>
<td>Call Sign:</td>
<td>WCZ7501</td>
</tr>
<tr>
<td>MMSI</td>
<td>366838530</td>
</tr>
</tbody>
</table>

**General Characteristics:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length over all:</td>
<td>54 ft.</td>
</tr>
<tr>
<td>Beam:</td>
<td>16-1/2 ft.</td>
</tr>
<tr>
<td>Draft:</td>
<td>5 ft.</td>
</tr>
<tr>
<td>Displacement:</td>
<td>54,000 lb. (full load)</td>
</tr>
</tbody>
</table>

**Machinery:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Engine:</td>
<td>Cat. 3176B 6 cyl. (capable of up to 600 HP)</td>
</tr>
<tr>
<td>Reduction Gear:</td>
<td>Twin Disc, Mod. MG5111A, 2.444:1 ratio</td>
</tr>
<tr>
<td>Propeller:</td>
<td>Osborne Supertorg, 36” dia., 5 blade, 28” pitch</td>
</tr>
<tr>
<td>Fuel Capacity:</td>
<td>1,200 gal.</td>
</tr>
<tr>
<td>Generator:</td>
<td>Northern Lights, 230/117 Vac, 1 φ, 60 Hz., 7.5 kW</td>
</tr>
<tr>
<td>Bow Thruster:</td>
<td>Key 12”</td>
</tr>
</tbody>
</table>

**Science Equipment:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A-frame:</td>
<td>2,000 lb. SWL*</td>
</tr>
<tr>
<td>Winch:</td>
<td>1/4 in. dia. 3x19 or EM cable</td>
</tr>
<tr>
<td>Transducer well:</td>
<td>15 inch ID, through hull</td>
</tr>
</tbody>
</table>

Additional Equipment is listed in Appendix 3 in this manual.

*Design SWL is 4,000 lbs but 2,000 lbs will be operational SWL except for special operations approved by the marine superintendent.
Operating Range:

The normal operating range is bounded by Crescent City, CA harbor (apx. 41°30'N) to the south, Grey's Harbor, WA (apx. 47°00'N) to the north, extend out 50 nm offshore and include the various navigable harbors and rivers along the coast between the southern and northern boundaries including the Columbia River up to Portland, OR.

Operations beyond this area may be approved but will require advance planning and will involve additional costs for insurance, crew lodging, port fees and other unusual expenses.

Speed and Endurance:

Normal cruise is at no more than 1,800 engine rpm – this gives a speed of about 10 knots in moderate sea conditions and a fuel consumption of about 8 gph (exclusive of generator use).

Higher engine speeds, up to 2,200 rpm, give somewhat increased vessel speeds but greatly increased fuel consumption. Engine speeds over 1,800 rpm will not be used unless warranted in the operator’s opinion by an emergency or approved by the marine superintendent. Since fuel consumption is substantially increased, the hourly rate will be increased for cruises requiring higher speeds.

Engine speeds over 2,200 rpm will not be used since the exhaust gas pressures exceed Cat factory recommendations.

Normal cruises will not exceed 12 hours away from Newport.
Range is limited to about 400 nm.
Cruises in excess of 12 hours will require a second operator onboard the vessel and advance planning with Ship Operations.
Nighttime operations may be conducted.
It is anticipated that the normal use of the boat will be for cruises less than 12 hours and mostly during daylight hours.

Crew:

One licensed operator for day cruises (12 hours or less) and two for longer cruises plus one crewmember.

Scientists/Students:

Up to 13 for trips inside Yaquina Bay or other inland waters (limited by the number of life jackets).
Up to 08 for trips less than 12 hours offshore (limited by life raft capacity).
Up to 2 for longer trips offshore where two operators will be required (limited by sleeping accommodations).
2. **Scheduling**

Optimum scheduling of R/V ELAKHA is necessary to accomplish the greatest amount of work and keep vessel operation costs down. The guidelines below were modified after the March ‘13 meeting in an effort to improve scheduling. These procedures can be changed again if needed.

The "summer season" begins on 01 April and ends 15 Oct. of each year. A meeting of interested users* will be held before 01 Oct. each year to schedule planned trips during this period. The PISCO program, for its duration, will have priority in scheduling trips, then other OSU users (for the purpose of scheduling and billing an OSU user is defined as any user paying through an OSU FIS Index), then all others. This schedule will be posted on the ELAKHA's home page. Days outside the summer season or not reserved on the published schedule after the meeting may be scheduled by any user at any time on a "first scheduled - first served" basis. There will be no "bumping" of scheduled cruises, though users are encouraged to work together, when work needs to be rescheduled.

The following process will be used to establish a schedule:

OSU Ship Operations will initiate a draft schedule for the coming year by 01 September of the prior year. This draft will have days blocked out for maintenance, "emergency days" (see below), planned vessel downtime, etc. This schedule will be posted and work outside the summer season may be scheduled. This schedule will identify the date for the scheduling meeting.

The PISCO program will provide a schedule for their planned work during the summer season by no later than the 10th of September of the prior year.

A draft schedule for the summer with the PISCO work included will be made available to interested OSU users who may submit their scheduling needs to Ship Operations up to mid-September. Ship Operations will attempt to schedule this work following the general guidelines below:

Short (i.e., one or two day) use periods will be scheduled at the beginning or end of the week or put together to leave the remaining time available for projects needing larger blocks of time.

Sundays will generally not be available for scheduling to give the operator a day off each week.

Every other Saturday during the summer season will be held in reserve as an “Emergency Day” for use by groups needing the day because weather prevented scheduled work or unanticipated problems (e.g., a mooring coming adrift) require access to ELAKHA. These days will be held until the preceding Friday morning at 0800.

*This meeting may also be used to discuss equipment upgrades, operational policies or other matters related to the operation of R/V ELAKHA that may be of interest to the group.
An attempt will be made to leave blocks of time open rather than distributing short open periods between projects.
Work away from Newport will be organized to minimize “deadhead” transits.

In order for this scheduling process to work the requests should be general (e.g., 3 contiguous days in August) rather than specific (e.g., 22-24 August) if possible. Where conflicts can’t be avoided (e.g., cruises requesting specific dates or more work than days in a given time period) the vessel will be “double booked” and the conflict noted for resolution.

The draft schedule developed above will be made available on ELAKHA’s web page for review before the scheduling meeting. Individual users are encouraged to develop solutions to conflicts and let Ship Operations know of the resolution. Changes will be made to the schedule as long as they are in keeping with the general guidelines above.

A “final draft” schedule will be posted a few days before the scheduled meeting. This will be used as the basis for discussion at the meeting. Once conflicts are dealt with, non-OSU users may schedule work in the available time remaining at the scheduling meeting.

The schedule developed at the meeting will be posted on ELAKHA’s web page. Additional work may be scheduled in open periods and individuals can be asked to be posted as an “alternate” to scheduled work (e.g., it’s often possible to work in Yaquina Bay when work offshore had to be canceled due to weather). When cancellations occur Ship Operations will notify (to the extent our limited staff can) all on the ELAKHA user’s email list.

The cancellation policy is:

Cruises may be cancelled due to weather or sea conditions at any time the Chief Scientist or vessel operator. The vessel operator has the ultimate responsibility for the safety of the vessel and may remain in port, return to port, or take other prudent action as necessary for the safety of the vessel and embarked personnel.

Scheduled cruises that are not expected to take place because of equipment problems, lack of personnel, etc., should be cancelled as early as possible but at least two working days in advance. This will allow the opportunity to schedule other work. Ship Operations may maintain a list of alternate users for such occasions.

Should it become apparent that cancelled cruises are becoming a problem, a non-refundable deposit for scheduling the vessel will be established.
3. Cruise Plans and Release Forms

Cruise Plans are required for each cruise. These plans will help assure that the vessel and equipment are ready for the work planned, that adequate staff is available and provide information required (people on board, operating area, planned return) in case of an emergency. The form can be found in Appendix 1 of this document or can be printed from the ELAKHA web page (http://www.shipops.oregonstate.edu/ops/elakha/). The completed form is due in the Ship Operations Office (fax or e-mail) no later than two working days before the scheduled departure, but you are encouraged to submit a cruise plan at least a week in advance. The failure to submit a cruise plan in a timely manner may result in the vessel being rescheduled.

When planning the scientific complement please be aware that the boat crew will not be able to assist. The scientific complement may be required to assist in casting off the vessel when getting underway and making up the lines when returning to the dock. They will also be responsible for “over the side” operations other than operating the winch and A-frame. **Sufficient personnel should be provided for these tasks.** It is strongly recommended that all routine users of ELAKHA complete the “Shipboard Safety & Survival Training for Scientists” class provided by OSU Ship Operations. At least one member of each science party must have current (within 5 years) training.

Cruises of over 12 hours duration will include a second vessel operator but only one operator will be on watch at a time. The scientific complement should be adequate for all planned operations without having to call out the second operator to assist. No cook or food will be provided – the scientific complement is responsible for bringing adequate food for all embarked personnel, preparing the food and cleanup of the galley – meal plans should be coordinated with the vessel operator.

The original of the cruise plan will be maintained in a file in the Ship Operations office. A copy will be given to the vessel operator who will carry it on ELAKHA & complete the appropriate sections at the end of the trip and turn it in to the office.

Release & Consent forms are a University requirement for all users of the vessel. Those scheduling the vessel are responsible for providing insurance coverage for all embarked members of the science party. The 2-page form can be found in Appendix 2 of this document or can be printed from the ELAKHA web page. They are due upon departure, and to be handed to the boat operator. ELAKHA will not depart the pier until a completed and signed form is in hand for each member of the scientific complement.

Pre & Post Cruise setup time
A total of one hour is included with each cruise, to MOB and/or DeMOB. Any additional time will be charged per the OSU fee guide. Additional hourly fees apply to have the engine running while vessel is tied up at pier.

There is a No Smoking policy for all cruises on the ELAKHA. Smoke-free OSU http://oregonstate.edu/smokefree/
4. **Configuration Control**

In order to assure the long life, safety and operational capability of the vessel **no modifications**, such as drilling holes in the aluminum structure, decking, paneling or woodwork; modifying electrical or electronic wiring; removing or adding equipment (other than portable scientific equipment); replacing equipment or components with other than original; etc., are to be made without the knowledge and approval of the marine superintendent.

Corrosion of the hull is a particular concern with aluminum-hulled vessels. Specifically, **no copper or copper bearing materials should come in direct contact with the aluminum structure**:

- No copper, brass, bronze, copper-nickel, etc., pipe fittings, castings, etc., should be used. (e.g., a vent petcock on a transducer mounting plate for the well should be stainless rather than brass).
- No copper or copper containing materials should be dropped in the bilges or on deck (a copper penny dropped into the bilge and sitting in sea water can eat a penny sized hole in the hull in fairly short order).
- No copper bearing anti-seize compounds are to be used on threaded fasteners (e.g., bolts going into the deck sockets).

Damage to the bottom paint should be avoided (e.g., by dragging a wire rope or chain on the turn of the bilge or rolling chock during over-the-side operations. If the paint is damaged below the waterline to the point where the aluminum is exposed severe corrosion will take place eventually eating a hole through the hull.

Stray electrical currents resulting from improper wiring or mounting of equipment can also cause severe corrosion:

- Equipment, powered either from the vessel’s 117 Vac or 12 Vdc supplies, are to be connected only to the available receptacles installed on the vessel. **-- connections are not to be made directly to the batteries, bus bars, etc.** 12 Vdc powered equipment having the negative side of the power connected to the case are to be isolated from the aluminum structure of the vessel by mounting on a wood base or other means.

- Science equipment powered from storage batteries (e.g., the mini-bat winch) with voltages below 32 Vdc may be used but the electrical system is to be isolated from the vessel’s structure. Lead-acid batteries are to be in suitable plastic battery boxes to prevent the possibility of spilled electrolyte coming in contact with the aluminum structure. In no case will the structure of the vessel be used as one of the current carrying conductors.

- Science equipment requiring an onboard power source, other than the vessel’s generator, above 32 V (e.g., a portable generator) must be discussed with the marine superintendent in advance. The use of gasoline powered equipment is discouraged for safety reasons.
• Any electrical equipment used on the vessel while tied to the dock must be connected to the vessel’s electrical system – extension cords are not to be run from dockside receptacles onto the vessel. The vessel’s shore power system includes an isolation transformer to reduce the possibility of stray ground currents through the hull and a Ground Fault Interrupter Circuit Breaker to reduce shock hazards. Any connection, other than the installed shore power connection, between shore-side electrical systems and the vessel are to be avoided.

• No welding is to be done on the vessel without the knowledge and approval of the marine superintendent.

• Do not use duct tape or similar materials to secure cables or equipment to interior bulkhead sheathing or cabinets. The adhesive pulls the coating off the panels and leaves a gummy residue.
5. **Installed Equipment**

Appendix 3 contains a list of equipment installed on ELAKHA or available from the Ship Operations equipment pool for installation. A good deal of installed equipment including radios, the radar, echo sounder, navigation equipment, etc., is intended for the safety of the vessel – it may be used to aid the scientific work only to the extent that it does not interfere with the safety of the vessel.
6. Installation of Temporary (Science) Equipment

The following general guidelines are provided for the installation of scientific equipment and are intended to avoid:

- unsafe operating conditions on or in the vessel,
- reductions of the vessel's stability to an unsafe degree,
- structural damage to the vessel and
- damage to the vessel’s electrical and hydraulic systems.

Some criteria, such as the stability of the vessel, involve a number of considerations and are beyond the simple guidelines in this section. Unusual requirements or requirements coming close to the limits below should be identified in the cruise plan and discussed, well in advance, with the Marine Superintendent. Inadequate planning, which results in potentially unsafe conditions, may result in all or part of a cruise being canceled.

Loading limits:

The total science load on the vessel should not exceed 4,000 pounds. This includes all equipment (including ELAKHA’s portable mooring winch and crane if installed – weights are listed in Appendix 3 of this manual) and personnel (estimate at 170 pounds each). No single piece of science equipment should exceed 2,000 pounds (limited by the structural strength of the deck as well as the lifting capacity of the shore crane used to load/unload ELAKHA at OSU’s dock.) The load must be distributed as follows:

- Loading on the main working deck should not exceed 125 pounds per square foot (psf). Equipment weighing more than 500 pounds must span at least two frames (i.e. two rows of deck sockets fore and aft) and over 1,000 pounds must span at least three frames (i.e., three rows of deck sockets).
- Loading in the laboratory should not exceed 40 psf (this is a plywood over aluminum frame deck).
- Loading on the upper deck (where the life raft is) is limited to no more than 500 pounds total and not more than 40 psf. An open access from the ladder to the life raft and EPIRIB must be maintained for safety reasons.
- Dunnage is to be used to protect the deck and distribute the load of heavy equipment such as anchors.
- Deck sockets are rated for a safe working load (swl) of 1,000 pounds in shear and 2,000 pounds in tension. Bolts must engage in the threaded portion of the socket for ¾” of their length – this requires a bolt 1-1/4 to 1-1/2” longer that than the thickness bolted to the deck since the sockets are recessed into the deck. Only stainless bolts are to be used (an assortment is available on the vessel but specific equipment may require that bolts be provided with the equipment). An approved, non-copper bearing, anti-seize compound must be used on all fasteners used with the deck sockets.
- Equipment in the laboratory may be secured by drilling holes in or screwing to the “sacrificial” counter tops along port side or by mounting on the “Unistrut” channel. No holes are to be made in the deck, bulkhead or overhead paneling, finished cabinet tops,
etc. Tape should not be used on any paneling because it damages the coating when removed.

- Space is available in the pilot house for equipment on the port side of the console or the after ledge. No holes are to be made.

Areas to be kept clear:

The following areas must be kept clear for the safety reasons:

- The pilot house to allow the operator to have access to the operating position, the ladder aft, the port side door and the access door on the port side to the console (the immersion suits are stowed in this area).
- The port side deck to allow access for handling mooring lines and access to the bow for anchor handling.
- The bow area to allow emergency use of the anchor (e.g., the vessel looses power and must be anchored to avoid going aground).
- The starboard side of the laboratory to allow passage through the laboratory and access to the hatch to the machinery space and engine room.
- The aft control station including passage from both the aft door of the laboratory and the port side door from the pilot house. Cables running through the “mouse hole” must be secured to avoid interference with the controls.
- The port side immersion suit locker in the laboratory must be accessible at all times.
- Access to the galley and berthing area is not to be encumbered.
- Ladder and route to life raft and EPIRB on upper deck.

A-frame loading:

The stern A-frame may be used for loads of up to 1,000 pounds which is also the rated capacity of the installed oceanographic winch on ELAKHA. Loads of up to 2,000 pounds may be handled with the portable mooring winch (see Appendix 3) but handling of weights in excess of 1,000 pounds must be discussed with the marine superintendent well in advance and will result in reductions in the allowable weight of science gear to assure the stability of the vessel.

No wire or cable with a ultimate breaking strength in excess of 6,750 pounds (ultimate breaking strength of \( \frac{1}{4} \)” diameter 3 x 19 wire) may be used for over the side work off ELAKHA. This limitation is based on federal regulations pertaining to oceanographic vessels and the policies established by the University National Oceanographic Laboratory System in Chapter 12 of the UNOLS RVOC Vessel Safety Standards (www.unols.org/publications/manuals/saf_stand/contents.htm)

The applicable section of 49 CFR 189.35-9 is quoted below:

49CFR189.35-9(c)(1) Wet Weight Handling Gear: Wet gear shall be considered to consist of gear used to lower equipment, apparatus or objects beneath the surface of the
water or for trailing objects, where the wire rope or cable is payed out beneath the surface and becomes part of the line pull at the head sheave or winch drum. Wet gear shall be designed, as a minimum, to withstand and operate in excess of the breaking strength of the strongest section or wire to be used in any condition of loading.

The safety factor for all metal structural parts shall be a minimum of 1.5; i.e., the yield strength of the material shall be at least 1.5 times the calculated stresses resulting from application of a load equal to the nominal breaking strength of the strongest section or wire rope to be used. Suitable assumptions for the actual loading conditions shall be used in the design of wet gear. The lead of the wire rope from the head sheave or winch drum shall be considered to vary from the vertical and in azimuth in a manner to represent the most adverse loading condition.

The A-Frame structure was designed to meet the CFR requirement for a maximum wire strength of 6,750 pounds, the ultimate breaking strength of ¼” diameter 3x19 wire rope. No wire, rope, cable, etc. exceeding this strength may be used on ELAKHA for any operations over the A-frame. This limitation specifically applies to tow cables (e.g., the Mini-Bat electromechanical tow cable), mooring wires (e.g., the wire between a surface or subsurface buoy and the anchor if the anchor is to be recovered with the wire) or pickup lines for moorings, etc. Any equipment to be placed in the water off the ELAKHA or to be recovered by the ELKAHA must be designed to stay within this limitation.

The following table lists some standard wires, cables and lines which represent the maximum size that may be used on ELAKHA (this table was taken from a variety of sources including the UNOLS Wire Manual and manufacturer’s web sites):

<table>
<thead>
<tr>
<th>Wire/Cable</th>
<th>Breaking Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>¼” 3x19 Wired</td>
<td>6,750 pounds</td>
</tr>
<tr>
<td>1-H-225 EM Cable (0.252”)</td>
<td>5,600</td>
</tr>
<tr>
<td>3-H-250 EM Cable (0.254”)</td>
<td>5,500</td>
</tr>
<tr>
<td>5/8” 3 strand polypropylene fiber rope</td>
<td>5,580</td>
</tr>
<tr>
<td>½” Nylon fiber rope</td>
<td>5,670</td>
</tr>
<tr>
<td>9/16” Polyester fiber rope</td>
<td>6,435</td>
</tr>
<tr>
<td>7/16” Sampson double braid</td>
<td>6,600</td>
</tr>
<tr>
<td>¼” Spectra 12 strand</td>
<td>5,900</td>
</tr>
</tbody>
</table>

¼” Kevlar 12-strand single braid has a breaking strength of 7,100 pounds and may not be used for over the side operations off ELAKHA.

In addition to the limits on wire, cable, etc. all user supplied equipment such as winches or portable frames must also meet the quoted CFR requirements. The structural strength of the winch, including the attachment of the winch to the deck bolt sockets on ELAKHA’s deck, must
be at least 1.5 times the strength of the wire, cable, etc. used with the winch. Any user supplied blocks, attachment hardware, load cells, etc. must have a safety factor of at least 1.5 times the nominal breaking strength of wire rope to be used and, in all likelihood, more because of the geometry of the wire over the block. Any installation of user supplied weight handling gear including blocks, winches, load cells, etc. must be tested to 125% of the maximum anticipated load, including any dynamic load, prior to use. [UNOLS RVOC Vessel Safety Standards, Ch. 12].

Note that the CFR limitations have nothing to do with what weight is on the end of the wire, cable, etc. or the expected load. The limitation is strictly on the strength of the wire.

The size of objects deployed with ELAKHA’s A-frame are limited to no more than 10’ in any dimension – the A-frame is 10’ wide and pivots to a point 5’ aft of the deck. The 10’ height limit includes any hardware, blocks, load cells, etc. suspended from the A-frame. Operations with objects approaching the 10’ limit should be carefully planned in advance using actual measurements of ELAKHA and the science equipment. Heavy objects will require steadying lines and suitable attachment point on the object. A cradle or dunnage must be provided to avoid concentrated loads on deck which could cause structural damage.

Portable crane:

The portable crane (see Appendix 3) may be mounted in various locations on the main deck and may be used either to move equipment on deck or for “over-the-side” operations. Weights should be limited to 500 pounds though larger weights may be possible – please discuss with the marine superintendent well in advance. Towing over the side is possible but requires a “forestay” be rigged to prevent side loads on the crane. The exact arrangement should be discussed with the operator or marine superintendent in advance.

As with user installed weight handling gear above, the breaking strength of any wire or cable going in the water is to be less than the load rating of the crane (the crane has at least a 150% safety factor) and the crane must be tested to 125% of the maximum anticipated load prior to the cruise.

The crane is rated only for intermittent operation.

Electrical connections:

- Electrical/electronic cables may be run through exiting wire ways. Capped penetrations are provided on the after, port corner of the laboratory and after part of pilothouse near false stack.
- 117 Vac loads under 250 watts (like a laptop computer) may be plugged into the inverter receptacle in the laboratory (under the bench, just forward of the immersion suit locker) – this intended to avoid having to run the vessel’s generator only to power such a load.
- A very limited amount of 12 Vdc power is available – planned use should be discussed well in advance.
• Lab, pilot house and galley receptacles are standard “U-ground” 15 amp devices. The vessel’s system neutral is ungrounded so some devices, such as UPS’s, may not work correctly though this is uncommon in our experience.

• A 117 Vac, 15 amp watertight receptacle is available on deck. A Leviton Cat. No. 320P4W plug will mate with the receptacle. A suitable plug is available on ELAKHA to be installed on scientific equipment but is not to be removed from ELAKHA. A Ground Fault Current Interrupter (GFCI) receptacle box is available to connect to this but is intended for use only alongside the dock since the receptacles are not waterproof. Requirements for 117 Vac on deck at sea should be met either by using a suitable waterproof plug to connect to the watertight receptacle or by leading the cable though the “mouse hole” into the laboratory.

• A 240 Vac, 15 amp receptacle is also available on deck. A Leviton Cat. No. 420P12W plug will mate with it. A suitable plug is available on ELAKHA to be installed on scientific equipment but is not to be removed from ELAKHA.

• The electrical power from ELAKHA’s systems is subject to voltage and (for the alternating current system) frequency fluctuations depending on load. Suitably rated power conditioners may be required for particular applications but, as above, this has not been common in our experience.

Data output from vessel’s equipment:

GPS and depth data are available as standard NMEA “sentences” on the “RS-232 plugs” in the laboratory above the bench on the port side. The available NEMA sentences are SDDPT and SDDBT (meters only) for depth and GPGAA, GPGLL and GPRMC for GPS position. The NMEA outputs of the vessel’s equipment (two GPS receivers, navigation computer and the echo sounder) are not available from other than the port described above and are not to be changed since they serve critical functions including the navigation computer, the remote operating station navigation and depth display and the GMDSS Category E VHF transceiver.

Hydraulic connection:

Connection to the vessel hydraulics is possible but requires careful planning well in advance. ELAKHA’s hydraulic system services the bow thruster, anchor windlass, oceanographic winch, A-frame and the portable mooring winch and crane when installed. This system is fairly sophisticated and relies on load sense signals sent back to the pump from each piece of equipment. A single piece of equipment requiring hydraulics may be connected to the auxiliary control valve on the oceanographic winch using Parker ½” quick release fittings. This valve provides the required load sense signal and can be used to run a single motor or ram in either direction. This valve is used for the portable mooring winch or the crab block (see Chapter 3).

There is also an additional hydraulic port connected directly to the hydraulic manifold. This port is used with the portable crane but can be available for other, limited use. Any planned connection to the vessel’s hydraulics must be planned well in advance and discussed with the port engineer.
Any hydraulic equipment connected to the vessel’s system must be clean, have Chevron AW 46 (?) or approved equivalent hydraulic fluid (to avoid contamination of the vessel hydraulic system) and be rated for the available system pressure of 2,200 psi.

Technical Services:

Meeting unusual requirements, such as connection to the vessel’s hydraulic system, modification of the vessel’s data stream to the laboratory, etc. will require the technical services of the port engineer or marine superintendent. Services beyond a minimal level will be billed to the project at cost. Marine technician services are not included in ELAKHA’s rate structure so any such services must be arranged with the head of the Marine Technician Group.

Shore Support Services:

If the Ship Operations yard crane will be required to load/unload this should be noted in the “Special Requirements – Other” section of the cruise planning form. (This crane is old and occasional taken out of service for repair and maintenance.)

Any need for storage or shop space at Ship Operations should be discussed with the Marine Superintendent well in advance. Outside storage space for short periods (i.e., a few weeks between cruises) is generally not a problem (equipment must be on a pallet or otherwise easy to move with a forklift) but inside space is at a premium.
7. Safety

Safety is of paramount importance in operating the ELAKHA. This includes operating the vessel in a safe manner, keeping the vessel and vessel equipment in a seaworthy and safe condition, and the safe behavior of all embarked personnel including scientists as well as crew. The following paragraphs do not attempt to address all vessel safety matters but only to call attention to specific areas.

The operators and crew, by virtue of their experience, training, Coast Guard licensing and documentation, etc., are expected to operate the vessel in a safe manner. They are to keep themselves familiar with all vessel systems including emergency systems (e.g., bilge pumps, engine room fire suppression system, communications and navigation equipment, emergency equipment, etc.) and be capable of training others.

The vessel is to be maintained in a safe and seaworthy condition at all times – it is not to leave the dock with any critical system inoperable (the definition of “critical” obviously depends on planned operations, e.g., having only one VHF radio or one GPS would not be a problem for near shore trips but could be a problem for longer trips further offshore). Vessel maintenance shall be kept up with in accordance with the Maintenance section of this document. Any equipment failures, potential problems, etc., should be noted on the copy of the Cruise Plan turned in to the Marine Superintendent. Problems which can’t be corrected by the operator are to be discussed with the Marine Superintendent who will arrange for repair.

The training and indoctrination of scientific personnel, particularly personnel with little previous sea-going experience or familiarity with ELAKHA, is to be emphasized. As a bare minimum, all scientific personnel shall be instructed on the following (46 CFR185.25.1 gives guidance for Subchapter T Small Passenger Vessels) before the vessel leaves the dock:

- Stowage location of life preservers and immersion suits (offshore only).
- Proper method of donning and adjusting life preservers and immersion suits (offshore only).
- Location and use of life rings.
- Location of life raft and method of deployment.
- Location in pilothouse of emergency check off lists.
- The use of hard hats and work vests for overhead and over-the-side operations (if anticipated).
- The location and use of the EPIRB.
- Instruction on use of other vessel equipment such as VHF radios, cellular phone, winch, etc., if appropriate.

Users of ELAKHA are encouraged to read the RVOC Safety Training Manual – Research Party Supplement (available on ELAKHA), view the RVOC Safety Training Video (available in Ship Operations and the Pattullo Study in the Oceanography Administration Building) and attend a one day “Safety and Survival at Sea” training session when offered by Ship Operations.
The boat operator is to conduct a drill, at least once each month, involving him/herself, the crew member and available scientific personnel. Drills should, over the course of the year, cover various emergency situations including fire, grounding, flooding, collision, abandon ship, man overboard, hazardous material spill, and a medical emergency. Drills are to be logged in red ink in the ELAKHA’s log book.
8. **Vessel Maintenance**

Refer to appropriate manuals on boat and coordinate with the Marine Superintendent as required to perform the identified tasks.

**Before getting underway:**

1. Check oil in main engine
2. Check coolant level in main engine
3. Check oil level in generator
4. Check coolant level in generator.
5. Check sea strainers.
6. Check bilges for water, loose materials (which could clog pumps), etc.
7. Check fresh water tank level (gauges)
8. Check fuel level (gauges)
9. Check holding tank levels (gauges)

**After returning from trip:**

1. Check bilges.
2. After offloading stow A-frame in full inboard position to protect rams from corrosion.

**Every two weeks:**

1. During periods of active use, grease bearings on oceanographic winch and steering gear.
2. During periods of active use, grease diamond screw on oceanographic winch level wind.

The following maintenance is to be performed at the identified intervals and recorded on the sheets provided in the maintenance log binder maintained on the boat.

**Monthly:**

1. Check electrolyte level in all storage batteries.
2. Check hydraulic fluid level in main and steering system tanks.
3. Check gear oil level in reduction gear.
4. Check operation of four emergency flashlights.
5. Check and test EPIRB (see 46CFR185.25-20), log in ship’s log.
6. Check fire extinguishers (invert or shake dry chemicals).
7. Check life rings, strobe light and rescue collar.
8. Grease bearings and diamond screw on oceanographic winch, grease anchor windless.
9. Lower, raise and stow anchor to check operation of winch, controls and bail.

**Quarterly:**

1. Check and maintain oil level in winch gear box.
2. Check all dogging hatches (lazerette, door to engine room, bow thruster compartment, emergency escape hatch) and free up if necessary.
3. Check heat detectors (engineroom and galley) (use heat gun, not open flame).
4. Check operation of float switches on electric bilge pumps and high water level alarm switches by manually lifting.

Annually:

1. Change oil in winch gear box.
2. Life raft service (during Winter)
3. Check expiration dates on flares.
4. Check expiration dates on life jacket, immersion suit and life ring lights.
5. Fixed fire fighting and fire extinguisher service.
6. Check EPIRB battery expiration date (May 2005) and hydrostatic release expiration date (Aug 2002) and service as required.
7. USCG Document must be renewed every year (June).
8. USCG Letter of Designation must be renewed every other year (July of even numbered years).
9. Haul-out every two years.
10. FCC Station License must be renewed every 5 years (May of 2005).

Maintenance Schedule as Required by Hours

Every 50 Service Hours:

- Main Engine zinc rods
  - Inspect / Replace:
    - 2ea. Right heat exchanger bonnet
    - 1ea. Left heat exchanger bonnet
    - 1ea. Raw water pump elbow
    - 1ea. Oil cooler bonnet

- Generator zinc rod
  - 1ea. Heat exchanger

- Generator V-belt tension
  - Check

Every 100 Service Hours:

- Generator engine oil and filter
  - Change

- Generator engine air cleaner
  - Check

Every 200 Service Hours:

- Generator engine primary fuel filter
  - Check/Replace

- Generator engine secondary fuel filter
  - Replace

- All hoses & clamps on Generator engine
  - Check
Generator engine crankcase breather Clean
Generator engine air cleaner element Clean

Every 250 Service Hours:
Main engine primary fuel filters Clean/Replace
Main engine secondary fuel filter Clean/Replace
Main engine air cleaner element Change
Main engine crankcase breather Clean
Main engine oil and filter Change
All hoses and clamps Inspect/Replace as required

Every 600 Service Hours:
Generator engine valve clearances Check
Generator engine injectors Check
Generator engine cooling system Check and flush
Generator engine raw water pump impeller Change

Every 1000 Service Hours:
Main engine after-cooler core Clean/Test
Main engine Transmission oil and filter Change
Main engine Transmission suction strainer: Clean

Every 2000 Service Hours:
Main engine transmission input coupling Check

Every 2400 Service Hours:
Generator engine fuel injector pump: Check
Generator engine heat exchanger: Check and clean

Every 3000 Service Hours (Dealer Service):
Main engine coolant (DEAC) Change
Main engine coolant (ELC) Add as required
Main engine cooling system water temp. regulator Replace
Main engine crankcase vibration damper Inspect
Main engine electronic unit injector Inspect/Adjust
Main engine Clean
Main engine mounts Inspect
Main engine speed/timing sensors Clean/Check/Calibrate
Main engine valve lash Inspect/Adjust
Main engine valve rotators  Inspect
Main engine starting motor  Inspect
Main engine turbocharger  Inspect
Main engine water pump  Inspect

Every 6000 Service Hours:

Main Engine Cooling System Coolant (ELC)  Change

Every 9,600 Service Hours  -- Consider generator engine overhaul.

Every 10,000 Service Hours  -- Consider Main and Generator engine overhaul.
9. **Routine Procedures**

The following notices, check-off lists and procedures are intended to aid in the everyday operation of the vessel and address routine operations such as:

a. Notice to Scientists  
b. Departure Checklist  
c. Arrival Checklist  
d. Generator Startup and Shutdown, Shore power.  
e. Sewage and Grey Water Discharges.
Notice to Scientists

The following information is provided in an effort to ensure the safety, operational usefulness, environmental compliance, and lifetime of the R/V ELAKHA:

- The sinks (outside, laboratory, galley) drain overboard. Do not put any petroleum products, hazardous chemicals, etc. in them -- such products are to be returned to shore for proper disposal.
- The head (bathroom) is not to be used when the vessel is alongside. Do not put anything in the commode, with the exception of limited quantities of toilet paper, that you haven’t eaten.
- The galley and appliances (small refrigerator, range, microwave) are not to be used for scientific samples.
- Please keep mud, slime, etc. out of the laboratory. Rain gear, dirty coveralls, etc. are to be taken off before going in the galley or berthing area.
- Mounting holes, screws, etc. may be put in the hardboard tops of the counters along the port and forward side of the laboratory. No other holes, fasteners, etc. or any other modification may be made to any part of ELAKHA without the approval of the Marine Superintendent. Any such modifications must be requested well in advance of the planned cruise.
- Please clean any mess made on deck and in the laboratory, galley and berthing area before leaving.
- If you have equipment that needs to be stowed at Ship Operations between cruises please make arrangements with the Boat Operator – do not leave anything on ELAKHA.
- No copper or copper bearing (brass, bronze, etc.) hardware, compounds (e.g., anti-seize), etc. are to be used on ELAKHA. Copper, even traces leached off, causes rapid corrosion of aluminum in sea water.
Departure Checklist


Machinery space and Engineroom:
2. Check potable water tank level (sight glass on port side of tank) & top off if necessary.
3. Check Main and Gen. engine oil level.
4. Check Main and Gen. engine raw saltwater strainers visually.
5. Switch on Main engine must be in “I” position.
6. Close and dog W.T. door to engineroom.
7. Set both battery switches to “Both” position.

In Pilot House:
9. Unlock and undog port side door (so you can get from pilot house to after control station and back.
10. Turn all A.C. Ckt. Bkrs. off, main Bkr. to off and turn selector switch from “Shore Power” to off.
11. Put Engine/Reverse gear control handle in neutral position.
12. Turn Main Engine key switch to “On” position and wait for lights to stop flashing, gauges to settle, etc.
13. Press button on control handle station to take control – green “Neutral” light should be on and orange” Station” light should be on.
14. Turn key to “Start” position and release once engine has started.
15. Turn on D.C. Ckt. Bkr. for:
   All required electronics.
   Lower Cabin Lights.
   Refrig.
   Head.
   Fresh water pump (make sure all valves in galley, head and lab are closed).
16. Turn on inverter and circuit breaker on lower left of A.C. panel.
17. Turn on navigation computer and bring up software.
18. Turn on all required electronics, set to desired ranges, etc.
19. Set VHF’s to Ch. 16 and 68 (w/outside speaker) and Ch. 13 – comms check with KFB if staffed.
20. Turn Autopilot to “Power Steering” and check rudder movement.
21. Conduct safety lecture, tour and demonstration (tailor to scientific complement, planned operations, etc.)
22. Engage hydraulics clutch.
23. Turn on Bow Thruster Ckt. Bkr. and briefly test.
24. Log “Departure checks complete.”
25. Turn off shore power switch (on float) and disconnect shore power.
26. Shift control to aft station if desired (make sure it’s in neutral). Check for engine, steering and bow thruster control.
27. Take in lines, etc., log departure.
Arrival Checklist

If beyond 3 nm limit pump black and gray water holding tanks. Valves will need to be “lined up” in machinery space, port side-forward, to do so. Return valves to the shoreside position before reentering the 3 nm limit.
Engage hydraulics clutch and turn on Bow Thruster – test.

After alongside:
Log arrival.
Turn off all electronics equipment, and turn off D.C. Ckt. Bkrs.
Shutdown navigation computer and, once shut down, A.C. circuit breaker and inverter.
Secure all D.C. circuit breakers except galley lights.
Disengage hydraulics clutch.
Secure A.C. generator if it was on line (will probably be secured once science ops are complete).
Secure main engine by pushing “Kill” button and turning key to off position (must do both).
Connect shore power cable, turn switch (on float) on. Turn selector switch in pilot house to “Shore” position, turn on main Ckt. Bkr., turn on “Eng. Rm. & Mach. Space Outlets,” (powers up battery charger), Refrig., and other circuit breakers as required. (Probably don’t need hot water, etc.)
Clean up boat, secure uncontaminated sea water through hull (if opened), wash down, remove engine key, lock doors, etc.
Generator Startup and Shutdown, Shore power.

1. The A.C. power selector switch should be in the “Off” or “Shore” (if shore power is available) setting.
2. Hold the top switch (glow plugs) switch on the generator panel down for a while – time depends on how cool the engine is.
3. While holding the top switch down hold the bottom one up to crank the engine – release both when you hear the engine start or when the oil pressure comes to about 40 psi (hard to hear the generator engine with the main engine running).
4. Switch off all A.C. Ckt. Bkrs. including the main breaker, shift the selector switch to “Generator,” turn the main breaker on and any other breakers needed.
5. The A.C. voltage may be read with the Volt meter and switch on the panel (note that when on shore power the only reading will be in the “Line 1” position)
6. To secure the generator turn off all A.C. Ckt. Bkrs., the main breaker and switch the A.C. power selector switch to Off (or “Shore” and reconnect loads).
7. Secure the generator engine by flipping the bottom switch down to the “Off” position.

Note, if only a small amount (<250 watts) of A.C. power is needed in the laboratory it may be obtained from the inverter. The Ckt. Bkr is the bottom, right one on the A.C. power panel and the receptacle is the furthest outboard one under the counter on the port side of the laboratory.
Sewage and Grey Water Discharges.

ELAKHA is equipped with both “Black water” (sewage containing untreated human wastes) and “Grey water” (sink and shower drains not containing human wastes) holding tanks. The tank levels may be observed on gauges in the pilot house.

Sewage (Black water) is not to be discharged into the water unless beyond 3 nautical miles of land (MarPol). Grey water may be discharged but is best discharged outside the bay where the presence of soap suds, etc. will not be a problem.

To discharge either Black or Grey water into the sea:

Set the valve(s) (forward, port side of the Aux. Mach. Space outboard of the holding tanks) to line up the pump output(s) with the overboard discharge(s).

Turn the pump Ckt. Bkr(s). (lower part of D.C. panel) on.

Observe the overboard discharges(s) on the port side and continue pumping until finished – turn the breaker(s) off.

Return the valve(s) to the shore alignment before reentering the 3 nm limit.

To discharge either Black or Grey water at a shore side vacuum station:

Verify that the valve(s) are lined up from the pump to the deck connection(s) (port side deck by the bulwark just aft of the door to the pilot house).

Remove the caps, connect to the fitting(s) and vacuum tank contents out.

Replace caps.
Waste Management Plan
(33 CFR 151.57)

The purpose of this procedure is to set forth the guidelines necessary for proper waste oil, sewage and trash management aboard the R/V ELAKHA and has been adapted from the WECOMA’s Safety Management Manual.

The Master is responsible for ensuring proper waste oil, sewage and trash disposal both at sea and ashore. All vessel personnel, including crew and scientists, are responsible for ensuring waste oil, sewage and trash are disposed of in accordance with this plan.

A. Waste Oil

1. All waste oils are to be taken ashore and stored in designated containers for further proper disposal. In outlying ports, paperwork documenting the transfer of waste oil must be retained by the vessel for submission to the Ship Operations Office.

B. Sewage

1. Under no circumstances will sewage be pumped directly over the side while either in port or out to 3 nautical miles from port or shore, except in extreme cases involving direct harm/danger to the vessel or crew. These limits may be modified or extended as necessary to comply with local laws and regulations.

2. At sea, sewage is discharged in compliance with MARPOL 73/78 ANNEX V. Every effort shall be made to discharge as far out as possible. In keeping with the law sewage shall never be discharged closer than 3 N/M. These limits may be modified or extended to comply with local law as required. Sewage may be retained on board upon the high seas for an extended period if requested by the chief scientist so as to not compromise the science work.

3. If necessary, sewage may be discharged at the Port of Newport’s pump facility at the South Beach Marina or at similar facilities in other ports.

4. Procedures for sewage handling and discharge are provided in Section 9 (e) of this document.

C. Trash

1. At sea, disposal of trash is done in accordance with the restrictions set forth in the MARPOL 73/78 ANNEX V. As a general rule all trash will be retained on board and brought ashore for proper disposal. Under no circumstances are plastics to be disposed of in the ocean or waterways.
2. Items that may be disposed of at sea include biologic samples in the area in which they were caught and small food scraps.
3. Permission must be obtained from the Master before dumping of any waste is allowed in order to ensure compliance with regulations or to prevent harm to the science project.
4. In the unlikely event that other trash (e.g., cardboard, paper, metal, etc.) is dumped at sea the Master will log the date, time position, description of the material and estimated volume in the vessel’s log.
10. Emergency Procedures

46 CFR 185.25 requires that the master of a “Subchapter T” Small Passenger Vessel “prepare and post emergency check off lists in a conspicuous place accessible to crew and passengers.” Recommended emergency check off lists are in 46 CFR 185.25-5. Though ELAKHA is not a small passenger vessel, and therefore not required to comply with the cited CFR, the usefulness of prepared and readily available emergency plans is clear. The following sheets are intended to serve this purpose.

a. Rough Weather At Sea or Crossing Hazardous Bars
b. Man Overboard
c. Fire
d. Abandoning the Vessel
e. Grounding or Stranding
f. Collision/Allision
g. Flooding
h. Injury/Medical Emergency
i. Oil Spill
a. **Rough Weather At Sea or Crossing Hazardous Bars**

- Close all weather tight doors (pilothouse and lab doors to weather deck) and hatches (lazerette, engineroom and forward escape hatch)
- Keep all bilges dry to maintain stability.
- Secure all equipment, particularly heavy equipment on deck.
- Move life jackets and immersion suits to laboratory or pilothouse area, have personnel don if appropriate.
- Notify USCG of situation (e.g., about to cross Yaquina Bay Bar) if appropriate.
- If assistance is required call the USCG on Ch. 16 VHF or 2182 kHz as appropriate.
- Do not abandon the vessel unless actually forced to do so (see Abandon Ship Procedure).
b. **Man Overboard**

- Throw a life ring or any other handy object that will float overboard as close to the person as possible.
- Sound “Man Overboard” signal – 3 long blasts on the horn – if other vessels are in area.
- Post lookout(s) to keep the person in sight.
- Pass the word “Man Overboard” by voice or use of the Loud Hailer.
- Maneuver the vessel to pick up the person in the water.
- Have another person (crew or scientist) don an immersion suit and equip them with a life line. This person will be the rescue swimmer if required.
- Have the rescue sling ready.
- If the person overboard is not immediately located notify the USCG and other vessels in the area on Ch. 16 VHF or 2182 kHz as appropriate.
- Continue to search until released by the Coast Guard.
c. **Fire**

Pass the word to all by voice, Loud Hailer.
Cut off the air supply by closing doors and hatches as appropriate. (Do not trap personnel in area of fire however.)
Cut off the air supply by closing doors and hatches as appropriate. (Do not trap personnel in area of fire however.)
Immediately use portable fire extinguishers at base of flames for inflammable liquid or grease fires or water (from salt water supply) for fires in ordinary combustible materials.
Maneuver the vessel to minimize the effect of wind on the fire.
If the fire is in the engineroom secure the main engine and generator and discharge the fixed fire fighting system. Do not attempt to open or enter the space afterward – this will likely result in a reflash of the fire.
If unable to control the fire, or if otherwise appropriate (e.g., an extinguished fire has disabled critical vessel systems), call the USCG on VHF Ch. 16 or 2182 kHz.
Move personnel away from fire, have them don life jackets or immersion suits as appropriate. If necessary, prepare to abandon ship.
d. Abandoning the Vessel

Abandoning the vessel should be a last resort – do so only if forced to do so. Before abandoning have all personnel don immersion suits or life vests.
Notify the USCG and other vessels on VHF Ch. 16 or 2182 kHz. Provide name of vessel, number of persons on board and last known position.
Remove the EPIRB from its housing, activate it, and assign it to a person to bring into the life raft.
If time allows have personnel bring emergency equipment such as handheld VHF radios, flashlights, blankets, etc.
If possible, bring the life raft down to the main deck and launch it off the side of the vessel keeping it near the vessel. (A placard on life raft procedures is posted on the starboard bulkhead of the lab just inside the door to the weather deck.)
If possible, have all personnel board the life raft without getting into the water. Remember that there is a knife by the door of the raft to cut the painter if need be. Stay with the vessel if at all possible – it will be easier for aircraft or other vessels to locate you. Use the flares, signal mirror, flashlights, handheld radios, etc., only if a vessel or aircraft is seen or heard.
e. **Grounding or Stranding**

- Stop the engine.
- Determine position (may use the MOB function on the GPS).
- Check for damage and flooding.
- Notify onboard personnel if there is danger to the vessel.
- Notify the USCG on VHF Ch. 16 or 2182 kHz if appropriate.
- Determine if tide will help or hinder, is surf driving vessel further aground, etc.
- Determine which way deep water lies – don’t get off only to get in more trouble.
- Determine nature of sea bed – don’t head for the rocks.
- Consider having personnel move about, pump holding tanks, etc., if appropriate.
- Once off check again for damage and flooding, make sure strainers are clear and adequate cooling water is available. Check rudder and engine operation.
f. Collision/Allision

- Muster personnel and have them don life jackets or immersion suits.
- Check for damage and flooding.
- Keep bilges dry with pumps if possible.
- Notify USCG and other vessels in area on VHF Ch. 16 or 2182 kHz.
- Offer assistance to other vessel or persons in water if appropriate.
g. **Flooding**

- Have personnel don immersion suits or life jackets and prepare to abandon if flooding is severe and uncontrolled. Notify USCG on VHF Ch. 16 or 2182 kHz, prepare to abandon ship (see section above)
- Attempt to dewater with bilge pump(s).
- Attempt to locate source of flooding and correct if possible.
- Flooding of the machinery space or engineroom may result in saltwater getting to the batteries – this will release deadly chlorine gas.
- Unless the flooding is limited and can be controlled notify the USCG as above.
h. Injury/Medical Emergency

- Injuries beyond minor ones treatable with standard first aid techniques should be quickly reported to the USCG.
- Crew or scientific personnel should get the sick or injured person in a safe place (e.g., the laboratory) and as comfortable as possible (blankets, pillow, etc.). First aid should be administered as appropriate.
- Head the vessel for port or the nearest USCG vessel or aircraft as directed.
- Emergency medical advice may be obtained by VHF or cellular phone (dial 911 if appropriate) from the USCG, a local hospital emergency room or a medical advisory service.
i. Oil Spill Response:

This procedure establishes an Oil Spill Response Plan for ELAKHA.

The intent of this plan is to:

- Identify preventative and precautionary measures to aid in preventing spills.
- Provide procedures to control and respond to spills.
- Provide reporting procedures for reporting spills to appropriate authorities.
- Provide other information that may be of use in dealing with a spill.

Prevention:

Prevention is the easiest, cheapest and most effective way of avoiding oil spills and the resulting safety and pollution hazards. Prevention includes:

* Maintaining the vessel’s machinery and equipment in good condition. Particular attention should be paid to all fuel system components (hoses, valves, filters, tanks, vents, etc.), hydraulic system components (pumps, hoses, seals, motors, rams, etc.) and equipment containing lubricating oils (main engine, generator engine, winch gear boxes, reduction gear). These inspections should be conducted as part of the routine departure checks (Section 9.b. of this manual) as well as maintenance (Section 8.).
* Exercising care during fueling to avoid “burping” fuel. ELAKHA’s large fuel capacity eliminates any requirement to “top off” the tanks for normal operations.
* Inspection of any scientific equipment containing petroleum based fuels, lubricants or working fluids.

Containment:

In the event of a leak or spill on the vessel attempt to contain the spill by:

- Shutting down equipment to the extent it is safe to do so (e.g., it may be necessary to secure equipment on deck before the hydraulics could be shut down because of a seal leaking on an A-frame hydraulic ram).
- Isolating the leak (e.g., closing a fuel cutoff valve from a tank).
- Containing the spill by placing barriers, etc. The contents of the emergency oil spill response kit in the machinery space as well as rags, paper towels, etc., may be used to contain and clean up a minor spill. Spills into the bilges should be left there unless safety (e.g., flooding) requires pumping.

Reporting:

If oil or other hazardous materials enters the water the spill must be reported. This reporting should be done as soon as feasible without limiting the operators ability to contain the spill. Within the normal operating area of ELAKHA it will be sufficient to report the spill to the
nearest Coast Guard station and to OSU Ship Operations. Radio or cellular telephone may be used as available. This section of the manual includes an “Emergency Contact Numbers” sheet for a variety of agencies as well as office and home numbers for Ship Operations personnel should they be needed.

Information reported should include:

* The name of the vessel and call sign.
* Location of the vessel.
* Type and estimated quantity of spill.
* When the spill happened.
* Actions being taken by vessel to control or contain the spill.
* Other information which may be of use (e.g., other vessels in area assisting).

**Recovery and Cleanup:**

Spills on deck should be recovered (probably using absorbent materials) and cleaned up to avoid possible migration to the water and reduce hazards to personnel (e.g., slipping). Appropriate precautions (e.g., ventilate enclosed spaces before entering, wear rubber gloves, coveralls, safety glasses) should be taken by personnel cleaning up the spill and any recovered product (e.g., absorbent materials with oil) should be retained in plastic bags or buckets for disposal ashore. The final clean-up may include washing with soap and water but clean-up liquids are to be retained for disposal ashore.

Small spills into the water may be contained or recovered using the materials onboard ELAKHA (see listing in this section) but any significant discharge will probably require assistance in containment of recovery. Should a spill occur at the OSU dock the oil spill boom in the yard may be deployed to contain the spill.

**Do not use detergent, etc., to attempt to disperse a spill - this is in violation of federal law and will probably cause more harm than good.**
List of Emergency Contacts

Newport:

United States Coast Guard ................................................................. 541-265-5381
Newport Fire Department ................................................................. 541-265-9461 or 911
Newport Police Department ............................................................... 541-265-5331 or 911
Department of Fish and Wildlife ....................................................... 541-867-4741

State and National:

National Spill Response Center
   (All spills) ....................................................................................... 800-424-8802

In CA, OR, WA and Canada -- call this number and it will automatically route you to the
Emergency Operations Center for the spill reporting for that area. It meets both the Coast Guard
and state local reporting requirements: 800-OILS-911

Ship Operations:

Telephone Number (0800 - 1630) ....................................................... 541-867-0295
Demian Bailey (Marine Superintendent) .............................................. 541-250-0444 (Home)
   541-867-0225 (Office)
   541-961-3840 (Cellular)
Don Weiner (Port Engineer) ................................................................. 541-765-6708 (Home)
   541-867-0217 (Office)
   541-961-0427 (Cellular)
Monita Cheever (Office Coordinator) .................................................. 541-961-9865 (Cellular)
   541-867-0295 (Office)

Attempt to contact OSU Ship Operations first. If you are unsuccessful, attempt contact using
cellular and then home numbers in order listed.
List of Oil Spill Response Material Onboard ELAKHA

1. An Emergency Spill Response Pack (#CEP-SK5) is located in the forward machinery space below the lab. 
   Spill Response Pack Contents: 

2. Absorbent pads: 10ea. Located on top of holding tanks in forward machinery space.

3. Cotton rags: 5lb. Located on top of holding tanks in forward machinery space.

4. Plastic trash container liners: Located in galley area. Under counter and in storage space at bottom of ladder to galley.

5. Plastic container located under aft deck counter.
Petroleum Products Found Aboard ELAKHA

(Material Safety Data Sheets for the following petroleum products are filed at the back of the manual)

No. 2 High Sulfur Diesel Fuel: 1200 gal. capacity. 600 gal. tanks located port & stbd eng. room.

AW-46 Hydraulic Oil: 30 gal. tank in after lazarette, 10 gal. tank in port side of engine room.

15 w 40 Lube Oil: 12 qts. Forward machinery space, used in engine and generator.

30 w Lube Oil: 2 gal. in forward machinery space, used in transmission.
11. Appendices

1. Cruise Plan Form
2. Release and Consent Form
3. List of Equipment
4. Drawings
5. MSDS
R/V ELAKHA CRUISE PLAN

Appendix 1

Departure Date: _________ ETD _______ Arrival Date: _________ ETA _______

Chief Scientist: Name: ______________________________ Phone: __________________

E-Mail: ______________________________ Fax: __________________

OSU Users: Index to be Charged: ___________ Department: __________________

Other Users: Billing Address: ____________________________________________

City/State/Zip: ____________________________ P.O.#: __________

Special Requirements: ___________ Chemical onboard Type: __________ Volumne: _______ MSDS required to be brought onboard

☐ Diving (OSU Diving Officer Authorization Required)*

☐ Radioactive Materials (OSU Radiation Safety Office Permit Required)*

☐ Other (Describe): ________________________________________________

Area of Operation/Itinerary:
(Include estimated times at major locations and any ports other than Newport)
____________________________________________________________________

Type of Work:
(Include vessel equipment requirements.)
____________________________________________________________________

Science Party: Attach List of Science Party Personnel by Name & Affiliation. Please indicate those participants who have completed Sea Safety & Survival Training. (Required Release & Consent Forms will be e-mailed to the Chief Scientist.)

NOTES:
1. Chief Scientist is responsible for any required sampling permits or approvals (*).
2. Cancel Policy: At least two working days in advance.
3. This Cruise Plan will also be used for billing purposes.

FOR SHIP OPERATIONS USE ONLY

Departure Date: _________ Time _______ Arrival Date: _________ Time _______

____________________ Tot. Hrs. ________________________ Rate ____________________

____________________ Sub Tot. ________________________ Other Chgs __________________

____________________ Total ________________________ Total __________________

J/V Inv

____________________________________________________________________

Boat Operator ____________________ Marine Superintendent _________________

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APPENDIX 2

R/V ELAKHA Release and Consent

Signature of Cruise Participant ___________________________ Date ____________

Information

This form must be read and applicable portions completed by each member of the science party (i.e., anybody other than paid crew members or OSU Ship Operations staff) prior to going out on ELAKHA. The completed form is valid for the calendar year in which completed provided the information is complete and remains accurate. Should any information change (employment status, person to notify, health, etc.) it is your responsibility to inform us so we may update your form.

Prior to your cruise please read this form and provide the needed information on page 2 of this form. Bring the completed form to the ship when you board. You are required to fill out a new Release & Consent form every year.

In consideration of permission to be present on the ELAKHA, I agree to the following terms:

Partial Waiver and Release of Rights: This paragraph applies to all except individuals who are employed by OSU (in a pay status and in a position that includes going to sea as part of the position description). I, the undersigned, agree to accompany the cruise(s) on R/V ELAKHA listed. I understand that I am not covered by OSU’s insurance and that appropriate insurance coverage must be provided by me, my employer or sponsoring institution. (OSU students or sponsored volunteers may be covered – please check with the Principal Investigator to ensure that you are covered. The OSU Principal Investigator/Chief Scientist is responsible for having volunteers complete the “Conditions of Volunteer Service” and “Partial Waiver & Release of Rights” forms. If you have any questions about your insurance coverage please resolve them with the Principal Investigator/Chief Scientist for the cruise.) I agree that I will not be compensated by OSU for my participation nor will I be covered by OSU’s insurance. I understand that such participation, including my operation of ship’s equipment necessary for my research, may expose me to certain risks of injury, death or damage to my property. I hereby release and hold the State of Oregon, its officers, agents and employees harmless from any and all claims or liabilities which I might have or claim to have against the State of Oregon, its officers, agents, and employees for injuries to my person, including death, or property arising out of my participation in the cruise(s). I also agree to indemnify the State of Oregon for any of my negligent or intentional actions.

Consent: I understand that and agree to:

• OSU supports the Federal “Zero Tolerance Policy” which strictly prohibits illegal drugs and controlled substances onboard ELAKHA and that my violation of this policy could lead to termination of the voyage and my arrest by Federal authorities.
• Alcoholic beverages, including beer and wine, are prohibited onboard at all times.
• Federal regulations require me to submit to a drug/alcohol test should I be involved in a “Serious Marine Incident” and that a failure to submit to this test, if requested, will require termination of the cruise and OSU to report my name and address to the U.S. Coast Guard and my parent institution.

Medical: I understand that there is no expert medical care provider on ELAKHA. For my protection, I have listed past or present health problems which could require emergency medical treatment (including the use of prescription medications) along with describing what actions need to be taken by others in the event I am unable to provide for my own emergency care. (Any medical information will be treated as confidential. It will be provided to the Captain of ELAKHA and to our medical advisory service if appropriate, e.g., injury, illness, concern about the appropriateness of you going to sea on ELAKHA.) Each individual is responsible for bringing along any medications they may require during the cruise – ELAKHA does not stock medications other than a limited supply for emergency use as prescribed by our contract medical advisory service.

Cruise Participants Under 18 Years of Age: The participant’s parent or legal guardian must execute this form on behalf of his/her minor child in the space provided.

Cruises Calling in Foreign Ports: If the cruise begins, ends, or calls in a foreign port the “Foreign Port” information must be completed.

Page 1 of 2
R/V ELAKHA Release and Consent Form

Calendar Year: 20__

Your Name:  Last: ______________________  First: ______________________  M.I.: ____________

Function:  ☐ Scientist  ☐ Technician  ☐ Grad Student  ☐ Undergrad  ☐ Observer  ☐ Foreign Obsvr

Employer/Sponsor:

Street Address: ___________________________________________
City, State, Zip: ___________________________________________
Phone Number: ____________________________  E-Mail: ____________________________

Person to be notified in emergency:

Name: ____________________________
Relationship: (opt.) ____________________________
Street Address: ____________________________
City, State, ZIP ____________________________
Phone Number: ____________________________
E-Mail: ____________________________

Past or Present Health Problems: ____________________________________________

Current Medications: ____________________________________________

Actions to be taken by others in the event I am unable to provide for my own emergency care: ______________=

I have read, understood and agree to the conditions stated on page 1 of this “Release and Consent Form.”

Signature of Cruise Participant ____________________________  Date ______________

IF THE PARTICIPANT IS UNDER 18 YEARS OF AGE, the undersigned parent or legal guardian hereby executes this Release and Consent on behalf of his/her minor child:

Signature of Parent/Guardian ____________________________  Date ______________

For cruises calling in Foreign Ports:

Passport Number: ____________________________  Citizenship: ____________________________
Date of Issue: ____________________________  Date of Expiration: ____________________________
Place of Birth: ____________________________  Date of Birth: ____________________________
Foreign Languages & Fluency (Optional): ____________________________
List of Equipment

Appendix 3

Basic Machinery
Main Engine – Caterpillar 3176B diesel developing approximately 400 HP at 2,000 rpm and consuming about 19 gal/hr (normal cruise speed of about 10 knots).
Reduction gear includes a trolling valve for low speed operation.
Bow Thruster – 12” Key Power hydraulically driven off main engine
Generator – 115/230 Vac, 60 Hz, 1 phase, 8 kW Northern Lights.
Anchor and winch – 50 fathoms of line, 44 lb anchor.

Scientific Support
A-Frame – 2,000 pound SWL on stern (see limitations in Chapter 6).
Winch – Sound Ocean Systems STW-1012L-7 with 600 m of ¼” 3x19 wire. Capable of spooling ¼” electromechanical cable with hollow shaft for slip ring installation.
However, at this time no slip rings or electromechanical cable are available.
MacArtney Winch – EM wire winch. 400 meter capacity. May be available for use – contact Marine Superintendent.
Auxiliary Winch – Marco W0800. Capable of 4,200 pounds of pull on bare drum at 86 feet/minute but limited to no more than 2,000 pound loads because of deck structural loading limits), can spool 500 ft of ¼” wire. Portable – bolts to deck and connects to vessel hydraulics. This unit will constitute 500 pounds of the science load when in place)
Crane – Morgan M/N 14. 13 ft reach, 716 pound capacity at full reach. (see limitations in Chapter 6). Portable – bolts to deck and connects to vessel hydraulics. This unit will constitute 1,000 pounds of the science load when in place.
Crab block – a small line pulling “crab block” is available. It runs off the vessel hydraulics and may be mounted either on the A-frame (hydraulics comes from oceanographic winch) or the crane (hydraulics from the crane).
Starboard side bulwark opening.
NMEA format data from the vessel’s fathometer ($SDDPT and $SDDBT) and Garmin GPS ($GPRMC,$GPGGA and $GPGLL) are available from the NMEA data receptacle above the port side bench in the laboratory and through the Black Box distribution unit under the bench. (The distribution unit is part of the ADCP and flow-through systems below.) No other NMEA data is available from the vessel’s installed equipment.
Transducer well. (in Aux. Mach. space) (ADCP may be available – contact Mike Kosro in COAS (kosro@coas.oregonstate.edu 737-3079).
Flow through uncontaminated salt water supply (connected flow-through system may be available – contact Jack Barth in COAS (barth@coas.oregonstate.edu 737-1607).
Portable cleats (bolt to deck for mooring work)
Bolts, washers, and U-bolts to (drawer in lab, more in Aux. Mach. space)
Half meter Kahl block (3/16” wire) with mechanical readout on A-frame
One meter Kahl block (1/4” wire) with remote electronic readout (normally in place)
117 Vac and 230 Vac plugs to mate with deck receptacles (drawer in lab)
117 Vac, GFI protected extension cord for use on deck (drawer in lab) in port. This is not to be used at sea since the receptacles are not waterproof.
A Meteorological Data Logging package may be available. Contact Hemantha Wijesekera in COAS (hemantha@coas@oregonstate.edu 737-2568).

Safety
Immersion suits (10)
Type I PFD’s (15)
Work vests (15)
Hard hats (3)
SOLAS A pack inflatable life raft – 10 person.
Offshore flare kit.
Safety harnesses (one S/M, one L/XL) and straps.

Electronics/Navigation
Cat. 1 EPIRB – ACR 2774
MF/HF SSB radio – ICOM IC-M700PRO-21, w/tuner
VHF radios (2) – ICOM IC-M59 and M502
Handheld VHF radios (2) – Uniden
Cellular – Motorola 2950
Radar – Furuno 1761
Echo Sounder --- Furuno 582L
GPS 1 (incl. USCG Diff. Rcvr.) – Furuno GP36
GPS 2 – Garman 128
Navigation computer with Nobletech charting software.
Compass – Riche
Autopilot – ComNav 2001FC with KVH fluxgate compass
Loudhailer – Standard LH5
Handheld “FRS” radios (3) - Motorola
General Layout, Main Deck and Laboratory Drawings

Figure 1 Main Deck & Laboratory Drawing