



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric
Administration
Pacific Islands Fisheries Science Center
1845 Wasp Blvd. Bldg. 176 • Honolulu, Hawaii
96818

FINAL Project Instructions

Date Submitted: September 29, 2017
Platform: NOAA Ship *Oscar Elton Sette*
Project Number: SE-17-07 (OMAO)
Project Title: Insular Bottomfish Survey
Project Dates: October 20, 2017 to November 3, 2017

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Approved by: *Michael Seki* Dated: *10/2/17*
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I. Overview

A. Brief Summary and Project Period

NOAA Ship *Oscar Elton Sette* will be engaged as support for a Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS), project from October 20 through November 3, 2017, for a total of 15 days at sea (DAS).

The focus of this mission is to support the operational survey of Deep-7 bottomfish stock across the Main Hawaiian Islands using the Modular Optical Underwater Survey System (MOUSS) fishery-independent sampling gear. The MOUSS builds and improves upon previous efforts with the Baited Stereo-Video Bottom Camera System (BotCam), which has been effectively used to collect fishery-independent species-specific size-structured abundance data on bottomfish in the Main Hawaiian Islands (MHI).^{1,2}

Both MOUSS and DropCam Instrument Packages (DCIPs) will be utilized during this mission. The MOUSS units will be deployed and recovered from PIFSC 19ft small boats launched from *Oscar Elton Sette*. The DCIP (predominantly surface-tethered, and only when necessary, untethered) will be deployed and recovered using *Oscar Elton Sette* deck equipment and personnel. MOUSS and DCIP sampling will be concentrated within and near the State of Hawaii Bottomfish Restricted Fishing Areas (BRFAs). Each unit will remain on the seafloor for a minimum of 15 minutes at each sampling station.

B. Days at Sea (DAS)

Of the 15 DAS scheduled for this project, 15 DAS are funded by a Line Office Allocation. This project is estimated to exhibit a Medium Operational Tempo.

C. Operating Area

The area of scientific operations encompasses waters around the Main Hawaiian Islands. The state's Bottomfish Restricted Fishing Areas (BRFAs) will be the focus of this mission, with alternate workable weather-sheltered areas chosen as necessary (*Appendix 1*). Surveys will be conducted in water depths of 75m to 300m.

The project will target specific areas (grid cells) following a stratified-random sampling approach in an effort to best characterize bottomfish abundance across the survey domain.

¹ Moore, C. H., Drazen, J. C., Kelley, C. D., Misa, W. F. X. E. (2013) Deepwater marine protected areas of the main Hawaiian Islands: establishing baselines for commercially valuable bottomfish populations. *Marine Ecology Progress Series*, 476: 167-183.

² Sackett, D. K., J. C. Drazen, V. N. Moriwake, C. D. Kelley, B. D. Schumacher, and W. F. X. E. Misa. (2014) Marine protected areas for deepwater fish populations: an evaluation of their effects in Hawai'i. *Marine Biology* 161:411-425.

Daily site selection will be largely weather dependent. The Station/Waypoint List for these grids is presented as an attached spreadsheet file (*Appendix 2*). Upon request, a file format suitable for direct upload to the ship's navigation software will be provided to the Command prior to departure.

D. Summary of Objectives

The MOUSS platform will collect stereoscopic video data to support fishery-independent estimates of species-specific, size-structured abundance for the Main Hawaiian Islands Deep-7 bottomfish stock.

The objectives of the project are (in order of priority):

1. Deploy MOUSS from *Oscar Elton Sette*-based PIFSC 19ft SAFE Boats to collect stereoscopic video data to support fishery-independent estimates of species-specific, size-structured abundance for the Main Hawaiian Islands Deep-7 bottomfish stock focusing in the State of Hawaii Bottomfish Restricted Fishing Areas (BRFAs).
2. Deploy surface-tethered/untethered DropCam Instrument Packages (DCIPs) from *Oscar Elton Sette* for data collection and to test additional camera sensors and equipment. Anticipated tempo is 4-8 deployments per day, not to interfere with Objective 1. (DCIPs have been previously deployed using the ship's A-frame and recovered using the port J-frame.)
3. Deploy Seabird 19+ with turbidity sensor to obtain a turbidity profile of the water column prior to DCIP deployments. (See options A, B, and C in "Operations to be Conducted", Section II.C.)

E. Participating Institutions

- NOAA Pacific Islands Fisheries Science Center:
 - Science Operations Division (SOD)
 - Fisheries Research and Monitoring Division (FRMD)
 - Ecosystem Sciences Division (ESD)
 - Protected Species Division (PSD)
- Joint Institute for Marine and Atmospheric Research (JIMAR)

F. Personnel / Science Party

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Abdul, Jesse	Data Manager	10/20/17	~10/31/17	M	JIMAR/SOD	USA
Amin, Ruhul	Tech Manager / Gear Specialist	10/20/17	11/03/17	M	NOAA/SOD	USA
Asher, Jacob	Coxswain / Gear Specialist	10/20/17	11/03/17	M	JIMAR/ESD	USA
Demarke, Christopher	Gear Specialist	10/20/17	11/03/17	M	JIMAR/SOD	USA
Giuseffi, Louise	Gear Specialist	10/20/17	11/03/17	F	NOAA/SOD	USA
McVay, LT David	Coxswain / Gear Specialist	10/20/17	11/03/17	M	NOAA/SOD	USA
Miller, Dianna	Gear Specialist	10/20/17	11/03/17	F	JIMAR/SOD	USA
Norris, Erik	Coxswain / Gear Specialist	10/20/17	11/03/17	M	JIMAR/PSD	USA
Ossolinski, Justin	Operations Lead / Coxswain / Gear Specialist	10/20/17	11/03/17	M	JIMAR/SOD	USA
Reardon, Russell	Project Leader	10/20/17	11/03/17	M	JIMAR/SOD	USA
Richards, Benjamin	Science Advisor	10/20/17	11/03/17	M	NOAA/FRMD	USA
Taylor, Jeremy	Tech Manager / Gear Specialist	10/20/17	11/03/17	M	JIMAR/SOD	USA

G. Administrative

1. Points of Contact

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NOAA Ship *Oscar Elton Sette*
1897 Ranger Loop, Building 184, Honolulu, HI 96818
808-725-5791 (Office)

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

The Science Advisor will ensure the appropriate authorizations are secured for all planned scientific operations prior to the start of the project. These authorizations include the following:

NEPA: Activities for this cruise will be analyzed in accordance with NOAA Administrative Order 216-6A and accompanying Companion Manual, the National Environmental Policy Act of 1969 (NEPA) and Council on Environmental Quality regulations 40 CFR §§ 1500-1508. A NEPA document is currently pending and will be completed prior to departure.

ESA: A consultation under Section 7 (a)(2) of the Endangered Species Act was signed on September 15, 2017.

Essential Fish Habitat: An Essential Fish Habitat consultation has been approved under the EFH provision of the Magnuson-Stevens Fishery Conservation and Management Act. (09/26/2017)

State of Hawaii: DLNR Special Activity Permit No. 2018-16 allows the take and possession of bottomfish and various fish spp. (incidental catch) and the deployment of stationary stereo-video camera stations at select locations both inside and outside of Bottomfish Restricted Fishing Areas. Permit valid through 23 February 2018.

A copy of necessary research permits will be provided to the Command prior to commencing scientific operations.

II. Operations

The Project Leader is responsible for ensuring the scientific staff is trained in planned operations. The Science Advisor is responsible for ensuring that the scientific staff is knowledgeable of project objectives and priorities. The Commanding Officer is

responsible for ensuring all operations conform to the ship's accepted practices and procedures.

A. Project Itinerary

Weather, equipment failures, and scheduling problems are unpredictable. As such, the following planned 'ideal' itinerary should be considered as only a guide for survey progression. Operations may be altered as appropriate based on weather, sea conditions, or the progress of the survey itself. Some adjustment is highly anticipated given the exposure of the survey areas to prevailing conditions. Ship transit estimates to and from the survey areas have been estimated based on a ship speed of 9 knots.

Daily Overview: Upon overnight arrival at a BRFA, as time allows, *Oscar Elton Sette* will survey potential DCIP deployment locations for depth and slope characteristics prior to the routine morning operations meeting held on the bridge between the Command and the Project Leader/Scientific Advisor. A standard day of operations will consist of MOUSS deployment/recovery operations from two Program 19ft SAFE Boats (*Steel Toe* and *Rubber Duck*) and DCIP operations from *Oscar Elton Sette*. Conduct Small Boat Safety Meeting (SBSM) at 0730 each morning. After the SBSM, each small boat will be launched pre-loaded with all necessary MOUSS operational gear, the coxswain and one scientific crewmember. The remaining scientific compliment of each small boat to embark via Jacob's Ladder. Ideally the small boats will be launched as close as possible to their target survey locations. The *Oscar Elton Sette* would then deploy and recover the SBE 19+ package prior to commencing DCIP operations within a safe operating distance (e.g. within VHF radio range) of the small boats. Each small boat is anticipated to complete 8-12 MOUSS evolutions per day based upon conditions and transit between sites. *Oscar Elton Sette* is anticipated to complete 4-8 DCIP evolutions per day based upon the same. After each full day of operations, small boat recoveries aboard *Oscar Elton Sette* are anticipated to occur at ~1615 and ~1630. Under this schedule, a total of 8 lunches would be necessary for small boat crews each day.

16 OCT **Begin Staging:** Begin staging large gear on the pier throughout the week for subsequent loading onto the ship in coordination with the Command. The second small boat cradle may be loaded directly onto fantail deck (to join cradle and stand already aboard *Oscar Elton Sette* on winch deck) at the Deck's convenience, as the Program small boats will be among the last equipment loaded 19 OCT.

18 OCT **Fuel Delivery:** Fuel to be delivered and pumped into hip tanks and drums on shore for subsequent loading onto ship.

20 OCT **Finish Ship Loading:** Load full hip tanks, fuel drums, and any final gear.

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20 OCT **Depart Pearl Harbor:** Embark full scientific complement at Ford Island per ship's sailing board. Depart Pearl Harbor (preferably no later than 1000) and begin transit to Niihau survey area (~160 nmi; 18h). If time permits, conduct trial deployment/recovery of surface-tethered DCIP prior to transit and/or trial small boat deployments/recoveries in protected waters for shakedown and proficiency. Conduct Welcome Aboard Brief, safety drills, operational planning and equipment preparations throughout the day.

21 OCT **Conduct Niihau Scientific Operations:** Arrive Niihau (#B) for a full day of scientific operations. (*Note: Kauai BRFA #C or its alternates are not intended to be surveyed during SE-17-07 unless weather or other factors dictate project course changes.*)

Standard daily operations consist of MOUSS deployments and recoveries from small boats (*Appendix 3*) and DCIP (tethered and/or untethered) operations from *Oscar Elton Sette* (*Appendix 4a & 4b*). Two 19ft SAFE Boats will be launched each morning to conduct small boat MOUSS operations. If conditions in the BRFAs do not permit small boat operations, then suitable alternate work areas will be found. Tempo of ship-based DCIP operations may be increased if weather conditions preclude small boat operations on a given day. Small boats will be fueled daily aboard *Oscar Elton Sette*. Batteries that power the pot haulers will need to be charged overnight in the small boats and will require the use of A/C outlets and power cords on deck.

Unless otherwise specified, these science operations will be standard throughout the project and repeated at each location. In order to avoid repetition, the above description will be omitted from the remainder of the itinerary section.

Upon conclusion of Niihau operations on 21 October, depart for west Oahu. Order of BRFAs worked off Oahu will be weather dependent, but BRFA #D (Kaena Pt.) is the preferred initial destination (~125 nmi; 13-14h).

22 OCT **Begin Oahu Scientific Operations (Part 1 of 2):** Begin scientific operations off Oahu, BRFA #D (Kaena Pt.). Upon conclusion of Oahu scientific operations on 22 October, depart for Maui Nui

BRFAs. Actual destination in Maui Nui will be weather dependent (~80-130 nmi; 9-14h).

23-25 OCT **Conduct Maui Nui Scientific Operations (Part 1 of 2):** Arrive Maui Nui on 23 October and begin scientific operations in BRFA #F, #G, or #H, as appropriate. Two days of operations are required to survey BRFA #F, and one day each to survey BRFAs #G and #H.

The regional weather will be closely monitored during operations in Maui Nui in order to take advantage of any 3-4+ day weather window that would allow for transit to, and operations around, Hawaii Island. Should such a window present itself, an overnight transit to BRFA #K (North Kohala / Hamakua) would be warranted to begin Hawaii Island operations at the first opportunity. Maui Nui operations would then be continued (Part 2 of 2) after all Hawaii Island sites had been completed.

Departure from BRFAs #F, #G, or #H in the Maui Nui area would allow for overnight transit to BRFA #K (North Kohala / Hamakua, ~75-125 nmi; 9-14h).

Upon conclusion of Part 1 Maui Nui scientific operations (or otherwise when presented the appropriate weather window) depart for Hawaii Island.

26-30 OCT **Conduct Hawaii Island Scientific Operations:** Arrive Hawaii Island and begin scientific operations. Preferably, operations will begin and end in BRFA #K (1 day each), thus limiting transit time to/from Maui Nui BRFAs and facilitating transits between survey locations around Hawaii Island: BRFAs #L (Hilo) and #M (South Point) (~60-125 nmi; 6-14h). Likely progression of survey: #K, HARP*, #M, #L, #K.

*If a transit along the west coast of Hawaii Island is possible within the time constraints, a High-frequency Acoustic Recording Package (HARP) recovery and re-deployment is desired off the Kona Coast (N19° 34.983', W156° 00.951'). However, this is a Supplementary Project not to interfere with the primary objectives of the mission.

Personnel Transfer: During this period, a personnel transfer ashore will be necessary in a location where most easily accommodated. Scientist Abdul will need to depart the project on or before 31 October. PI will coordinate with command to decide when and where to conduct the small boat transfer.

Upon conclusion of Hawaii Island scientific operations on 30 October, depart from BRFA #K (anticipated) to Maui Nui. Actual destination in the Maui Nui BRFAs will be distance, weather, and survey dependent (~75-125 nmi; 9-14h).

- 31 OCT – **Conduct Maui Nui Scientific Operations (Part 2 of 2):** Arrive
1 NOV Maui Nui on 31 October to complete scientific operations in BRFAs #F, #G, or #H based upon earlier survey progression.
- 2 NOV **Conduct Ohau Scientific Operations (Part 2 of 2):** Arrive Oahu to complete scientific operations in BRFA #E (Makapuu).
- 3 NOV **De-couple Small Boat Operations from Ship (as necessary) / Return to Pearl Harbor:** If Oahu operations have not been completed due to weather or other unforeseen events, two 19ft SAFE boats will be launched in the remaining Oahu survey location to conduct small boat MOUSS operations. The small boats will likely finish the day totally decoupled from the ship (such that a full operational day may be achieved utilizing local PIFSC shore-based contacts and support) while allowing *Oscar Elton Sette* to return to Pearl Harbor at the convenience of the Command. The small boats will be retrieved by PIFSC personnel at a nearby boat ramp and trailered back to Ford Island at the end of the operational day.

Oscar Elton Sette returns to Pearl Harbor at a time deemed appropriate by the Command, disembarking any remaining scientific personnel aboard the ship. **End of project.**

B. Staging and Destaging

Staging: Assistance from ship personnel for craning aboard large gear and transferring small boat fuel will be necessary. Loading is anticipated to occur mid/late week, 18-19 October. Delivery of small boat fuel for transfer into hip tanks is anticipated to occur 18 October. Small boats will be delivered to the ship 19 October. Hand carried items will be loaded 18-19 October.

Destaging: Full off-load of all program-provided gear and small boats will begin in coordination with the Command upon return to Pearl Harbor, 3 November.

C. Operations to be Conducted

The Project Leader has the authority to revise or alter the technical portion of the instructions as work progresses, provided that, after consultation with the Science Advisor and Commanding Officer, it is ascertained that the proposed changes will not (1) jeopardize the safety of personnel or the ship, (2) exceed the overall time allotted for the project, (3) result in undue additional expenses, and (4) alter the

general intent of the project instructions or scientific integrity of the project. In addition, the Project Leader must notify the Office of the Science Director of the Pacific Islands Fisheries Science Center at the earliest opportunity prior to making (1) deviations from the general project track or area of operations noted in the project instructions, (2) changes or additions of research operations to those specified in the project instructions, or (3) port calls not specifically identified in the project instructions.

Multi-gear fishery-independent surveys are an important component of the efforts to improve the data informing current stock assessment models. The focus of this mission is to sample the Main Hawaiian Islands Deep-7 bottomfish stock using the Modular Optical Underwater Survey System (MOUSS).

MOUSS is an evolution of the existing BotCam developed in 2005 by PIFSC. In contrast to the BotCam, the MOUSS is smaller, lighter, able to attach to different deployment platforms, and captures high-resolution digital footage. This reduction in size and weight allows for hand-davit deployment from small boats, while the use of high-resolution digital video enables more accurate and precise fish identifications and measurements. Project operations will further support the development and evaluation of the MOUSS as an effective and efficient sampling gear for use in operational fishery-independent surveys of deep slope bottomfish assemblages in the Pacific Islands Region.

This mission will target a minimum of 100 primary sampling units (500m x 500m grid cells) across the Main Hawaiian Islands. In an effort to best characterize bottomfish size-structured abundance across the survey domain, sampling will follow a stratified-random sampling approach based on habitat type to include a larger area within the region bounded by Main Hawaiian Islands. Specific grid cells will be chosen daily based on weather and local conditions prior to the sampling effort.

Research efforts will require routine small boat operations from *Oscar Elton Sette*. Two program-provided 19ft SAFE Boats (F1913 *Steel Toe* and F1921 *Rubber Duck*) will be required to support daily MOUSS operations. An *Oscar Elton Sette* small boat coxswain will be required to support any potential scientific efforts and/or personnel exchanges from *SE-4*. The *Oscar Elton Sette* small boat coxswain would also serve as a backup coxswain for the Program boats, should unforeseen circumstances warrant any such need.

Each SAFE Boat will be launched with two MOUSS units for daylong, replicate deployment and retrieval operations. The minimum anticipated sample size is two MOUSS deployments per grid cell (100 Primary Sampling Units x 2 deployments) for a total of at least 200 deployments for the project. The general goal, however, is to cover as many grid cells as possible in a work area in order to increase sample size. The operational tempo may be adjusted as the project progresses based on underway efforts, weather, and experience. The standard

operating procedures for deployment and recovery of MOUSS from a small boat are attached (*Appendix 3*).

As time and conditions permit, DropCam Instrument Packages (DCIPs) will be deployed and recovered from *Oscar Elton Sette* in an effort to test various camera sensors and equipment. The standard operating procedures for both surface-tethered and untethered DCIPs are attached (*Appendix 4a & 4b*).

Each day, prior to deploying the DCIPs from *Oscar Elton Sette*, a small CTD package (SBE 19+) with a Wetlab C-star Transmissometer and a Biospherical Reflectance Radiometer will be lowered through the water column primarily to assess turbidity in the areas of the survey grids. The SBE 19+ unit could be attached directly to ship's CTD rosette, if this is deemed easier/necessary. This deployment will occur once daily on days of MOUSS and DCIP operations. Three possible scenarios have been identified for deployment of this package, presented in order of preference:

- A) The SBE 19+ is attached to the CTD wire (to determine depth of package from wire-out readings) and deployed using the starboard J-frame.
- B) In the event that Option A is unavailable due to equipment issues, the SBE 19+ is attached to the CTD wire and deployed off the stern using the A-frame.
- C) If neither Options A nor B are available, the package is deployed from the longline pit using a custom-made davit system rigged with ½" yellow polypropylene rope of known length.

Ideally, this operation utilizes the starboard J-frame (Option A), leaving the fantail and A-frame free so as not to introduce any additional potential obstacles to DCIP deck/deployment operations. The CTD package will be lowered to the deepest depth of the MOUSS/DCIP deployments (~300m), and brought back to the surface. If all is working properly, this operation is anticipated to take less than ~20 minutes. Though this operation is lower in priority than MOUSS deployments and DCIP deployments during SE-17-07, it serves as a critical component in steps being taken to increase successful data collection and efficiency on similar and related future projects.

D. Dive Plan

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (<http://www.ndc.noaa.gov/dr.html>) and require the approval of the ship's Commanding Officer.

There are no dives planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations: Poor weather and sea conditions, equipment failure, safety concerns, heavy local vessel traffic, and/or unforeseen circumstances, may alter or prohibit operations as planned. At these times, the Project Leader and Commanding Officer will determine the appropriate plan of action, consulting with the Science Advisor as necessary.

NMFS employees are not exempt from the requirements of the Marine Mammal Protection Act (MMPA) or the Endangered Species Act (ESA). PIFSC has developed mitigation measures for its fisheries and ecosystem research projects to avoid take and to comply with the Lecky, Murawski, and Merrick guidance. A copy of these documents is available at <https://sites.google.com/a/noaa.gov/pifsc-science-operations/nepa-permits/protected-species-mitigation-measures> and on the ship's bridge.

1. "Take" of Protected Species
 - a. Under the MMPA and ESA it is unlawful to take a protected species. The MMPA defines take as "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." The ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." An incidental take is one that is incidental to, but not the purpose of, otherwise lawful activities.
 - b. In the event of an incidental take of a marine mammal or federally listed threatened or endangered species during the project, the Project Leader will report the incident to the ship's Commanding Officer then the PIFSC Director and Deputy Director IMMEDIATELY via IRIDIUM, INMARSAT, and email. Samples should not be collected from any incidentally taken marine mammals, sea turtles, or seabirds.
 - c. PIFSC has developed mitigation measures for its fisheries and ecosystem research cruises to avoid take and comply with the Lecky, Murawski, and Merrick guidance. A copy of these documents is available at <https://sites.google.com/a/noaa.gov/pifsc-science-operations/home/nepa-permits/protected-species-mitigation-measures> and on the ship's bridge.
2. Activities in the Hawaiian Islands Humpback Whale National Marine Sanctuary
 - a. The humpback whale season in Hawaii is November through May.

- b. Unless otherwise authorized under the MMPA and ESA, it is unlawful to approach, or cause a vessel or other object to approach, within 100 yards of any humpback whale within the Sanctuary. Please reference the complete list of prohibited activities and boundary maps at <https://sites.google.com/a/noaa.gov/pifsc-science-operations/nepa-permits/protected-species-mitigation-measures>. A copy of these materials will also be available on the ship's bridge.

III. Equipment

A. Equipment and Capabilities Provided by the Ship

1. **Equipment:** To successfully meet the project objectives, the scientific compliment aboard will need the ship to provide the items listed below. Prior to sailing, the ship's crew will inspect these items to ensure they are in proper working order for the project:

- Operational Scientific Computing System (SCS)
- Acoustic Doppler Current Profiler (ADCP)
- ThermoSalinoGraph (TSG)
- Adequate fresh water for gear and small boat wash-down
- Boat Deck and Aft deck (knuckle) cranes
- A-Frame, block and winch (for package deployment)
- J-frame (port) with pot hauler block (for package recovery)
- J-frame (starboard) for SBE 19+ deployment
- Scientific freezer (maintained -30°C to -20°C)
- Chest freezer in Breezeway for bait (less than full size)
- Working Wet Lab faucets and drains
- Iridium phone
- Ice for food and water jugs on small boats
- GPS navigational system
- Depth sounders and recorders
- Two hip tanks for small boat gasoline storage
- Sea Catch Toggle Release (or similar) for package deployment
- Grapples and heaving lines for recovering survey packages
- Northwind launch, *SE-4*
- Acoustic Release Deck Box and Dunking Transducer (8011M)
- Wireless internet connection from fantail and longline pit
- CTD winch for servicing stbd J-frame and A-frame (DESH-5?)

2. **Capabilities:** It is requested that the ship provide the following:

- a.** A Survey Technician that is available 8 hours per day to assist with DropCam Instrument Package deployments and recoveries, as well as SBE 19+ deployments.
- b.** A small boat coxswain for *SE-4* to support (potential) HARP recovery operations, and other fishing/sampling opportunities, as well as any personnel exchanges. This coxswain would also serve as a backup coxswain/crewmember in the small boats conducting MOUSS operations.
- c.** Deck personnel for the deployment and recovery of small boats and DCIPs.
- d.** Permission for scientists to ready scientific work spaces (e.g. computer/camera stations) prior to departure.
- e.** Assistance from the ship's Deck Department in craning and staging large gear during loading and off-loading.
- f.** Support from the Engineering and Deck departments prior to sailing to transfer program-provided gasoline into the ship's hip tanks to be used as outboard engine fuel: two hip tanks (400 gallons total) and up to an additional 3 drums of fuel (150 gallons total).
- g.** Support from the Engineering department to fuel small boats daily after scientific boat operations are completed.
- h.** Daily lunches and water jugs provided from the Steward Department for small boat operations.
- i.** Support from the Deck department to secure a second 19ft boat cradle directly onto the fantail deck (i.e. without 10' conex box). (One cradle with frame should already be in place on winch deck from SE-17-06.)
- j.** Support from electronics technician to establish Wifi connectivity from fantail and longline pit to facilitate use of electronic datasheets.
- k.** Support from Deck Department to configure Stbd J-frame and/or A-frame for CTD operations.
- l.** Chest freezer (smaller size) in breezeway for MOUSS and DCIP bait.

B. Equipment and Capabilities Provided by the Scientists

1. **Equipment:** The program's full equipment list is presented in *Appendix 5* (attached file).
2. **Capabilities:** In addition to scientific expertise, the program will provide experienced coxswains for both SAFE Boats and routine boat and outboard engine maintenance.

IV. Hazardous Materials

A. Policy and Compliance

The Project Leader is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and quantity, MSDS, appropriate spill cleanup materials (neutralizing agents, buffers, or absorbents) in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and chemical safety and spill response procedures. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per OMAO procedure, the scientific party will include with their project instructions and provide to the CO of the respective ship 30 days before departure:

- List of chemicals by name with anticipated quantity
- List of spill response materials, including neutralizing agents, buffers, and absorbents
- Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
- For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship's Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

- An inventory list showing actual amount of hazardous material brought aboard
- An SDS for each material

- Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program
- Confirmation that chemical safety and spill response procedures were brought aboard

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory showing that all chemicals were removed from the vessel. The CO's designee will maintain a log to track scientific party hazardous materials. SDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of hazardous materials is not permitted aboard NOAA ships.

B. Inventory of Hazardous Materials

See Appendix 6.

C. Chemical Safety and Spill Response Procedures

See Appendix 7.

D. Radioactive Materials

No Radioactive Isotopes are planned for this project.

V. Additional Projects

Supplementary (piggyback) and ancillary projects are secondary to the objectives of the project and should be treated as additional investigations. The difference between the two types of secondary projects is that an ancillary project does not have representation aboard and is accomplished by the ship's force.

A. Supplementary ("Piggyback") Projects

In collaboration with PIFSC Protected Species Division (PSD) Cetacean Research Program, a High-frequency Acoustic Recording Package (HARP) will be recovered and a new HARP deployed off West Hawaii, aka Kona HARP. Recovery will be accomplished by acoustically releasing the HARP during day-time hours. Once the package is spotted at the surface, recovery will be done directly by the ship using the aft crane or by small boat (*SE-4*). HARP location is N19° 34.983', W156° 00.951'. Deployment can occur during day or night-time operations. These operations are supplementary in nature and not to interfere with

the primary objectives of SE-17-07. As with all operations, the HARP recovery is weather and cruise track dependent.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

Disposition of data gathered aboard NOAA ships will conform to NAO 216-101 *Ocean Data Acquisitions* and NAO 212-15 *Management of Environmental Data and Information*. To guide the implementation of these NAOs, NOAA's Environmental Data Management Committee (EDMC) provides the *NOAA Data Documentation Procedural Directive* (data documentation) and *NOAA Data Management Planning Procedural Directive* (preparation of Data Management Plans). OMAO is developing procedures and allocating resources to manage OMAO data and Programs are encouraged to do the same for their Project data.

A. Data Classifications: *Under Development*

1. OMAO Data
2. Program Data - *Under Development*
The project will follow the current PIFSC data management plans, which comply with NOAA requirements. Contact Nori Shoji (noriko.shoji@noaa.gov), Director, PIFSC Science Operations Division, for PIFSC data policy updates.

B. Responsibilities: *Under Development*

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The Project Leader, Science Advisor and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship's crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship's Operations Officer usually is delegated to assist the Project Leader in arranging this meeting.

B. Vessel Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer.

- C. **Post-Project Meeting:** The Commanding Officer is responsible for conducting a meeting no earlier than 24 hours before or 7 days after the completion of a project to discuss the overall success and shortcomings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the Project Leader, Science Advisor and members of the scientific party and is normally arranged by the Operations Officer and Project Leader.
- D. **Project Evaluation Report:** Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Project Leader. The form is available at <https://sites.google.com/a/noaa.gov/omao-intranet-dev/operations/marine/customer-satisfaction-survey> and provides a "Submit" button at the end of the form. It is also located at https://docs.google.com/a/noaa.gov/forms/d/1a5hCCkgIwaSII4DmrHPudAehQ9HqhRqY3J_FXqbJp9g/viewform. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships, specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served three times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Packed lunches and water jugs will be required for scientists on all full-day small boat operations. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least seven days prior to the project.

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Project Leader. The Project Leader and Commanding Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement. The Project Leader is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Project Leader is also responsible for the cleanliness

of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Project Leader will ensure that all non NOAA or non-Federal scientists aboard also have proper orders. It is the responsibility of the Project Leader to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (03-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Project Leader or the NOAA website <http://www.corporateservices.noaa.gov/~noaaforms/eforms/nf57-10-01.pdf>.

NHSQs must be submitted every 2 years for individuals under the age of 50 and every 1 year for ages 50 and above. NHSQs must be accompanied by NOAA Form (NF) 57-10-02 - Tuberculosis Screening Document in compliance with OMAO Policy 1008 (Tuberculosis Protection Program, which requires a yearly PPD or TB exam).

The completed forms should be sent to the Marine Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than 4 weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

The participant can mail, fax, or email the forms to the contact information below. Participants should take precautions to protect their Personally Identifiable Information (PII) and medical information and ensure all correspondence adheres

to DOC guidance
(http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240).

The only secure submission process approved by NOAA is Accellion Secure File Transfer which requires the sender to set up an account using a valid NOAA email address and password. Accellion's Web Users Guide is a valuable aid in using this service. As a cost-reduction measure under the DOC contract with Accellion, user accounts expire after 30 days of inactivity. Simply re-register to send and receive files.

Persons without a NOAA email account must fax or mail their forms.

Contact information:

Regional Director of Health Services
Marine Operations Center – Pacific
2002 SE Marine Science Dr.
Newport, OR 97365
Telephone 541-867-8822
Fax 541-867-8856
Email MOP.Health-Services@noaa.gov

Prior to departure, the Project Leader must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: contact name, address, relationship to member, and telephone number.

C. Shipboard Safety

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. At the discretion of the ship CO, safety shoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide steel-toed boots. The ship's Operations Officer should be consulted by the Project Leader to ensure members of the scientific party report aboard with the proper attire.

Hard hats are required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the program and worn when required.

All scientists will comply with standing safety regulations of PIFSC and that of the vessel's standing orders from the Commanding Officer.

D. Communications

A progress report on operations prepared by the Project Leader may be relayed to the program office. Sometimes it is necessary for the Project Leader to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Project Leader. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via e-mail and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30-day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required and it must be arranged at least 30 days in advance.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *NMAO Fleet IT Security Policy 1.1* (November 4, 2005) prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to:

1. Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
2. Installation of the latest critical operating system security patches.
3. No external public Internet Service Provider (ISP) connections.

Completion of these requirements prior to boarding the ship is required.

Computer Operating Systems that the support vendor has identified as reaching "End of Life" for support will not be allowed on the shipboard network. Examples include Microsoft Windows XP and Vista as well as Windows Server 2003.

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within 3 days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

Foreign National access to the NOAA ship or Federal Facilities is not required for this project.

IX. APPENDICES

- Appendix 1:* Operating Area for SE-17-07: Main Hawaiian Islands Bottomfish Restricted Fishing Areas (BRFAs)
- Appendix 2:* Station/Waypoint List (Coordinates in Latitude, Longitude: Degree-Minutes) *(To be provided to Command prior to departure)*
- Appendix 3:* Standard Operating Procedures for the Deployment and Recovery of a Modular Optical Underwater Survey System (MOUSS) from a 19ft SAFE Boat *(Attached File)*
- Appendix 4a:* Standard Operating Procedures for the Deployment and Recovery of a Surface-Tethered DropCam Instrument Package (DCIP) *(Attached File)*
- Appendix 4b:* Standard Operating Procedures for the Deployment and Recovery of an Untethered DropCam Instrument Package (DCIP) *(Attached File)*
- Appendix 5:* Program Equipment List *(Attached File)*
- Appendix 6:* Section IV.B. Hazardous Materials Inventory
- Appendix 7:* Section IV.C. Chemical Safety and Spill Response Procedures

Appendix 1: Operating Area for SE-17-07: Main Hawaiian Islands Bottomfish Restricted Fishing Areas (BRFAs)

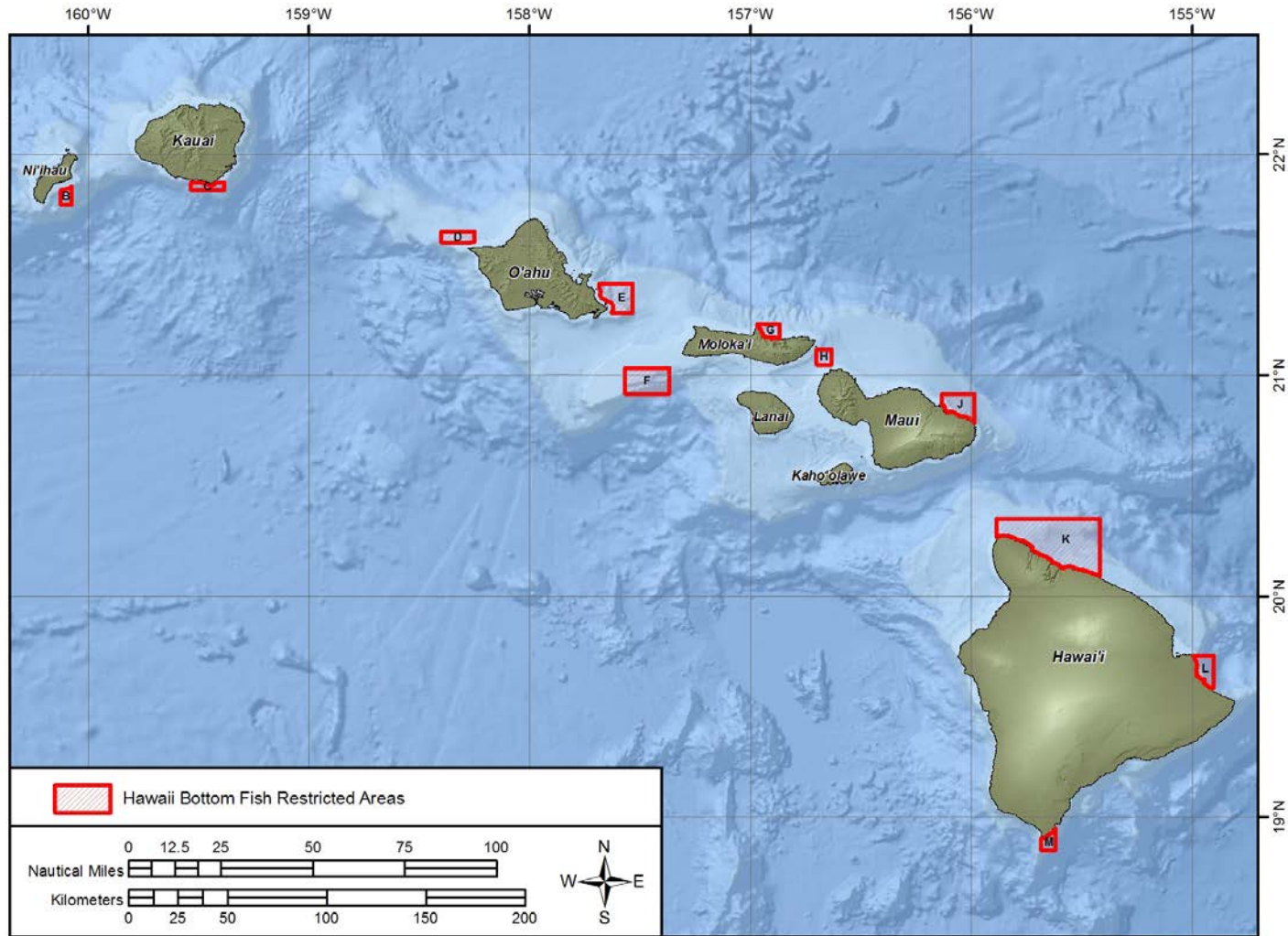


Figure 1. The primary MOUSS survey locations are the depicted Bottomfish Restricted Fishing Areas (BRFAs)

Appendix 2: Station/Waypoint List (Coordinates in Latitude, Longitude: Degree-Minutes)

A file format suitable for direct upload to Oscar Elton Sette's navigation software will be provided to the Command prior to departure.

Appendix 3: Standard Operating Procedures for the Deployment and Recovery of a Modular Optical Underwater Survey System (MOUSS) from a 19ft SAFE Boat.

(Attached File)

Appendix 4a: Standard Operating Procedures for the Deployment and Recovery of a Surface-Tethered DropCam Instrument Package (DCIP).

(Attached File)

Appendix 4b: Standard Operating Procedures for the Deployment and Recovery of an Untethered DropCam Instrument Package (DCIP).

(Attached File)

Appendix 5: Program Provided Equipment List

(Attached File)

Appendix 6: Section IV.B. Hazardous Materials Inventory

Inventory of Hazardous Materials

Common Name	Quantity	Notes	Trained Individual	Spill Control*
Gasoline, unleaded	2.1 kL (550 gal)	Volatile, Flammable Stored in ship's fantail tank & drum rack	Ship's Chief Engineer	Ship SOP
NiMH Battery Packs (Comprised of Rechargeable Tenergy D-cell Batteries)	20	14.4v, 16Ah battery packs Sealed non-spillable. Under normal operating conditions, the materials sealed inside should not be a health hazard. Only when these materials are exposed (e.g. case broken) may they pose a hazardous condition.	Jeremy Taylor	BAT (NiMH)
12V Deep Cycle AGM Battery (SlimLine Compressed AGM 12/185)	6	200Ah, 900A CCA, (22x5x11 inches; 119lb) ea. Sealed non-spillable. Under normal operating conditions, the materials sealed inside should not be a health hazard. Only when these materials are exposed (e.g. case broken) may they pose a hazardous condition.	Jeremy Taylor	BAT (LA)
Commercial Bleach	7.6L (2 gal)	Stored in Hydro Lab corrosives locker	Russell Reardon	B
Ethanol	2L	Flammable. Stored in ship's hazardous waste cabinet (wet lab)	Jeremy Taylor	AL

* Spill Control Key is presented in *Appendix 7*.

Appendix 7: Section IV.C. Chemical Safety and Spill Response Procedure

AL: Alcohols

- Remove all sources of ignition.
- Wear appropriate PPE and clothing during clean-up.
- Ventilate closed spaces before entering them.
- Use absorbent socks to surround spills or to divert fluid flow.
- Use vermiculite or kitty litter to soak up and absorb fluid.
- Do not use combustible materials, such as saw dust.
- Use absorbent pads/diapers to wipe up the spill or a dust pan to sweep up vermiculite/kitty litter.
- Place used absorbents in plastic bag or pail.
- Clean surface thoroughly to remove residual contamination.
- Bags containing used absorbents will be properly disposed of once the ship returns to port.

B: Bases

- Wear appropriate PPE and clothing during clean-up.
- Keep upwind. Keep out of low areas.
- Ventilate closed spaces before entering them.
- Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
- Never mix with an unknown liquid or residue or any compound incompatible with oxidizers.
- **Large Spills:** Dike ahead of spill for containment. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.
- **Small Spills:** Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.
- Never return spills to original containers for re-use.
- Neutralize spill area and washings with product such as Grainger Base Eater Spill Kit. Collect in a non-combustible container for prompt disposal.

BAT (LA): Batteries (Lead Acid)

No hazards occur during the normal operation of a Lead Acid Battery. Lead Acid Batteries have three significant characteristics:

- 1) They contain an electrolyte in a sealed case which contains diluted sulfuric acid which acts corrosively and may cause severe chemical burns.
- 2) During the charging process or during operation they might develop hydrogen gas and oxygen, which under certain circumstances may result in an explosive mixture.
- 3) They can contain a considerable amount of energy, which may be a source of high electrical current and a severe electrical shock in the event of a short circuit.

Spill or Leak Procedures:

- Wear protective goggles, rubber or PVC gloves, acid-resistant clothing, safety boots.
- Stop flow of material: Contain/absorb small spills with a bonding agent such as dry sand, earth, vermiculite or pads.
- Do not allow discharge of unneutralized acid to sewer, overboard, etc.
- Carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, or liquid reagent, etc.
- Collect neutralized material in sealed container and handle as hazardous waste as applicable.

Direct contact with the ingredients:

- Skin contact: Rinse with soap and water, remove and wash wetted clothing.
- Inhalation of acid mist may damage respiratory tract: Inhale fresh air, seek advice of a medical doctor. If breathing is difficult, give oxygen.
- After contact with the eyes: Rinse under running water for several minutes; seek advice of a medical doctor
- After swallowing: Drink lot of water immediately; swallow activated carbon, do not induce vomiting; seek advice of a medical doctor.

BAT (NiMH): Batteries (Nickel-Metal Hydride)

No hazards occur during the normal operation of Nickel-Metal Hydride Batteries. The battery cell is contained in a hermetically-sealed case. Concentrations of hazardous chemicals vary depending on the state of charge. They contain a caustic electrolyte which includes nickel hydroxide, sodium hydroxide and lithium hydroxide.

Spill or Leak Procedures:

- Wear protective goggles, rubber or PVC gloves, acid-resistant clothing, and safety boots.
- Stop flow of material: Contain/absorb small spills with a bonding agent such as dry sand, earth, vermiculite or with pads.
- Avoid contact of internal battery components with acids, aldehydes, and carbamate compounds.
- Do not allow discharge of unneutralized acid to sewer, overboard, etc.
- Carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, or liquid reagent, etc.
- Collect neutralized material in sealed container and handle as hazardous waste as applicable.

Direct contact with the ingredients:

- Skin contact: Rinse with soap and water continuously for 15 minutes, remove and wash wetted clothing.
- Inhalation of acid mist may damage respiratory tract: Inhale fresh air, seek advice of a medical doctor. If breathing is difficult, give oxygen.

- After contact with the eyes: Rinse under running water continuously for at least 15 minutes; seek advice of a medical doctor
- After swallowing: Drink lot of water immediately; swallow activated carbon, do not induce vomiting; seek advice of a medical doctor.

Inventory of Spill Kit Supplies

Product Name	Qty	Chemicals useful against	Amount of clean up possible
Chemical Spill Kit Contents: - Acid Neutralizer (1qt) - Base Neutralizer (1qt) - Halogen Neutralizer (1qt) - Hydrofluoric Neutralizer (1qt) - Surface Cleaner (1qt) - Goggles - Safety Gloves - Vinyl Apron - Sponge - Sprayer Applicator - Instructions	1 1 1 1 1 2 2 1 1 1 1	AL B BAT (NiMH) BAT (LA) Neutralizes the following into Non-Toxic Organic Salts and Water: Acids, Hydrofluoric Acid, Caustics, Halogens, Bases, and Solvents	Amount neutralized varies with concentration. pH indicating neutralizers eliminate need for pH meters or strips to determine appropriate amount.
HazMat Spill Kit Contents: - 20 Gallon Overpack - HazMat Socks (48") - HazMat Pillows - Yellow HazMat Bonded Pads - Safety Gloves - Goggles - Light Stick - Response Guide Book - Disposal Bags w/ Hazardous Waste Labels	1 6 7 20 5 1 1 1 3	AL B BAT (NiMH) BAT (LA) Chemical & HazMat Fluids	64 L (17 gal) collectively