



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Marine Fisheries Service  
Southwest Fisheries Science Center  
8604 La Jolla Shores Drive  
La Jolla, CA 92037

5/15/07

## **CRUISE INSTRUCTIONS**

NOAA Ship: NOAA Ship *Miller Freeman*

Cruise Number: MF-07-09

Cruise Dates: June 5 - 10, 2007

Cruise Title: Northwest Sardine Biomass Survey.

Study Area: 43°N to 47°N out to 126° W and no less than 15 miles from the coast.

### Itinerary:

Ship loading and gear preparation: 04 JUN in Astoria, OR.  
05 JUN - Depart Astoria, OR 10 JUN - Arrive Newport, OR

Track lines and station positions are included at the end of this document in Appendix 1.

Sponsoring Institutions: NOAA/NMFS, the Southwest Fisheries Science Center (SWFSC) Fisheries Resources Division (FRD) and the Northwest Fisheries Science Center (NWFSC) Fish Ecology Division (FED).

### Cruise Description and Objectives:

1. To conduct continuous underway sampling of surface waters. Temperature and salinity will be automatically logged by computer with the output from the GPS navigational unit.
2. To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler.
3. To perform an assessment of pelagic fish stocks between Cape Blanco, OR and Gray's Harbor, WA.
4. To monitor environmental conditions within the survey area.



5. To make continuous observations of sea birds and marine mammals.
6. To record continuous acoustic targets obtained with a Simrad EK-500 scientific sounder.

Chief Scientist: David A. Griffith, SWFSC (858) 546-7155, Dave.Griffith@noaa.gov

## **PLAN OF OPERATIONS**

### 1.0 OPERATIONS

1.1 The *Miller Freeman* will conduct operations in the coastal and offshore waters of Oregon and Washington. Sampling operations will be divided between daytime and nighttime activities. Fifteen primary stations have been plotted on the survey track with an approximate spacing of 30 nautical miles between stations and 60 nautical miles between survey lines (please refer to attached diagram in Appendix 1). Stations will be occupied during nighttime hours.

1.1.1 Each nighttime station will include the following:

1.1.1.1 CTD - will be lowered to 200 meters (depth permitting) to measure salinity, temperature, oxygen and chlorophyll.

1.1.1.2 CalBOBL (CalCOFI Bongo Oblique) - standard oblique plankton tow with 300 meters of wire out, depth permitting, using paired 505  $\mu\text{m}$  mesh nets with 71 cm diameter openings. The technical requirements for this tow are: Descent wire rate of 50 meters per minute and an ascent wire rate of 20 meters per minute. All tows with ascending wire angles lower than  $38^\circ$  or higher than  $51^\circ$  in the final 100 meters of wire will be repeated. Additionally, a  $45^\circ$  wire angle should be closely maintained during the ascent and descent of the net frame.

1.1.1.3 Weather observations.

1.1.1.4 Pairovet net - will be fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150  $\mu\text{m}$  mesh nets out to and including station 70. The technical requirements for Pairovet tows are: Descent rate of 70 meters per minute, a terminal depth time of 10 seconds and an ascent rate of 70 meters per minute. All tows with wire angles exceeding  $15^\circ$  during the ascent will be repeated.

1.1.1.5 Surface trawling - A Nordic 264 surface trawl will be deployed between the hours of approximately 1800 and 0600 PST at positions indicated in appendix 1. The positions within the survey pattern may be changed at the discretion of the Chief Scientist or Cruise Leader depending on information gained by the CUFES system or the EK-500.

1.1.2 Daytime activities will consist of :

1.1.2.1 CUFES, EK-500, ADCP and TSG - will be operated continuously during daylight hours in cooperation with the NWFSC's salmon survey conducted aboard a charter vessel.

1.1.2.2 Marine seabird and mammal observations - will be conducted during daylight hours enumerating and identifying all seabirds and marine mammals encountered.

1.1.3 Thermosalinometer sampling - The ship will provide and maintain a thermosalinometer (TSG), which is calibrated and in working order, for continuous measurement of surface water temperature and salinity. A backup unit (calibrated and in working order) will also be provided by the vessel and remain aboard during the cruise. The Scientific Computing System (SCS) will serve as the main data collection system.. All SCS data will be provided to SWFSC personnel at the completion of the cruise.

1.1.4 Acoustics –The Simrad EK-500 depth sounder will be operated at 18, 38, and 120 kHz and interfaced to a data acquisition system to estimate micronekton biomass between 0 and 500 m.

1.1.5 ADCP – The ship's ADCP should run continuously and be logged to a data acquisition system. Complete system settings will be provided by the oceanographer, but will include 5-minute averaging of currents, AGC and 4 beam returns in 60 8-meter bins. The ADCP will be set to receive an external trigger from the EK-60 to avoid cross talk.

1.1.6 CUFES - The egg pump will be mounted inside the ship's hull drawing water from a depth of seven meters. During the grid occupation, the pump will run continuously between stations to sample any pelagic fish eggs. At any time during the survey when the CUFES detects sardine egg concentrations of one egg per minute or higher in two consecutive samples, the ship will begin conducting paironet tows at four mile intervals until the egg concentration falls below a density of one egg per minute in two consecutive samples. This information will be relayed to the bridge by scientists monitoring the CUFES system.

## 2.0 SCIENTIFIC PERSONNEL

2.1 Chief Scientist - The Chief Scientist is David A. Griffith, SWFSC, at phone (858) 546-7155.

The Chief Scientist is authorized to alter the scientific portion of this cruise plan with the concurrence of the Commanding Officer, provided that the proposed changes will not: (1) jeopardize the safety of personnel or the ship, (2) exceed the time allotted for the cruise, (3) result in undue additional expense, or (4) change the general intent of the project.

## 2.2 Participating Scientists

Please see Appendix 3.

2.3 Medical Forms - All scientific personnel will complete a NOAA Health Services Questionnaire (NHSQ) prior to embarking, as per NC Instruction 6000. This form will be routed through MOP Health Services for approval 30 days prior to the cruise.

## 3.0 EQUIPMENT

### 3.1 Supplied by scientific party:

1. 37% Formalin (SWFSC)
2. Ethanol (SWFSC)
3. Tris buffer (SWFSC)
4. Sodium borate (SWFSC)
5. 30 cc and 50 cc syringes (SWFSC)
6. Canulas (SWFSC)
7. Pint, quart and gallon jars (SWFSC)
8. Inside and outside labels (SWFSC)
9. CalCOFI net tow data sheets (SWFSC)
10. 71 cm CalCOFI Bongo frames (SWFSC)
11. 71 cm CalCOFI 505  $\mu$ m mesh nets (SWFSC)
12. CalCOFI 150  $\mu$ m Calvet nets and codends (SWFSC)
13. CalCOFI Pairovet frames (SWFSC)
14. 333  $\mu$ m mesh codends (SWFSC)
15. Inclinator for bongo tows (SWFSC)
16. Digital flowmeters (SWFSC)
17. 75 lb Bongo weight (SWFSC)
18. Standard CalCOFI tool boxes (SWFSC)
19. Bucket thermometers and holders (SWFSC)
20. Hand held inclinometer for Pairovet tows (SWFSC)
21. Data sheets for scheduled hydrographic work (SIO)
22. Weather observation sheets (SIO)
23. Dissecting microscopes (SWFSC)
24. Nordic 264 rope trawl (NWFSC)
25. Trawl rigging (NWFSC)
26. 3.0 m<sup>2</sup> XL-Lite foam core trawl doors (SWFSC)
27. Motion compensated balances (SWFSC)
28. Fish measuring boards (SWFSC)

3.2 Supplied by ship - We request the following systems and their associated support services, sufficient consumables, back-up units, and on-site spares. All measurement instruments are assumed to have current calibrations and we request that all pertinent calibration information be included in the data package.

1. Port and starboard winches with .322" conductive cable

2. Port and starboard trawl winches with 1" trawl cable
3. Port and starboard gantries with trawl blocks for 1" trawl cable
4. A-frames w/blocks to accommodate .322" cable
5. Winch monitoring system
6. Seabird thermosalinometer
7. Seabird 9/11+ CTD system
8. Raytheon Deep Water Echo Sounder (12 kHz) with UGR recorder and JRC color scope
9. Acoustic Doppler Current Profiler w/writeable CD drive
10. Multiple frequency transducer of 12, 38 and 120 kHz frequencies for the EK-500

3.3 Installation and Maintenance - Prior to departure from Astoria the Chief Scientist and members of the scientific party may board the vessel, with permission of the Commanding Officer, to test survey equipment and environmental sensors.

3.4 Hazardous Materials - The Chief Scientist shall be responsible for complying with NC Instruction 6280a, Hazardous Materials and Hazardous Waste; policy, guidance, and training, dated February 4, 1991, paragraph 7.g and paragraph 9. By Federal Law, the ship may not sail without a complete inventory of Material Safety Data Sheets (MSDS's) and appropriating neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemicals brought on board. The Chief Scientist will provide the Commanding Officer with a copy of all MSDS's prior to the cruise.

#### 4.0 DATA RESPONSIBILITIES

4.1 Collection of Data - The Chief Scientist will receive all original data related to the project. The Chief Scientist will in turn furnish the Commanding Officer with a complete inventory listing of all data gathered by the scientific party, detailing types of operations and quantities of data prior to departing the ship. All data gathered by the vessel's personnel that are desired by the Chief Scientist will be released to the Chief Scientist, including supplementary data specimens and photos gathered by the scientific crew.

4.2 Dissemination of Data - The Chief Scientist is responsible for the quality assurance, disposition and archiving of data and specimens collected aboard the ship. The Chief Scientist is also responsible for the dissemination of copies of these data to cruise participants and to any other requesters. The SWFSC cruise report will be submitted according to SWFSC procedures to appropriate persons and groups.

4.3 Evaluation Form - The Chief Scientist will complete the Ship Operations Evaluation Form and forward it to the Office of Marine and Aviation Operations. The Commanding Officer will provide this form.

#### 5.0 ADDITIONAL INVESTIGATIONS AND PROJECTS

5.1 Ancillary Projects - Ancillary projects are secondary to the objectives of the cruise,

should be treated as additional investigations, do not have representation aboard, and are accomplished by the ship's force. Ancillary tasks will be accomplished in accordance with the NOAA Fleet Standing Ancillary Instructions. Any additional work will be conducted so as not to interfere with operations as outlined in these instructions. The Chief Scientist will be responsible for determining the priority of additional work relative to the primary project with approval from the Commanding Officer.

## 6.0 COMMUNICATIONS

6.1 Radios - The Cruise Leader or designee may request, from the Commanding Officer, the use of radio transceivers aboard the ship to communicate with other vessels and aircraft, if necessary.

6.2 Telephone - The Cruise Leader or designee may require access to the ship's INMARSAT or cellular telephone systems with permission from the Commanding Officer. The Commanding Officer will provide the Cruise Leader with a log of all INMARSAT calls made from the ship for SWFSC business at the end of each leg. In accordance with the Communications Reimbursement Policy, SWFSC will pay these charges via a transfer of funds from SWFSC to the ship.

6.3 Electronic Mail - All members of the scientific party will have access to e-mail for communications with persons not aboard the ship. The amount of such communication traffic will be determined by the Chief Scientist.

6.4 Routine Reports - The Cruise Leader will submit a weekly cruise report, along with time and attendance for the scientific party, to the Survey Coordinator each Thursday during the cruise via e-mail or, if e-mail is not functioning properly, via fax. Richard Charter at SWFSC will be on the distribution list for the ship's noon position reports.

## 7.0 MISCELLANEOUS

7.1 Pre-cruise Meeting - A pre-cruise meeting between the Chief Scientist and the Commanding Officer (and his staff) will be held prior to the start of the cruise to identify operational requirements (i.e., overtime, modifications, repairs or procurement). The date and time for this meeting is yet to be scheduled.

7.2 Underway Meetings - Meetings between the Commanding Officer (and other officers) and the Cruise Leader should occur at the beginning and end of each leg to discuss and solve any problems or changes that may arise. Additional meetings should occur as needed.

7.3 Debrief - A post-cruise debriefing will be held between the Chief Scientist and the Commanding Officer. If serious problems are identified, the Commanding Officer shall notify the Marine Operations Center, Pacific, in the most direct means available. The Chief Scientist shall document identified problems in the Ship Operations Evaluation Form. The time and date for the debrief will be determined toward the end of the cruise.

7.4 Time and Attendance - Time and Attendance will be filled out by the SWFSC timekeeper while the ship is at sea, based on information transmitted by the Cruise Leader to the Survey Coordinator. Scheduled overtime is authorized for Saturdays, Sundays, holidays and any hours over a standard eight hour week day. Irregular overtime will be authorized by the Cruise Leader as required. SWFSC personnel are authorized per diem at the rate of \$3.00 per day to be paid via a travel voucher at the termination of the cruise. Task Number E8LAF28-P05 will pay for per diem and overtime for any SWFSC permanent, term or temporary employees.

7.5 Navigation - Primary control will be GPS, also dead reckoning based on visual bearings and radar ranges when possible.

7.6 Scientific Spaces - The Cruise Leader shall be responsible for the proper upkeep and cleaning of all spaces assigned to the scientific party, both laboratory and living spaces, throughout the cruise. The Cruise Leader or Chief Scientist will make berthing assignments for scientific personnel on a per-leg basis, with approval of the Commanding Officer.

7.7 Foreign Nationals Access to NMAO Vessels -  
Please see Appendix 4.

For further information contact Richard Charter, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 8604 La Jolla Shores Drive, La Jolla, CA 92037; Richard.Charter@noaa.gov, Phone (858) 546-7157.

Prepared by: \_\_\_\_\_  
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Chief Scientist, SWFSC

Date: \_\_\_\_\_

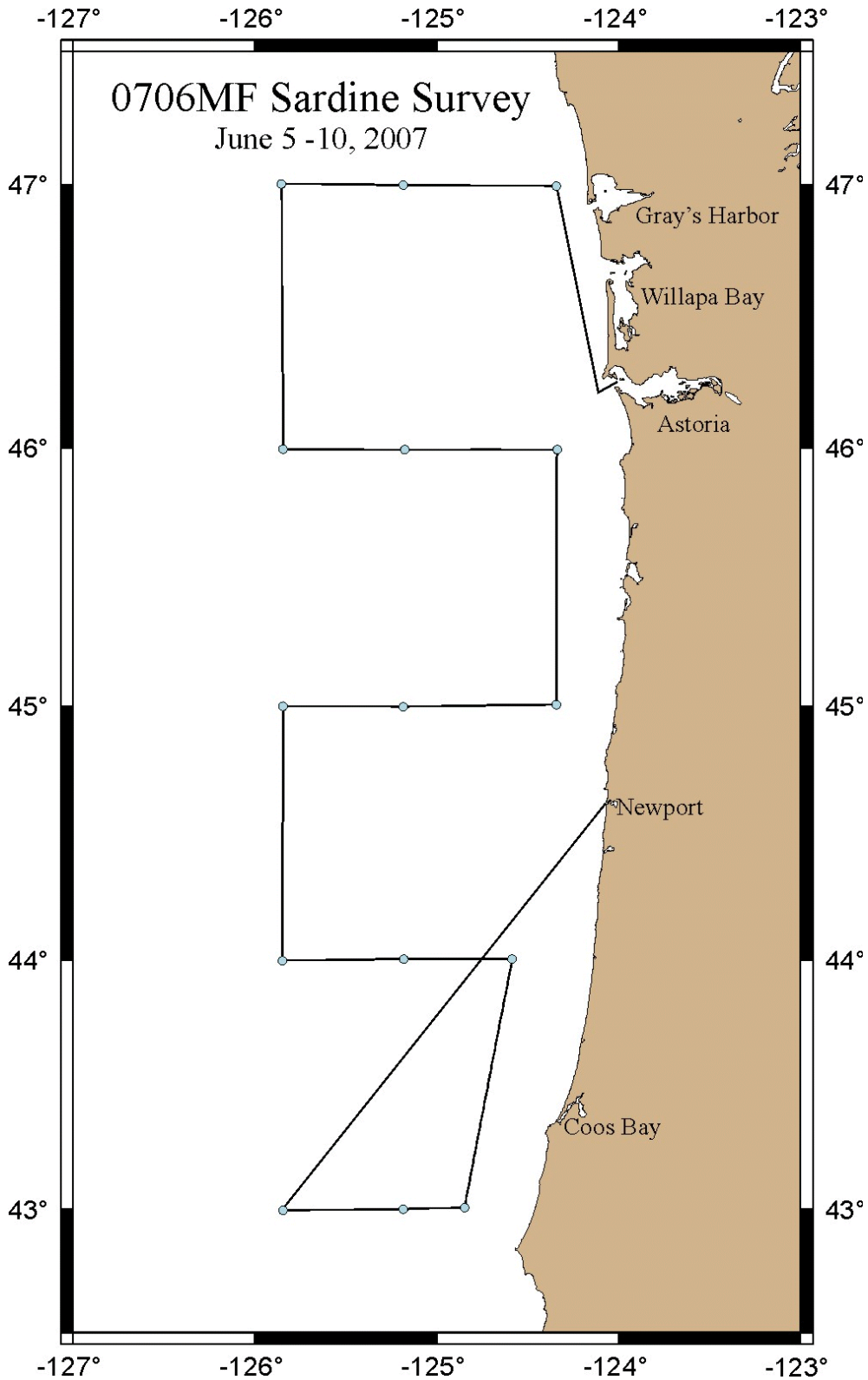
Approved by: \_\_\_\_\_  
William W. Fox, PhD.  
Science & Research Director  
Southwest Region

Date: \_\_\_\_\_

Approved by: \_\_\_\_\_  
CAPT Jon Rix  
Commanding Officer  
NOAA Marine Operations Center - Pacific

Date: \_\_\_\_\_

Appendix 1. NOAA Ship *Miller Freeman* track lines for 0704MF Northwest Sardine Biomass Survey.





## Appendix 2. Station positions:

	Line	Station	Dlatitude	Dlongitude
1	17.3	0.4	46.9966252301235	124.343015373878
2	15.8	8.1	46.9997661845922	125.182808349287
3	14.6	14.2	47.0042789481671	125.85239541305
4	19.1	21.1	45.9948560847611	125.843307721021
5	20.3	14.9	45.9936766545195	125.174484932923
6	21.8	7.1	45.9938690333842	124.337695398303
7	26.2	13.9	45.0051000113872	124.341070913889
8	24.7	21.9	44.9982409658559	125.183386336009
9	23.5	28.1	44.9994203960975	125.843563620008
10	27.9	35.3	43.9973180407672	125.848737886822
11	29.1	28.9	44.0028052771923	125.180877307174
12	30.2	23.2	44.0022796883597	124.583956487633
13	34.1	32.8	43.0067798734078	124.846776895362
14	33.5	36.1	43.0007029218619	125.183640038191
15	32.3	42.5	42.9952156854369	125.84324032216

Finish in Newport, OR

## Appendix 3. Personnel for the 0706MF Northwest Sardine Biomass Survey

Position	Name	Affiliation	Berth
Chief Scientist	Dave Griffith	SWFSC	
Fishery Biologist	Dimitry Abramenkoff	SWFSC	
Fishery Biologist	Bev Macewicz	SWFSC	
Fishery Biologist	Noelle Bowlin	SWFSC	
Acoustician	Randy Cutter	SWFSC	
Fishery Biologist	Ric Brodeur	NWFSC	
Fishery Biologist	Bob Emmett	NWFSC	
Marine Mammal Observer	Jen Zamon	NWFSC	
Student	Marisa Litz	OSU	
Marine Mammal Observer	Troy Guy	OSU	
Student	Casey Benkwitt	OSU	

## Appendix 4. Foreign National Access

### Foreign National Access and Deemed Export Controls on NMAO Vessels

All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo ( <http://deemedexports.noaa.gov> ). The foreign national's sponsor is responsible for obtaining clearances and export licenses required and for providing for required escorts by the NAO. Programs sponsoring foreign nationals should consult with their designated line office personnel to assist with the process (<http://deemedexports.noaa.gov/contacts.html> ).

The following are basic requirements. Full compliance with NAO 207-12 is required.

**Responsibilities of the Chief Scientist:**

Ensure the following is provided to the Commanding Officer before any foreign national will be allowed on board for any reason:

1. Written notification identifying the NOAA Program individual who is responsible for ensuring compliance with NOAA and export regulations for the foreign national (see Foreign National Sponsor responsibilities below).
2. A copy of the DOC/OSY clearance authorization for access by the foreign national.
3. A copy of Appendix B of NAO 207-12 with NOAA Chief Administrative Officer concurrence endorsement.
4. Written notification that the foreign national has been cleared against the State, Commerce and Treasury departments' Lists to Check.  
<http://www.bis.doc.gov/ComplianceAndEnforcement/ListsToCheck.htm>
5. Provide the NOAA Foreign National List spreadsheet for each foreign national in the scientific party.

Escorts – The Chief Scientist is responsible to provide escorts to comply with NAO 207-12 Section 5.10, or as required by the vessel’s DOC/OSY Regional Security Officer.

Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Export Control - The Chief Scientist is responsible for complying with NAO 207-12 and the development of Technology Access Control Plans for items they bring aboard. The Chief Scientist must notify the Commanding Officer of any export controlled items they bring aboard and any access restrictions associated with these items.

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

**Responsibilities of the Commanding Officer:**

Ensure only those foreign nationals with DOC/OSY clearance are granted access..

Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for

anti-terrorism (AT) reasons and individuals from Cuba or Iran without written NMAO approval and compliance with export and sanction regulations.

Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.

Ensure receipt from the Chief Scientist of the NOAA Foreign National List spreadsheet for each foreign national in the scientific party.

Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.

Export Control - 8 weeks in advance of the cruise, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology.

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

### **Responsibilities of the Foreign National Sponsor**

Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.

The Departmental Sponsor/NOAA of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen, NOAA employee or be approved by the vessel's DOC Regional Security Officer homeport.

Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National Guest) as required by NAO 207-12 Section 5.03.h