

MEMORANDUM OF AGREEMENT

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I. PURPOSE

The purpose of this Memorandum of Agreement (MOA) is to facilitate the use of U.S. Navy submarines for scientific research in the Arctic. This MOA sets forth the functions, responsibilities, and actions of the Chief of Naval Research (CNR), the Chief of Naval Operations (CNO), the U.S. Submarine Force, the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Geological Survey (USGS).

II. BACKGROUND

The federal agencies that fund Arctic marine science believe that existing fleet nuclear submarines (SSN) are invaluable research platforms in the Arctic, as was demonstrated during Arctic Submarine Science Cruise 1993. These agencies are seriously interested in continued utilization of U.S. SSN's for science. The Navy believes that SSN's must retain a global ocean operational capability. The Submarine Force is committed to sustaining its Arctic training and readiness levels through recurring deployments to that area.

III. GOALS

The overall goal of the Submarine Arctic Science Program is to improve understanding of Arctic Ocean processes and their role in the earth's climate system by dual use of nuclear submarines, thus fully capitalizing on existing national platform capabilities. This Agreement is intended to mutually support the objectives of both the civilian and military communities.

IV. DEFINITIONS

A. Parties to Agreement. The following parties are entering into this Agreement:

1. CNO, represented by the Attack Submarine Branch of the Submarine Warfare Division (N872).
2. U. S. Submarine Force, represented by Commander Submarine Force, U. S. Atlantic Fleet for Atlantic submarine involvement and Commander Submarine Force, U.S. Pacific Fleet for Pacific submarine involvement.
3. CNR, represented by the Ocean and Atmosphere and Space Science and Technology Department (ONR 32).

4. NSF, represented by the Office of Polar Programs (OPP) and the Division of Ocean Sciences (OCE).
5. NOAA, represented by the Ocean and Atmospheric Research Directorate (OAR).
6. USGS, represented by the Chief Office of Energy and Marine Geology.

B. Functioning Bodies. The following bodies are established by this Agreement:

1. Operational Planning Board (BOARD). The BOARD shall have five members: a representative of ONR, CNO, the U.S. Submarine Force, the Naval Undersea Warfare Center/Division Keyport/Arctic Submarine Laboratory (ASL) and the Arctic Research Commission.
2. Science Steering Committee (COMMITTEE). The COMMITTEE shall have eleven members: a representative of ONR, NSF, NOAA, and USGS, a member of the science community designated by each Agency, a member of the Polar Research Board and a member of the Naval Studies Board. The ONR representative will serve on both the COMMITTEE and the BOARD. One additional representative from the BOARD will be nominated as a standing member of the COMMITTEE. Representatives from other interested agencies may serve as ad hoc members of the COMMITTEE by request.

V. FUNCTIONS, RESPONSIBILITIES & ACTIONS

A. The CNO agrees to:

1. Establish and chair the BOARD to plan and execute Arctic submarine science cruises. The functions of the BOARD are to:
 - a. Review proposed projects to verify technical and operational feasibility and data declassification. The BOARD will not review scientific merit, but may limit the extent of some investigations based on operational issues.
 - b. Nominate a member to sit on the COMMITTEE who will serve to assist the science community in early screening of the technical feasibility of research proposals.
 - c. Apprise the COMMITTEE of operational matters such as schedules, berthing for embarked scientists and status of installations.

2. Authorize the ASL as the CNO and Submarine Force Arctic Advisor to coordinate the operational and technical aspects of each Arctic submarine science cruise. Coordination includes managing with ONR an annual advance planning process.
3. Provide a Technical Advisor (TA), knowledgeable in submarine Arctic operations, who will facilitate equipment installation, load out and data collection, and will be on board for the duration of the science cruise. The TA will serve in a liaison role between the embarked scientists and the submarine crew.

B. The U. S. Submarine Force agrees to:

1. Provide SSN assets for Arctic scientific research on a periodic schedule and of a duration agreed to by both the ONR and the Submarine Force. These deployments must be consistent with availability and military commitments as determined by the Fleet Commander. The Submarine Force retains the right to cancel or shorten any cruise if operationally required.
2. Provide all operational support for the submarine cruise to include training, operating orders and associated support.
3. Make available space for scientific personnel and equipment as feasible.
4. Obtain data specified in the Science Plan. This Plan, composed by the Chief Scientist in collaboration with all principal investigators and approved by the COMMITTEE and BOARD, establishes the cruise priorities for collection of baseline and special data as defined in Paragraph VI. The Commanding Officer of the participating submarine retains the absolute right to modify or delete portions of the Science Plan consistent with the ship's safety. The Science Plan may also be modified at sea in response to:
 - a. unanticipated environmental conditions;
 - b. instrumentation malfunctions or failures;
 - c. unplanned contingencies or limitations.

At sea modifications to the Science Plan will be recommended by the Chief Scientist in consultation with the TA. The Commanding Officer will execute such changes subject to maintaining safety and remaining within overall

operational directives.

5. Make science data sets available to principal investigators as soon as possible consistent with the submarine's operational employment and declassification requirements.

C. The CNR agrees to:

1. Serve as the focal point for the scientific aspects of the Submarine Arctic Science Program, ensuring multi-agency participation in identifying science requirements and evaluation of proposals, thereby making available the unique attributes of a nuclear submarine to as many in the science community as possible.
2. Initiate a Broad Agency Announcement (BAA) requesting proposals from the science community for each planned Arctic submarine science cruise. The BAA and subsequent funding process will be multi-agency, fulfilling the intent of the Arctic Research and Policy Act as implemented by the Interagency Arctic Research and Policy Committee. The BAA ensures fair and open competition in selecting the best science for use of nuclear submarines in Arctic research.
3. Implement with ASL an annual advance planning process involving both the science and operational communities. This process provides adequate time for BAA response, review of candidate investigations, funding decisions and deployment preparation.
4. Establish and chair the COMMITTEE to work directly with the science community. The COMMITTEE will orchestrate the overall Science Plan including both long term and short term projects. For each planned cruise, the functions of the COMMITTEE are to:
 - a. Establish broad scientific priorities and review and approve with the BOARD the Science Plan drafted by the Chief Scientist;
 - b. Ensure that interested scientists are informed of the nature and objectives of the exercise, including limitations and prioritizations;
 - c. Evaluate proposed science projects based on scientific merit, the ability to obtain adequate funding, and the applicability of results to national research goals;
 - d. Ensure that proposed scientific projects fully address all temporary

installations, equipment load plans, and storage space requirements;

e. Recommend onboard scientists using berthing allowances provided by the BOARD. Within this group, the COMMITTEE will designate a Chief Scientist who will draft the Science Plan and have final decision authority on scientific issues at sea. Each onboard scientist must meet the security and physical requirements specified by the CNO, and be approved by the Submarine Type Commander conducting the deployment.

5. Establish a system to provide independent and periodic review of procedures and achievements.

D. **The NSF, NOAA, and USGS each agree to:**

1. Endorse the multi-agency BAA, and identify funds available to support research and coordination services for each cruise. Each agency reserves the right to select and review proposals according to its own policy.
2. Designate an agency representative and a science community representative as members of the COMMITTEE and participate actively in the annual advance planning process and periodic reviews.

VI. DATA

A. Baseline data included under this agreement are:

1. water samples;
2. temperature or sound velocity profiles taken by expendable probe;
3. Conductivity, Temperature, Depth (CTD) profiles taken by expendable probe;
4. CTD data taken from sail mounted SUBCTD system;
5. bathymetry recorded by installed fathometers;
6. ice profile data from upward looking, narrow beam sonar;
7. ice image data from upward looking video and sidescan sonar if available;
8. supporting navigation and operational data at a non-classified level.

B. Other special data included under this agreement are those specified in the approved Science Plan.

VII. FISCAL

A. This Agreement identifies three fiscal elements required for the Arctic

Submarine Science Cruise Program. Parties to the Agreement who are actively participating in a planned Arctic submarine science cruise will contribute as follows:

1. Ship Costs. The Submarine Force will provide funds for the shiptime component of the deployment.
2. Baseline and Special Data Acquisition Costs. Participating parties will provide equal share funds to support baseline data acquisition and fair share funds for special data acquisition related to specific science investigations. Costs will be determined by the Submarine Force and ASL as part of the proposal evaluation process. Funds will be provided to ASL at least three months prior to installation. This acquisition includes:
 - a. installing, removing and operating (if required) equipment and instrumentation for science;
 - b. classification review, copying, packaging and forwarding data.
3. Coordination Costs. Participating parties will provide funds in equal shares to support TA services from ASL. These services include liaison with the fleet, review of proposal feasibility and estimation of data acquisition costs. Six months prior to each cruise, ASL will propose funding rates and a payment schedule associated with these services based on anticipated level of effort. This proposal will be reviewed and endorsed by the BOARD and forwarded to the COMMITTEE as part of the proposal evaluation process.

VIII. SECURITY

All scientific and other data collected on each cruise will be evaluated for security purposes by a USN representative selected by the BOARD. This evaluation will be completed as soon as possible, nominally within 30 days after the ship's return to home port. The BOARD will make every effort to ensure the acquired data are declassified; however, all data will be afforded proper protection if determined to be classified due to extenuating circumstances.

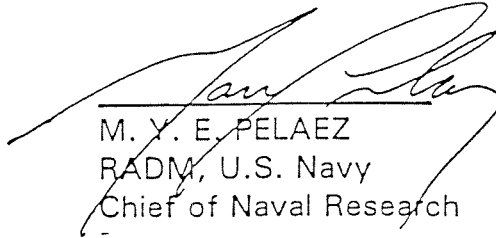
IX. PERIOD OF AGREEMENT

This agreement shall be effective upon the date of the last signature below, and will remain in effect until terminated or modified by mutual agreement of all the parties.

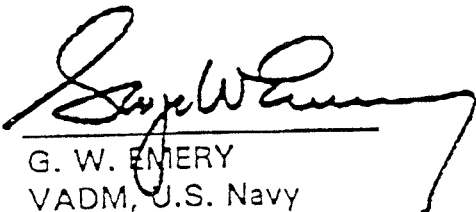
X. SIGNATURES



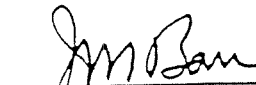
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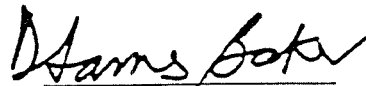
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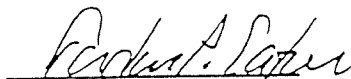
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