No. 18064

UNITED STATES OF AMERICA
and
CANADA

Agreement relating to the evaluation of a sonar system of high speed surface vessel (with annexes). Signed at Washington on 12 September 1977 and at Ottawa on 12 October 1977

Authentic text: English.
Registered by the United States of America on 14 November 1979.

ÉTATS-UNIS D'AMÉRIQUE
et
CANADA

Accord relatif à l'évaluation du système sonar des navires de surface à grande vitesse (avec annexes). Signé à Washington le 12 septembre 1977 et à Ottawa le 12 octobre 1977

Texte authentique : anglais.
Enregistré par les États-Unis d'Amérique le 14 novembre 1979.

AGREEMENT[1] BETWEEN THE UNITED STATES DEPARTMENT OF THE NAVY AND THE CANADIAN DEPARTMENT OF DEFENCE PRODUCTION (REPRESENTED BY THE CANADIAN DEPARTMENT OF INDUSTRY, TRADE AND COMMERCE) FOR A PROJECT HYTOW

1. INTRODUCTION

1.1. This Project Agreement sets forth arrangements between the United States Department of the Navy (USN) and the Canadian Department of Defence Production, as represented by the Canadian Department of Industry,Trade and Commerce (DITC), for a cooperative project undertaken within the framework of and pursuant to the terms and conditions of the Memorandum of Understanding in the Field of Cooperative Development between the United States Department of Defense and the Canadian Department of Defence Production entered into on November 21, 1963, as set forth under the Armed Services Procurement Regulations (ASPR) 6.507 and other sections of ASPR related to U.S./Canada joint projects.

2. SCOPE AND OBJECTIVES

2.1. The overall objective of this program is to evaluate the performance of a variable depth sonar (VDS) system in conjunction with a high speed surface vessel in order to determine the potential of the vessel in the anti-submarine role.

2.2. The primary test goals will be:

a. To determine the physical effects on a VDS system when towed by a hydrofoil through the full range of speed and turns under operational conditions;

b. To determine the effect of towing a VDS on the handling characteristics of a hydrofoil, through the full range of speed and turns under operational conditions;

c. To determine the effect on the detection capabilities of the sonar caused by being towed at high speeds by a hydrofoil under various environmental conditions; to measure acoustic characteristics which could be applied to a variety of possible hydrofoil sonars;

d. To assess the utility of the VDS system in an operational environment aboard a Patrol-combatant Missile Hydrofoil (PHM).

2.3. More specific guidance to the trials to be conducted are contained in annex "A" to this Agreement.

3. BACKGROUND INFORMATION

3.1. Since the 1950s, innumerable studies, research, development, and production have been conducted on hydrofoils and sonars with the ultimate goal of providing a viable ASW vehicle. However, since no sonars have been tested on hydrofoils to date the validity of the premise has not been operationally tested.

[1] Came into force on 12 October 1977 by signature, in accordance with section 16.1.

3.2. Canadian industry with design and financial assistance from the Government of Canada has developed and produced a light weight variable depth sonar for use with high speed surface craft, the HS 1001. Although designed for use by high speed craft this set has not been tested above 32 knots.

3.3. The United States Navy has designed and developed a hydrofoil, which is operated and maintained by the Hydrofoil Special Trials Unit, DTNSRDC at Bremerton, Washington. This hydrofoil (PCH 1) is capable of carrying the HS 1001 sonar set.

3.4. The United States Navy also has a hydrofoil which is currently assigned to the Commander, Naval Surface Forces, U.S. Pacific Fleet (COMNAVSURPAC) at San Diego, Cal. This hydrofoil (PHM-1) is also capable of carrying the HS-1001 Sonar Set.

3.5. It is mutually advantageous to both countries to determine the potential of a hydrofoil/VDS combination in ASW. Moreover since PCH-1 and PHM-1 are hydrofoils having different characteristics it is agreed that it is desirable to evaluate the HS-1001 on both units.

4. WORK TO BE PERFORMED

4.1. The following is an outline of the work to be accomplished in this test and evaluation effort and is subject to the agreement of the parties hereto in the trials program and final statement of work incorporated as annexes A and B, respectively, to this Agreement.

4.2. This project shall be conducted in five phases as follows:

Phase I. Planning phase

a. Assembly of Project team;
b. Preparation of Project schedule;
c. Preparation of technical and trials plans.

Phase II. Installation and checkout phase on PCH-1

a. Preparation of plans and work orders for ship modification;
b. Preparation of ship for VDS installation;
c. Provision of sonar and precursor checkout;
d. VDS installation and dockside checkout;
e. Equipment familiarization and training;
f. Ship/VDS operation underway checkout;
g. Sonar performance measurements.

Phase III. Trials phase on PCH-1

a. Ship seaworthiness and handling tests;
b. VDS handling and towing strain tests;
c. Sonar performance measurements;
d. Sonar detection and tracking runs;
e. Instruments range runs;
f. Ship/VDS, operation demonstrations.

Phase IV. Termination phase, analysis and reporting for PCH-1

a. Removal of VDS system and preparation for installation on board PHM-1;

b. Return of ship to required status;

c. Reduction and analysis of trials results;

d. Preparation of final report.

Phase V. PHM-1 evaluation

a. Phase II will be repeated aboard PHM-1;

b. The HS-1001 will be evaluated by the U.S. Navy on board PHM-1;

c. Removal of the VDS from PHM-1 in preparation for shipment;

d. Preparation of final report;

e. Dissolution of Project team.

The results of the proposed tests will serve to establish the operational feasibility of the Canadian-developed sonar equipment in the high speed towing range, together with validation of the USN's developing high speed surface vessel programme.

5. PROJECT IMPLEMENTATION

5.1. In order to implement the Project program:

a. DITC will make available a HS 1001 sonar set including the VDS handling gear, bodies and cable necessary to obtain the desired information;

b. DITC shall be responsible for the operation and support of the sonar equipment;

c. The USN will provide the hydrofoils PCH-1 and PHM-1 and be responsible for their operation and support;

d. The DITC (through DND) will make available range facilities as required; both parties shall cooperate in the provision of submerged targets and the collection and reduction of acquired data.

5.2. Both parties will jointly make provision for the installation of the VDS system in the hydrofoil as set forth in annex B. Each party shall be responsible for the modification of its provided equipment to make it suitable for the program to be undertaken pursuant to the Project Agreement.

5.3. The tests will be conducted within the operational area of the Canadian Maritime Command (Pacific) Forces and the United States PACFLT OPAREAS.

5.4. The time schedule of this program will vary according to the dictates of a number of factors. However, it shall be the aim of the participants to adhere as close as practicable to the following schedule:

Item	*Weeks after effective date of Project Agreement*
Delivery of VDS and support equipment to dockside	4
Commencement of phase III (trials phase)	8
Completion of phase III	15
Removal of VDS from PCH-1	16
Submission of PCH-1 final report	18
Transfer to PHM-1	20
Removal from PHM-1	52
Submission of PHM-1 final report	56

6. COST-SHARING ARRANGEMENTS

6.1. It is estimated that the overall cost for this Project will be $600,000 (U.S.) including the provisions of equipment and services.

6.2. Each government's responsibility for the costs incurred in this Project will be satisfied through the contractual arrangements for the provision of equipment as set out in section 5 above, and the statement of work allocated in annex B.

6.3. This project is subject to the availability of funds. Each party will notify the other immediately if the resources available are inadequate for its portion of the project.

7. PROGRAM MANAGEMENT

7.1. Each party will appoint one representative to be the Co-chairman of Project Management Committee (PMC). The PMC shall be responsible for the overall management of the program within the expenditure limits specified in this Agreement. The main functions of the PMC are to review proposed tests, receive regular test and cost reports, to review the progress of work done against expenditure and to mutually authorize any major change to the technical content, time schedule of program plan as necessary to ensure that the authorized funds are not exceeded. The PMC shall meet at least every four weeks or more frequently as mutually agreed.

7.2. A Program Manager (PGM) shall be responsible to the PMC for the efficient conduct of the project program, so as to meet the goals set forth in test plans, including the preparation of trials agenda, reports and provision of facilities. He shall also be responsible for the safe operations of the VDS in the absence of the APGM. The PGM shall be provided by the U.S. Navy.

7.3. An Assistant Program Manager (APGM), provided by the DITC, shall assist the Program Manager in the planning and conduct of the Project program. He shall be responsible for the safe operation of the VDS and to determine when conditions are unsuitable for such operations. In the event of nonavailability of an APGM this responsibility shall be assumed by the PGM.

8. REPORTS

8.1. The PGM shall provide to the PMC *(a)* weekly status reports covering Project plan progress and forecast schedule of events for following week; *(b)* a comprehensive technical report of test results and conclusions on completion of this Project.

8.2. All information arising out of this Project shall be made available to each other on a cost-free, royalty-free basis for defence purposes.

8.3. Disclosure of information to any third party will be subject to the provisions of paragraph 11 of the Memorandum of Understanding in the Field of Cooperative Development between the United States Department of Defense and the Canadian Department of Defence Production.

9. CLAIMS

9.1. Any claim for damage or loss to property, or injury to persons arising from the carrying out of the program will be dealt with in accordance with the

provision of article VIII the Agreement between the parties to the North Atlantic Treaty Organization regarding the Status of their Forces dated 19 June 1951 [1].

10. PROPRIETARY RIGHTS

10.1. Both parties including all authorities and participants shall respect and provide adequate protection for proprietary information and rights generated and exchanged under this Project Agreement in accordance with the requirements set forth in ASPR 6.507.

11. ESTABLISHMENTS AND AUTHORITIES

11.1. All establishments and authorities participating in the project are listed in annex C. Updating of annex C shall be carried out as necessary by agreement between PGM's.

12. EXCHANGE OF INFORMATION AND VISITS

12.1. To facilitate the conduct of the project, the PGM's are delegated the authority to exchange information and to approve visit requests to activities indicated in annex C, in accordance with the procedures set forth in existing Agreements between the Governments of the United States and Canada.

12.2. All authorities, and establishments listed in annex C are authorized to correspond with each other. Such correspondence shall be forwarded from the PGM of the originating party or his representatives to the PGM of the receiving party for necessary distribution.

12.3. Visits under this Project shall be made only by personnel representing the authorities and establishments listed in annex C. Visit request shall include a statement of confirmation that such personnel are actively engaged in work having a direct relationship with the subject covered by the Project.

12.4. Requests from personnel of the establishments listed in annex C for classified information within the scope of this Project Agreement and originated by the other party shall be processed through PGM's. Such requests shall be transmitted through the channels prescribed and shall be afforded the same degree of security protection as that prescribed for classified information in section 13 of this Project Agreement.

13. SECURITY CLASSIFICATION

13.1. The program is unclassified; and, as far as can be foreseen, all information arising from the tests will be classified not higher than confidential. However, the responsibility lies with the PMC to ensure or arrange for appropriate protection of all information. If any classified information is developed or furnished during the program, it will be protected in accordance with the appropriate national regulations, and the procedures set forth in existing Agreements between the Governments of the United States and Canada.

[1] United Nations, *Treaty Series*, vol. 199, p. 67.

14. TAXES AND CUSTOMS

14.1. To the extent permitted by national law, the participating governments will waive duties and import tariffs on all equipment necessary for the efficient execution of the project.

15. TERMINATION

15.1. This Project shall end upon completion of the effort required in the statement of work, unless terminated sooner by mutual agreement. However, withdrawal by one government is not precluded. Any proposal for withdrawal or termination shall be the subject of immediate consultation between the two governments and a final report on the status of the program and results achieved shall be prepared.

16. PROGRAM EXTENSION

16.1. This program may be extended beyond the current plan by unanimous decision by the PMC.

SIGNATURE

This Project Agreement will be effective from the latest date of signature given below.

IN WITNESS THEREOF, the parties have executed this Agreement.

For the Canadian Department of Industry, Trade and Commerce:
[*Signed*]
J. R. SCOPICK
Director General
Enterprise Development Branch

Date: October 12, 1977

For the United States Department of the Navy:
[*Signed*]
P. B. ARMSTRONG
Vice Admiral
U.S. Navy
Director
Research, Development, Test and Evaluation

Date: 12 Sep[tember] 1977

ANNEX A

1. OBJECTIVES OF TRIALS

1.1. The objective shall be to conduct a test program to:

a. Obtain quantitative time and track information during tactical maneuvers for the purpose of determining the enhancement of ASW tactical operations that can be gained by higher speed capability;

b. Obtain quantitative time and track information during search operations for the purpose of verifying hydrofoil/ sonar operational concepts such as sprint-drift;

c. Obtain technical data to define design requirements for VDS systems to meet the unique requirements of hydrofoils; including:

1. Tow tension as a function of tow length, speed, and ship maneuvers;
2. All body motions and relative position with respect to the ship;
3. Launch and retrieval time for VDS at various ship operating conditions;

4. Body settling time following a speed and/or course change;
5. Effects of tow on hydrofoil operation, i.e., maximum speed, take-off, etc.;
6. Noise levels at the VDS transducer and sonar self-noise as a function of ship speed, running condition and tow configuration;
7. VDS target detection capability;

d. Obtain operational data to assist in establishing sonar and ship manning criteria and to identify special operator and handling crew problems unique to hydrofoil sonar operation;

e. Obtain operational experience for evaluating the use of hydrofoil VDS in shallow and coastal waters as well as open ocean.

2. TEST DESCRIPTION AND REQUIREMENTS

2.1. The following describes the post installation tests, lists the basic test requirements, identifies the test platform and places the test in a priority scale between 1 and 3:

a. Priority 1 tests are those whose completion must be achieved before the project can be considered basically completed.

b. Priority 2 tests shall only be scheduled or conducted when it is considered that they can be carried out without prejudice to priority 1 tests.

c. Priority 3 tests shall be carried out only when the opportunity presents itself or the progress of priority 1 and 2 tests makes it apparent that the conduct of a priority 3 test will not prejudice the completion of the basic project program.

2.2. *Alongside trials*

Test 1

a. Description: ship and instrumentation check-out;

b. Priority: 1;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: to verify the VDS installation prior to equipment/ ship operations and assess physical, electrical and electronic interference between ship and VDS;

e. Requirements and conduct of the test:

1*a.* Run up ship's main and auxiliary machinery, including foil extension operation, steering and electrical generators and converters;

1*b.* Check out communication, radar and navigational equipment for interference;

1*c.* Check fire-fighting and safety procedures which may be affected by the sonar electronics and hydraulic hoist gear;

1*d.* Check instrumentation required for the trials.

Test 2 PCH-1 or PHM-1

a. Description: VDS Hoist Group checkout;

b. Priority: 1;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: to verify the VDS Hoist Group operation;

e. Requirements and conduct of the test with dummy (instrumented) towed body fitted:

2*a.* Electrical power is to be provided to the hoist group motors;

2*b.* Hydraulic fluid and gas systems to be charged, filters, valves and controls checked as well as confirmation that all preventive maintenance routines have been completed;

2*c*. Equipment run-up, pressures checked and systems run through the full limits of operation in accordance with the manual;

2*d*. Cable to be laid out and checked with attention being paid to broken fairing pieces and links, unusually large gaps, fracture/corrosion/damage to outer armour strands and towing yoke;

2*e*. Stable platforms and body sensors to be checked as well as recording equipment.

Test 3

a. Description: sonar check-out;

b. Priority: 1;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: to verify operation of sonar electronics;

e. Requirements and conduct of the test with acoustic body fitted (transducer):

3*a*. Electrical power supplied to sonar;

3*b*. Switch on power and test electronic components and sub-systems for correct power supply;

3*c*. With VDS body in water at a depth of 20 ft (with steadying lines fitted) sonar is to be operated and checked that it is functioning normally;

3*d*. With the body at 20 ft and a suitable jig fitted, an SPF test hydrophane is to be used to assess the acoustic source level on at least four relative bearings; these will be averaged;

3*e*. Verify that sonar operators and handling gear personnel are adequately trained; this will be the responsibility of the PMC.

Test 4 (may be combined with test 5)

a. Description: hullborne trials, VDS inboard;

b. Priority: 1;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: confirm seaworthiness of hullborne hydrofoils with VDS fitted and inboard;

e. Requirements and conduct of test:

4*a*. With trials personnel, all equipment and spares embarked, the ship is to proceed to sea in the prevailing weather conditions and execute the full range of speed and maneuvers while remaining hullborne;

4*b*. Speed increments of 5 knots are to be checked while using rudder for standard and emergency turns;

4*c*. If the sea state is above 2, these maneuvers should be done in at least two quadrants;

4*d*. Ship behaviour is to be qualitatively assessed.

Test 5

a. Description: foilborne trials, VDS inboard;

b. Priority: 2;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: confirm seaworthiness of foilborne hydrofoils with VDS fitted and inboard;

e. Requirements and conduct of test:

5*a*. As for test 4 but with ship foilborne.

Test 6

a. Description: hullborne trials, VDS streamed;

b. Priority: 2 and 3;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: ascertain behavior of the VDS streamed when the hydrofoils are hullborne;

e. Requirements and conduct of test: instrumented VDS body fitted:

6*a.* As for test 5 but with VDS streamed to 30, 60, 90 metres: priority 2;

6*b.* Assess towing strains and body behaviour by monitoring and logging hydraulic system pressures, depth sensor and compass readout: priority 3.

Test 7

a. Description: foilborne trials, VDS streamed;

b. Priority: 2 and 3;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: ascertain behaviour of the VDS streamed when the hydrofoils are hullborne;

e. Requirements and conduct of test: instrumented VDS body fitted:

7*a.* As for test 6*a* but with ship foil borne: priority 2;

7*b.* As for test 6*b*: priority 3.

Test 8

a. Description: 3D range trials;

b. Priority: 1;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: to assess and document VDS body positioning and behaviour from a hydrofoil underway;

e. Requirements and conduct of test: instrumented VDS body fitted; with ship and VDS bodyfitted with standard 3D range instrumentation, the ship is to conduct maneuvers on the range using the following minimum variables (body position in relation to the ship is to be assessed):

8*a.* Rudder, standard and emergency, speeds, 10, 20, 30, 35 and 40 knots; cable out, 30, 60 and 90 metres;

8*b.* On a straight course run at above speed and cable out variables, ship is to be accelerated and decelerated through its speed range.

Test 9

a. Description: SPF (Sonar Performance Figure), part II;

b. Priority: 1 and 3;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: to establish Sonar Performance Figures by measuring self-noise and combining with source level measurement;

e. Requirements and conduct of test:

i) Acoustic bodyfitted;

ii) BT data requirements;

iii) SPF recording and processing gear installed;

9*a.* In sea state less than 2 with a quiet shipping background sonar/ship self-noise measurements are to be recorded at VDS Body depth of 30, 60 and 90 metres and at speed increments of 5 knots using hull borne and foil borne modes: priority 1;

9*b.* In accordance with a separate trials plan (Defence Research Establishment Pacific) conduct self-noise trials over a wider band width and a more accurate assessment of environmental conditions including ambient noise: priority 3.

Test 10

a. Description: acoustic targets of opportunity;

b. Priority: 2;

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: to assess sonar capability over full speed range;

e. Requirements and conduct of test:

i) Acoustic bodyfitted;

ii) Bathythermograph data required;

iii) Initial detector card required;

iv) As targets of opportunity present themselves such as commercial shipping, detection and tracking runs are to be made; if feasible, each run should be made in 5 knot increments above 10 knots on the same target, the object being to determine initial detection range on closing and at varying range attack angles (180°) maximum holding range on opening.

Test 11

a. Description: initial detection and holding trials, transponder;

b. Priority: 2 (1 if submarine services are not available);

c. Test platforms: PCH-1 and PHM-1;

d. Purpose: to assess sonar capability over full speed range;

e. Requirements and conduct of test:

i) Acoustic bodyfitted;

ii) 10 KHz transponder buoy;

iii) Bathythermograph;

iv) Initial detection card;

v) At best VDS depth, ship is to conduct initial detection runs against the target at 5 knot speed increments from 10 knots through maximum towing speed;

vi) A minimum of 5 runs per speed increment is to be conducted; if the detection spread is significant, additional runs are to be conducted.

Test 12

a. Description: initial detections runs, submarine;

b. Priority: 1 (if services are available);

c. Test platforms: PHM-1;

d. Purpose: to assess sonar capability against submarine targets including initial detection and tracking;

e. Requirements and conduct of test:

i) Acoustic body;

ii) Bathythermograph;

iii) Initial detection card;

iv) Tracking/plotting facilities as available;

v) Relaxation of VDS body depth restriction;

vi) Submarine target;

12*a*. Submarine at periscope depth; VDS at best depth, conduct lateral range runs to assess detection capability at various target aspects and at both best sonar operating speed and maximum sonar speed (assessed from test 11); sonar track to be compared to radar/visual track;

12*b*. Submarine at best depth to avoid detection; VDS at best depth as for test 12*b* except for track comparison.

Test 13

a. Description: ASW tactical exercising;

b. Priority: 2;

c. Test platforms: PHM-1;

d. Purpose: to assess tactical use of sonar equipped hydrofoil in ASW operation;

e. Requirements and conduct of tests:

i) Acoustic body;
ii) Bathythermograph;
iii) Initial detection card;
iv) Tracking/plotting facilities as available in PCH-1;
v) Submarine target;
vi) Conventional surface ASW ships;
13*a.* CASEX-A-6;
13*b.* Area search using conventional techniques;
13*c.* Area search using "sprint and drift" techniques.

2.3. *Records/data collection.* Throughout the actual trials period and identified by the time and test nos., the following data is required:

— Ship: speed, heading, stern vertical acceleration, heave, pitch, roll, machinery quiet condition (i.e., quiet/normal/noisy) and plotted track;

— VDS tow: tension, tow-off angle, sheave angle, photography;

— VDS body: instrumentic—roll, yaw, pitch; acoustic—compass heading for yaw and noise background with relation to bearing;

— Environment: time of day, cloud cover, wind vector, bathythermograph, sea height and direction, swell height and direction, water depth, bottom type, shipping in area;

— Target—geographical position, course, aspect, depth, speed, type of target, track chart (range bearing at time intervals during contact from shipborne radar when available and sonar operators range and bearing at time intervals from HS-1001 when available).

ANNEX B

1. STATEMENT OF WORK

1.1. This annex sets out the work to be done under this Project Agreement and establishes the national responsibilities for its accomplishment.

2. ASSIGNMENT OF TASKS AND RESPONSIBILITIES

2.1. The assignment of tasks and responsibilities [is] as follows:

A. *Project implementation*

1.	Formulation and production of:	
	a) Project plan	
	b) Safety instructions	
	c) Operation order	
	d) Trials agenda	PGM (USN)
2.	Liaison with appropriate governments, industry, agencies and ships	PGM (USN)
3.	Scheduling of ships and test personnel	PGM (USN)
4.	Arranging operation areas, services	PGM (USN)
5.	Arranging submarine services	PGM (USN)
6.	Conduct of trials	PGM (USN)
7.	Periodic and final reports	PGM (USN)

B. *Ship preparation*

1.	Preparation of plans and work orders for VDS installation	USN
2.	Preparation of ships	USN
3.	Receiving and installation of VDS	USN/DITC
4.	Instrumentation and test equipment	USN
5.	Provision of berthing and working space	USN
6.	Removal of VDS system from ships	USN/DITC
7.	Tear down of test installation and modifications	USN

C. *Ship logistics and test operations*

1.	Routine support of ship	USN
2.	Manning including crew and test personnel	USN
3.	Operational communications	USN
4.	Test support operations	USN

D. *VDS logistics*

1.	Provision of VDS at designated U.S. air base	DITC
2.	Transportation from airbase (USA) to dockside (USA):PCH-1 to PHM-1 and dockside to airbase (USA)	USN
3.	Technical support	DITC
4.	Storage as required within the USA	USN
5.	Equipment spares	DITC
6.	Handbooks	DITC
7.	Drawing and installation data	DITC
8.	Trials support stores	DITC

E. *VDS test operations*

1.	Training/indoctrination/familiarity with VDS system	DITC
2.	Special-tow cable and body test instrumentation	DITC
3.	Shipboard instrumentation	USN
4.	Tow data analysis	USN
5.	Trials photographic support	DITC/USN
6.	Range and non-submarine target support (DITC provides the range)	DITC/USN

ANNEX C

UNITED STATES

Establishments

Office of the Chief of Naval Operations
(Ops 098, 982, 095, 37, 009D)
Department of the Navy
Washington, D.C. 20350

Naval Sea Systems Command
(NAVSEA 032)
Department of the Navy
Washington, D.C. 20362

Commander, Naval Surface Forces
U.S. Pacific Fleet
San Diego, Ca.

Commander, Destroyer Squadron Nine
FPO San Francisco, Ca.

Commandant, Thirteenth Naval District
Seattle, Washington

Commanding Officer
USS Pegasus (PHM-1)
FPO San Francisco, Ca.

David Taylor, Naval Ship Research and Development Center

Bethesda, Md. 20034
Hydrofoil Special Trials Unit (HYSTU)
Puget Sound Naval Shipyard
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Naval Torpedo Station
Keyport, Washington 98345
Naval Underwater Systems Center
New London Laboratory
New London, Conn. 06320
U.S. Coast Guard Station
Port Angeles, Washington
Commanding Officer
U.S. Naval Air Station
Whidbey Island
Oak Harbor, Washington 98278
Boeing Marine Systems
Renton, Washington
Officer in Charge
HIGHPOINT (PCH-1)
Puget Sound Naval Shipyard
Bremerton, Washington
U.S. Defense Attaché Office
Ottawa, Canada
ATTN: U.S. Naval Attaché

Authorities

Project Management Committee Officer
CDR G. Jenkins, USN
Office of the Chief of Naval Operations (Op-373)
Department of the Navy
Washington, D.C. 20350
Program Manager (*to be designated*)

CANADA

Establishments

Department of Industry, Trade and Commerce
— Electrical and Electronics Branch
— Defence Programs Branch
— Transportation Industries Branch
— Enterprise Development Branch (DIP)
— Office of Science and Technology
Office of the Counsellor Defence Production
2450 Mass. Ave.
Washington, D.C.
Department of Supply and Services
— Science Procurement Branch
Department of National Defence
National Defence Headquarters
(Chief Maritime Operations DMCS-CRAD)
Ottawa, Canada.
— Defence Research Establishment; Victoria, B.C. (Pacific)
— Headquarters Canadian Forces; Maritime Command (Pacific); Victoria, B.C.
— Canadian Forces Maritime Experimental and Test Range; Rocky Point, B.C.
Westinghouse Canada Limited
Hamilton, Ont.
Fathom Oceanology Limited
Port Credit, Ont.

Authorities

Project Management Committee Officer
H. Shaver
Transportation Industries Branch
(*Alternate*) R. C. Brown
Defence Programs Branch
Assistant Program Manager
(*To be designated*)
Local Coordinator
P. Holton
Office of Counsellor (Defence Production)