

No. 50109*

**United States of America
and
Norway**

Memorandum of Understanding between the Department of Defense of the United States of America and the Ministry of Defence of the Kingdom of Norway for the composite hull embedded sensor system (CHESS) (with annex). Kjeller, 24 June 1996 and Washington, 6 June 1996

Entry into force: *24 June 1996, in accordance with section XVI*

Authentic text: *English*

Registration with the Secretariat of the United Nations: *United States of America, 23 October 2012*

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**États-Unis d'Amérique
et
Norvège**

Mémorandum d'accord entre le Département de la Défense des États-Unis d'Amérique et le Ministère de la Défense du Royaume de Norvège pour le système de capteur intégré dans les coques composites (CHESS) (avec annexe). Kjeller, 24 juin 1996 et Washington, 6 juin 1996

Entrée en vigueur : *24 juin 1996, conformément à la section XVI*

Texte authentique : *anglais*

Enregistrement auprès du Secrétariat des Nations Unies : *États-Unis d'Amérique, 23 octobre 2012*

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[ENGLISH TEXT – TEXTE ANGLAIS]

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
DEPARTMENT OF DEFENSE
OF THE UNITED STATES OF AMERICA
AND THE
MINISTRY OF DEFENCE
OF THE KINGDOM OF NORWAY
FOR THE
COMPOSITE HULL EMBEDDED SENSOR SYSTEM
(CHESS)

INTRODUCTION

The Department of Defense of the United States of America and the Ministry of Defence of the Kingdom of Norway, hereinafter referred to as the "Participants":

Having a common interest in defense;

Recognizing the benefits to be obtained from standardization, rationalization, and interoperability of military equipments;

Desiring to improve their mutual conventional defense capabilities through the application of emerging technology;

Having a mutual need for the Composite Hull Embedded Sensor System to satisfy common operational requirements; and

Having independently conducted research and testing of the applications of various technologies, recognize the benefits of cooperation in the Composite Hull Embedded Sensor System;

Have reached the following understandings:

**SECTION I
DEFINITIONS**

The Participants have jointly decided upon the following definitions for terms used in this Memorandum Of Understanding (MOU):

Classified Information	Official information that requires protection in the interests of national security and is so designated by the application of a security classification marking.
Contract	Any mutually binding legal relationship which obligates a Contractor to furnish supplies or services, and obligates one or both of the Participants to pay for them.
Contracting	The obtaining of supplies or services by Contract from sources outside the government organizations of the Participants. Contracting includes description (but not determination) of supplies and services required, solicitation and selection of sources, preparation and award of Contracts, and all phases of Contract administration.
Contracting Agency	The entity within the government organization of a Participant, which has authority to enter into, administer, and/or terminate Contracts.
Contracting Officer	A person representing a Contracting Agency of a Participant who has the authority to enter into, administer, and/or terminate Contracts.
Contractor	Any entity awarded a Contract by a Participant's Contracting Agency.
Controlled Unclassified Information	Unclassified information to which access or distribution limitations have been applied in accordance with applicable national laws or regulations. Whether the information is provided or generated under this MOU, the information will be marked to identify its "in confidence" nature. It could include information which has been declassified, but remains controlled.

Cost Ceiling	The maximum amount to which the Cost Target may move without the prior written approval of the Participants.
Cost Target	The accepted planning figure of the total financial cost of the Project.
Designated Security Authority (DSA)	The security office approved by national authorities to be responsible for the security aspects of this MOU.
Financial Contributions	The contribution of a Party's share of Project costs that by their nature, take a monetary form.
Government Purposes	Manufacture or other use in any part of the world by or for the government of any Participant.
Non-financial Contribution	The contribution of a Party's share of Project costs that, by their nature, take a non-monetary form.
Patent	Legal protection of the right to exclude others from making, using, or selling an invention. The term refers to any and all patents including, but not limited to, patents of implementation, improvement, or addition, petty patents, utility models, appearance design patents, registered designs, and inventor certificates or like statutory protection as well as divisions, reissues, continuations, renewals, and extensions of any of these.
Project	The Development of a Composite Hull Embedded Sensor System (CHESS) as described in this MOU between the Department of Defense of the United States and the Minister of Defence of the Kingdom of Norway.
Project Equipment	Any material, equipment, end item, subsystem, component, special tooling or test equipment used in the Project.
Project Background Information	Information not generated in the performance of the Project.

Project Foreground Information	Project Information generated in the performance of the Project.
Project Information	Any information provided to, generated in, or used in this Project regardless of form or type, including, but not limited to, that of a scientific, technical, business, or financial nature, and also including photographs, reports, manuals, threat data, experimental data, test data, designs, specifications, processes, techniques, inventions, drawings, technical writings, sound recordings, pictorial representations, and other graphical presentations, whether in magnetic tape, computer memory, software, or any other form and whether or not subject to copyright, Patent, or other legal protection.
Project Invention	Any invention or discovery formulated or made (conceived or first actually reduced to practice) in the course of work performed under a Project. The term first actually reduced to practice means the first demonstration, sufficient to establish to one skilled in the art to which the invention pertains, of the operability of an invention for its intended purpose and in its intended environment.
Project Plan	An Annex to this MOU (Annex A) that provides a description of the Project's technical work and milestones.
Third Party	Any person or other entity whose governing authority is not a Participant to this MOU.

SECTION II OBJECTIVES

- 2.1. The objective of the Composite Hull Embedded Sensor System (CHESS) Project is to design, develop, fabricate, and install experimental strain monitoring systems using distributed fiber optic sensors for ships and hull structures. The sensor systems will be used to monitor loads on ship hulls. The sensor systems will also be used to study the effect of wave slamming on the composite materials and to investigate methods for early detection of damage. The following actions will be undertaken:
- 2.1.1. develop and optimize the fiber Bragg grating (FBG) sensor array for monitoring the strains in composite hull structures;
 - 2.1.2. perform modeling and finite element analysis to determine measurement requirements and sensor placement;
 - 2.1.3. develop data acquisition and processing concepts for the CHESS system;
 - 2.1.4. embed or attach FBG sensors in composite specimens and sample hull structures for testing;
 - 2.1.5. conduct testing on air-cushion catamaran vessels in service (mine countermeasures vessels) and on scale models to validate concepts; and
 - 2.1.6. conduct full scale testing on a prototype fast patrol boat air-cushion catamaran vessel (ACV).

SECTION III SCOPE OF WORK

- 3.1. The overall work to be undertaken under this MOU includes:
- | | US | Norway |
|---|----|--------|
| 3.1.1. Determine the required performance parameters of the fiber optic sensor system. | X* | X |
| 3.1.2. Determine the interrogation scheme and multiplexing techniques to be used for the Project. | X* | X |
| 3.1.3. Establish the requirements for monitoring the loading of the wet decks on air-cushion catamaran vehicles. These requirements shall include the loading caused by wave slap against the hull for both local stresses and total stresses on the ACV. | | X |

		US	Norway
3.1.4.	Conduct modeling and finite element analysis to determine the measurement requirements, number (nominally 32 to 64 sensors), and placement of the fiber Bragg grating (FBG) sensors on the ACVs.		X
3.1.5.	Determine the optimal location of the sensor array on ACVs such as Fast Patrol Boats (FPBs) and Mine Counter-Measure Vehicles (MCMVs).		X
3.1.6.	Develop embedding procedures and mounting procedures, sensor responsivities, and effects of the embedded sensors on the composite structure.	X	X*
3.1.7.	Embed FBG sensors in samples of hull composite structures to determine the effects of the FBGs on the composite materials.	X	X*
3.1.8.	Develop data processing techniques for the FBG array.	X	X*
3.1.9.	Conduct test to assess the performance of the sensors for composites used in ACVs.	X*	X
3.1.10.	Conduct simulated load tests in ship model tanks at the Marine Technology Research Institute, Norway.	X	X*
3.1.11.	Finalize the design of the CRESS system for the sea tests on a Norwegian prototype FPB.	X*	X
3.1.12.	Fabricate FBG array for installation on the prototype FPB.	X*	X
3.1.13.	Install the FBG array on the prototype FPB and conduct experiments at sea.	X	X*
3.1.14.	Characterize the performance of the CRESS system, determine the optimum design of a CRESS system for follow-on systems.	X*	X
3.1.15.	Produce final reports and documentation.	X	X

* Indicates Lead Participant

3.2. The work schedule is provided for in Annex A.

SECTION IV

MANAGEMENT (ORGANIZATION AND RESPONSIBILITY)

4.1. This Project will be directed and administered on behalf of the Participants by an organization consisting of a Steering Committee (SC) and Project Managers (PMs) appointed by the Participants. The SC will have overall authority over the PMs, in accordance with this MOU. The PMs will have primary responsibility for effective implementation, efficient management, and direction of the Project in accordance with this MOU. The Participants will maintain and fund their own organizations for managing this Project.

4.2. The SC will consist of a representative appointed by each Participant. The SC will meet as required, at the request of either representative. Each meeting of the SC will be chaired by the representative of the Participant hosting the meeting. Decisions of the SC will be made unanimously. In the event that the SC is unable to reach a timely decision on an issue, each SC representative will refer the issue to its higher authority for resolution. In the meantime, the approved Project Plan will continue to be implemented without interruption under the direction of the PMs while the issue is being resolved by higher authority.

4.3. The SC will be responsible for:

- 4.3.1. Exercising executive-level oversight of the Project.
- 4.3.2. Reviewing the technical progress of the Project against Annex A (Project Plan).
- 4.3.3. Reviewing the financial status of the Project to ensure compliance with the provisions of Section V (Financial Provisions) of this MOU.
- 4.3.4. Resolving issues brought forth by the PMs.
- 4.3.5. Reviewing and forwarding to the Participants for approval recommended amendments to this MOU in accordance with Section XVI (Amendment, Termination, Entry Into Effect, and Duration).
- 4.3.6. Approving amendments to Annex A (Project Plan), of this MOU consistent with Section XVI (Amendment, Termination, Entry Into Effect, and Duration).
- 4.3.7. Approving plans to manage and control the transfer of Project Equipment provided by either Participant to support the execution of the Project in accordance with Section VII (Project Equipment).

- 4.3.8. Approving plans for the disposal of jointly acquired Project Equipment under this MOU in accordance with Section VII (Project Equipment).
 - 4.3.9. Maintaining oversight of the security aspects of the Project, including reviewing and obtaining approval from the appropriate Designated Security Authority of a Project Security Instruction and a Classification Guide prior to the transfer of Classified Information or Controlled Unclassified Information.
 - 4.3.10. Monitoring Third Party sales and transfers authorized in accordance with Section XII (Third Party Sales and Transfers).
 - 4.3.11. Reviewing the semi-annual status report submitted by the PMs.
- 4.4. Project offices will be established in Washington, DC at the Naval Research Laboratory (NRL) and in Kjeller, Norway at the Norwegian Defence Research Establishment (NDRE) to manage the Project. The NRL will appoint the U.S. PM, and the NDRE will appoint the Norwegian PM, both of whom will be responsible for implementing this MOU and for carrying out the Project.
- 4.5. For matters under their cognizance the PMs will be responsible for:
- 4.5.1. Managing the cost, schedule, performance requirements, technical, and financial aspects of the Project.
 - 4.5.2. Executing the approved Project Plan (Annex A).
 - 4.5.3. Developing and submitting any required changes to the approved Project Plan (Annex A) to the SC for approval.
 - 4.5.4. Executing the financial aspects of the Project in accordance with Section V (Financial Provisions) of this MOU.
 - 4.5.5. Referring issues to the SC that cannot be resolved by the PMs.
 - 4.5.6. Developing and recommending amendments to this MOU and its Annexes to the SC.
 - 4.5.7. Developing and implementing SC-approved plans to manage and control the transfer of Project Equipment provided by either Participant in accordance with Section VII (Project Equipment).
 - 4.5.8. Developing and implementing SC-approved plans for the disposal of jointly acquired Project Equipment under this MOU in accordance with Section VII (Project Equipment).

- 4.5.9. Developing and forwarding to the SC a Project Security Instruction and a Classification Guide for the Project within three months after MOU signature, and implementing them upon final approval.
- 4.5.10. Providing a semi-annual status report to the SC, and other such reports as directed by the SC.

SECTION V

FINANCIAL PROVISIONS

5.1. Each Participant will provide its equitable share of the full Financial and Non-financial Contributions to the Project, including overhead costs, administrative costs, and costs of claims. The assignment of work represents an equitable sharing of work to be performed under the Project, and each Participant will receive an equitable share of the results of the Project.

5.2. Each Participant will fund the full extent of its participation in this Project. The Participants estimate that the performance of the responsibilities under this MOU will not cost more than a Cost Ceiling of \$6 million fiscal year 1996 U.S. dollars. The Participants will use their best efforts to perform, or to have performed, the work specified in Section III (Scope of Work) and fulfill all the responsibilities under this MOU within a Cost Target of \$5 million fiscal year 1996 U.S. dollars. The difference between the Cost Ceiling and the Cost Target will be considered a contingency only and will be managed by the Steering Committee. The U.S. dollar will be the reference currency for the Project and the Project fiscal year will be the U.S. fiscal year.

5.3. The full Financial and Non-Financial Contributions to the Project will be shared according to the following percentages:

<u>Participant</u>	<u>Percentage Share</u>
United States	50 percent
Norway	50 percent

5.4. Each Participant will bear the full Cost it incurs for performing, managing, and administering its activities under this MOU and all such costs will be included as part of each Participant's contributions to the Project. These costs include, but are not limited to, salaries, travel, and per diem costs for its Project personnel, as well as any Contract costs.

5.5. Cooperative efforts of the Participants over and above the jointly determined work set forth in Section III (Scope of Work) will be subject to future arrangement by the Participants.

5.6. The following costs will be borne entirely by the Participant incurring the costs:

5.6.1. Costs associated with any unique national requirements identified by a Participant.

5.6.2. Any other costs outside the scope of this MOU.

5.7. A Participant will promptly notify the other Participant if available funds are not adequate to fulfill its responsibilities under this MOU. If a Participant notifies the other Participant that it is terminating or reducing its funding for this Project, both Participants will immediately consult with a view toward continuation on a modified basis.

SECTION VI

CONTRACTING PROVISIONS

6.1. If either Participant determines that Contracting is necessary to fulfill that Participant's responsibilities under Section III (Scope of Work) of this MOU, that Participant will contract in accordance with their respective national laws, regulations and procedures.

6.2. When one Participant individually contracts to perform a task under this MOU, it will be solely responsible for its own Contracting, and the other Participant will not be subject to any liability arising from such Contracts.

6.3. For all Contracting activities performed by either Participant, the PMs will, upon request, be provided a copy of all statements of work prior to the development of solicitations.

6.4. Each Participant's Contracting Agency will negotiate to obtain the rights to use and disclose Project Information required by Section VIII (Disclosure and Use of Project Information). Each Participant's Contracting Agency will insert into its prospective Contracts (and require its subcontractors to insert in subcontracts) suitable provisions to satisfy the requirements of this MOU, including Section VIII (Disclosure and Use of Project Information), Section IX (Controlled Unclassified Information), Section XI (Security) and Section XII (Third Party Sales and Transfers). During the Contracting process, each Participant's Contracting Officer will advise prospective Contractors of their responsibility to immediately notify the Contracting Agency, before Contract award, if they are subject to any license or agreement that will restrict that Participant's freedom to disclose information or permit its use. The Contracting Officer will also advise

prospective Contractors to employ their best efforts not to enter into any new agreement or arrangement that will result in restrictions.

6.5. In the event a Participant's Contracting Agency is unable to secure adequate rights to use and disclose Project Information as required by Section VIII (Disclosure and Use of Project Information), or is notified by Contractors or potential Contractors of any restrictions on the disclosure and use of information, that Participant's PM will notify the other Participant's PM of the restriction(s).

6.6. Each Participant's PM will promptly advise the other Participant's PM of any cost growth, schedule delay, or performance problems of any Contractor for which its Contracting Agency is responsible.

6.7. No requirement will be imposed by any Participant for worksharing or other industrial or commercial compensation in connection with this MOU that is not in accordance with this MOU.

SECTION VII

PROJECT EQUIPMENT

7.1. Each Participant may provide Project Equipment identified as being necessary for executing the MOU to the other Participant. Project Equipment will remain the property of the providing Participant. A list of all Project Equipment provided by one Participant to another will be developed and maintained by the PMs and will be incorporated into this MOU as a separate Annex prior to such transfer.

7.2. The receiving Participant will maintain any such Project Equipment in good order, repair, and operable condition and return the items in as good condition as received, normal wear and tear excepted. The receiving Participant will pay the cost of damage (other than normal wear and tear) to or loss of Project Equipment.

7.3. All Project Equipment that is transferred will be used by the receiving Participant only for the purposes of carrying out this MOU. In addition, in accordance with Section XII (Third Party Sales and Transfers) Project Equipment will not be retransferred to a Third Party without the prior written consent of the providing Participant.

7.4. Project Equipment transferred to the other Participant under this MOU will be returned to the providing Participant prior to the termination or expiration of this MOU.

7.5. Any Project Equipment which is jointly acquired on behalf of both Participants for use under this MOU will be disposed of during the Project or when the Project ceases, as determined by the SC.

7.6. Disposal of jointly acquired equipment may include a transfer of the interest of one Participant in such Project Equipment to the other Participant, or the sale of such equipment to a Third Party in accordance with Section XII (Third Party Sales and Transfers) of this MOU.

SECTION VIII

DISCLOSURE AND USE OF PROJECT INFORMATION

8.1. General

Both Participants recognize that successful collaboration depends on full and prompt exchange of information necessary for carrying out this Project. The Participants intend to acquire sufficient Project Information and rights to use such information to enable the development of the Composite Hull Embedded Sensor System (CHESS). The nature and amount of Project Information to be acquired will be consistent with the objectives stated in Section II (Objectives), and Section III (Scope of Work).

8.2. Government Project Foreground Information

8.2.1. **Disclosure:** Project Foreground Information generated in whole or in part by a Participant's military or civilian employees will be disclosed without charge to both Participants.

8.2.2. **Use:** Each Participant may use all Government Project Foreground Information without charge for Government Purposes. The Participant generating Government Project Foreground Information will also retain its rights of use thereto. If a Participant intends to use any Government Project Foreground Information in a sale or other transfer to a Third Party, however, the provisions of Section XII (Third Party Sales and Transfers) of this MOU will also apply.

8.3. Government Project Background Information

8.3.1. **Disclosure:** Each Participant, upon request, will disclose to the other Participant any relevant Government Project Background Information generated by its military or civilian employees outside the scope of this MOU, provided that:

- 8.3.1.1. such Project Background Information is necessary to or useful in the Project, with the Participant in possession of the information determining whether it is "necessary to" or "useful in" the Project;
 - 8.3.1.2. such Project Background Information may be made available without incurring liability to holders of proprietary rights; and
 - 8.3.1.3. disclosure is consistent with national disclosure policies and regulations of the furnishing Participant.
- 8.3.2. **Use:** Government Project Background Information disclosed by one Participant to the other may be used without charge by the other Participant for Project Purposes only; however, the furnishing Participant will retain all its rights with respect to such Project Background Information.

8.4. Contractor Project Foreground Information

- 8.4.1. **Disclosure:** Project Foreground Information generated and delivered by Contractors, will be disclosed without charge to both Participants.
- 8.4.2. **Use:** Each Participant may use without charge for Government Purposes all Contractor Project Foreground Information generated and delivered by Contractors of the other Participant. The Participant whose Contractors generate and deliver Contractor Project Foreground Information will also retain rights of use thereto in accordance with the applicable Contract(s). If a Participant intends to use any Contractor Project Foreground Information in a sale or other transfer to a Third Party, the provisions of Section XII (Third Party Sales and Transfers) of this MOU will also apply. The Participants will consider acquiring the legal rights to use Contractor Project Foreground Information in a sale.

8.5. Contractor Project Background Information

- 8.5.1. **Disclosure:** Any relevant Project Background Information, (including information subject to proprietary rights) generated and delivered by Contractors outside the scope of this MOU, will be made available to the other Participant provided the following provisions are met:

- 8.5.1.1. such Project Background Information is necessary to or useful in the Project, with the Participant in possession of the information determining whether it is "necessary to" or "useful in" the Project;
 - 8.5.1.2. such Project Background Information may be made available without incurring liability to holders of proprietary rights; and
 - 8.5.1.3. disclosure is consistent with national disclosure policies and regulations of the furnishing Participant.
- 8.5.2. Use: Project Background Information furnished by one Participant's Contractors and disclosed to the other Participant may be used without charge by the other Participant for Project Purposes only, and may be subject to further restrictions by holders of proprietary rights; however, the furnishing Participant will retain all its rights with respect to such Project Background Information.

8.6. Proprietary Project Information

- 8.6.1. All Project Information subject to proprietary interests will be identified and marked, and it will be handled as Controlled Unclassified Information.
- 8.6.2. The provisions of the NATO Agreement on the Communication of Technical Information for Defence Purposes, done at Brussels on 19 October 1970,¹ and the Implementing Procedures for the NATO Agreement on the Communication of Technical Information for Defence Purposes, approved by the North Atlantic Council on 1 January 1971,² will apply to proprietary Project Information related to this MOU.

8.7. Patents

- 8.7.1. Where a Participant owns title to a Project Invention, or has the right to receive title to a Project Invention, that Participant will consult with the other Participant regarding the filing of a Patent application for such Project Invention. The Participant which has or receives title to such Project Invention will, in other countries,

¹ TIAS 7064; 22 UST 347.

² No record of this document in Office of Treaty Affairs' files.

file, cause to be filed, or provide the other Participant with the opportunity to file on behalf of the Participant holding title, or its Contractors, as appropriate, Patent applications covering that Project Invention. If a Participant having filed or caused to be filed a Patent application decides to stop prosecution of the application, that Participant will notify the other Participant of that decision and permit the other Participant to continue the prosecution.

- 8.7.2. The other Participant will be furnished with copies of Patent applications filed and Patents granted with regard to Project Inventions.
- 8.7.3. The other Participant will acquire a non-exclusive, irrevocable, royalty-free license to practice or have practiced, by or on behalf of the Participant, throughout the world for Government Purposes, any Project Invention.
- 8.7.4. Patent applications which contain Classified Information, to be filed under this MOU, will be protected and safeguarded in accordance with the requirements contained in the NATO Agreement for the Mutual Safeguarding of Secrecy of Inventions Relating to Defense and for Which Applications for Patents Have Been Made, done in Paris on 21 September 1960,¹ and its Implementing Procedures.
- 8.7.5. Each Participant will notify the other Participant of any Patent infringement claims made in its territory arising in the course of work performed under the Project. Insofar as possible, the other Participant will provide information available to it that may assist in defending the claim. Each Participant will be responsible for handling and payment of all Patent infringement claims made in its territory, and will consult with the other Participant during the handling, and prior to any settlement, of such claims. The Participants will, in accordance with their national laws and practices, give their authorization and consent for all use and manufacture in the course of work performed under the Project of any invention covered by a Patent issued by their respective countries.

¹ TIAS 4672; 12 UST 43.

**SECTION IX
CONTROLLED UNCLASSIFIED INFORMATION**

9.1. Except as otherwise provided in this MOU or as authorized in writing by the originating Participant, Controlled Unclassified Information provided or generated pursuant to this MOU will be controlled as follows:

- 9.1.1. Such information will be used only for the purposes authorized for use of Project Information as specified in Section VIII (Disclosure and Use of Project Information).**
- 9.1.2. Access to such information will be limited to personnel whose access is necessary for the permitted use under subparagraph 9.1.1. and will be subject to the provisions of Section XII (Third Party Sales and Transfers).**
- 9.1.3. Each Participant will take all lawful steps, which may include national classification, available to it to keep such information free from further disclosure (including requests under any legislative provisions), except as provided in subparagraph 9.1.2., unless the originating Participant consents to such disclosure. In the event of unauthorized disclosure, or if it becomes probable that the information may have to be further disclosed under any legislative provision, immediate notification will be given to the originating Participant.**

9.2. To assist in providing the appropriate controls, the originating Participant will ensure that Controlled Unclassified Information is appropriately marked. The SC will decide, in advance and in writing, on the markings to be placed on the Controlled Unclassified Information.

9.3. Controlled Unclassified Information provided or generated pursuant to this MOU will be handled in a manner that ensures control as provided for in paragraph 9.1.

9.4. Prior to authorizing the release of Controlled Unclassified Information to Contractors, the Participants will ensure the Contractors are legally bound to control such information in accordance with the provisions of this Section.

SECTION X VISITS TO ESTABLISHMENTS

10.1. Each Participant will permit visits to its government establishments, agencies and laboratories, and Contractor industrial facilities by employees of the other Participant or by employees of the other Participant's Contractor(s), provided that the visit is authorized by both Participants and the employees have any necessary and appropriate security clearances and a need-to-know.

10.2. All visiting personnel will be required to comply with security regulations of the host Participant. Any information disclosed or made available to visitors will be treated as if supplied to the Participant sponsoring the visiting personnel, and will be subject to the provisions of this MOU.

10.3. Requests for visits by personnel of one Participant to a facility of the other Participant will be coordinated through official channels, and will conform with the established visit procedures of the host country. Requests for visits will bear the name of the Project.

10.4. Lists of personnel of each Participant required to visit, on a continuing basis, facilities of the other Participant will be submitted through official channels in accordance with Recurring International Visit Procedures.

SECTION XI SECURITY

11.1. All Classified Information or material provided or generated pursuant to this MOU will be stored, handled, transmitted, and safeguarded in accordance with the General Security Agreement between Norway and the United States of America, of 26 February 1970, amended 27 September 1984,¹ and including the Industrial Security Annex thereto, of 24 October 1984.²

11.2. Classified Information and material will be transferred only through official government-to-government channels or through channels approved by the Designated Security Authorities (DSAs) of the Participants. Such information and material will bear the level of classification, denote the country of origin, the conditions of release, and the fact that the information relates to this MOU.

¹ TIAS 6836, 11136; 21 UST 462.

² No record of this document in Office of Treaty Affairs' files.

11.3. Each Participant will take all lawful steps available to it to ensure that information provided or generated pursuant to this MOU is protected from further disclosure, except as permitted by paragraph 11.8., unless the other Participant consents to such disclosure. Accordingly, each Participant will ensure that:

11.3.1. The recipient will not release the Classified Information to any government, national, organization, or other entity of a Third Party without the prior written consent of the originating Participant in accordance with the procedures set forth in Section XII (Third Party Sales and Transfers).

11.3.2. The recipient will not use the Classified Information for other than the purposes provided for in this MOU.

11.3.3. The recipient will comply with any distribution and access restrictions on information that is provided under this MOU.

11.4. The Participants will investigate all cases in which it is known or where there are grounds for suspecting that Classified Information or material provided or generated pursuant to this MOU has been lost or disclosed to unauthorized persons. Each Participant will also promptly and fully inform the other Participant of the details of any such occurrences, and of the final results of the investigation and of the corrective action taken to preclude recurrences.

11.5. The PM will prepare a Project Security Instruction and a Classification Guide for the Project. The Project Security Instruction and the Classification Guide will describe the methods by which Project Information and material will be classified, marked, used, transmitted, and safeguarded. The Instruction and Guide will be developed by the PM within three months after this MOU enters into effect. They will be reviewed and forwarded to the appropriate DSA and will be applicable to all government and Contractor personnel participating in the Project. The Classification Guide will be subject to regular review and revision with the aim of downgrading the classification whenever this is appropriate. The Project Security Instruction and the Classification Guide will be approved by the appropriate DSA prior to the transfer of any Classified Information or Controlled Unclassified Information.

11.6. Contractors, prospective Contractors, or subcontractors which are determined by DSAs to be under financial, administrative, policy or management control of nationals or entities of a Third Party, may participate in a Contract or subcontract requiring access to Classified Information provided or generated pursuant to this MOU only when enforceable measures are in effect to ensure

that nationals or other entities of a Third Party will not have access to Classified Information. If enforceable measures are not in effect to preclude access by nationals or other entities of a Third Party, the other Participant will be consulted for approval prior to permitting such access.

11.7. For any facility wherein Classified Information or material is to be used, the responsible Participant or Contractor will approve the appointment of a person or persons to exercise effectively the responsibilities for safeguarding at such facility the information or material pertaining to this MOU. These officials will be responsible for limiting access to Classified Information or material involved in this MOU to those persons who have been properly approved for access and have a need-to-know.

11.8. Each Participant will ensure that access to the Classified Information is limited to those persons who possess requisite security clearances and have a specific need for access to the information in order to participate in the Project.

11.9. Information or material provided or generated pursuant to this MOU may be classified as high as CONFIDENTIAL. The existence of this MOU is Unclassified, and the contents are Unclassified.

SECTION XII

THIRD PARTY SALES AND TRANSFERS

12.1. Except to the extent permitted in paragraph 12.2., the Participants will not sell, transfer title to, disclose, or transfer possession of Project Foreground Information to any Third Party without the prior written consent of the other Participant. Furthermore, neither Participant will permit any such sale, disclosure, or transfer, including by the owner, without the prior written consent of the other Participant. Such consent will not be given unless the government of the intended recipient consents in writing with the Participants that it will:

- 12.1.1. not retransfer, or permit the further retransfer of, any equipment or information provided; and
- 12.1.2. use, or permit the use of, the equipment or information provided only for the purposes specified by the Participants.

12.2. Each Participant will retain the right to sell, transfer title to, disclose, or transfer possession of Project Foreground Information which is:

12.2.1. generated solely by either that Participant or that Participant's Contractors in performance of that Participant's work allocation under Section III (Scope of Work); and

12.2.2. which does not include any Project Background Information of the other Participant.

12.3. In the event questions arise as to whether the Project Foreground Information that a Participant intends to sell, transfer title to, disclose, or transfer to a Third Party is within the scope of paragraph 12.2., the matter will be brought to the immediate attention of the other Participant's PM. The Participants will resolve the matter prior to any sale or other transfer of such Project Foreground Information to a Third Party.

12.4. A Participant will not sell, transfer title to, disclose, or transfer possession of Project Equipment or Project Background Information provided by the other Participant to any Third Party without the prior written consent of the Participant which provided such equipment or information. The providing Participant will be solely responsible for authorizing such transfers and, as applicable, specifying the method and provisions for implementing such transfers.

SECTION XIII

LIABILITY AND CLAIMS

13.1. Claims against either Participant or its personnel shall be dealt with in accordance with the terms of Article VIII of the NATO Status of Forces Agreement (NATO SOFA) dated 19 June 1951.¹ Civilian employees of the Participants assigned to duty within their government's Defense Department or Ministry shall be deemed for the purpose of Article VIII of NATO SOFA to be members of a civilian component within the meaning of Article I of NATO SOFA while present in the territory of the other Participant for the purpose of this MOU.

13.2. Claims arising under or related to any Contract awarded pursuant to Article VI (Contractual Provisions) shall be resolved in accordance with the provisions of the Contract.

13.3. Employees and agents of Contractors shall not be considered to be civilian personnel employed by a Participant for the purpose of paragraph 1, above.

¹ TIAS 2846; 4 UST 1792.

SECTION XIV

CUSTOMS DUTIES, TAXES, AND SIMILAR CHARGES

14.1. Customs duties, import and export taxes, and similar charges will be administered in accordance with each Participant's respective laws and regulations. Insofar as existing national laws and regulations permit, the Participants will endeavor to ensure that such readily identifiable duties, taxes and similar charges, as well as quantitative or other restrictions on imports and exports, are not imposed in connection with work carried out under this Project.

14.2. Each Participant will use its best efforts to ensure that customs duties, import and export taxes, and similar charges are administered in a manner favorable to the efficient and economical conduct of the work. If any such duties, taxes, or similar charges are levied, the Participant in whose country they are levied will bear such costs.

SECTION XV

SETTLEMENT OF DISPUTES

15.1. Disputes between the Participants arising under or relating to this MOU will be resolved only by consultation between the Participants and will not be referred to a national court, to an international tribunal, or to any other person or entity for settlement.

SECTION XVI

AMENDMENT, TERMINATION, ENTRY INTO EFFECT, AND DURATION

16.1. All activities of the Participants under this MOU will be carried out in accordance with their national laws and the responsibilities of the Participants will be subject to the availability of appropriated funds for such purposes.

16.2. In the event of a conflict between a Section of this MOU and any Annex to this MOU, the Section will control.

16.3. Except as otherwise provided, this MOU may be amended by the mutual written consent of the Participants. Annex A (Project Plan), of this MOU may be amended by the written approval of the SC.

16.4. This MOU may be terminated at any time upon the mutual written consent of the Participants. In the event both Participants consent to terminate this MOU, the Participants will consult prior to the date of termination to ensure termination on the most economical and equitable terms.

16.5. Either Participant may terminate this MOU upon 90 days written notification to the other Participant. Such notice will be the subject of immediate consultation by the SC to decide upon the appropriate course of action. In the event of such termination, the following rules apply:

- 16.5.1. The terminating Participant will continue participation, financial or otherwise, up to the effective date of termination.
- 16.5.2. Each Participant will pay the costs it incurs as a result of termination.
- 16.5.3. All Project Information and rights therein received under the provisions of this MOU prior to the termination will be retained by the Participants, subject to the provisions of this MOU.

16.6. The respective rights and responsibilities of the Participants regarding Section VII (Project Equipment), Section VIII (Disclosure and Use of Project Information), Section IX (Controlled Unclassified Information), Section XI (Security), Section XII (Third Party Sales and Transfers), and Section XIII (Liability and Claims), will continue notwithstanding termination or expiration of this MOU.

16.7. This MOU, which consists of the Introduction, sixteen (16) Sections and one (1) Annex, will enter into effect upon signature by both Participants and will remain in effect for four (4) years. It may be extended by the mutual written consent of the Participants.

The foregoing represents the understandings reached between the Department of Defense of the United States of America and the Ministry of Defense of the Kingdom of Norway upon the matters referred to therein. Signed in duplicate in the English language by authorized representatives.

**FOR THE DEPARTMENT OF
DEFENSE OF THE
UNITED STATES OF AMERICA:**

**FOR THE MINISTRY OF DEFENCE
OF THE KINGDOM OF NORWAY:**

John W. Douglass
Signature

Nils Holme
Signature

John W. Douglass
Name

Nils Holme
Name

ASN (RD&A)
Title

Director General, Norwegian
Defence Research Establishment
Title

JUN 06 1996
Date

24 June 1996
Date

Location

Kjeller, Norway
Location

**ANNEX A
PROJECT PLAN**

1. Background and Objectives

a. The U.S. and Norwegian defense research communities are each developing fiber optic sensor systems for the use on naval ships. This cooperative research and development effort brings together the Naval Research Laboratory's (NRL) experience in fiber optic sensors and Norway's expertise in designing and building advanced composite catamaran hulls for use in high-speed vessels. The ship's hulls have a sandwich composite design using GRP inner and outer skins with a dense PVC foam core. Delamination due to heavy slamming loads caused by wave slap against the hull is of particular concern. The "wet" deck between the catamaran hull sections is especially susceptible to such damage. Experimental fiber optic strain sensor systems can be used to study the effect of slamming the composite materials and develop methods for early detection of damage. The sensor system can also be used to monitor load on the hull. This early testing will validate the concept of using fiber optic strain sensors in composite materials and provide a solid experimental base for developing follow-on systems for both the U.S. and Norwegian Navies.

b. The Project will require approximately 36 months to complete. The remaining time (36 to 48 months) will be used as a contingency.

2. Tasks and Performance Period Requirements

The general tasks and Project schedule are as provided in the following table:

Tasks and Project Schedule

DURATION TASK	0 to 6 months	6 to 12 months	12 to 18 months	18 to 24 months	24 to 30 months	30 to 36 months
2.1 Develop the Fiber Bragg Grating (FBG) sensors and electrooptics for CHES	■	■				
2.2 Perform modeling and finite element analysis of various ship designs.	■	■	■	■	■	
2.3 Develop data acquisition and processing concepts	■	■	■			
2.4 Conduct testing on composite specimens, scale models, and ships in operation at sea to validate concepts.			■			
2.5 Finalize the design of the CHES system for the sea tests on a Norwegian prototype FPB.				■	■	
2.6 Design and build the CHES system for the sea tests on a Norwegian prototype FPB.				■	■	
2.7 Install a FBG array on the prototype FPB.					■	
2.8 Conduct Experiments at sea.						■
2.9 Characterize the performance of CHES, determine the optimum design for follow-on systems.						■
2.10 Produce final reports and documentation.						■