

UNDERSTANDING

AMONG

THE DEPARTMENT OF COMMUNICATIONS OF CANADA,

THE CENTRE NATIONAL D'ETUDES SPATIALES OF FRANCE,

THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
OF THE UNITED STATES OF AMERICA,

AND

THE ROYAL NORWEGIAN COUNCIL FOR  
SCIENTIFIC AND INDUSTRIAL RESEARCH

CONCERNING

PARTICIPATION BY NORWAY IN AN INVESTIGATION OF  
THE DEMONSTRATION AND EVALUATION OF AN EXPERIMENTAL  
SATELLITE-AIDED SEARCH AND RESCUE SYSTEM

## ARTICLE 1: INTRODUCTION

1.1 The Parties to this Understanding are: the Department of Communications of Canada (DOC), the Centre National D'Etudes Spatiales of France (CNES), and the National Aeronautics and Space Administration of the United States of America (NASA) which are participating in an experimental satellite-aided Search and Rescue project, hereinafter called SARSAT, and the Royal Norwegian Council for Scientific and Industrial Research (NINF). This Understanding has been concluded following the submission of a proposal by NINF for a Norwegian SARSAT investigation consistent with the guidelines agreed among the SARSAT parties concerning prospective participation in SARSAT by additional countries.

1.2 In view of the Memorandum of Understanding of November 29, 1979 concluded between the SARSAT Parties and the Ministry of Merchant Marine of the Union of Soviet Socialist Republics for a cooperative demonstration and evaluation program of their two systems (SARSAT and COSPAS) the SARSAT parties have, at the request of NINF, obtained approval for NINF to access the COSPAS spacecraft subject only to confirmation by COSPAS of the technical compatibility of NINF equipment and plans as provided for by 5.2.5 of this Understanding.

1.3 The Parties affirm their intention to co-operate in the demonstration and evaluation of COSPAS-SARSAT in the belief that Norwegian participation in these activities will contribute to the

objectives of the COSPAS-SARSAT parties, enhance the COSPAS-SARSAT project and will permit prospective Norwegian users of a possible future operational system to obtain experience using the experimental system.

ARTICLE 2: ABBREVIATIONS AND DEFINITIONS

2.1 Abbreviations

CNES	Centre National d'Etudes Spatiales of France
DOC	Department of Communications of Canada
ELT	Emergency Locator Transmitter
EPIRB	Emergency Position Indicating Radio Beacon
ICAO	International Civil Aviation Organization
IMCO	Inter-governmental Maritime Consultative Organization
INMARSAT	International Maritime Satellite Organization
LUT	Local User Terminal (earth terminal)
NASA	National Aeronautics and Space Administration of the USA
NOAA	National Oceanic and Atmospheric Administration of the USA
NTNF	Royal Norwegian Council for Scientific and Industrial Research

2.2 Definitions

For the purpose of this Understanding:

"Parties" means the signatories to this Understanding.

"SARSAT" means the Canada/France/USA Search and Rescue Satellite Project.

"MOU" means the Memorandum of Understanding between DOC, CNES and NASA concerning Co-operation in an Experimental Satellite-Aided Search and Rescue System.

"Understanding" means the Understanding among DOC, CNES, NASA and NTNF concerning Participation by Norway in an Investigation of the Demonstration and Evaluation of an Experimental Satellite-Aided Search and Rescue System.

"SARSAT parties" means the parties to the MOU.

"COSPAS" means the USSR Space Project for Searching for Vessels and Aircraft in Distress.

ARTICLE 3: THE SARSAT PROJECT AND THE COSPAS-SARSAT CO-OPERATIVE PROGRAM

3.1 The project, which is defined in a Memorandum of Understanding of August 27, 1979 concluded among DOC, CNES and NASA, involves equipping and orbiting at least three spacecraft operated by

the NOAA with SARSAT repeaters and processors. Ground local user terminals (LUT's), at least one in Canada, one in the USA and one in France, will provide emergency notification and location information. The system will undergo test and evaluation using emergency locator transmitters (ELT's) operating at 121.5 MHz and 243 MHz, now in use in aircraft, and the marine equivalent, the emergency position indicating radio beacons (EPIRB's) used in certain classes of vessels. Experimental ELT/EPIRB test units operating at 406.025 MHz, a frequency assigned internationally for emergency beacons using space techniques, will also be tested.

3.2 The initial SARSAT demonstration and evaluation phase is expected to last for approximately fifteen months after the launch of the first successful SARSAT spacecraft. Upon the completion of a successful demonstration and evaluation phase, the SARSAT parties plan to conduct an operational evaluation phase which will continue for the duration of the lifetimes of NOAA satellites E, F, and G, at least.

3.3 The scope of the COSPAS-SARSAT co-operative program is described in the Memorandum of Understanding identified in 1.2 above.

#### ARTICLE 4: THE OBJECTIVE OF THE NORWEGIAN INVESTIGATION

The objective of the Norwegian investigation is to contribute to the demonstration and evaluation of satellite-aided techniques

for Search and Rescue designed to improve distress monitoring coverage, reduce detection time and provide more accurate initial location of distress incidents, thereby offering the potential for significantly (a) improving chances of saving lives and (b) reducing resources expended in search and rescue operations.

ARTICLE 5: PROJECT RESPONSIBILITIES OF THE PARTIES

5.1 NINF will use its best efforts to fulfill the following responsibilities:

1. Provide a ground LUT to receive 121.5, 243 and 406 MHz ELT/EPIRB signals relayed by the spacecraft receiver(s) at the downlink frequency of 1544.5 MHz and process the ELT/EPIRB signals using the doppler information to determine the location of distress signals. This LUT will be deployed at the site of the NINF Tromsø Telemetry Station;
2. Provide existing ELT/EPIRB's operating at 121.5 and 243 MHz and experimental ELT/EPIRB's operating at 406 MHz, one or more 406 MHz calibration transmitters to update satellite orbit parameters, and auxiliary equipment to permit evaluation of the SRSAT system in the Norwegian Search and Rescue area of responsibility;

3. Assure that Norwegian equipment meets technical specifications and standards, as determined by the SARSAT project, required for it to be interoperable with the COSPAS-SARSAT project;
4. Provide the SARSAT project with experimental 406 MHz ELT/EPIRB's for certification testing by the SARSAT project, test data or other information the COSPAS-SARSAT project may request to verify technical compatibility;
5. Prepare an Investigation, Implementation, Demonstration and Evaluation Plan to be coordinated with and agreed to by each of the SARSAT parties. This Plan will include information on hardware development and test activities, demonstration and evaluation activities, and required coordination with the COSPAS-SARSAT parties;
6. Conduct demonstration and evaluation activities including system performance tests and simulations of aircraft and ship distress incidents, on a schedule compatible with the SARSAT project schedule;
7. Provide real time data from the SARSAT parties' experimental 406 MHz ELT/EPIRB's to points of contact

designated by the SARSAT parties, in accordance with the plan referred to in 5.1.5 above. Transmit any actual incident data from existing ELT/EPIRBs of the COSPAS-SARSAT parties received by the Norwegian LUT to existing rescue coordination centres for disposition through existing channels;

8. Support initiatives in Norwegian and in international forums such as IMCO, ICAO and INMARSAT to obtain acceptance of the COSPAS-SARSAT system, when successfully demonstrated, as part of the international satellite global distress system;

9. Provide to the SARSAT project, for SARSAT project review and mutual approval, a written report of the investigation including an evaluation of the utility of the SARSAT system. In addition, as agreed between the SARSAT project and NINP, NINP will provide to the SARSAT parties performance data on various of the Norwegian hardware elements and results of real and simulated search and rescue activities.

5.2 The SARSAT parties, for their part, will use their best efforts to fulfill the following responsibilities:

1. Provide required COSPAS-SARSAT system information to NINF, including updated satellite ephemeris data on the spacecraft carrying the SARSAT spaceborne hardware and the COSPAS system;
2. Provide to NINF the results of the SARSAT project's certification testing of NINF SARSAT investigation experimental 406 MHz ELT/EPIRB's;
3. Provide real time and stored data from Norwegian experimental 406 MHz ELT/EPIRB's to the NINF designated point of contact in accordance with the plan referred to in 5.1.5 above. Transmit any actual incident data from existing Norwegian ELT/EPIRB's received by SARSAT LUT's to existing rescue coordination centres for disposition through existing channels;
4. Provide to NINF the results of the SARSAT parties' test results and system assessments developed in the course of their demonstration and evaluation activities, as mutually agreed;
5. Obtain from COSPAS confirmation of the technical compatibility of Norwegian hardware (ELT/EPIRB's and LUT) and NINF Demonstration and Evaluation plan by the provision to COSPAS of appropriate technical documents and information.

ARTICLE 6: NOAA PROJECT SUPPORT CONSTRAINTS

The NINF recognizes and accepts the spacecraft, launch, operational and other constraints relating to the NOAA's support of the SARSAT project as set out in Article 5 of the SARSAT MOU.

ARTICLE 7: INVOLVEMENT OF USER AGENCIES

The Norwegian proposal represents the interests of several Norwegian user agencies and the Swedish user agency, represented by the Swedish Telecommunication Administration through an arrangement with the Norwegian Telecommunication Administration, the NINF having been designated as the point of contact with the SARSAT project. NINF will ensure sufficient involvement of these user agencies throughout the demonstration and evaluation of COSPAS-SARSAT so that these agencies will be in a position to determine their respective interest in the possible establishment of an operational system.

ARTICLE 8: PROCUREMENT

The parties to the SARSAT MOU, in their own countries may, on request, assist NINF in any procurement of equipment or related components required for the purpose of carrying out its responsibilities under this Understanding.

ARTICLE 9: FREQUENCY CLEARANCES

The NTNF will be responsible for obtaining the required frequency clearances for its areas of responsibility and for supporting international implementation of the SARSAT frequencies for Search and Rescue.

ARTICLE 10: CUSTOMS DUTIES

The NTNF and each of the SARSAT parties will use their best efforts, in accordance with their international commitments, to arrange free customs clearance for materials required for the purpose of carrying out their responsibilities under this Understanding; these arrangements will be the responsibility of the receiving Party.

ARTICLE 11: PUBLIC INFORMATION

11.1 The NTNF and the SARSAT parties may release general information to the public regarding their respective activities carried out under this Understanding as desired and, insofar as the activities of the other Parties are concerned, after having secured the consent of those Parties. No Party will unreasonably withhold giving such consent. In the event that such consent is not given, the reasons for withholding consent will be given to all other Parties.

11.2 It is understood, however, that NINF will not release any reports to the popular or technical press on the results of its investigation without the prior consent of the SARSAT project.

ARTICLE 12: IMPLEMENTATION

It is anticipated that the major portion of the communications between the SARSAT parties and NINF required for the implementation of its responsibilities can be handled by correspondence and exchange of documents. In addition, the SARSAT parties will hold special meetings as necessary to facilitate more detailed exchange of technical information between the SARSAT parties and those agencies participating in the evaluation and demonstration phase of the SARSAT project. These meetings will probably be held in Canada, France or the United States.

ARTICLE 13: LOAN OF ITEMS

Any items to be supplied by one Party to another for the purposes of this Understanding will be provided under a loan agreement between the Parties involved. The receiving Party will be responsible for such items and will return such items, except expendables, to the supplying Party in as good condition as when received, reasonable wear and tear excepted. Possession will pass from the supplying Party to

the receiving Party at the point of off-loading. If the receiving Party fails to return such items, except expendables, the receiving Party will pay to the supplying Party an amount equal to the replacement value of such items less the amount agreed between the Parties involved to represent reasonable wear and tear, for the time during which the items were used.

ARTICLE 14: LIABILITY

The Parties will not make claim or bring action against each other for injury to or death of their employees, contractors, subcontractors or agents, or damage to their property or the property of their employees, contractors, subcontractors or agents arising out of activities under this Understanding.

ARTICLE 15: EXCHANGE OF INFORMATION

15.1 Information will be exchanged among the Parties to permit them to perform their responsibilities under Article 5.

15.2 The performance, ephemeral, evaluation, and other information identified in the Understanding to be exchanged among the Parties will be made available without restrictions on their use. In the event that it is necessary to exchange design or manufacturing information in

order to implement the Understanding, such information will be exchanged under any protective conditions as agreed between the furnishing and receiving Parties. If no protective conditions are stipulated by the furnishing Parties at the time of exchange, such additional information furnished is available without restrictions on its use. No rights are granted by this Understanding to any present or future patents of the Parties or their contractors, subcontractors or agents.

ARTICLE 16: FUNDING ARRANGEMENTS

The Parties will bear the costs of discharging their own responsibilities under this Understanding. It is understood that the ability of the Parties to carry out their obligations is subject to the availability of appropriated funds.

ARTICLE 17: ENTRY INTO FORCE AND TERMINATION

17.1 This Understanding will become effective upon signature. It may be modified by mutual agreement of the Parties. It will be terminated 180 days following receipt of written notification of intent to do so by any one of the Parties.

17.2 This Understanding consists of Articles 1 to 17 inclusive.

Done in four copies English and French languages, each version being equally authentic.

Le Président du C.N.E.S.

Alex Curran

For the Department  
of Communications  
of Canada

Alain

For the Centre  
National  
d'Etudes Spatiales  
of France

Frank Fieber

For the National  
Aeronautics and  
Space Administration  
of the United States  
of America

Signed at Ottawa

Signed at Paris

Signed at Washington, D.C.

September 25, 1981

30 SEP. 1981

October 19, 1981

Date

Date

Date

For the Royal  
Norwegian Council for  
Scientific and  
Industrial Research

Signed at Oslo

Gustav M. ...

Date 13 November 1981

Understanding concerning participation by Norway in an investigation of the demonstration and evaluation of an experimental satellite-aided search and rescue system Signed at Ottawa, Paris, Washington and Oslo September 25 and 30, October 19 and November 13, 1981, entered into force November 13, 1981 TIAS

Parties

Canada

France

Norway

United States