

**FIRST AMENDMENT  
TO THE  
MEMORANDUM OF UNDERSTANDING  
SIGNED AT WASHINGTON ON DECEMBER 16, 1997  
BETWEEN  
THE DEPARTMENT OF SPACE AND  
THE DEPARTMENT OF SCIENCE AND TECHNOLOGY  
OF THE GOVERNMENT OF THE REPUBLIC OF INDIA  
AND  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND  
THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
OF THE UNITED STATES OF AMERICA  
FOR  
SCIENTIFIC COOPERATION  
IN THE AREAS OF EARTH AND ATMOSPHERIC SCIENCES**

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**WHEREAS** the Department of Space (hereinafter referred to as "DOS") and the Department of Science and Technology (hereinafter referred to as "DST") of the Government of the Republic of India, (hereinafter jointly referred to as the "Indian Party") and the National Aeronautics and Space Administration (hereinafter referred to as "NASA") and the National Oceanic and Atmospheric Administration (hereinafter referred to as "NOAA") of the United States of America, (hereinafter jointly referred to as the "U.S. Party"), have entered into a Memorandum of Understanding for Scientific Cooperation in the Areas of Earth and Atmospheric Sciences, signed at Washington on December 16, 1997 (hereinafter referred to as "the MOU"), the U.S. Party and the Indian Party constituting the Parties to this First Amendment to the MOU;

**WHEREAS** the Parties note the success of their cooperation to date under the MOU and the desire of both Parties to expand upon this success;

**WHEREAS** the Parties note many new opportunities exist for joint scientific activities and exchange of data from current and future Indian and U.S. Earth and atmospheric observation missions and future plans;

**WHEREAS** the Parties recognize that the MOU entered into force for an initial period of 5 years ending on December 16, 2002, and the Parties desire to extend the MOU for an additional period of 5 years; and

**WHEREAS** the Parties now wish to enter into this Amendment to the MOU in order to extend the MOU and amend certain terms while keeping all other terms constant, and to continue their mutually beneficial relationship;

**THE PARTIES AGREE AS FOLLOWS:****ARTICLE 1**

Article 3 of the MOU, "Data Access and Transmission," is hereby amended by deleting it in its entirety and replacing it with a new Article 3, which reads as follows:

**"Article 3  
DATA ACCESS AND TRANSMISSION**

**The U.S. Party shall:**

- make available to the Indian Party the agreed Earth and atmospheric observation data, produced by the research and operational systems of the U.S. Party, as well as the retrospective data from such systems contained in their respective archives, as agreed;
- install a communication network to allow Earth and atmospheric observation data from the U.S. Party to be accessed by the Indian Party and to transfer data from the Indian National Satellite System (INSAT); India's first exclusive meteorological satellite, METSAT; and other Earth and atmospheric observation systems as mutually agreed from a pick-up point designated by the Indian Party to the United States;
- provide the capability for the U.S. Party to receive all environmental data from INSAT and METSAT on a near real-time basis as approved by the Parties;
- work with the Indian Party to determine the feasibility of acquiring INSAT and METSAT data as mutually agreed at hourly intervals or at maximum temporal frequency and, as appropriate, fund any augmentation in ground capacity necessary to accomplish this end, if determined desirable by the U.S. Party;
- provide the capability for the U.S. Party to receive, and work with the Indian Party to determine the feasibility of acquiring, other Earth and atmospheric observation data as mutually agreed; and
- provide training and full support for the maintenance of the communication links.

**The Indian Party shall:**

- make available to the U.S. Party the agreed Earth and atmospheric observation data, including data produced by INSAT and METSAT, as well as retrospective Indian Party data, as agreed;

- provide an interface for a U.S. communication network established under this MOU to allow Earth and atmospheric observation data from the U.S. Party to be accessed by India and to transfer INSAT, METSAT, and other Earth and atmospheric observation data as mutually agreed from a pick-up point designated by the Indian Party to the United States;
- provide necessary technical and auxiliary information to permit the U.S. Party to install and enable the maintenance of the communication circuits for the reception of the Indian Earth and atmospheric observation data;
- use its best efforts to maintain the communication links for timely and efficient data transfer;
- cooperate with and assist the U.S. Party to transmit all full spatial resolution, full disk, digital data from INSAT, METSAT, and other Earth and atmospheric observation systems as mutually agreed, on a near-real time basis and at optimum temporal frequency, along with any other auxiliary data and along with supporting information necessary for radiometric calibration and geolocation of the images;
- work with the U.S. Party to study the feasibility of providing imagery at one-hourly intervals; and
- assist the U.S. Party with the installation of any augmentation to Indian ground processing systems, if provided by the U.S. Party, that may be required to facilitate data access, utilization and transmission pursuant to this MOU and assist the U.S. Party with their operation."

**ARTICLE 2**

Article 4.3 of the MOU, "Definitions," is hereby amended by adding a new item a(iii) as follows:

"a(iii) 'Earth and atmospheric observation data' means current and historical space-based and in-situ observations of the Earth and its environment as mutually agreed by the Parties in support of specific projects established under this MOU, including but not restricted to land, ocean, and atmospheric measurements and weather data gathered from orbiting satellites, upper air measurements and ground stations operated by the Parties."

**ARTICLE 3**

The first line of Article 9 of the MOU, "Liability," is hereby amended by deleting the word "another" and substituting therefore the word "other."

ARTICLE 4

The first sentence of Article 12, of the MOU, "Entry into Force, Amendments, Termination," is hereby amended by deleting the first sentence and substituting therefore the following:

"This MOU shall enter into force upon signature by the Parties and shall remain in force for a period of ten (10) years."

Done in duplicate in the English language. This Amendment shall enter into force upon signature by [the Parties] [DOS, DST, NASA, and NOAA].

FOR THE DEPARTMENT OF SPACE OF THE REPUBLIC OF INDIA:



K. Kasturirangan  
Secretary

Date: Dec 16, 2002

Place: Bangalore.

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

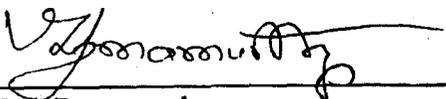


Sean O'Keefe  
Administrator

Date: December 12, 2002

Place: Washington, DC

FOR THE DEPARTMENT OF SCIENCE AND TECHNOLOGY OF THE REPUBLIC OF INDIA:

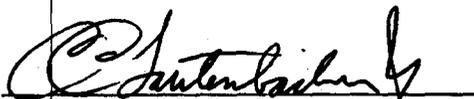


V. S. Ramamurthy  
Secretary

Date: Dec. 17, 2002

Place: New Delhi

FOR THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION OF THE UNITED STATES OF AMERICA



Vice Admiral Conrad C. Lautenbacher, Jr.,  
U.S. Navy (Retired)  
Undersecretary of Commerce for Oceans and Atmosphere and NOAA Administrator

Date: Dec 12, 2002

Place: Washington, DC