



IMPLEMENTING ARRANGEMENT

BETWEEN

THE CENTRE NATIONAL D'ETUDES SPATIALES

AND

THE INDIAN SPACE RESEARCH ORGANISATION

CONCERNING COOPERATION IN DEFINITION STUDIES

ON A FUTURE JOINT THERMAL INFRA-RED EARTH

OBSERVATION MISSION

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PREAMBLE

CENTRE NATIONAL D'ETUDES SPATIALES of France (hereinafter referred to as "CNES") and the INDIAN SPACE RESEARCH ORGANISATION (hereinafter referred to as "ISRO"),

Hereinafter individually referred to as "Party" or collectively to as "the Parties" to this Implementing Arrangement ("IA");

RECALLING the interest expressed by both Parties during previous bilateral technical discussions and, in particular, those held in Bangalore on June 17th, 2014 on a future mission on thermal infrared;

RECALLING the terms of the Cooperation Agreement signed on April, 10 2015 between the Parties and called: "Programme between CNES and ISRO for a reinforced cooperation in space activities" (hereinafter referred to as "Cooperation Agreement") which set out the terms and conditions for a favourable cooperative framework between the Parties for the implementation of any future joint mission and/or any cooperative activities decided by the Parties;

HAVE AGREED on the following:

ARTICLE 1 PURPOSE

- 1.1. The purpose of this IA is to describe the undertakings of ISRO and CNES to conduct definition studies for a potential joint thermal-infrared (TIR) Earth Observation mission.
- 1.2. The Parties shall carry out the cooperative activities under this IA, on a best effort basis, subject to the laws and regulations applicable in each country and to the availability of their respective resources.

ARTICLE 2 OBJECTIVES

- 2.1. The proposed joint mission will be devoted to remotely sensing our planet in the thermal infrared (TIR) and visible part of the electromagnetic spectrum, at a high spatial scale (resolution of a few tens of meters) coupled with a high temporal scale (revisit of

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a few days) with two main objectives driven by scientific requirements:

2.1. 1. Ecosystem stress and water use monitoring,

2.1. 2. Coastal zone monitoring and management.

2.2. The main objectives of the present IA are:

2.2.1. To finalize scientific requirements; and

2.2.2. To define a technically feasible and cost affordable concept corresponding to these requirements taking benefit of the relevant capabilities in India and France.

2.3. In order to achieve these objectives, the Parties shall carry out joint activities under the present IA that will enable the achievement of feasibility studies for a potential joint thermal-infrared (TIR) Earth Observation mission in terms of:

2.3.1. Science requirements as developed by Joint Science Team as defined in Article 5.2,

2.3.2. Mission and system requirements,

2.3.3. Data Policy,

2.3.4. Payload concept,

2.3.5. Platform configuration,

2.3.6. Launch strategy,

2.3.7. Cost-effectiveness,

2.3.8. Cost sharing, work share and responsibilities.

2.4. The outcome of the feasibility studies is intended to provide sufficient information in order to allow the Parties to take the necessary decisions on the next steps of a potential joint satellite mission.

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ARTICLE 3 APPLICATION OF COOPERATION AGREEMENT

- 3.1. The Parties acknowledge that this IA refers and is subject to the Cooperation Agreement referred to in Preamble and shall be considered as an Implementing Arrangement under Article 6 of the Cooperation Agreement.
- 3.2. Therefore, all the relevant provisions contained in the Cooperation Agreement shall apply to the activities carried out by the Parties under this IA and in particular those of Articles 8 (Financing), 10 (Transfer of Goods and Technical Data) and 15 (Liability).

ARTICLE 4 UNDERTAKING BY THE PARTIES

- 4.1. The Parties will jointly undertake during these definition studies the following activities:
 - 4.1.1. finalization of the Scientific Mission Requirement Document (SMRD),
 - 4.1.2. definition of a first version of the Science Plan detailing the scientific work to be conducted,
 - 4.1.3. definition of the Data Policy,
 - 4.1.4. realization of trade off studies and definition of an agreed and feasible system concept,
 - 4.1.5. definition of Parties' sharing of responsibilities and identification of their respective contributions for the subsequent phases,
 - 4.1.6. provision of a first version of the development plan, program schedule and cost estimate and identification of critical items,
 - 4.1.7. preparation of the agreements required to proceed with the subsequent phases of the TIR mission; and

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4.1.8. sharing of all the results of the Phase A studies between the Parties according to Article 7 hereafter.

4.2. The definition studies consist of 2 phases.

4.2.1. The first phase (Phase 1) is devoted to the finalisation of the mission requirements and the associated data policy principles and to the definition of the work share and responsibilities. A Mission Definition Review (MDR) organized by the Project Managers referred to in Article 5 hereafter will conclude the activities of Phase 1. Based on the results of this review, the Joint Working Group (JWG) mentioned in Article 5, shall decide on work and responsibility sharing and decide on the start of Phase 2.

4.2.2. During the second phase (Phase 2) and according to work and responsibility sharing agreed, the Parties will conduct all the studies to finalize the system requirements, define the satellite configuration, the payload concept, the launch strategy, the development plan and the costs. A Preliminary Requirement Review (PRR), organized by the Project Managers referred to in Article 5 hereafter will check feasibility, development plan and readiness for next phase. The JWG will decide on the conclusion of phase 2 activities.

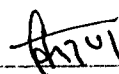
ARTICLE 5 ORGANISATION

The Parties have agreed to set up the following mechanisms for the management of the activities covered by the present IA:

5.1 Joint Project Team

5.1.1. The Joint Project Team shall be composed of technical experts and shall be co-chaired by the Indian and French Project Managers designated by each Party as the Point of Contact in Article 6. The Project Managers are responsible for monitoring and implementing each Party's activities under this IA according to each Party's rules and procedures.





5.1.2. The Joint Project Team will meet when necessary and at least every three months for the proper implementation of the cooperative activities under this IA. The meetings will take place in principle alternatively in India and France except if Project Managers decide to hold the meeting by means of tele-or video-conference.

5.1.3. The Joint Project Team shall report to the Joint Working Group set in place in the frame of the Cooperation Agreement on the Earth Observation mission mentioned in Article 4.1 of the Cooperation Agreement.

5.2 Joint Science Team

The Science Team shall include scientific experts and shall deal with all scientific issues within the joint thermal-infrared Earth Observation mission. The Science Team shall be co-chaired by the French and Indian Principal Investigators.

5.3 Joint Working Group

5.3.1. Under the Cooperation Agreement referred to in the Preamble, the Parties have set up a Joint Working Group (JWG) who shall report to the Steering Committee, also set up under the Cooperation Agreement, for all matters relating to this cooperation and the implementation of the activities covered by the present IA.

5.3.2. The JWG is composed of representatives from the entities that are involved in the implementation of the activities covered by the present IA and co-chaired by an ISRO and a CNES representative. The JWG will meet when necessary to review progress. The meeting of the JWG will take place in principle alternately in India and France except if the co-chairs decide to hold the meeting by means of tele-or video-conference. The co-chairs will chair the steering board of the MDR and the PRR.

5.3.3. Both ISRO and CNES Project Managers as well as the PIs shall be invited to the meetings of the JWG.

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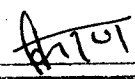
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ARTICLE 6 POINTS OF CONTACT

- 6.1. The ISRO point of contact is:
Somya S SARKAR
Sensor Systems Division
Space Applications Centre
Indian Space Research Organisation (ISRO)
Ahmedabad 380015
Tel: +91 79 2691 3821
Email: sssarkar@sac.isro.gov.in
- 6.2. The CNES point of contact is:
Benoit BOISSIN
CNES/DIA/TEC
Centre spatial de Toulouse
18 avenue Edouard Belin
31 401 TOULOUSE CEDEX 9
FRANCE
Tél : +33(0)5 61 27 42 34
Fax : +33(0)5 61 28 34 21
Email: benoit.boissin@cnes.fr

ARTICLE 7 INTELLECTUAL PROPERTY AND CONFIDENTIALITY

- 7.1. Each Party retains the ownership of methods, technical know-how and products used for the realisation of activities under this IA.
- 7.2. The results of the studies conducted by or on behalf of each Party under this IA, remain the property of the relevant Party. The results of studies which belong to one Party shall be considered as proprietary information for which protection is to be maintained and may be communicated to the other Party in compliance with the provisions of Article 10 "Transfer of Goods and technical data" of the Cooperation Agreement.
- 7.3. The result of joint studies will be the joint property of both Parties and considered as proprietary Information for which



protection is to be maintained according to the provisions of Article 10 of the Cooperation Agreement related to the use, disclosure and retransfer of "Proprietary Information".

- 7.4. It is the joint intention of the Parties that other entities (hereafter referred to as the Other Entities), including but not limited to Entities located in or having their places of business in India and France, shall be involved in the completion of the studies referred to above. Such Other Entities will be required by the Parties, by contract or otherwise, to be bound by the provisions of Article 10 of the Cooperation Agreement related to the use, disclosure and retransfer of proprietary Information.

ARTICLE 8 AMENDMENTS

Any modification to this IA shall be executed in writing. The amendment shall be signed by an authorized representative of ISRO and CNES.

ARTICLE 9 SETTLEMENT OF DISPUTES

- 9.1. Any dispute which cannot be resolved at the level of the Project Managers shall be referred to the Steering Committee of the Cooperation Agreement for final mutual decision.
- 9.2. If the matter cannot still be solved at the Steering Committee level, the issue will be submitted to the Presidents of both Parties for a final mutual decision.

ARTICLE 10 ENTRY INTO FORCE AND DURATION

- 10.1 This IA shall enter into force upon the date of its signature by the representatives of the Parties and shall remain valid until the closure of the PRR, unless unilaterally terminated by either Party in accordance with the provisions of the paragraph below. The

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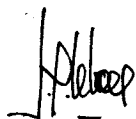
estimated duration of Phase 1 and Phase 2 are 6 months and 2 years respectively.

- 10.2 Either Party may unilaterally terminate this IA before its expiration date by written notice to the other Party six (6) months before the desired date of termination. The terminating Party will not incur any liability to the other Party for terminating this IA. It may also be jointly terminated by the Parties in writing, with termination to become effective as of the date stated by the Parties in the written termination.
- 10.3 Expiration or termination of this IA will not affect the Parties' continuing obligations under Articles 7, 10, 11, 12, 13, 14 and 15 of the Cooperation Agreement unless otherwise agreed by the Parties.

Done at New Delhi, on January 25, 2016 in two originals, in French, Hindi and English languages, all texts being equally authentic. However, the English version shall be used for any issue related to the interpretation or implementation of this IA.

IN WITNESS WHEREOF, the undersigned, duly authorized, hereby sign this IA.

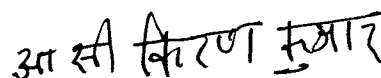
For CNES



(Jean-Yves Le Gall)

President

For ISRO



(A.S. Kiran Kumar)

Chairman