

MEMORANDUM OF UNDERSTANDING BETWEEN
THE UNITED STATES ENERGY RESEARCH AND
DEVELOPMENT ADMINISTRATION AND THE
FRENCH CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
FOR COOPERATION ON CERTAIN SAFETY ASPECTS OF SOLAR TOWERS

PREAMBLE

WHEREAS the Government of the United States and the Government of the French Republic have, in joint statements on cooperation in science and technology released on September 23, 1969 and November 25, 1969, expressed the intention to cooperate through their respective agencies and institutes in activities to explore methods of providing alternative energy sources; and

WHEREAS the National Science Foundation of the United States (NSF) and the Centre National de la Recherche Scientifique of the French Republic (CNRS) have been cooperating in the study, research, and evaluation of components, subsystems, and systems for the thermal conversion of solar energy into electrical power through an agreement signed on June 24, 1974 between the Georgia Institute of Technology (GIT) and CNRS; and

WHEREAS the United States Energy Research and Development Administration (ERDA) and the Centre National de la Recherche Scientifique (CNRS), signed on May 7th, 1976 a memorandum of understanding for cooperation in joint research on solar thermal conversion systems; and

WHEREAS, satisfied with the results, they are willing to extend this cooperation to new topics and especially to the study of certain safety aspects of solar towers;

Now therefore the United States Energy Research and Development Administration (ERDA) and the Centre National de la Recherche Scientifique (CNRS), hereinafter referred to also as the Parties,

Hereby agree as follows:

II.

GENERAL PRINCIPLES

1. The immediate aim of the cooperative program described hereinafter is to acquire information about the risks involved in the use of fields of heliostats with solar towers and on how to minimize these risks.

III.

CONDUCT OF THE PROGRAM

1. ERDA will conduct tests at the solar thermal test facility at Sandia laboratories, Albuquerque, New Mexico, on: (1) flux intensity measurements of single heliostat beams versus distance at ground level; and (2) qualitative and quantitative characterization of light reflected into the airspace above the field of 78 focused heliostats by means of aircraft (or helicopter) flyovers.

2. The CNRS will conduct similar tests at the solar furnace at Odeillo using the 63 flat heliostats.

3. The tests will involve the calculation of the flux at different points in space for the most dangerous configurations, calculations of the probability that given danger thresholds will be crossed, and definition of procedures for piloting aircraft over the heliostat field in such a way as to minimize risks in that air space.

4. Movie film is expected to be the principal method of data acquisition followed by densitometry and image analysis techniques for quantification of typical and worst case conditions.

5. Each Party will develop its own test plan, conduct its own tests, and analyze its own data; general test plans will be exchanged and test data and analyses will be jointly reviewed.

6. Observers from one Party will be welcome at principal tests of the other Party. The nomination of these observers shall be made by the sending party and is subject to the approval of the joint committee defined in paragraph 8 of this Article.

7. ERDA tests are scheduled for the period May to August, 1977; CNRS tests are scheduled for April, 1978.

8. A joint committee composed of six members is hereby established to coordinate the specific program defined above in this memorandum, to settle disagreements, to review the progress of this cooperative arrangement, and to ensure

a balanced exchange of information. ERI and CNRS shall each appoint three members of the joint committee, and alternate members as may be necessary. The joint committee shall meet at least once a year, and at such other times as mutually agreed.

9. CNRS assumes responsibility for the safe functioning of the test facilities in Odeillo and ERDA or its contractors according to the conditions laid down in the agreements between them, assumes responsibility for the safe functioning of the test facilities in Albuquerque.

Each party assumes responsibility inside the precincts of its test facilities, for the safety of the observers of the other party except in cases when the observer was the victim of his own fault or negligence.

10. The joint examination of the results of these tests will include conclusions about the potential risks, probabilities of accident conditions, resulting constraints on the choice of sites, the optimum procedures for piloting aircraft in the region, and any special civil air navigation rules which might become necessary, such as forbidden zones or signalling.

11. These results will be exchanged and discussed at joint meetings of the Parties' representatives planned for October, or November, 1977, in Albuquerque, New Mexico, U.S.A., and in the summer of 1978 in France, and at other appropriate occasions.

12. Should the results obtained justify the undertaking of joint tests, the joint committee will study the manner of carrying them out. Such extension of the research effort will be made the subject of further agreements. Such further agreements will specify, with respect to each program, each party's contribution of equipment and manpower, the conditions under which the program is to be implemented and under which the data may be used, and the allocation of rights to inventions and to any use of such inventions. In each instance, a joint committee will be responsible for the implementation of the jointly agreed upon program.

IV.

DATA

1. Except in cases where there could be an invention, referred to in article V, scientific and technical results, information, and data resulting from the program activities will be freely available to both ERDA and CNRS for their use or for use by other persons as either Party may deem appropriate.

2. Except in cases where there could be an invention, referred to article V, each Party will be permitted to disseminate these data as publications in scientific journals or by other channels customary to the scientific community.

INVENTIONS

1. Any invention or discovery made or conceived by either Party or its contractors in the course of or under the implementation of this cooperative program will be exclusively owned by this party.

The party which patents an invention referred to in this article V, paragraph 1, shall license the patent to nationals of the other party upon request of such other Party, on nondiscriminatory terms and conditions. At the time of such a request, the other Party will be informed of all licenses already granted under such patent.

2. The inventions resulting from work achieved jointly by the Parties under this agreement shall be the ownership of both Parties.

The rights of each Party on the said inventions and the mode of use will be decided by mutual agreement between the Parties.

3. The Parties to this Memorandum shall provide all necessary cooperation from their inventors to carry out the provisions of paragraphs 1 and 2 above.

4. Each Party to this Memorandum shall assume the responsibilities to pay awards or compensation required to be paid to its own national according to its own laws.

5. Disclosure of inventions made by one Party to the other during the course of any technical interchange or review shall be held confidential for the period necessary to file patent applications in the country of either Party.

6. The Joint Committee established in article III above is responsible for coordinating matters and settling disputes resulting from the application of paragraphs 1 and 2 above.

7. In this article III above the meaning of "Party" shall include any affiliated government agency holding patents on behalf of a Party.

VI.

FINANCING

Each party shall bear the costs of its participation in the activities under this memorandum, including the costs of its observers in the country of the other party, and shall control the expenditures of its funds necessary to meet such costs. Responsibilities of the parties hereto are subject to the availability of appropriations as such appropriations are determined in accordance with applicable laws.

VII.

FINAL PROVISIONS

1. This Memorandum will become effective upon signature

by the duly authorized representatives of both Parties and will remain in effect for two years after the date of signature.

2. By mutual consent of the Parties, this Memorandum may be renewed for additional periods should the results obtained show that further tests are necessary.

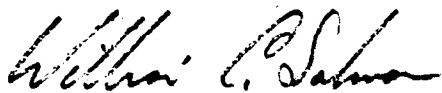
3. By mutual consent of the parties, this memorandum may at any time be modified.

4. In case of disagreement regarding interpretation or application of the provisions of this Memorandum not settled by the joint committee, CNRS and ERDA shall consult for the purpose of amicably settling the dispute before presenting it to the competent legal authority.

5. The Parties agree that no classified information will be transferred under this Memorandum.

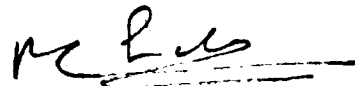
IN WITNESS WHEREOF, the Parties have executed this Memorandum on Wednesday, the 28th of September, 1977.

FOR THE ENERGY RESEARCH AND
DEVELOPMENT ADMINISTRATION



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FOR THE CENTRE NATIONAL
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Robert Chabbal
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