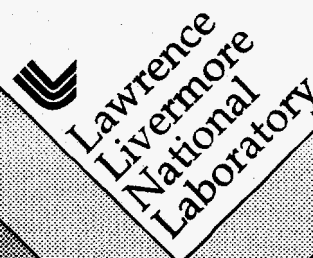


Analysis of DOE International Environmental Management Activities

Richard C. Ragaini

September 1995



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ANALYSIS OF DOE INTERNATIONAL ENVIRONMENTAL MANAGEMENT ACTIVITIES

TABLE OF CONTENTS

INTRODUCTION

I. DETAILS OF THE EM-RELATED INTERNATIONAL PROGRAMS BEING CONDUCTED AT LLNL

A. CHERNOBYL STUDIES PROJECT

B. RUSSIAN PILOT PROJECTS

C. COLLABORATIVE RESEARCH ON ATMOSPHERIC ADVISORY CAPABILITY (ARAC) MODELS

D. SISTER LABORATORIES PROJECT

II. SUMMARY OF ANALYSIS PROCESS

III. APPENDIX

A. DATA COLLECTION SHEETS

B. RELEVANT TECHNICAL INFORMATION

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ANALYSIS OF DOE INTERNATIONAL ENVIRONMENTAL MANAGEMENT ACTIVITIES

INTRODUCTION

The Department of Energy's (DOE) Strategic Plan (April 1994) states that DOE's long-term vision includes world leadership in environmental restoration and waste management activities. The activities of the DOE Office of environmental Management (EM) can play a key role in DOE's goals of maintaining U.S. global competitiveness and ensuring the continuation of a world class science and technology community. DOE's interest in attaining these goals stems partly from its participation in organizations like the Trade Policy Coordinating Committee (TPCC), with its National Environmental Export Promotion Strategy, which seeks to strengthen U.S. competitiveness and the building of public-private partnerships as part of U.S. industrial policy.

The International Interactions Field Office task will build a communication network which will facilitate the efficient and effective communication between DOE Headquarters, Field Offices, and contractors. Under this network, Headquarters will provide the Field Offices with information on the Administration's policies and activities (such as the DOE Strategic Plan), interagency activities, as well as relevant information from other field offices. Lawrence Livermore National Laboratory (LLNL) will, in turn, provide Headquarters with information on various international activities which, when appropriate, will be included in reports to groups like the TPCC and the EM Focus Areas.

This task provides for the collection, review, and analysis of information on the more significant international environmental restoration and waste management initiatives and activities which have been used or are being considered at LLNL. Information gathering will focus on efforts and accomplishments in meeting the challenges of providing timely and cost effective cleanup of its environmentally damaged sites and facilities, especially through international technical exchanges and/or the implementation of foreign-development technologies.

The following types of information are included:

1. technology transfer mechanisms employed;
2. technologies and services imported;
3. technologies and services exported;
4. technologies transferred to the private sector that have been exported;

5. procurements/total money committed to foreign companies; or their U.S. subsidiaries;
6. activities associated with international organizations;
7. foreign visitors reviewing EM-related activities (by country length of stay, and technical interest by Focus Group);
8. foreign travel by LLNL employees (by country and technical interest by Focus Group);
9. any other information deemed to be relevant.

A "data collection sheet" (maximum of 1, 2-sided sheet) is included for each international activity at LLNL. A listing of the information to be included is in the appendix. Information from the Data Sheets will be entered into the following fields of a computerized data base to be provided by EM-52:

- (i) EM-50 Focus Area or Technical Program Area
- (ii) Foreign Country
- (iii) B&R code/EM organization
- (iv) Type of interaction:
 - (a) international organization activity,
 - (b) scientist exchange,
 - (c) information exchange,
 - (d) foreign demonstration,
 - (e) international conference, contract/procurement (work done in U.S.)
- (v) Funding Levels:
 - (a) \$0-25,000,
 - (b) \$25,000-100,000,
 - (c) \$100,000-350,000,
 - (d) over \$250,000.
- (vi) Use of International Agreement:
 - (1) yes (include Agreement title and expiration date),
 - (2) no.

I. DETAILS OF THE EM-RELATED INTERNATIONAL PROGRAMS BEING CONDUCTED AT LLNL

A. CHERNOBYL STUDIES PROJECT

In April 1988, the US and the former USSR signed a Memorandum of Cooperation (MOC) for Civilian Nuclear reactor Safety. This MOC was a direct result of the accident at the Chernobyl Nuclear Power Plant Unit 4, and the subsequent efforts of the two countries to implement a joint program to improve the safety of nuclear power plants, and to understand the implications of environmental releases. A Joint Coordinating Committee for Civilian Nuclear Reactor Safety (JCCCNRS) was formed to implement the MOC. The JCCCNRS established many working groups, and most of these were the responsibility of the US Nuclear Regulatory Commission. Working Group 7, on Environmental Transport and Health Effects, was the responsibility of the USDOE. The purpose of Working Group 7 was to develop methods to rapidly project the health effects of any future nuclear reactor accident. Two subgroups were formed: 7.1 Environmental Transport; and 7.2 Health Effects. The majority of the initial tasks for this project are completed or near completion.

The current focus is on health effects. Attention is concentrated on studies of thyroid diseases among Belarussian children, including dosimetric aspects of the diseases. Initiation of similar studies in the Ukraine are planned. A major part of the effort of these projects is supporting these studies by providing methods and applications of dose reconstruction and support and equipment for the medical teams. Current FY95 Tasks for the Chernobyl Studies Project include:

7.0A Management

Lynn Anspaugh and Sheilah Hendrickson
LLNL

7.1C External Dose

Harold Beck
Environmental Measurements Laboratory

7.1F Hydrological Transport

Yasuo Onishi
Batelle Pacific Northwest Laboratories

7.2A4 Chromosome Painting Dosimetry

Tore Straume and Joe Lucas
LLNL

7.2D Stochastic Effects
Marvin Goldman
University of California, Davis

7.2F Thyroid Studies
Lynn Anspaugh
LLNL

7.2G Leukemia Studies
Lynn Anspaugh
LLNL

B. RUSSIAN PILOT PROJECTS

The Russian Pilot Projects involve 5 subtasks directed toward initiating pilot technology development projects involving Former Soviet Union FSU environmental restoration and waste management technologies which have high probability for application in the DOE complex cleanup. Each project is small (\$5K - \$10K), and provides an initial assessment of technology status, suitability, and risk associated with possible use of innovative Russian EM technologies at DOE sites. All technologies will be assessed and established in support of the five focus areas. Technologies found appropriate for further examination will be identified, and a more detailed evaluation program will be developed.

Subtask 1: Identify candidate technologies for evaluation for EM needs in support of the five focus areas and three crosscutting programs.

Subtask 2: Develop and manage initial pilot technology evaluations for EM needs at appropriate FSU institutes.

Subtask 3: Coordinate with potential DOE/EM users of FSU technologies to insure that information from projects is reviewed in a timely manner.

Subtask 4: Develop and implement business practices and procedures for subcontract activities with FSU institutes and enterprises which are acceptable to LLNL.

Subtask 5: Assist in the display of information on Russian technology. Assist various FSU counterparts in gaining display space at selected EM conferences and symposium.

The purpose of the LLNL project is to complete the technology development work initiated at the Boreskov Institute of Catalysis (BIC) in 1993. The principle task is to complete the development of the improved DeNO_x catalyst that meets the California Land Ban Disposal Restrictions. Successful completion of this project will result in the identification of a US commercial partner willing to enter into a cooperative production and distribution agreement with the BIC. LLNL will continue to cooperate with BIC on the Honeycomb Catalyst Testing Unit for potential application in the Mixed Waste Focus Area. The Catalyst is scheduled to be demonstrated in FY96 at WETO, the Western Environmental Testing Office, in Butte, Montana.

C. COLLABORATIVE RESEARCH ON ATMOSPHERIC ADVISORY CAPABILITY (ARAC) MODELS

ARAC operates as a national center for the DOE's Emergency Response Program and several DOD programs, and for other federal and state agencies. ARAC provides state-of-the-art, real-time, model-derived assessments of the health and environmental impacts of atmospheric releases of radionuclides and other hazardous materials. Assessments, which are available worldwide and 24 hours a day, incorporate detailed terrain effects, continuously updated three-dimensional meteorological data, and nationally approved health impact factors. In 1994 ARAC began assessments related to nonproliferation issues.

Switzerland and Sweden are implementing the ARAC code as part of their own Emergency Response Programs. In return, the ARAC Program receives their expertise and code modules for implementation into the ARAC Program (e.g., plume washout/rainout; phase change). From Sweden, Lennart Thaning first contacted ARAC in 1984 about getting copies of ARAC codes. From Switzerland, Volker Herrenberg first contacted ARAC in 1992 to be collaborators after they had selected the ARAC dispersion model to be the model of choice. No bilateral agreements have been involved, and the activities have consisted of mutual exchange of scientists to date.

D. SISTER LABORATORIES PROJECT

DOE is collaborating with the State Department and the Arms Control and Disarmament Agency (ACDA) to fund 'sister laboratory' activities in support of Section IV of the Nuclear Non-proliferation Treaty, which calls for technical assistance from the nuclear nations to those forgoing nuclear weapons programs. The direct funding from DOE is \$100,000 per country arrangement, and involving a different Laboratory for each project. This is to be leveraged as

much as possible with outside funding of specific activities, e.g. technical missions supported by IAEA.

The Memorandum 'Arrangement for the Exchange of Technical Information and for Cooperation in the Field of Peaceful uses of Nuclear Energy between the Moroccan National Center for Nuclear Energy Sciences and Techniques and the Lawrence Livermore National Laboratory" was signed by the Directors of the two laboratories in February and March 1994. The term extends until either party wishes termination.

A first visit to Morocco occurred in October 1993 by a DOE/State Department/National Laboratory team, which resulted in the negotiation of the Arrangement. The first technical mission from LLNL took place in December 1993. Additional visits have taken place and are planned for the future. The DOE funded LLNL \$100,000 to be used on behalf of the Moroccans through this arrangement, which is being leveraged by preparing proposals to be funded by the IAEA.

To date only technical consultations have taken place. We foresee the transfer of some commercial US software products with training on their use. A consulting visit by DOE's Physical Security review team is being planned for late summer/fall 1995.

No "commercialization or export" efforts planned. Arrangement continues on a technical consultation and collaboration basis. An arrangement similar to that described above is being negotiated with the Malaysian Institute of Nuclear Technology and Research (MINT). A draft arrangement document is in the hands of Malaysians, being made to become subordinate to a formal government to government agreement for technical cooperation. The initial visit with DOE and ACDA representatives and other national labs took place in June 1994.

II. SUMMARY OF ANALYSIS PROCESS

Information for this report was collected by sending out inquiries to each Directorate within LLNL, delineating the EM 52.1 task and the selection criteria for inclusion in this data base. Subsequently, interviews were conducted with each principle investigator who responded in order to discuss each item of the required fields for the international coordination task. In some instances, the amount of EM involvement was not known. In those cases, the project was included to ensure that no EM projects would be inadvertently left out of the exercise. No major problems were encountered, and the analysis proceeded smoothly.

III. APPENDIX

A. DATA COLLECTION SHEETS

A. CHERNOBYL STUDIES PROJECT

International Coordination Task (EM-52.1)

| <u>Data Field:</u> | <u>Data Description:</u> |
|---------------------------|--|
| DOE-HQ Sponsor: | H. Pettengill, DOE/EH-63, Office of International Health Studies, 301-903-7030, 301-903-3445 FAX |
| DOE-Field Office Sponsor: | P. Hill, DOE/OAK, 510-422-0139 |
| U.S. Contact(s): | L. Anspaugh, Scientific Director, Risk Sciences Center, LLNL, 510-424-6409 |
| Foreign Contact(s): | V. I. Vozniak, First Deputy Minister Ministry of the Russian Federation for Civil Defense Affairs, Emergencies and Elimination of Consequences of Natural Disasters N. N. Egorov, Deputy Minister Ministry of the Russian Federation for Atomic Energy A.D. Tsaregorodtsev, Deputy Minister of Health and the Medical Industry |
| Company/Organization: | V. I. Vozniak, Russian Co-Chairman of Joint Coordinating Committee on Radiation Effects Research (JCCRER) |
| Foreign Country(s): | Russia |
| Other Participants: | U.S. Members: T. O' Toole, USDOE Assistant Secretary for ES&H; E.G. de Planque, Commissioner, USNRC; J.I. Boufford, Principal Deputy Assistant Secretary, USDHHS |
| EM Focus Area: | NA |

A. CHERNOBYL STUDIES PROJECT

International Coordination Task (EM-52.1)

| | |
|----------------------------|---|
| Activity Description: | Chernobyl Studies Project. The focus is on health effects from the Chernobyl accident. Thyroid diseases among Belarussian children are being studied. A major part of the program is providing methods and applications of dose reconstruction, and support and equipment for the medical teams. |
| Technology Description: | NA |
| Background: | 1988 US-USSR Memorandum of Cooperation (MOC) for Civilian Nuclear Reactor Safety was a direct result of the accident at Chernobyl. Joint Coordinating Committee on Radiation Effects Research (JCCRER) was formed to implement the MOC. The JCCCNRS established many working groups. Working Group 7 on Environmental Transport and Health Effects is the responsibility of DOE. The Chernobyl Studies Project is being done under their sponsorship. |
| Estimated Cost: | \$1.386M |
| Bilateral Agreement: | 1988 US-USSR Memorandum of Cooperation (MOC) for Civilian Nuclear Reactor Safety |
| Duration of Collaboration: | TBD |
| Travel/Visit Dates: | Dr. Oleg Pavlovsky, Institute of Nuclear Safety, Moscow, Russia—Feb/Mar 1994 Mr. Vladimir Drozoovitch, Research Institute of Radiation Medicine, Minsk, Belarus—Dec 1993 |

A. CHERNOBYL STUDIES PROJECT

International Coordination Task (EM-52.1)

Travel/Visit Dates: Dr. Sergei Chinkarev, Institute of Biophysics,
Moscow, Russia—Dec 1993
Dr. Ilya Likhtarev, Ukrainian Research Center
for Radiation Medicine, Kiev, Ukraine—Oct
1993
Dr. Mark Jheleznyak, Institute of Mathematical
Machines and Systems, Kiev,
Ukraine—Sep 1993
Dr. Leonilla Kovgan, Ukrainian Research
Center for Radiation Medicine, Kiev, Ukraine—
June 1993 to January 1994
Dr. Evgenii Garger, Institute of Radioecology
of the Ukrainian Agricultural Academy of
Sciences, Kiev, Ukraine—Jan 1993
Mr. Vladimir Kashpur, Institute of
Radioecology of the Ukrainian Agricultural
Academy of Sciences, Kiev, Ukraine—Jan 1993
Dr. Evgenii Garger, Institute of Experimental
Meteorology, Kiev, Ukraine—Mar 1991
Mr. Vladimir Kashpur, Institute of
Experimental Meteorology, Kiev, Ukraine—
Mar 1991
Dr. Oleg Vozzhennikov, Institute of
Experimental Meteorology, Obninsk, USSR—
Mar 1991

FTMS/VAMS ID: NA

Technology Transfer Type: NA

Status: NA

B. RUSSIAN PILOT PROJECTS

International Coordination Task (EM-52.1)

| <u>Data Field:</u> | <u>Data Description:</u> |
|--------------------------|--|
| DOE-HQ Sponsor: | Susan Johnson, EM-52, 301-903-7640 |
| DOE-Field Office Sponsor | Richard Scott, Oakland Operations Office, 510-637-1623 |
| U.S. Contact(s): | Martin Adamson, LLNL, 510-423-2024 |
| Foreign contact: | Zinfer Ismagilov |
| Company/Organization: | Boreskov Institute of Catalysis, Novosibirsk, (007)3832 35 57 50 |
| Foreign Country(s): | Russia |
| Other Participants: | TBD |
| EM Focus Area | Mixed Waste |
| Activity Description: | TTP SF 234301 Title: Russian Pilot Projects. Activity is to initiate Russian pilot technology development projects involving FSU environmental restoration and waste management technologies which have high application in the DOE complex cleanup activities. |
| Technology Description: | Task includes the continuation of the development of the improved DeNOx catalyst, the Honeycomb Catalyst Testing Unit, for off-gas emissions that meet the California Land Ban Disposal Restrictions. Successful completion of this project will result in the identification of a U.S. commercial partner willing to enter into a cooperative production and distribution agreement with the BIC. Preliminary plans will be made for |

B. RUSSIAN PILOT PROJECTS

International Coordination Task (EM-52.1)

the U.S. demonstration of this Russian Technology at an appropriate site.

Background:

Initial contacts were made between J.I. Davis and Zinifer Ismagilov at the 1992 DOE Workshop "Innovative Technologies for Cleaning the Environment: Air, Water, and Soil", organized by R. C. Ragaini, April 1992, in Erice Sicily.

Estimated Cost:

\$70K

Bilateral Agreement:

None

Duration of Collaboration:

FY95

Travel/Visit Dates:

None

FTMS/VAMS ID:

TBD

Technology Transfer Type:

NA

Status:

TBD

**C. COLLABORATIVE RESEARCH ON ATMOSPHERIC ADVISORY
CAPABILITY (ARAC) MODELS**

International Coordination Task (EM-52.1)

| <u>Data Field</u> | <u>Data Description</u> |
|--|---|
| DOE-HQ Sponsor | Lisa Gordon-Hagerty, Office of Emergency Response, DP-23 phone: (301) 903-3558; FAX 903-6417 |
| DOE-Field Office Sponsor | Alan Remick, DOE/SAN Phone: (510) 422-0688; FAX 423-5650 |
| U.S. Contacts | None |
| Foreign Contacts/ Organizations/ Foreign Countries | Erik Nasslund, Scientist Lennart Thaning Nat. Defence Research. Estab. (NDRE) S-907 42 Umea, Sweden Phone: 4690106600; FAX 4690106800 Volker Herrenberg, Scientist Paul Scherrer Institute (PSI), ETA Zurich, Switzerland Phone: 056992111; FAX 056982327 Guenter Prohaska, Scientist Swiss Federal Safety Inspect (HSK) |
| Other Participants | None |
| EM Focus Area | NA |
| Activity Description | Collaborative research on Atmospheric Release Advisory Capability (ARAC) models. |

C. COLLABORATIVE RESEARCH ON ATMOSPHERIC ADVISORY CAPABILITY (ARAC) MODELS

International Coordination Task (EM-52.1)

| | |
|---------------------------|---|
| Technology Description | The Swiss and Swedes are implementing the ARAC code as part of their emergency response programs. In return, the ARAC Program receives their expertise and code modules for implementation into the ARAC Program (e.g., plume washout/rainout; phase change) |
| Background | Sweden - Lennart Thaning first contacted ARAC in 1984 about getting copies of ARAC codes. Swiss - On Nov. 16, 1992 asked ARAC to be collaborators after they had selected the ARAC dispersion model to be the model of choice. |
| Estimated Cost | Mutual exchange of scientists results in no net cost to the program. |
| Bilateral Agreement | No bilateral agreement |
| Duration of Collaboration | Sweden - 1984 to date Swiss - 1982 to date |
| travel/Visit Dates | Sweden - E. Nasslund (NDRE) visit LLNL 6/92-6/93 J. Nasstrom(LLNL) visit NDRE 4/94-6/94 T. Sullivan (LLNL) visit NDRE 5/94 E. Nasslund(NDRE) visit LLNL 7/95 Switzerland - B. Lawver (LLNL) visit PSI 5/92 & 10/92 V. Herrenberg (PSI) visit LLNL 7/95 |

**C. COLLABORATIVE RESEARCH ON ATMOSPHERIC ADVISORY
CAPABILITY (ARAC) MODELS**

International Coordination Task (EM-52.1)

| | |
|--------------------------|--|
| FTMS/VAMS ID | None |
| Technology Transfer Type | Collaborative Agreements |
| Status | Effort is not for commercialization Both countries have the ARAC models |

D. SISTER LABORATORIES

International Coordination Task (EM-52.1)

| <u>Data Field:</u> | <u>Data Description:</u> |
|-------------------------|---|
| DOE-HQ Sponsor: | Ed Fei, DOE/NN-42, Office of Arms Control and Nonproliferation, International and Regional Security Division, 202-586-2124 |
| Field Office Sponsor: | DOE/OAK |
| U.S. Contact: | William Isherwood, LLNL, 510-423-5058 |
| Foreign Contacts: | Centre National de l'Energie, des Sciences et des Techniques Nuclearies (CNESTEN), Director EL MEDIOURI Khalid and ZENZOUNI Boujemaa, both at CNESTEN, 65 Rue Tansift - Agdal, Rabat, Morocco. Telephone (07) 77.87.04, Fax (07) 77.99.78 |
| Focus Area: | NA |
| Activity Description: | See trips |
| Technology description: | no new technologies developed |
| Background: | State Department and Arms Control and Disarmament Agency (ACDA) persuaded DOE NN to fund 'sister laboratory' activities in support of Section IV of the Nuclear Non-proliferation Treaty, which calls for technical assistance from the nuclear nations to those forgoing nuclear weapons programs. |
| Estimated Cost: | Direct funding from DOE is \$100,000 per country arrangement. This is to be leveraged as possible with outside funding of specific activities, e.g. technical missions supported by IAEA. |

D. SISTER LABORATORIES

International Coordination Task (EM-52.1)

Bilateral Agreement:

The 'Arrangement for the Exchange of Technical Information and for Cooperation in the Field of Peaceful uses of Nuclear Energy between the Moroccan National Center for Nuclear Energy Sciences and Techniques and the Lawrence Livermore National Laboratory" was signed by the Directors of the two laboratories in February and March 1994. The term extends until either party wishes termination.

Duration of Collaboration:

A first visit occurred to in October 1993 by a DOE/State Department/National Laboratory team, which resulted in the negotiation of the Arrangement. The first technical mission from LLNL took place in December 1993. Additional visits have taken place and are planned for the future. The DOE funded LLNL \$100,000 to be used on behalf of the Moroccans through this arrangement, which is being leveraged by preparing proposals to be funded by the IAEA.

Travel/Visit Dates:

LLNL personnel have traveled to Morocco as follows:
Bill Isherwood - October 1993, initial presentations of capabilities
Roger Carlson - December 1993, consultation on Safety Analysis Report
Bill Isherwood - October 1994, planning future work (in conjunction with the North Africa/Middle East Economic Summit)
In July 1994, a delegation of 5 Moroccan from CNESTEN visited LLNL for a week of technical discussions.

FTMS/VAMS ID:

NA

D. SISTER LABORATORIES

International Coordination Task (EM-52.1)

| | |
|---------------------------|--|
| Technology Transfer Type: | To date only technical consultations have taken place. We foresee the transfer of some commercial US software products with training on their use. A consulting visit by DOE's Physical Security review team is being planned for late summer/fall 1995. |
| Status: | No "commercialization or export" efforts planned. Arrangement continues on a technical consultation and collaboration basis. An arrangement similar to that described above is being negotiated with the Malaysian, Institute of Nuclear Technology and Research (MINT). A draft arrangement document is in the hands of Malaysians, being made to become subordinate to a formal government to government agreement for technical cooperation. The initial visit with DOE and ACDA representatives and other national labs took place in June 1994. |

III. APPENDIX

B. RELEVANT TECHNICAL INFORMATION

CHERNOBYL STUDIES PROJECT

Attached is the Memorandum of the First Meeting of the Joint Coordinating Committee for Radiation Effects Research (JCCRER), which was held on October 24-25, 1994 in Bethesda, Md.

СОГЛАШЕНИЕ

между Правительством
Российской Федерации и
Правительством Соединенных
Штатов Америки о

СОТРУДНИЧЕСТВЕ В ОБЛАСТИ ИЗУЧЕНИЯ
РАДИАЦИОННЫХ ВОЗДЕЙСТВИЙ
С ЦЕЛЬЮ МИНИМИЗАЦИИ ВЛИЯНИЯ
ПОСЛЕДСТВИЙ РАДИОАКТИВНОГО
ЗАГРЯЗНЕНИЯ НА ЗДОРОВЬЕ
ЧЕЛОВЕКА И ОКРУЖАЮЩУЮ СРЕДУ

A G R E E M E N T

between the Government of the
United States of America and
the Government of the
Russian Federation on

COOPERATION IN RESEARCH ON
RADIATION EFFECTS FOR THE
PURPOSE OF MINIMIZATION OF
CONSEQUENCES OF RADIOACTIVE
CONTAMINATION ON HEALTH
AND THE ENVIRONMENT

Меморандум рабочего совещания

Объединенного Координационного Комитета по
Изучению Радиационных Воздействий

Memorandum of Meeting

of the Joint Coordinating Committee on
Radiation Effects Research

24-25 октября 1994 г.
г. Бетезда, штат Мэриленд

24-25 October, 1994
Bethesda, Maryland

Memorandum

of the First Meeting of the Joint Coordinating Committee On Radiation Effects Research (JCCRER)

A Meeting of the joint Russian-American delegation within the framework of the Intergovernmental Russian-American Agreement on "Cooperation in Research on Radiation Effects for the purpose of Minimizing the Consequences of Radioactive Contamination on Health and the Environment" was held in Bethesda, MD, USA, on 24-25 October, 1994 at the Uniformed Services University of the Health Sciences.

The purpose of this meeting was to jointly review and agree on the plan of implementation of Activities under the program of cooperation, to approve the guidelines to be utilized to develop and carry out co-operative research projects, and to adopt a research agenda to be initiated within the first year of Activities under the Agreement.

The American side was represented by:

United States JCCRER members:

- Dr. Tara O'Toole - Assistant Secretary for Environment, Safety and Health, U.S. Department of Energy and U.S. Co-chair;
- Dr. E. Gail de Planque - Commissioner, U.S. Nuclear Regulatory Commission;
- Dr. Jo Ivey Boufford - Principal Deputy Assistant Secretary for Health, U.S. Department of Health and Human Services;
- Ms. Christine Eisemann - Deputy Director, Environmental and Life Sciences, U.S. Department of Defense (alternate);

United States Executive Committee (EC) members:

- Dr. Harry J. Pettengill - Director, Office of International Health Studies, U.S. Department of Energy and U.S. Co-chair;
- Dr. E. John Ainsworth - Scientific Director, Armed Forces Radiobiological Research Institute, U.S. Department of Defense;
- Dr. Peter Henry - Director, Office of Europe and the NIS (OIH/OASH), U.S. Department of Health and Human Services;
- Ms. Carol Kessler - Deputy for Nuclear Safety, Office of Nuclear Energy, U.S. Department of State;
- Dr. Terry L. Thomas - Associate Professor and Director, Division of Epidemiology, Uniformed Services University of the Health Sciences;

- **Dr. Shlomo S. Yaniv** - Senior Technical Advisor, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission.

The Russian side was represented by:

Russian JCCRER members:

- **Dr. Vassily Iakovlevich Vozniak** - First Deputy Minister, Ministry of the Russian Federation for Civil Defense Affairs, Emergencies and Elimination of Consequences of Natural Disasters and Russian Co-chair;
- **Dr. Nikolai Nikolaevich Egorov** - Deputy Minister, Ministry of the Russian Federation for Atomic Energy;
- **Dr. Alexandr Dmitrievich Tsaregorodtsev** - Deputy Minister, Ministry of Health and the Medical Industry of the Russian Federation.

Russian EC members:

- **Dr. Leonid Alexandrovich Bolshov** - Director, Russian Academy of Sciences Nuclear Safety Institute and Co-Chair;
- **Dr. Lubov Ivanovna Arissimova** - Advisor to Minister, Ministry of the Russian Federation for Civil Defense Affairs, Emergencies and Elimination of the Consequences of Natural Disasters;
- **Dr. Mikhail Filippovich Kisselev** - Deputy Director, Federal Department, Ministry of Health and the Medical Industry of the Russian Federation;
- **Dr. Alexandr Pavlovich Panfilov** - Division Head, Ministry of the Russian Federation for Atomic Energy.

In accordance with the provisions of responsibility that were determined at the July 27-28, 1994 preparation meeting in Moscow, the American delegation reported on the proposed plan for implementation of activities under the Agreement. After discussion of the administrative and organizational structures to implement the program of cooperation the joint parties agreed to the adoption of the document with the following stipulations and instructions:

Within the framework of the Implementation Plan, it has been determined the parties to the Agreement may utilize different methods to fund and support both administrative and research activities under the Agreement. The Russian Federation intends to fund all activities through a centralized authority established by EMERCOM whereas the United States may utilize differing methods to support research institutions and researchers for activities jointly approved by both parties. The United States has not established the appropriate method to provide funding for administrative and operational costs that are necessary to oversee and administer the program of cooperation and are the responsibilities of both parties. The JCCRER by joint decision hereby instructs that within the next 60 days, the EC to the JCCRER will evaluate and report the following:

- a) Determine the funding necessary to permit the development of proposals and feasibility studies for those research directions approved by the JCCRER for the

first year under the Agreement. Pending final agreement on financing research projects, both Parties have indicated that about 1 million dollars US and equivalent Russian assistance is available to support independent and cooperative aspects of research under the Agreement during the first year.

- b) Evaluate and recommend the most appropriate method to ensure effective administration and oversight of operations under the JCCRER. At least two practical methods to be evaluated include the adoption of an Executive Secretariat that would be jointly supported by the parties or by utilization of an arrangement of joint support to be carried out by the Executive Agents to the Agreement.
- c) Determine and propose the joint funding required by both parties to organize and support at least two workshops during the first year of the Agreement. At least one workshop should present the information and the data available from dose reconstruction and epidemiological studies that have already been performed in the U.S. and RF within the context of Directions 1 and 2.
- d) Evaluate and propose the funding necessary and the methods for selection that would result in the selection of Scientific Review Group participants for the first and second scientific directions within the first year.

The Russian delegation reported on plans for research activities proposed under the program of cooperation. The parties upon review of the research activities proposed have agreed to the following:

- 1) For Direction 1, both parties agree to these research proposals with the stipulation that the EC should modify proposals 1.1 and 1.2 to 1) ensure data identification, quality assurance and preservation and to 2) accommodate the closer integration of the dosimetry (dose reconstruction) with the risk estimation for defined residential populations. Both parties agree that initial epidemiologic studies of residential populations should focus on, but not be limited to, stochastic effects in the South Urals populations.
- 2) For Direction 2, both parties jointly agree to adopt the program of research as presented with minor modification.
- 3) For Direction 3, the following conclusions were reached. The United States delegation proposed that no definitive decisions be made on project 3.2 until the U.S. has evaluated and coordinated on other potential inter-governmental Agreements that may more appropriately facilitate or support this area of research. With respect to 3.1 the JCCRER proposed that the EC be asked to evaluate this proposal and to further integrate these methodological research approaches with the activities defined in Direction 1 and Direction 2. The EC and the US should be prepared to report its conclusions to the

JCCRER within the next 60 days...

The American delegation presented the proposed guidelines for conducting joint scientific research under the Agreement. The parties endorse their adoption with the following stipulations:

The EC is instructed to further evaluate and report to the JCCRER on proposed modified language for incorporation within the guidelines to provide the following within 60 days:

- 1) Develop language that will ensure effective and efficient communication of research progress, interim and final results on a timely basis to the EC and JCCRER for release to the public.
- 2) Develop a mechanism to ensure the EC and JCCRER are advised and concur in the release of interim results and that such releases are fully coordinated in the Project Research Team. Measures should be included to ensure reasonable protection of scientific integrity and independence.
- 3) Propose language for inclusion in the guidelines to ensure strict adherence to intellectual property rights as prescribed in the Annex to the Agreement.

for the Russian Federation


Dr. Vassiliy Vozniak

for the United States of America


Dr. Tara O'Toole

**Proposed Implementation Plan under the
Agreement Between the Governments of the United States
of America and the Russian Federation on Cooperation in
Research on Radiation Effects**

1. BACKGROUND

The activities of nuclear industry, worldwide, during the last 50 years has resulted in significant contamination of the environment, and exposure to thousands of people among the general population and nuclear industry workers. Until recently much of the data related to these exposures remained classified. During the last few years a great deal of this information has been declassified, thus providing the opportunity to study the consequences of those exposures and greatly increase our understanding of the health effects of radiation.

The preservation, restoration and analysis of radiation exposure, medical, and environmental data is extremely important to the United States, the Russian Federation and to the world. These data may serve as the basis for new radiation effects studies that could offer conclusions that differ from those studies conducted in the past. Most of our knowledge on health effects and risks associated with radiation exposure is based on studies of persons exposed for medical purposes and studies of the atomic bomb survivors in Hiroshima and Nagasaki. The confounding factors in the studies on people exposed for medical reasons include an already diseased population, age and gender distributions which are unrepresentative of the general population, and in most cases, involve large doses, delivered at high rates, to just portions of the patients' bodies. The atomic bomb survivors were exposed to a very short burst of external radiation, which does not correspond to the pattern of exposure normally encountered or expected in the nuclear fuel cycle and in other uses of radiation and radioactive materials. In all radiation risk issues, there is no direct human database equal in robustness to that of the atomic bomb survivor database; and thus our current risk and regulatory policies are primarily driven by and extrapolated from the Hiroshima and Nagasaki data. However, the assessment of risk by extrapolation to low doses and dose rates, from data collected at high doses and rates, has not been validated and this issue is of premier importance for accurate risk assessment and management.

One of the world's most significantly contaminated areas is in the Southern Urals area of the Russian Federation. The Southern Urals databases may provide an opportunity to answer the question of whether chronic low-level exposures pose a coefficient of risk different from that previously assumed. The range of doses is comparable to Hiroshima-Nagasaki, and the exposed populations in the Russian Federation are larger. The significant differences are that the Southern Urals populations were chronically exposed over long periods of time, and the exposures

were from both external radiation and internally deposited radionuclides. More definitive studies on these populations may prove to be a key factor in future reassessments of radiation protection standards and regulations as well.

Accordingly, this situation now provides us with a unique opportunity to address our questions and issues concerning possible risks to populations from protracted exposure to internal and/or external radiation. Possible examples include exposures from uranium mining, from nuclear facilities operations, from transport and disposal of radioactive materials, from radon, from the testing and dismantling of nuclear weapons, from medical exposure, and from grossly contaminated sites or facilities. Investigation and validation of a coefficient of risk from chronic radiation exposure compared to acute exposure could be of major medical and economic significance, as it could provide guidance on risks to actually and potentially exposed populations, populations that today are seriously concerned about future risks from past or future nuclear operations.

As a result of these opportunities and concerns, several discussions were held between the United States and Russian Governments during the past two years. The culmination of these negotiated efforts was in January, 1994, when both Governments signed the *"Agreement Between The Government of the United States of America and the Government of the Russian Federation on Cooperation in Research on Radiation Effects for the Purpose of Minimizing the Consequences of Radioactive Contamination on Health and the Environment."*

2. AUTHORITIES

Article III of the signed Agreement authorizes the Parties to establish a Joint Coordinating Committee for Radiation Effects Research (JCCRER) for the purpose of implementing the Agreement.

Article III also states that the Executive Agents responsible for coordination of this Agreement, shall be, for the United States of America, the United States Department of Energy (DOE), and for the Russian Federation, (since renamed to) the Ministry of the Russian Federation for Civil Defense Affairs, Emergencies, and Elimination of Consequences of Natural Disasters (EMERCOM).

3. SCOPE OF THE WORK

The areas of cooperation under the Agreement and the forms of cooperation to be approved by the JCCRER under this Agreement (Article II and Article IV), and as mutually agreed to by the Parties, falls under the broad field of ionizing radiation effects research, more specifically radiation effects upon the health and the

environment for the purpose of minimizing the consequences of radioactive contamination. Also noted in the Agreement, as a benefit to humanity, is the increased scientific understanding of the radiation effects upon the health and the environment.

4. STRUCTURE AND MEMBERSHIP

A. Joint Coordinating Committee for Radiation Effects Research (JCCRER)

Article III of the Agreement calls for the establishment of a Joint Coordinating Committee for Radiation Effects Research (JCCRER) to implement the Agreement. According to the Agreement, the JCCRER "shall consist of an equal number of representatives from each Party". It is proposed that, initially, four members be chosen by each Party to the Agreement. A Co-Chairperson for each Party shall be represented by a JCCRER member of each Executive Agent, which is responsible for coordinating the Agreement. The level of representation should be at the rank of Deputy Minister, Assistant Secretary, or equivalent, from key Ministries and Agencies involved in the cooperation within the framework of the Agreement. In the future, the membership of the JCCRER may be expanded upon mutual agreement of the Parties. It is initially proposed that the JCCRER meet annually, with meetings to be hosted by each Party on an alternate basis. Following is the proposed initial membership of the JCCRER:

United States of America:

- U.S. Department of Energy**
Tara J. O'Toole, M.D., M.P.H. (Co-Chairperson for United States of America)
Assistant Secretary for Environment, Safety and Health
- U.S. Nuclear Regulatory Commission**
E. Gail de Planque, Ph.D.
Commissioner
- U.S. Department of Health and Human Services**
Jo Ivey Boufford, M.D.
Principal Deputy Assistant Secretary for Health
- U.S. Department of Defense**
Joseph Osterman, Ph.D.
Director, Office of Environmental and Life Sciences

СОГЛАШЕНИЕ

между Правительством
Российской Федерации

и

Правительством Соединенных
Штатов Америки

о

СОТРУДНИЧЕСТВЕ В ОБЛАСТИ ИЗУЧЕНИЯ
РАДИАЦИОННЫХ ВОЗДЕЙСТВИЙ С ЦЕЛЬЮ
МИНИМИЗАЦИИ ВЛИЯНИЯ ПОСЛЕДСТВИЙ
РАДИОАКТИВНОГО ЗАГРЯЗНЕНИЯ НА
ЗДОРОВЬЕ ЧЕЛОВЕКА И
ОКРУЖАЮЩУЮ СРЕДУ

A G R E E M E N T

between the Government of the
United States of America

and

the Government of the
Russian Federation

on

COOPERATION IN RESEARCH ON
RADIATION EFFECTS FOR THE
PURPOSE OF MINIMIZATION OF
CONSEQUENCES OF RADIOACTIVE
CONTAMINATION ON HEALTH
AND THE ENVIRONMENT

Direction 1

MEDICAL ASPECTS OF RADIATION EXPOSURE EFFECTS ON POPULATION

PROJECT 1.1

Dose Reconstruction for the Population Subjected to Radiation

Moscow

1994

PROJECT 1.1

Dose Reconstruction for the Population Subjected to Radiation

1 Background

Technological dumps of the radioactive materials into the atmosphere, waste dumps into Techa river, occurred in 1949-1956, emergency situations in 1957 and 1961 resulted in high exposure levels of the population in the region of the river Techa and the Eastern Ural radioactive trace. The information on the radioactive contamination of the environment, source characteristics, and dosimetry studies requires systematization and estimation.

Since 1986 large scale dosimetric studies of the population subjected to radiation after the Chernobyl accident are performed.

The aim of the project is the improving of the reconstruction methods of the internal and external population exposure doses, and the dose reconstruction itself for the population with the maximum exposure rate.

2 Directions of work

Analysis and systematization of all archive information on Ural district including:

- measurements of the radioactivity in the environment objects, which started from 1951;
- personalized data on migration for 90,000 people — residents of the most contaminated territories;
- life-time measurements of the radionuclide content of the whole body (12 thousand persons), separate organs (15 thousand persons), autopsy data (since 1951).

System analysis of the archive information on regions contaminated by radionuclides after the Chernobyl accident includes:

- measurements of radioactivity in the environment, which started from 1986;
- dosimetric data on external and internal irradiation.

Continuation of the dosimetry investigations using whole body counting, electron spin resonance, thermo-luminescent dosimetry methods.

Development of the data reconstruction models of the external (under conditions of the radioactive contamination of the local site and the atmosphere) and internal exposure from long-living plutonium, strontium-90, cesium-137, tritium, short-living iodine-131, and other radionuclides with account for the local conditions.

Improving of the databases and software for the exposure dose reconstruction.

Reconstruction of the personal exposure doses and estimate of the reliability of the obtained data.

3 First-year works of the project

- proofing of the project;
- detailed formulation of the aims and tasks of the project;
- choice of partners;
- collecting and preliminary estimate of the accumulated data on the radioactive contamination of the environment and results of the dosimetry measurements;
- determination of the sources and amount of funding;
- detailed planning of the joint work.

4 Assumed Russian participants of the project

- Ural Research Center for Radiation Medicine;
- St. Petersburg Radiation Hygiene Institute;
- The First Branch of the Biophysics Institute of the Russian Ministry of Health;
- Industrial Association "MAYAK".