

ORNL-51 Foreign Trip Report

Travel Authorization Number 41061

Date	09/04/2003	
Subject	Report of Foreign Travel	
Traveler	Marvin J. Haire	User ID mjh
Position	Project Manager, Depleted Uranium Uses Research and Development Project	
To	P. M. Dehmer	
Joint Report	No	Joint Travel Authorization #
Sensitive Country	Yes	
Purpose	(1) To review detailed work plans for International Science and Technology Center (ISTC) Projects 2691, 2693, and 2694 in Moscow and Sarov, Nizhny Novgorod Region, Russia, and (2) to attend and participate in the 2nd International Symposium on Safety and Economy of Hydrogen Transport (IFSSEHT-2003), August 18–21, 2003, in Sarov, Nizhny Novgorod Region, Russia.	
Date From	08/16/2003	Date To 08/23/2003
Sites Visited	The International Center, Sarov, Nizhny Novgorod Region, Russia: August 18–22, 2003. ISTC Headquarters Building, Moscow, Russia: August 22, 2003.	
Abstract	Approval was given for the detailed work plans of ISTC Projects 2691, 2693, and 2694. The goal of ISTC Project 2693 is to provide fundamental scientific information concerning the sorption properties of technetium and neptunium on oxides and hydroxides of uranium under spent nuclear fuel (SNF) repository conditions. The information will better define the potential benefits of using depleted uranium to improve the performance of waste repositories such as Yucca Mountain. The objective of Project 2694 is to develop improved technology for the low-cost manufacture of depleted-uranium dioxide/steel cermet casks for storage, transport, and disposal of SNF. Project 2691 has the goal of developing better methods for the manufacture of uranium aggregate and uranium aggregate concretes for SNF storage casks. At the IFSSEHT-2003 Conference, the traveler presented a paper describing hydrogen storage research activities at Oak Ridge National Laboratory. The Russians are at an early stage in the development of a coherent hydrogen research and development program.	
Itinerary	8/15–8/16: Travel from Oak Ridge, Tennessee, USA, to Moscow, Russia 8/17–8/18: Travel from Moscow, Russia, to Sarov, Russia 8/21–8/22: Travel from Sarov, Russia, to Moscow, Russia 8/23: Travel from Moscow, Russia, to Oak Ridge, Tennessee, USA	

Contacted

IFSSEHT Conference

Alexander Gusev	Principal organizer of the IFSSEHT Conference
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ISTC Project Reviews at Sarov

Alexander Morenko	
Tatyana Kazakovskaya	Geochemistry expert
Victor Scherbakov	
Ivan Goncharov	Corrosion expert
Sergei Yermichev	Concrete expert
Vitaly Matveev	Assistant Program Manager
Vyacheslav Shapovalov	Program Manager, primary contact
Anna Galkina	Translator

Meeting at ISTC Building in Moscow

Lev Tocheny	ISTC Project Manager
Vyacheslav Shapovalov	All-Russian Research Institute of Experimental Physics (VNIIEF)
Sergei Yermishev	VNIIEF
Tatyana Kazakovskaya	VNIIEF
Anna Galkino	VNIIEF, translator
Vladimir Orlov	Russian Institute for Inorganic Materials (VNIINM) (commonly called the Bochvar Institute)
Victor Sergeev	VNIINM
Alexey Visin	VNIINM
Alexander Maslov	VNIINM
Vladimir Sorokin	VNIINM
Victor Seredenko	Russian Research Institute of Chemical Technology (RRICT)
Vitaly Gotovchikov	RRICT
Alexander Ivanov	RRICT
Valentin Orekhov	RRICT
Vladimir Shatalov	RRICT
Vladimir Gromov	Physical Chemistry Institute (geochemistry expert)
Elena Zakharova	Physical Chemistry Institute (geochemistry expert)
Nikolai Sviridov	26 Institute of RFMOD

**Report of Foreign Travel to Russia to Review Detailed Work Plans for
ISTC Projects and to Participate in the 2nd International Symposium on Safety
and Economy of Hydrogen Transport**

**Marvin Jonathan Haire
August 16–23, 2003**

The traveler (1) reviewed detailed work plans for International Science and Technology Center (ISTC) Projects 2691, 2693, and 2694 in Moscow and Sarov, Nizhny Novgorod Region, (2) attended and participated in the 2nd International Symposium on Safety and Economy of Hydrogen Transport, August 18–21, 2003 (IFSSEHT-2003), in Sarov, Nizhny Novgorod Region, Russia.

Beneficial Uses of Depleted Uranium

ISTC Projects 2691 (DUCRETE), 2693 (Sorption), and 2694 (Cermet) have the common goal of developing beneficial uses of surplus depleted uranium (DU). This work is funded by the U.S. Department of State through the ISTC, which paid travel expenses for this trip. The work supports the U.S. Department of Energy (DOE) DU Uses Research and Development Project, which is funded by DOE–Environmental Management (EM). A number of draft work plans had previously been developed and exchanged. Comments had been provided by Oak Ridge National Laboratory (ORNL) staff and resolved by All-Russian Research Institute of Experimental Physics (VNIIEF) staff. Thus, many of the details of the work plans had been resolved prior to the travel.

The major discussions involved definition of technical and project interfaces. Technical interface specifications (available forms of DU, composition of Yucca Mountain repository groundwater, etc.) involved defining research boundary conditions to ensure that the results of the work are applicable to the use of DU in the United States as well as in Russia. Project interfaces included defining technical and project contacts for each ISTC activity. One of the major issues was the terms and conditions for transport of DU samples of cermets and DUCRETE to the United States. VNIIEF staff requested that ORNL and VNIIEF agree to a separate contract to transport samples from Sarov, Russia, to Oak Ridge, Tennessee. Apparently, a great deal of paperwork is required to ship nuclear materials from VNIIEF. The traveler insisted that DOE, through ORNL, would pay only for the shipping container and shipment of the material from VNIIEF to Oak Ridge and that VNIIEF and the ISTC must bear the cost of preparing the samples for shipment and provide them on a loading dock at Sarov, FOB.

The “sorption” project will deal with properties of uranium in various chemical forms that impact the sorption of various radionuclides. The scope does not include changes in permeability to groundwater flow (a second set of mechanisms that retards release of radionuclides from the repository). This subject represents a possible new initiative for ISTC Project No. 2693.

Neither ISTC Project 2691 nor Project 2694 includes within their workscope evaluation of the potential for the corrosion, over geologic time, that is caused by trace amounts of fluorine impurities in urania. This subject would be a useful addition to the present scope of these two projects.

The scope of work for a new International Proliferation Prevention (IPP) proposal to DOE-NN was agreed upon. Due to cost constraints (~\$1M), the proposal will be for a 1/4-scale demonstration SNF cask of either DUCRETE or DUO_2 -steel cermet materials. The proposed work will include designing and fabricating the demonstration cask, as well as conducting tests to prepare the technological basis for licensing (but not licensing per se). The IPP proposal will be based on our joint paper to be presented at

the ATOMTRANS-2003 Conference in St. Petersburg, Russia, September 22–25, 2003. The current proposal is for one demonstration cask. However, two casks could be fabricated and tested if the U.S. partner company (presently thought to be Holtec International) were to design the cask. A first-draft IPP proposal will be developed by the time of the Joint Coordinating Committee Science and Technology (JCCST) meeting in St. Petersburg, September 24–25, 2003, which will be cochaired by DOE Undersecretary Robert Card.

ISTC project reviews took place in conference rooms at the International Conference Center in Sarov and at ISTC Headquarters Building in Moscow. Dr. Lev Tocheny of the ISTC led the review in Moscow. Dr. Vyacheslav Shapovalov of VNIIEF was the primary contact at Sarov.

Hydrogen Conference

Five Russian academicians attended the conference, indicating the importance the Russians placed on the meeting. The conference was held in Sarov, a closed city, with the meetings occurring in the International Conference Center in Sarov. A total of 280 people were registered (representing 82 institutes or organizations and 12 countries), and 114 presentations were made. The traveler presented the paper “Hydrogen Storage Research Activities at Oak Ridge National Laboratory.” Key Observations:

- *The European Community (EC) is developing a major hydrogen laboratory facility at Petten.* Dr. Constantina Filiou (scientific officer, Clean Energies Institute for Energy) presented a paper (copy of presentation available upon request) describing the major hydrogen test facilities being constructed at Petten in the Netherlands. These EC facilities will provide standardized testing for fuel cell systems and various hydrogen storage media (solid absorbers, high-pressure hydrogen, etc.). There are strong incentives for the U.S. to consider some type of joint agreement with the EC. The EC Petten facility will lead the jointly funded EC activities in Europe.
- *The Russians are at an early stage in the development of a coherent hydrogen research and development program.* The attendance list indicated a major interest in hydrogen. However, the papers and discussions indicated that the Russians are only beginning to organize their efforts in this area. In fact, one of the goals of the conference was to help organize the Russian effort to develop a hydrogen program.

DISTRIBUTION

1. R. L. Beatty, Bldg. 5700, MS 6165
2. Patrick J. Belland, Safeguards and Security Division, NADP-6, Y-12 Site Office, P.O. Box 2001, Oak Ridge, TN 37831-8570
3. Gerald Boyd, U.S. Department of Energy, MS-M-1, P.O. Box 2001, Oak Ridge, TN 37831
4. Dr. Patricia Dehmer, Associate Director for Basic Energy Sciences, SC-10/Germantown Building U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-1290
5. C. W. Forsberg, Bldg. 5700, MS 6165
6. R. G. Gilliland, Bldg. 4500N, MS 6248
7. M. Jonathan Haire, Bldg. 5700, MS 6166
8. D. J. Hill, Bldg. 4500N, MS 6228
9. Andrew Hood, U.S. Department of State, Office of Proliferation Threat Reduction, Rm. 3327, Truman Building, 2201 C Street, NW, Washington, DC 20520
10. Howard Huie, General Engineer, U.S. Department of Energy, EM-32, Cloverleaf Building, 1000 Independence Avenue, SW, Washington, DC 20585-2040
11. Office of Counterintelligence, 4007, MS 6076
12. ORNL FTMS Coordinator, 5002, MS 6389 (RC)
13. OSTI, Attn: David Bellis, P.O. Box 62, Oak Ridge, TN 37830
14. C. Doug Ringer, Bldg. 9114, MS 8284
15. Debbie Tijani, IN-1/Forrestal Building, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585
16. TRT, 4×24NHB, Washington, DC 20505