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**ORNL
FOREIGN TRIP REPORT
TA 406114**

DATE: June 5, 2017

SUBJECT: Report of Foreign Travel to Fontenay aux Roses, France – Vladimir Sobes, Reactor and Nuclear Systems Division

TO: Angela Chambers, **Nuclear Criticality Safety Program Manager, National Nuclear Security Administration / NA-511/GTN, 1000 Independence Ave., SW, Washington, DC 20585-1290**

FROM: Vladimir Sobes

**MEETING:
TITLE** Working Party on International Nuclear Data Evaluation Cooperation (WPEC)
Meeting and NCSP Nuclear Data Collaboration Meeting with IRSN

**MEETING:
LOCATION** Organization for Economic Co-operation and Development (OECD) Nuclear Energy Agency (NEA) Data Bank, Paris, France; Institute of Radiological protection and Nuclear Safety (IRSN), Fontenay Aux Roses, France

**MEETING:
DATES** 05/15/2017 – 06/02/2017

**ATTENDEES:
ON BEHALF
OF NCSP** Vladimir Sobes

**MEETING:
BENEFIT TO
NCSP** The US DOE Nuclear Data Advisory Group (NDAG) maintains and constantly updates lists of materials that are considered important for applications in nuclear criticality safety. The NDAG has identified gadolinium to be an important element for an updated nuclear data evaluation in the near future. The US DOE Nuclear Criticality Safety Program (NCSP), following the advice of the NDAG committee, added the evaluation of gadolinium to the list of isotopes considered as important for measurement and evaluation in the next five years to its published Five-Year Execution Plan for the Mission and Vision of the program. The nuclear data evaluation of gadolinium has been identified as a joint effort between Oak Ridge National Laboratory (ORNL) and the Institute of Radiological protection and Nuclear Safety (IRSN) in France under the existing NCSP/IRSN memorandum of understanding. Dr. Sobes, the traveler, and Dr. Leal were identified as the two Principle Investigators (PIs) for the evaluation of gadolinium respectively for their

institutions. This trip helped to accomplish the execution plan laid out by the US DOE NCSP and in particular supported the goal of improving the differential data evaluations for isotopes of interest for nuclear criticality safety in the US. Also, this visit helped ensure that DOE and ORNL maintain a leadership position in the nuclear data analysis area while also cultivating international partnerships that could provide further data and information to support the US NCSP.

During the travel to France, Dr. Sobes also participated in the OECD/NEA Working Party on International Nuclear Data Evaluation Co-operation (WPEC) meeting where he is an active participant in Subgroups 38 and 39 (SG38, SG39). SG38 is Working group is focused on developing a new nuclear data structure as an international standard and SG39 is focused on development of methods to provide feedback from nuclear covariance data adjustment to the evaluated nuclear data files. At the WPEC Meeting Dr. Sobes presented a proposal for a new OECD/NEA Subgroup (44) to focus on nuclear data covariance evaluation to the WPEC Committee. Nuclear data covariance is fundamentally important to the US DOE NCSP as it influences safety margins derived from modeling and simulation of existing and proposed criticality safety systems. Dr. Sobes has been selected to represent the interests of ORNL and serve as the chair of this international expert group. The proposal for the new subgroup was accepted by the WPEC committee and Dr. Sobes chaired the kick-off meeting of SG44. Overall, the objective of the WPEC meeting is to coordinate the international nuclear data measurement and evaluation work activities among the international nuclear data projects, and participation in the WPEC meeting is important for the NCSP as the meeting provides an opportunity to exchange information about nuclear data work efforts and help influence work activities that can benefit NCSP nuclear data work efforts.

PURPOSE: Dr. Sobes is the principle investigator (PI) for the task of performing the nuclear data evaluation in the resonance region for three of the isotopes of gadolinium that have been identified as important for evaluation in the next five years in Five Year Plan of the Mission and Vision of the NCSP. Dr. Leal is the PI for performing the nuclear data evaluation for the two other major isotopes of gadolinium from IRSN. The primary purpose of this trip was for Dr. Sobes to collaborate with Dr. Luiz Leal at IRSN on the joint evaluation of the isotopes of gadolinium and allow the two researchers to synchronize the on-going evaluation of all five isotopes. Further, Dr. Sobes and Dr. Leal collaborated methods of experimental data analysis, jointly studied historical cross section measurements that can serve to improve the nuclear data evaluation for gadolinium and discussed coordinated strategies for generating covariance data.

SITES: IRSN, Fontenay aux Roses, France
VISITED NEA OECD Conference Centre, Paris, France

ABSTRACT: The traveler made a trip to the Institute of Radiological protection and Nuclear Safety (IRSN) to work collaboratively with the IRSN nuclear data team on cross section evaluations in the resolved resonance region for isotopes of interest to NCSP and IRSN. The traveler also participated in expert group meeting at the NEA as part of the Working Party on International Nuclear Data Evaluation Co-operation.

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REPORT OF FOREIGN TRAVEL

**Vladimir Sobes
Fontenay aux Roses, France
May 14, 2017 – June 3, 2017**

PURPOSE OF TRAVEL

The US DOE Nuclear Data Advisory Group (NDAG) maintains and constantly updates lists of materials that are considered important for applications in nuclear criticality safety. The NDAG has identified gadolinium to be an important element for an updated nuclear data evaluation in the near future. The US DOE Nuclear Criticality Safety Program (NCSP), following the advice of the NDAG committee, added the evaluation of gadolinium to the list of isotopes considered as important for measurement and evaluation in the next five years to its published Five-Year Execution Plan for the Mission and Vision of the program. The nuclear data evaluation of gadolinium has been identified as a joint effort between Oak Ridge National Laboratory (ORNL) and the Institute of Radiological protection and Nuclear Safety (IRSN) in France under the existing NCSP/IRSN memorandum of understanding. Dr. Sobes, the traveler, and Dr. Leal were identified as the two Principle Investigators (PIs) for the evaluation of gadolinium respectively for their institutions. This trip helped to accomplish the execution plan laid out by the US DOE NCSP and in particular supported the goal of improving the differential data evaluations for isotopes of interest for nuclear criticality safety in the US. Also, this visit helped ensure that DOE and ORNL maintain a leadership position in the nuclear data analysis area while also cultivating international partnerships that could provide further data and information to support the US NCSP.

Dr. Sobes is the principle investigator (PI) for the task of performing the nuclear data evaluation in the resonance region for three of the isotopes of gadolinium that have been identified as important for evaluation in the next five years in Five Year Plan of the Mission and Vision of the NCSP. Dr. Leal is the PI for performing the nuclear data evaluation for the two other major isotopes of gadolinium from IRSN. The primary purpose of this trip was for Dr. Sobes to collaborate with Dr. Luiz Leal at IRSN on the joint evaluation of the isotopes of gadolinium and allow the two researchers to synchronize the on-going evaluation of all five isotopes. Further, Dr. Sobes and Dr. Leal collaborated methods of experimental data analysis, jointly studied historical cross section measurements that can serve to improve the nuclear data evaluation for gadolinium and discussed coordinated strategies for generating covariance data.

During the travel to France, Dr. Sobes also participated in the OECD/NEA Working Party on International Nuclear Data Evaluation Co-operation (WPEC) meeting where he is an active participant in Subgroups 38 and 39 (SG38, SG39). SG38 is Working group is focused on developing a new nuclear data structure as an international standard and SG39 is focused on development of methods to provide feedback from nuclear covariance data adjustment to the evaluated nuclear data files. At the WPEC Meeting Dr. Sobes presented a proposal for a new OECD/NEA Subgroup (44) to focus on nuclear data covariance evaluation to the WPEC Committee. Nuclear data covariance is fundamentally important to the US DOE NCSP as it influences safety margins derived from modeling and simulation of existing and proposed criticality safety systems. Dr. Sobes has been selected to represent the interests of ORNL and serve as the chair of this international expert group. The proposal for the new subgroup was accepted by the WPEC committee and Dr. Sobes chaired the kick-off meeting of SG44. Overall, the objective of the WPEC meeting is to coordinate the international nuclear data measurement and evaluation work activities among the international nuclear data projects, and participation in the WPEC meeting is important for the

NCSP as the meeting provides an opportunity to exchange information about nuclear data work efforts and help influence work activities that can benefit NCSP nuclear data work efforts.

Overall, Dr. Sobes' foreign travel to IRSN was successful and essential to enable ORNL to make progress on the planned NCSP nuclear data evaluation tasks as defined in the NCSP Five Year Plan.

Persons Contacted at IRSN

Luiz Leal, Host
Raphaëlle Ichou
Sophie Pignet
Stephan Ivo

Itinerary

05/13/17 – 05/14/17	Travel from Knoxville, USA to Paris, France
05/15/17 – 05/19/17	NEA/OECD Conference Center, Paris, France
05/22/17 – 06/02/17	IRSN, Fontenay aux Roses, France
06/03/17	Travel from Paris, France to Knoxville, USA

DISTRIBUTION

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