

COE-INES Business Trip Report

Conference Name: 9th International Conference "Nuclear Safety & Nuclear Education" and 1st Russia - Japan Workshop "Russia-Japan International Research Cooperation and Nuclear Education Toward Innovative Nuclear Energy Systems"

Person Attending: 原子核工学専攻博士後期過程 2年 Alan Takibayev

Dates: October 22-30, 2005

Venue: Obninsk State Technical University for Nuclear Power Engineering, Obninsk, Russia

The 9th International Conference "Nuclear Power Safety and Nuclear Education" was held in Obninsk, Russian Federation, 2005 October 24-27. The conference was set to cover a range of nuclear-related subjects including: nuclear safety, advanced nuclear system and fuel cycle concepts, nuclear power plant control and diagnosis, decommissioning, nuclear non-proliferation, nuclear education and environmental issues. The participants of the conference had a unique opportunity to share their ideas as well as to shape and to discuss current problems and shortcomings concerning nuclear education and nuclear science knowledge preservation.

The agenda of the conference was settled during the plenary session (Fig. 1) held on Day 1 at Obninsk Palace of Science: fast reactor systems (Prof. V. Orlov), self-consistent nuclear energy systems (Prof. M. Saito), small-scale nuclear reactors (Prof. Y. Kazansky), non-proliferation issues (Prof. A. Shmelev) and other interesting topics were presented and discussed by prominent scientists and nuclear experts. Parallel sessions were held on the second and third day of the conference at OINPE (Obninsk State Technical University for Nuclear Power Engineering and previously known also as Obninsk Institute for Nuclear Power Engineering). I attended sessions "Innovative Nuclear Systems and Fuel Cycles" at October 25, "Nuclear Non-Proliferation" and "Nuclear Education" at October 26.



Fig. 1. During the plenary session

My presentation entitled "Application of Fusion Neutron Source for Denaturing of Plutonium" was made at the session "Nuclear Non-Proliferation". The goal of the study presented is to reveal potential of hybrid fusion-fission facilities to be applicable to the problem of denaturing of plutonium either of reactor spent fuel or of military origin. An example (shown in Fig. 2) demonstrates typical change of proliferation resistance properties of weapon-grade Pu (red) and reactor-grade Pu (black) upon irradiation in gas-cooled pebble-bed type fission blanket of DT-fusion neutron source. The graph indicates that denaturing of weapon-grade Pu is effective even under a rather modest irradiation conditions assumed in the study. Denaturing of reactor

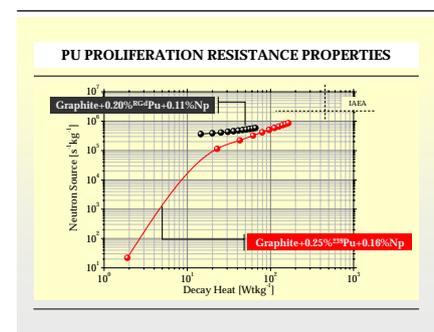


Fig. 2. Example of Pu denaturing

grade Pu has however higher requirements. Nevertheless the referred plutonium composition can be denatured up to approximately 10-15% of ^{238}Pu content.

The last day of the conference featured closing address and then technical tour to the 1st Nuclear Power Plant at IPPE (Obninsk Institute for Physics and Power Engineering). A very nice explanatory lecture was given on the history of the plant and current status of the activities around the reactor.

The 1st Workshop “Russia-Japan International Research Cooperation and Nuclear Education towards Innovative Nuclear Energy Systems” was held on October 28 at Obninsk Center of Science and Technology. The workshop included presentations delivered by members of Japanese team from Tokyo Institute of Technology (Tokyo Tech) and Russian team from OINPE (Fig. 3). Presentations made by students of Tokyo Tech and OINPE deserve to be mentioned apart: it was very interesting to learn how students view what is that to become a nuclear scientist or engineer and what they are thinking about their professional activities in the future. During the first part of the workshop direct internet video connection between Obninsk Center of Science and Technology and Tokyo Tech Research Laboratory for Nuclear Reactors was provided.



Fig. 3. The workshop

All in all, it was a great trip for me. In addition to gaining knowledge in the various fields of nuclear engineering I was fortunate to get a deep insight into the things I did not put very much attention before: future of nuclear education and knowledge preservation. The kindness of the COE-INES to give me the opportunity to participate at the event is truly appreciated.