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Safety and Security in shipment of spent nuclear fuel from a research reactor

The MTR type Spent Nuclear Fuel (SNF) assemblies used in the GRR-1 research reactor at National Centre for Scientific Research Demokritos (NSCRD), Greece, were repatriated to the United States under the US Foreign Research Reactor Spent Nuclear Fuel acceptance program. The operation comprised packaging and transportation of the SNF from NCSRD to the US Department of Energy, Savannah River Site. The project was performed using a NAC-LWT cask along with a lifting yoke, dry transfer system and cask drying and testing equipment. The cask and equipment were packaged in 3 ISO containers and transported by road from NCSRD to the Port of Piraeus, maritime from Piraeus to a military port at the US via Portugal and by road to Savannah River Site. The maritime transport was performed using a certified INF3 chartered vessel.

The identification and procurement of the appropriate transport package was performed in full compliance with the safety regulations for the transport of radioactive material that specify, inter alia, package design and test requirements. The carriers and the transport means were contracted, taking into account commercial criteria, along with their technical expertise and experience. The transport program and plan included project management, management systems, emergency preparedness and response arrangements, security means and arrangements. In particular, significant attention was given to the coordination and collaborative efforts performed between the staff of the NCSRD, the Greek Atomic Energy Commission (EEAE) and the Department of Energy (DOE), including NNSA Washington DC and Savannah River Site personnel, as well as, the contractors from the US and Greece. The well designed and cautious pre-shipment planning, and the smooth collaboration of the pertinent competent authorities, facilitated the operator in developing an understanding of how to fully comply with both sides of the regulatory framework (safety and security). Moreover, the transport safety-security interface issues were identified as early priority in an effort to evaluate and resolve any challenge in a timely manner.

Apart from broadly implemented SNF shipments'features, such as, efforts to avoid catching public attention, specific attention was given to the management of sensitive, security-related information, which was disclosed only on a "need to know"basis. It worth mentioning that the experience gained in the country during the previous SNF shipment in 2005 proved a significant asset, in facilitating the organization and the successful completion of the recent SNF shipment.

This paper gives an overview of the activities implemented for the SNF transport and the challenges encountered for the safe and secure completion of the shipment. It describes the main activities related to the secure and safe shipment performance, including the description of the pre-shipment planning and coordination activities which were a key to the success of the project.

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