

**THE UNITED STATES FOREIGN RESEARCH REACTOR
SPENT NUCLEAR FUEL ACCEPTANCE PROGRAM:
PROGRESS AT THE MIDPOINT**

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ABSTRACT

The United States Department of Energy (DOE), in consultation with the Department of State (DOS), adopted the *Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel* in May 1996. To date, the Foreign Research Reactor (FRR) Spent Nuclear Fuel (SNF) Acceptance Program has completed 25 shipments. Over 5,500 spent fuel elements from eligible research reactors throughout the world have been accepted into the United States under this program. Shipments are continuing on schedule, although a climate of increased security now exists following the terrorist attacks of September 11, 2001. Shipments of all types of radioactive material, both internationally and within the United States, are encountering greater public scrutiny and generally increased security and physical protection. The Acceptance Program has now reached the approximate midpoint of its duration; the current Acceptance Policy will expire in 2009 (fuel must not be irradiated after May 12, 2006). As the Acceptance Program draws closer to its termination date, an increased number of requests for program extension have been received. Currently, there are no plans to extend the policy beyond its current expiration date; therefore, eligible reactor operators interested in participating in this program are strongly encouraged to evaluate their inventory and plan for future shipments as soon as possible.

Introduction

The Foreign Research Reactor (FRR) Spent Nuclear Fuel (SNF) Acceptance Program, now in the seventh year of implementation, has to date completed 25 shipments safely and successfully, and another is expected to be completed very soon. 27 countries have participated so far, returning a total of 5,537 spent nuclear fuel elements to the United States for management at Department of Energy (DOE) sites in South Carolina and Idaho, pending final disposition in a geologic repository. 21 of the 25 shipments, containing aluminum-based spent nuclear fuel from research reactors, went to the Savannah River Site (SRS) in South Carolina. The most recent shipment arrived without incident at SRS on September 27, 2002. The other four, containing Training, Research, Isotope, General Atomic (TRIGA) spent nuclear fuel, were transported to the Idaho National Engineering and Environmental Laboratory (INEEL). During the next fiscal year (October 1, 2003—September 30, 2004), the program is planning a possible five shipments of fuel from reactors in Europe and Asia.

The FRR SNF Acceptance Program focuses on the planning and implementation of these shipments of research reactor spent fuel to the United States in support of worldwide nuclear nonproliferation efforts. Along with shipment logistics, the Department continues to address many other issues of importance to the program. As we approach the approximate midpoint in the duration of the Acceptance Policy, we continue to address and resolve issues that may impose barriers to program success.

The FRR SNF Acceptance Program works closely with federal, State and international contacts during planning for each shipment, thus ensuring that when the time comes for shipment, the transports occur smoothly and without incident. Open and responsive communication among international participants is essential, especially with regard to cask licensing. The Acceptance Program enjoys a very good working relationship with NRC staff and as such, wishes to take every measure possible to respect this relationship by ensuring that cask applications are timely and complete. In the past the Acceptance Program may have been able to rely on NRC to readjust its workload to accommodate a special request for package review and certification under less than optimum deadlines. However, the post-September 11 environment now has U.S. federal staff weighted down with evaluations into safeguards practices and preventive measures.

Over the past year, DOE programs that ship SNF have been working to better integrate their planning. We work with States and Tribes to plan for shipments—some shipments to DOE sites are subject to NRC regulations, and others are subject to DOE requirements. States have requested we handle both kinds of shipments the same way for consistency. Although we already do so in most areas of logistical operations, some practices do differ slightly and we are working toward a more uniform approach. Although this is not an issue specific to shipments of SNF from reactor operators abroad, it should be understood that we have complex planning relationships on the receipt end, and are not yet at the point where shipments are considered “routine.”

Security issues continue to occupy a central focus as a result of the September 11, 2001, terrorist attacks. The DOE, working in conjunction with international, federal, State, Tribal and local authorities, is re-examining procedures and requirements for transport of radioactive material, particularly commodities such as spent fuel. A temporary halt on all DOE-owned shipments of radioactive material in the U.S. was ordered by senior DOE management immediately after the September 11, 2001 attack, and again in October 2001 after commencement of the air campaign over Afghanistan. This action was taken in conjunction with other security measures throughout the DOE weapons complex and the nation at large. DOE was, and remains, in close contact with the Federal Bureau of Investigation, the Department of Defense, the NRC and other federal agencies responsible for transportation and infrastructure safety. The NRC implemented a series of Compensatory Measures for its licensees to follow in enhancing security for SNF shipments; the measures were later incorporated into an NRC Order for its licensees. These new measures are not expected to impact the FRR SNF Acceptance Program adversely; in fact, many of the proposed measures are based on additional security measures the Program has been following since its inception. While the changed security climate requires additional time and resources to coordinate among different law enforcement agencies, we are confident they will continue to ensure that these are among the safest and most secure shipments undertaken throughout the world.

Historically, spent nuclear fuel shipments have not been considered attractive targets for terrorist attack or sabotage, and threat assessments undertaken by law enforcement since last September seem to corroborate this view. However, across the globe spent fuel shipments are a matter of high concern for public officials due to the perceived perception that spent fuel transportation presents a heightened risk as compared to transport of other hazardous materials (e.g. propane and liquid natural gas). In addition, inspection, escort and other enforcement duties related to safe, routine transport can tax law enforcement and emergency response assets that could otherwise be deployed elsewhere. In the summer of 2002, the return of mixed-oxide (MOX) fuel from Japan to the United Kingdom gained international attention when Greenpeace organized a global protest flotilla which pursued the transport vessels along parts of the shipping route, and urged nations along potential routes (notably southern Pacific nations, Caribbean nations in proximity to the Panama Canal, and Ireland) to voice opposition to the shipment. This attention culminated in the Irish Sea, where vessels of the Irish Navy appeared and, apparently, policemen were stationed on uninhabited islands past which the vessels steamed, presumably to enhance the already formidable security in place. Despite these activities, which included large banners, boatloads of protesters, circling aircraft, BBC commentators and condemnations from rock stars, the vessel docked and the material was unloaded safely. You may have your own opinions as to whether the Greenpeace protest increased or detracted from the security of the material, but the ultimate outcome was, as anticipated, a safe conclusion.

The United States believes the stringent security employed was more than sufficient to ensure the safety and security of the MOX shipment, and further strongly believes that lawful shipment of nuclear cargoes on the high seas should not be impeded, either by nations along potential routes or by non-governmental organizations. Fuel shipments related to the FRR SNF Acceptance Program have experienced localized controversy from time to time, but have not encountered opposition of this magnitude, perhaps because the ultimate goal of the Program is to support nonproliferation efforts. We will, however, continue to follow shipping campaigns of other types of nuclear material with interest.

The Acceptance Program has now reached its approximate midpoint in duration. More than ever before, it is important that we continue to schedule shipments as soon as possible in order to allow for as much spent fuel to be shipped to the United States over the remaining six years of the program. Countries interested in participating in the Program should express their interest as soon as possible so that fuel and facility assessments can be scheduled and shipments may be entered in the long-term shipment forecast. The Program may not be able to accommodate a large number of last minute requests, particularly from geographically isolated regions. With more casks available for shipment and more casks allowed on a single ocean-going vessel, and with transportation plans into and across the United States established and implemented, shipments can be made more efficiently for all parties involved.

DOE expects about 53 shipments will take place between now and the end of the program in May 2006 (May 2009 for SNF irradiated before May 2006). Under current feedback from many participants, we do not believe there will be any delays toward the end of the program. The schedule is becoming more limited, however, and if eligible reactors are still evaluating whether to participate, we strongly urge them to step up as soon as possible. DOE will try to

accommodate everyone wishing to participate, but last-minute requests may not be able to be met.

A primary goal of the Acceptance Program is to support worldwide nonproliferation efforts by shipping high enriched uranium (HEU) of U.S.-origin to the United States for management and disposition. Integral to this process is the U.S. assistance offered in helping reactor operators convert their cores to low enriched uranium (LEU) as the reduced enrichment fuels become qualified and available. In addition, DOE plays a strategic role in ensuring a supply of enriched uranium for fuel fabrication. In the Acceptance Program, we realize our primary goal is intertwined with the missions of the Reduced Enrichment for Research and Test Reactors (RERTR) Program and the Enriched Uranium Operations group from DOE's Y-12 plant in Oak Ridge, TN. We remain committed to working with staff in these other program offices within DOE to do whatever we can to assist in smooth transitions of core enrichment level and a steady supply of fuel.

Within the United States, discussions and advances concerning the Yucca Mountain permanent geologic repository have renewed and invigorated ardent support, both pro- and anti-nuclear. Congress ultimately voted to continue the siting process at Yucca Mountain, and a repository there may become operational as early as 2010. The public has voiced opinions on both ends of the anti-nuclear spectrum; they are not comfortable with transport of nuclear material across interstate roadways, nor are they comfortable with having spent fuel and other high level radioactive waste stored at the 131 temporary storage facilities across the United States. The contentious debate over SNF transportation safety can be expected to continue, and likely increase, as the licensing process continues. Proposals of varying complexity have been made in Congress to enact additional measures related to SNF transport; however, none have been enacted to date and it is impossible to determine at this time what effect, if any, such measures may have on current shipments of SNF. Like others interested in permanent disposition of spent fuel, the Program continues to monitor closely developments in this issue.

Some reactor operators and contractors have voiced support for extension of the program expiration date beyond 2006 (2009 for some fuel irradiated prior to May 2006). While in the past the United States has had a fuel acceptance program of some type in place for many years, it should be understood by all involved parties that the DOE has no plans, at this time, to seek extension of the FRR SNF Acceptance Policy. Renewal or extension of the Acceptance Policy, if it were to be undertaken, would involve complex legal, regulatory and political efforts that have become even more difficult since the changed security climate and the recent vote to site a repository at Yucca Mountain. Fuel acceptance and eventual geologic disposal have been contentious issues in Congress, among States hosting fuel management facilities, and in the court of public opinion, and even if a renewal of the policy were to be undertaken, there could easily be substantial delays while requisite environmental studies, and the litigation that could likely result, are completed.

One thing is certain, however; the United States remains committed to supporting worldwide nonproliferation goals such as those for which this program was designed, and accepting eligible fuel now rather than later is a goal toward which we are striving. We hope to work with all remaining eligible research reactors to plan for shipments of their eligible spent fuel. The DOE

continues to support research reactor operators' needs and would be happy to meet any interested parties to discuss the program. The Program is preparing to send cables to countries eligible to participate, to request they consider participating if they are not already doing so.

Conclusion

We will have many challenges as we continue to plan for shipments during the remainder of the Acceptance Program. The United States, and likely as well for the international nuclear transport community, will have a more watchful public. Some of the issues DOE and other agencies are examining now include impacts for State, Tribal and local resources should shipments be halted again, or additional requirements imposed. As the FRR SNF Acceptance Program works toward accomplishing its mission over the next six years, we strongly encourage reactor operators to work closely with our technical points-of-contact to ensure shipping schedules are accurate and can be met.