

July 25, 2005

Federal Emergency Management Agency  
Attn: Ms. Rita Henry  
500 C Street, SW, Room 416  
Washington, DC 20472

Dear Ms. Henry:

In a letter to Mr. Luis A. Reyes, Executive Director for Operations, dated March 31, 2005, Under Secretary Michael D. Brown asked the U.S. Nuclear Regulatory Commission (NRC) to provide information for the biennial report on the status of Federal agency implementation of the "Federal Guidelines for Dam Safety" (FGDS). Our report, which discusses the progress on implementation of the FGDS from October 2003 through September 2005 (Fiscal Years 2004 and 2005), is enclosed.

During this period, NRC continued to use the technical assistance of the Federal Energy Regulatory Commission (FERC), to help with dam safety inspections at NRC licensee facilities. This cooperative effort is the result of the Interagency Memorandum of Agreement signed in September of 1992. By the end of this biennial period, FERC personnel, either alone or accompanied by NRC staff, will have completed inspections at nine licensee facilities, two of which are or were formerly associated with the extraction of uranium, and seven of which are nuclear safety-related dams at nuclear-powered electric generating facilities. By the end of September 2005, all dams under NRC jurisdiction will have had an initial inspection and all followup inspections scheduled for this reporting period.

Having received no negative feedback on NRC's 2002-03 Progress Report, no action items required response. However, NRC has continued with an aggressive dam inspection program. One embankment dam associated with uranium extraction has been transferred to the State of Utah, which became an NRC Agreement State, in this reporting period. Two other embankment dams associated with a site undergoing reclamation are dry and are being removed from the program.

R. Henry

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In the upcoming biennial period, we expect to keep the Federal Emergency Management Agency informed of further progress in the implementation of the FGDS through the quarterly meetings of the Interagency Committee on Dam Safety. Mr. Dan E. Martin, Senior Project Manager, Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, is NRC's Acting Dam Safety Officer, pending the hiring of a qualified geotechnical engineer.

I trust this letter and enclosure fully respond to your request.

Sincerely,

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Jack R. Strosnider, Director  
Office of Nuclear Material Safety  
and Safeguards

Enclosure:  
Fourteenth Biennial Report



THE U.S. NUCLEAR REGULATORY COMMISSION  
2004-2005 PROGRESS REPORT TO FEMA  
IMPLEMENTATION OF THE FEDERAL GUIDELINES FOR DAM SAFETY

Fourteenth Progress Report  
Reporting Period - October 2003 through September 2005

September 2005

I. INTRODUCTION

The U.S. Nuclear Regulatory Commission was created as an independent Agency, authorized to regulate and license nuclear facilities and the use of nuclear materials, and to conduct research in support of licensing and the regulatory process. The Commission does not plan, design, construct, nor operate such facilities, nor does it control the land on which the facilities are constructed. The legal authority for the Commission, in the realm of dam safety, is derived from the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). NRC has regulatory authority over only: 1) uranium mill tailings dams; 2) storage-water-pond dams at In-Situ Leach Mining Facilities; and 3) those dams integral to the operation of licensed facilities, or the possession and use of licensed material, that pose a radiological safety-related hazard should they fail. Exceptions to 3) are: (a) dams that are submerged in other impoundments (e.g., to provide an ultimate heat sink) and, therefore, do not pose flooding threats; or (b) dams that are regulated by other Federal agencies (e.g., Army Corps of Engineers, Federal Energy Regulatory Commission (FERC), Tennessee Valley Authority). No changes in dam safety responsibilities have occurred during this reporting period.

II. PROGRESS ON IMPLEMENTATION OF THE FEDERAL GUIDELINES FOR DAM SAFETY

A. Organization, Administration, and Staffing

The NRC organization for the administration of the Dam Safety Program has not changed since the last reporting period. The program is implemented through a matrix organization focused on the NRC Dam Safety Officer (DSO). None of the personnel associated with the program are employed full-time with the effort. Under this arrangement, NRC is able to define specific tasks for each dam facility that is to undergo a review and inspection by NRC, with the technical assistance of the FERC. The lead staff members involved in the implementation of the Dam Safety Program report to the NRC DSO, who is currently a Senior Project Manager in the Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards (NMSS). The DSO is supported by other NRC staff, including a Geotechnical Engineer. The DSO is directly responsible to the Director, NMSS, who is responsible to the NRC Executive Director for Operations (EDO). The EDO is directly responsible to the NRC Chairman.

The DSO is Chairman of the Dam Safety Advisory Group (DSAG), which provides coordination among the various NRC offices. DSAG provides for the consolidation of the interdisciplinary technical resources from within NRC, necessary for an effective program. The DSAG members coordinate the implementation of the Dam Safety Program within each NRC office.

Enclosure

The procedures that guide the implementation of the program are the procedural elements described in: (1) the Commission paper on the Dam Safety Program Plan, SECY-91-193 (June 25, 1991); (2) the Dam Safety Program Plan (July 1991); and (3) the Charter of the Dam Safety Officer (October 1990).

NRC has found that the organizational structure is fully adequate and capable of implementing the currently defined Dam Safety Program. With regard to the adequacy of available staff to execute the program, it is necessary to focus on the combined resources of 0.3 full-time equivalent (FTE) and contractual dollars that have been available. Since the initial round of dam safety inspections was completed in 1998, NRC has found that the allocated total of FTE and contractual dollars have been sufficient to address the Dam Safety Program, despite other higher-priority items within NRC. In the current reporting period, the target level has been met at a personnel effort of approximately 0.3 FTE. Consequently, the target level of work to be completed under the program has been reached. Despite initial concern that the impact of decreasing resources would extend the time that will pass before NRC's completing one review cycle of included dams, there have been no changes made now the program plan is implemented.

No deficiencies in NRC's program implementation plan were identified in the previous report; thus, no specific actions have been required to address Federal Emergency Management Agency concerns.

#### B. Dam Safety Training Activities

NRC as an Agency has not sponsored in-house dam safety-related training during the reporting period. The Agency has supported such training through the Interagency Committee on Dam Safety (ICODS) and has had Agency staff participate in that training. During the period, the DSO attended the 2-day, July 2005, "State Dam Security and Anti-Terrorism Workshop II." NRC relies on technical assistance from FERC to perform dam safety inspections at NRC-regulated facilities and requires those personnel to be adequately trained.

Personnel involved in the support of the Dam Safety Program continue to have direct access to the series of manuals, "Training Aids for Dam Safety," that are available for use, and all personnel are knowledgeable about current relevant literature and the state-of-the-art practices on dam safety.

#### C. Dam Inventories

NRC continues to verify the inventory of all dams for which the Agency has regulatory authority by providing information necessary to complete the basic fields in the National Inventory of Dams (NID) database. Presently, NRC uses existing hard-copy records and an electronic data base within the Agency to generate the input necessary for NID and then uses the actual dam inspections to verify the data that relate to the status of the dam, and the hazard classification to define the associated risks.

No new dams, meaning new dams being designed, constructed, and put into operation, have come under NRC's regulatory jurisdiction during this reporting period. However, two embankment dams, associated with the Ambrosia Lake mill site, which were added to the

inventory in the prior reporting period, are being removed as of the end of this reporting period, because they are dry and are undergoing reclamation. Another dam, at the White Mesa mill site in Utah, was transferred to the State of Utah, when Utah became an NRC Agreement State for uranium recovery sites. Any new dams that come under NRC regulatory jurisdiction will be added to the dam inventory and the information provided to NID during a subsequent update.

Land-use changes downstream of dams are some of the important items included in NRC dam inspections, because the initial hazard classifications were made based on information existing at the time the facility with a dam was licensed by NRC. To date, no revisions to hazard classifications have been necessary as a result of land-use changes.

#### D. Independent Reviews

Since NRC is a regulatory agency, it is not an owner of dams and, consequently, any reviews NRC completes of a licensee's facility are independent. During the current reporting period, no design nor construction activities were underway for dams that are or would be under NRC's regulatory authority and Dam Safety Program. In conjunction with the routine operational inspections conducted during this period at the nine facilities, certain design and construction elements were part of the review. For example, issues such as the design basis precipitation and flooding events were discussed and reviewed, as well as the control of materials during construction.

As noted previously, review activities are carried out with the technical assistance of FERC working for, and in conjunction with, NRC during the inspection process. From the standpoint of the owner (NRC licensee), these are considered to be independent reviews. To date, NRC has not used external consultants in the Dam Safety Program except the interagency technical support from FERC as previously noted.

#### E. Inspection Programs

The number of dam safety inspections conducted at NRC licensees' facilities during this reporting period is nine, seven of which were nuclear-powered electric generating facilities, and two of which were uranium processing sites. The inspections were conducted by FERC and NRC personnel under a technical assistance agreement between the two agencies. NRC has had no problems associated with these inspections related to the quality, experience, training or the number of the inspection teams' staff.

No unsafe dams and no improper classifications have been identified. Several open issues at the North Anna Service Water Pond (SWP) Dam in Virginia were identified in the prior reporting period and have now been resolved. There was never an indication that the SWP Dam was unsafe. With regard to responses and actions after the inspections, NRC sends the final report

and a list of actions to be completed, along with a schedule, to the licensee for action. This process has been effective in obtaining corrective action on the items NRC has identified to the licensees.

#### F. Dam Safety Rehabilitation Programs

No regulated dams within the NRC Dam Safety Program were involved in rehabilitation programs during this reporting period and none is scheduled. The two embankment dams at Ambrosia Lake, New Mexico, that were added to the program in the prior reporting period, had maintenance issues that would normally have required rehabilitation; however, both dams are currently dry and undergoing reclamation and are expected to be removed from the program by the next reporting period.

#### G. Management Effectiveness Reviews

Because of the low resource level needed by NRC to support this program and the fact that all dams under NRC's purview are *low-hazard* structures, no management effectiveness reviews have been performed either by internal management or the Government Accountability Office.

#### H. Dam Failures and Remedial Actions

No failures or incidents have occurred during this reporting period.

#### I. Emergency Action Planning

All dams under NRC's purview are *low-hazard* structures. This means that the potential for loss of life or property damage downstream of a dam from floodwaters released as a result of dam failure would be small (i.e., no lives lost and minimal economic loss). Further, it is unlikely that the hazard status of these structures will be elevated. For these reasons, NRC does not have an emergency action planning program for dam safety. Since the NRC Dam Safety Program Plan must provide for significant or high-hazard structures, should any be included in a future inventory, we have made arrangements with FERC for technical assistance with Emergency Action Plans (EAPs), should the need arise. The NRC Dam Safety Program Plan states that all radiologically safety-related dams or mill tailings dams under NRC jurisdiction, and classified as high- or significant-hazard dams, shall have EAPs that conform to Federal Guidelines for Dam Safety (FGDS). At this time, we do not foresee the need to write EAPs for any of the structures within our program.

Should the need to write an EAP be identified in the future, NRC intends to allow licensees to use elements of the existing radiological EAPs that are associated with the facility. Thus, the basic organization, methodology, and interfaces with State and local governments already exist. These facts will aid in the development of any necessary additional elements for dam-safety EAPs.

#### J. Application of ICODS Technical Guidance

##### Emergency Action Planning Guidelines for Dams:

Because of the low-hazard nature of all structures in the program, there are currently no plans for NRC to adopt these guidelines, but they will be considered if an EAP must be developed for dam safety.

#### Federal Guidelines for Earthquake Analyses and Design of Dams:

NRC's criteria for seismic design of safety-related structures at nuclear power reactor sites, which include dams involving radiological safety, are incorporated in the "Standard Review Plan" (SRP), Sections 2.5 and 3.7, and in Regulatory Guide 1.127. NRC staff has concluded that these guidance documents for power reactors meet the intent of the Federal Guidelines. Regulatory Guide 3.11, for mill tailings embankments (dams), also addresses seismic issues and implements the seismic siting requirements for impoundments in Criterion 4(e) of Appendix A to 10 CFR Part 40. These criteria are comprehensive and should produce safe seismic designs.

#### Selecting and Accommodating Inflow Design Floods for Dams:

NRC's criteria for selecting and accommodating the design flow are embodied in Section 2.4 of the SRP for nuclear power reactor sites, and the "Standard Review Plan for UMTRCA Title I Mill Tailings Remedial Action Plans," for inactive tailings embankments (dams). These criteria are quite conservative and are consistent with the Federal Guidelines. Regulatory Guide 3.11 also addresses upstream catchment requirements of Criterion 4(a) of Appendix A to Part 40, for UMTRCA Title II sites, and is equivalent to the Federal Guidelines. Regulatory Guide 1.59, which addresses the design basis floods for nuclear power plants, also addresses consideration of flood conditions that could be caused by dam failures from earthquakes.

#### Hazard-Potential Classification System for Dams:

All dams within NRC's program are low-hazard structures, based on hydraulics and remoteness of site. For this reason, there has been no action required to address reclassification of the structures. Should the overall Hazard Classification System be redefined to include factors other than hydraulics and potential loss of life from structural failure, then each structure will be reviewed to determine if a change in hazard classification is warranted.

#### K. State Dam Safety Agency Involvement

NRC generally contacts the agencies involved in dam safety in various states as the review and inspection process of the NRC Dam Safety Program is implemented. In addition, NRC will maintain liaison with the dam-safety agencies in the various states to avoid duplications in efforts and inventory data. Since all dams associated with a nuclear power plant are not necessarily radiologically safety-related, there is coordination between NRC and the states to ascertain that no dams are excluded from the NID. At this point in time, there has been no direct relationship with the various states in the area of training.

#### L. Research and Development and Special Initiatives

No new initiatives, research, technology transfers, or special studies were instituted during this period. Efforts were focused during this period on the necessary basics of inspection for the Dam Safety Program.

#### M. Public Concerns

No dams under NRC jurisdiction for regulatory control have been the subject of public concern. NRC procedures for licensing facilities that could include any new dams that would be constructed require that the licensing actions be in the public view, with provisions for public participation. If the public were to desire participation in issues regarding the operation of a regulated dam, it would be necessary for the public to petition for involvement.

#### III. IMPACT ON AGENCY OPERATIONS

The implementation of FGDS has necessitated the specific identification of the Dam Safety Program for internal budget purposes. This has, in turn, required a deliberate decision process of weighing various risks in other programs that NRC is directly responsible for, against the risks associated with dam safety. In the era of shrinking budgets, the Dam Safety Program becomes another responsibility to be addressed with fewer resources, since the existence of a Dam Safety Program has not been the basis for additional funding. In this regard, the Dam Safety Program has remained viable by receiving funds redirected from other areas. With across-the-board reductions, the availability of redirected funds becomes more limited. NRC is somewhat unique in that the focus of its main regulatory responsibility, namely nuclear materials and their applications, has the potential for significant impact on a large population if safety is compromised, similar to what might be expected from the failure of a very large high-hazard dam. Consequently, when NRC considers risk and cost benefits, there is a good understanding of the implications of changing the level of resources devoted to one or another safety program. NRC believes that adequate resources have been directed to ensuring safety of existing dams through inspection.

Funding for the Dam Safety Program for fiscal year 2004 (FY 2004) and fiscal year 2005 (FY 2005) reflected a separate commitment to the Dam Safety Program for a dedicated 0.3 FTE and \$35,000 of technical assistance funding for both years. The contract funding is solely for technical assistance from FERC in program implementation. In FY 2006, the program will function at a similar activity level. This level of effort has been found satisfactory, since the initial round of safety inspections was completed.

#### IV. ADDITIONAL OBSERVATIONS

NRC continues to implement dam safety actions under the NRC Dam Safety Program Plan that was adopted in July 1991. The plan describes the manner in which NRC will implement the FGDS. Because of funding limits dictated by the small number of dams under NRC's purview, a programmatic decision was made to emphasize the performance of dam safety inspections. Trained and experienced FERC personnel conducted inspections using NRC's standard operational inspection procedures. During the inspections, some of which were made with an NRC representative, no significant safety issues were identified.

NRC guidance regarding the documentation of the design record, construction record, reservoir filling and surveillance records, operation and maintenance records, and the permanent files, are updated as necessary. The elements of hazard evaluation, downstream effects, and warning systems have been reviewed and evaluated with respect to the NRC program. NRC guidance has been reviewed and evaluated for conformance to FGDS for the elements of: (1) operating

responsibility and procedures; (2) maintenance procedures; (3) periodic inspection program; (4) deficiency correction and documentation; (5) emergency action planning; and (6) elements on the scope and completion of internal and external reviews.

All dams under NRC's purview are on a 2 to 3-year inspection cycle, as advised by FERC. Further, the hazard classification has been reconfirmed as "low" for all structures; thus, preparation of EAPs has not been required. NRC has, however, made arrangements to receive technical assistance from FERC should the need to prepare EAPs develop.