

# NMSS Quarterly Newsletter



**U.S. Nuclear  
Regulatory  
Commission**

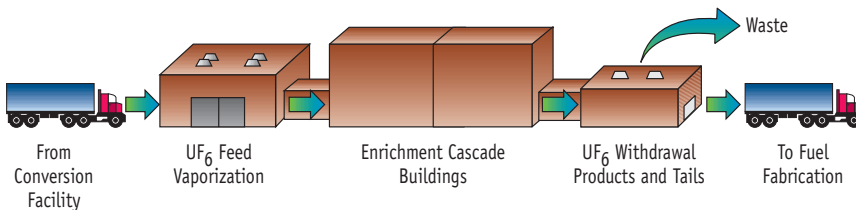
**Office of Nuclear  
Material Safety  
and Safeguards**

**NUREG/BR-0117  
No. 04-03  
September 2004**

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## GAS CENTRIFUGE LICENSING ACTIVITIES

There has been much activity recently in the area of gas centrifuge (GC) uranium enrichment facility licensing. Three applications for licenses have been received. These applications signal a changeover in uranium enrichment technology in the U.S. from the current gaseous diffusion process. Figure 1 depicts a typical uranium enrichment facility. It is the basic concept behind all enrichment facilities including the three recent applications for GC facilities.

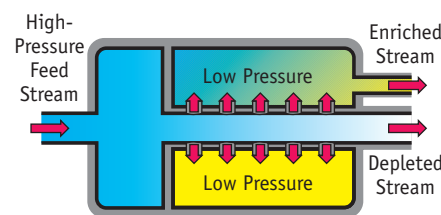


**Figure 1.** Typical Uranium Enrichment Facility

The fuel of a nuclear power plant is uranium, but only a certain type of uranium atom can be easily split to produce energy. This type of uranium atom – called uranium-235 (U<sup>235</sup>) – comprises less than one percent by weight of the uranium as it is mined or milled. Uranium-238 atoms, which constitute 99 percent of natural

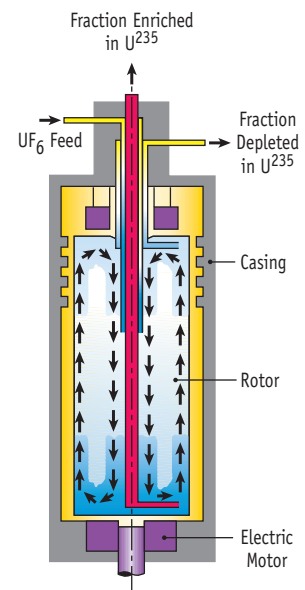
uranium, cannot be split easily to produce energy. To make fuel for light-water reactors, the natural uranium is enriched to increase the concentration of U<sup>235</sup> to three to five percent. This enriched uranium is then sent to fuel fabrication facilities for manufacture into reactor fuel.

Two different methods are utilized in the world today to enrich uranium. These involve the gaseous diffusion and GC processes. Figure 2 shows the gaseous diffusion process currently in use at the Paducah (KY) Gaseous Diffusion Plant (GDP). Figure 3 depicts a simplified schematic of the GC process, similar to what is proposed in each of the three applications. In both processes, uranium hexafluoride (UF<sub>6</sub>) in solid form is converted to a gas and transferred to the enrichment cascades.



**Figure 2.** Gaseous Diffusion Process

In the enrichment cascades, the U<sup>235</sup> atoms are physically separated from the heavier weight components. The enriched UF<sub>6</sub> is then withdrawn and packaged for shipment to a fuel fabrication facility. In addition to producing enriched U<sup>235</sup>, the cascades also generate uranium depleted in U<sup>235</sup>. Most of this material is packaged and stored onsite in air-tight cylinders.



**Figure 3.** Gas Centrifuge Process

The first of the recent applications was submitted by United States Enrichment Corporation (USEC) Inc. on February 12, 2003, for a Lead Cascade facility located at the Portsmouth GDP site in Piketon, OH. The Lead Cascade gas centrifuge is based on the U.S. Department of Energy's (DOE) advanced gas centrifuge technology. The Lead Cascade facility, consisting of up to 240 centrifuges, would enrich the uranium up to 10 percent U<sup>235</sup>. This facility is intended to provide operational information on the machines and the auxiliary systems as they would be used in commercial operations. The plant will operate in a recycle mode, meaning the only uranium withdrawals from the cascade will be in the form of samples. The staff completed its review of the application and issued a license to USEC Inc. for this facility on February 24, 2004.

The second application was submitted by the Louisiana Energy Services (LES) partnership on December 12, 2003, for a full-scale facility, the National Enrichment Facility (NEF), to be sited in Eunice, New Mexico. The LES partnership is made up of limited and general partners currently consisting of Urenco, Exelon, Duke Power, Entergy, and Westinghouse. The partnership intends to use Urenco's sixth generation gas centrifuge technology that is currently being used in Europe. LES is proposing a capacity of 3 million Separative Work Units (SWU)/yr, with up to 5 percent enrichment. The staff is currently reviewing this application and plans to issue the final Environmental Impact Statement and Safety Evaluation Report in June 2005.

The third application was submitted by USEC Inc. on August 23, 2004, for a gas centrifuge uranium enrichment facility known as the American Centrifuge Plant (ACP). USEC Inc. is proposing a 3.5 million SWU/year plant to be located at the Portsmouth GDP site in Piketon, OH. The ACP would be an expansion of the Lead Cascade and would operate at up to 10 percent enrichment. The staff is currently reviewing this application and plans to complete its initial acceptance review by September 22, 2004. If the application is determined to be acceptable, the staff will initiate its technical and environmental reviews.

For more information related to gas centrifuge uranium enrichment facility licensing, visit our website at <http://www.nrc.gov/materials/fuel-cycle-fac/gas-centrifuge.html>.

(Contact: Brian W. Smith, Fuel Cycle, NMSS, 301-415-5331; e-mail: [bws1@nrc.gov](mailto:bws1@nrc.gov))

## **NRC RELEASES CLEANED-UP PENNSYLVANIA SITE FOR UNRESTRICTED USE**

The Nuclear Regulatory Commission (NRC) has granted the request of Babcock and Wilcox Company, Pennsylvania Nuclear Operation (B&W), to terminate its license to possess radioactive material at a former nuclear service operations site in Parks Township, Pennsylvania, about 35 miles northeast of Pittsburgh, and has released the site for unrestricted use.

"Radioactive material on this site has been cleaned up to meet our strict criteria, and the site is now safe for other uses," said Daniel M. Gillen, Deputy Director for the Decommissioning Directorate, Division of Waste Management and Environmental Protection. "We have verified this through independent radiation surveys by the NRC and its contractor."

B&W and its predecessors used radioactive material at a facility on the site from 1960 until 1996 for nuclear fuel fabrication, research and development and service work. Based on the remedial actions taken by the licensee, the staff's review of the licensee's termination surveys, and the results of the staff's confirmatory surveys, NRC concluded that the licensee has completed the decommissioning activities in accordance with its approved decommissioning plan, and the site is suitable for unrestricted release.

( Contact: Amir Kouhestani, 301-415-0023; e-mail: [AGK@nrc.gov](mailto:AGK@nrc.gov))

## **GENERIC COMMUNICATIONS ISSUED (May 3, 2004 - September 15, 2004)**

The following are summaries of U.S. Nuclear Regulatory Commission (NRC) generic communications issued to the Office of Nuclear Material Safety and Safeguards (NMSS) licensees. If one of these documents appears relevant to your needs and you have not received it, please call one of the technical contacts listed below. The Internet address for the NRC library of generic communications is - <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/index.html> . Please note that this address is case-sensitive and must be entered exactly as shown. If you have any questions or comments about generic communications in general, please contact Ivelisse M. Cabrera, NMSS, at (301) 415-8152, or by e-mail: [imc1@nrc.gov](mailto:imc1@nrc.gov) .

## **Information Notices (INs)**

**IN 2004-12, “Spent Fuel Rod Accountability,”** was issued on June 25, 2004. This IN was sent to all holders of operating licenses for nuclear power reactors, research and test reactors, decommissioned sites storing spent fuel in a pool, and wet spent fuel storage sites. This notice informed addressees of issues at two reactor facilities regarding the effectiveness of the material control and accounting program.

(Technical Contacts: Todd Jackson, Region I, 610-337-5308; e-mail: [tjj@nrc.gov](mailto:tjj@nrc.gov); Martha Williams, NSIR, 301-415-7878; e-mail: [mw2@nrc.gov](mailto:mw2@nrc.gov))

**IN 2004-13, “Registration, Use, and Quality Assurance Requirements for NRC-Certified Transportation Packages,”** was issued on June 30, 2004. This IN was sent to all materials and decommissioning reactor licensees to clarify responsibilities regarding the packaging and transportation of licensed material, as delineated in 10 CFR Part 71. Specifically, this IN was issued to remind licensees of 10 CFR 71.12 requirements to notify NRC before the first use of NRC-approved transport packages (user registration), and to ensure licensees have copies of the current Certificates of Compliance, or other approval, and comply with all of their conditions before each transport; and, if necessary, to properly transfer licensed material prior to transport, or delivery to a carrier for transport.

(Technical Contacts: Cynthia Barr, NMSS, (301) 415-4015, e-mail: [csb2@nrc.gov](mailto:csb2@nrc.gov); Tomas Herrera, NMSS, 301-415-7138; e-mail: [txh1@nrc.gov](mailto:txh1@nrc.gov))

**IN 2004-14, “Use of Less than Optimal Bounding Assumptions in Criticality Safety Analysis at Fuel Cycle Facilities,”** was issued on July 19, 2004. This IN was sent to all licensees authorized to possess a critical mass of special nuclear material to alert them to a safety concern arising from the use of less than optimal bounding assumptions in criticality safety analysis at fuel cycle facilities.

(Technical Contact: Dennis Morey, NMSS, 301-415-6107; e-mail: [dcm@nrc.gov](mailto:dcm@nrc.gov))

### **Regulatory Issue Summaries (RIS’)**

**RIS 2004-08, “Results of the License Termination Rule Analysis,”** was issued on May 28, 2004. This RIS was sent to all holders of operating licenses for nuclear power reactors, research and test reactors, and decommissioning

sites, to inform them of: NRC’s analysis of issues associated with implementing NRC’s License Termination Rule; the Commission’s direction to date on how they can be addressed; schedule for future actions; and opportunities for stakeholder comment.

(Technical Contact: Robert L. Johnson, NMSS, 301-415-7282; e-mail: [rlj2@nrc.gov](mailto:rlj2@nrc.gov))

**RIS 2004-09, “Status of Deferral of Active Regulation of Ground-Water Protection at *In Situ* Leach Uranium Extraction Facilities,”** was issued on June 7, 2004. This RIS was sent to all holders of materials licenses for uranium and thorium recovery facilities to inform them and other interested parties of: (1) NRC’s plans for the deferral of active regulation of ground-water protection at *in situ* leach uranium extraction facilities; and (2) the comments received in response to RIS 2004-02 on this topic. This RIS supersedes RIS 2004-02 in its entirety.

(Technical Contact: John H. Lusher, NMSS, 301-415-7694; e-mail: [jhl@nrc.gov](mailto:jhl@nrc.gov))

**RIS 2004-11, “Supporting Information Associated with Requests for Withholding Proprietary Information,”** was issued on June 29, 2004. This RIS was sent to all submitters of proprietary information to the NRC to inform them that some submittals continue to not sufficiently support the basis for claims of competitive harm under 10 CFR 2.390(b).

(Technical Contacts: John W. Lubinski, NMSS, 301-415-6947; e-mail: [jwl@nrc.gov](mailto:jwl@nrc.gov); Jack N. Donohew, NRR, 301-415-3764; e-mail: [jnd@nrc.gov](mailto:jnd@nrc.gov))

## **SELECTED FEDERAL REGISTER NOTICES (May 1, 2004 - August 30, 2004)**

“Report to Congress on Abnormal Occurrences Fiscal Year 2003; Dissemination of Information” 69 FR 24688, May 4, 2004.

(Contact: Annette L. Vietti-Cook, Secretary of the Commission, 301-415-1969; e-mail: [avc@nrc.gov](mailto:avc@nrc.gov))

“Changes to Adjudicatory Process; Correction,” 69 FR 25997, May 11, 2004.

(Contact: Geary S. Mizuno, Office of the General Counsel, 301-415-1639; e-mail: [GSM@nrc.gov](mailto:GSM@nrc.gov))

“10 CFR Part 70, Office of Nuclear Material Safety and Safeguards; Notice of Issuance of Final Backfit Guidance,” 69 FR 28043, May 18, 2004.

(Contact: William Gleaves, Office of Nuclear Material Safety and Safeguards, Division of Fuel Cycle Safety and Safeguards, 301-415-5848; e-mail: [bcg@nrc.gov](mailto:bcg@nrc.gov))

“10 CFR Parts 30, 40, 50, 60, 61, 70, 72, and 76. Union of Concerned Scientists; Denial of Petition for Rulemaking,” 69 FR 28849, May 19, 2004.

(Contact: James R. Firth, Office of Nuclear Material Safety and Safeguards, 301-415-6628; e-mail: [jrf2@nrc.gov](mailto:jrf2@nrc.gov))

“10 CFR Part 2. Licensing Proceeding for a High-Level Radioactive Waste Geologic Repository; Licensing Support Network, Submissions to the Electronic Docket,” 69 FR 323836, June 14, 2004.

(Contact: Francis X. Cameron, 301-415-1642; e-mail: [FXC@nrc.gov](mailto:FXC@nrc.gov))

“Governors’ Designees Receiving Advance Notification of Transportation of Nuclear Waste,” 69 FR 39517, June 30, 2004.

(Contact: Rosetta O. Virgilio, Office of State and Tribal Programs, 301-415-2367; e-mail: [rov@nrc.gov](mailto:rov@nrc.gov))

“10 CFR Part 72. List of Approved Spent Fuel Storage Casks: NAC-MPC Revision,” 69 FR 50089, 13 August, 2004.

(Contact: Jayne M. McCausland, Office of Nuclear Material Safety and Safeguards, 301-415-6219; e-mail: [jmm2@nrc.gov](mailto:jmm2@nrc.gov))

(General Contact: Michael K. Williamson, NMSS, 301-415-6234; e-mail: [mkw1@nrc.gov](mailto:mkw1@nrc.gov))

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