

June 14, 2004

MEMORANDUM TO: Michael T. Lesar, Chief  
Rules Review and Directives Branch  
Division of Administrative Services  
Office of Administration

FROM: John Lubinski, Chief **/RA/**  
Fuel Manufacturing Section  
Fuel Cycle Facilities Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

SUBJECT: FEDERAL REGISTER NOTICE: FINDING OF NO SIGNIFICANT  
IMPACT FOR AMENDMENT REQUESTED BY NUCLEAR FUEL  
SERVICES, INC.

Attached please find one signed original, four copies, and an electronic version on a floppy diskette of the subject Federal Register Notice for your transmittal to the Office of the Federal Register for publication.

Docket No. 70-143  
License No. SNM-124

Attachments: 1. One original and four copies  
2. One floppy diskette (electronic version)

CONTACT: Kevin M. Ramsey, NMSS/FCSS  
(301) 415-7887

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<b>DATE</b>	5/25/04		5/26/04		5/26/04		6/8/04		6/14/04		6/14/04	

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**NUCLEAR REGULATORY COMMISSION**

**DOCKET NO. 70-143**

**NUCLEAR FUEL SERVICES, INC.,  
ENVIRONMENTAL ASSESSMENT AND FINDING OF  
NO SIGNIFICANT IMPACT RELATED TO  
PROPOSED LICENSE AMENDMENT AUTHORIZING  
OPERATIONS AT THE OXIDE CONVERSION BUILDING  
AND THE EFFLUENT PROCESSING BUILDING AT THE  
BLENDED LOW-ENRICHED URANIUM COMPLEX**

**AGENCY:** Nuclear Regulatory Commission

**ACTION:** Finding of no significant impact and environmental assessment

**FOR FURTHER INFORMATION CONTACT:** Kevin M. Ramsey, Fuel Cycle Facilities Branch,  
Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and  
Safeguards, U.S. Nuclear Regulatory Commission, Mail Stop T-8A33, Washington, D.C.  
20555-0001, telephone (301) 415-7887 and e-mail [kmr@nrc.gov](mailto:kmr@nrc.gov).

**SUPPLEMENTARY INFORMATION:**

**I. Introduction:**

The Nuclear Regulatory Commission (NRC) staff is considering the issuance of an amendment to NRC Materials License SNM-124 to authorize processing operations in the Oxide Conversion

Building (OCB) and the Effluent Processing Building (EPB) at the Blended Low-Enriched Uranium Preparation (BLEU) Complex. A notice of receipt and opportunity to request a hearing for this action was published in the Federal Register on December 24, 2003 (68 FR 74653). The NRC has prepared an Environmental Assessment (EA) in support of this action. Based upon the EA, the NRC has concluded that a Finding of No Significant Impact (FONSI) is appropriate and, therefore, an Environmental Impact Statement (EIS) will not be prepared.

## **II. Environmental Assessment**

### *Background*

The Nuclear Fuel Services (NFS) facility in Erwin, TN is authorized under License SNM-124 to manufacture high-enriched nuclear reactor fuel. NFS is undertaking the BLEU Project to manufacture low-enriched nuclear reactor fuel. NFS is constructing a new complex at the Erwin site to house the operations involving low-enriched uranium. On July 27, 2003, Amendment 39 to License SNM-124 was issued to authorize storage of low-enriched uranium in the new complex. This was the first of three amendments planned for the BLEU Project.

On January 13, 2004, Amendment 47 was issued to License SNM-124 to authorize downblending operations in the BLEU Preparation Facility. This was the second amendment planned for the BLEU Project. These operations involve the blending of high-enriched uranium with unenriched (natural) uranium to produce low-enriched uranium. Much of the downblending will be performed at other facilities, but NFS plans to perform some downblending at its facility. The BLEU Preparation Facility is located within the older complex because that complex is already authorized to handle high-enriched uranium. After the high-enriched uranium is

downblended and converted to a low-enriched uranium liquid, it will be transferred from the BLEU Preparation Facility to the new complex.

On October 23, 2003, NFS requested an amendment to authorize operations in the remainder of the new BLEU complex (Ref. 5). Supplemental information was submitted by letter dated April 30, 2004 (Ref. 9). This is the third and last amendment planned for the BLEU Project. The request includes OCB operations to convert low-enriched, uranium liquid to a solid, uranium oxide powder. It also includes EPB operations to treat process effluents for disposal.

#### *Review Scope*

The purpose of this EA is to assess the environmental impacts of the proposed license amendment. It does not approve the request. This EA is limited to the proposed OCB and EPB operations at the BLEU Complex and any cumulative impacts on existing plant operations. The existing conditions and operations for the Erwin facility were evaluated by the NRC for environmental impacts in a 1999 EA related to the renewal of the NFS license (Ref. 1) and a 2002 EA related to the first amendment for the BLEU Project (Ref. 2). In addition, the 2002 EA assessed the impact of the entire BLEU Project (including the proposed operations) using information available at that time. This assessment presents up-to-date information and analysis for determining that issuance of a FONSI is appropriate and that an EIS will not be prepared.

#### *Proposed Action*

The proposed action is to amend NRC Materials License SNM-124 to authorize processing operations in the OCB and EPB. The buildings are being constructed within the new BLEU Complex at the NFS site. The operations will convert low-enriched, uranium liquid to a solid,

uranium oxide powder. The uranium oxide powder will be shipped to another facility for fabrication of fuel for a commercial power reactor. The duration of the project is approximately five years. The proposed action in the amendment request is consistent with the proposed action previously assessed in the 2002 EA (Ref. 2).

The OCB operations are composed of four processes - - the Feed Batch Make-Up Process, Uranium Precipitation Process, Oxide Production Process, and Uranium Recovery Process.

- The Feed Batch Make-Up Process involves the transfer of uranyl nitrate solution from the Uranyl Nitrate Building to a blend tank in the OCB. If there is any solution available from the Uranium Recovery Process, it is added also. After the solution is mixed, it is fed to the Uranium Precipitation Process.
- The Uranium Precipitation Process involves the heating and mixing of uranyl nitrate with ammonium hydroxide. This forms ammonium diuranate (ADU) precipitate. The ADU slurry is pumped to a centrifuge feed tank where the pH is adjusted. Then, the slurry is fed to a centrifuge where the solid ADU is separated from the liquid.
- The Oxide Production Process involves the drying of ADU solids in a dryer. Then, the solids are fed to a calciner (i.e., rotary kiln) where hydrogen is used to reduce the ADU solids to uranium oxide powder. The powder is fed to a blender hopper where it is mixed and loaded into shipping pails.

- The Uranium Recovery Process involves the treatment of the liquid centrate from the centrifuge with filters and ion exchange resin to remove residual uranium from the liquid. The uranium is returned to the process and the remaining liquid is sent to the EPB. In addition, the Uranium Recovery Process has a dissolution system where off-specification uranium oxide powder is dissolved in nitric acid to form a uranyl nitrate solution. This solution is returned to the Feed Batch Make-Up Process.

The EPB operations are composed of three processes - - the Ammonia Recovery Process, the Liquid Waste Treatment Process, and the Waste Solidification Process.

- The Ammonia Recovery Process involves the mixing of ammonium nitrate waste solution with sodium hydroxide to form ammonium hydroxide and sodium nitrate. The solution is heated and sent to a stripping column. In the stripping column, steam is used to generate ammonia vapor which is sent to a condenser. The condensed distillate is an ammonium hydroxide solution which is returned to the OCB for reuse. The stripping column bottoms are composed of a sodium nitrate solution which is sent to the Liquid Waste Treatment Process.
- The Liquid Waste Treatment Process involves the concentration of sodium nitrate waste in an evaporator. The water vapor from the evaporator is condensed, sampled, and discharged to the sanitary sewer. The evaporator bottoms are sent to the Waste Solidification Process.
- The Waste Solidification Process involves the mixing of evaporator bottoms with clay and cement. The mixture is cured and shipped to a licensed disposal facility.

### *Need for Proposed Action*

Framatome ANP Inc. has contracted with NFS to downblend surplus high-enriched uranium material to a low-enriched uranium product. The NFS product is expected to be converted to commercial reactor fuel for a Tennessee Valley Authority (TVA) nuclear power reactor; however, the NFS proposed action is limited to the production of low-enriched, uranium oxide powder as feed material for Framatome. The BLEU Project is part of a U.S. Department of Energy (DOE) program to reduce stockpiles of surplus high-enriched uranium through re-use or disposal as radioactive waste. Re-use is considered the favorable option by the DOE because: (1) weapons grade material is converted to a form unsuitable for nuclear weapons (addressing a proliferation concern); (2) the product can be used for peaceful purposes; and (3) the commercial value of the surplus material can be recovered (Ref. 3). An additional benefit of re-use is to avoid unnecessary use of limited radioactive waste disposal space.

### *Alternatives*

The alternatives available to NRC are:

1. Approve the license amendment as described; or
2. No action (i.e., deny the request).

Other alternatives to the proposed action are addressed in the DOE Environmental Impact Statement (Ref. 3) and are not re-analyzed in this EA.

### *Affected Environment*

The affected environment for the proposed action and the alternative is the NFS site. The affected environment is identical to the affected environment assessed in the 2002 EA related



to the first amendment for the BLEU Project (Ref. 2). A full description of the site and its characteristics is given in the 2002 EA. Additional information can be found in the 1999 EA related to the renewal of the NFS license (Ref. 1). The NFS facility is located in Unicoi County, Tennessee, about 32 km (20 mi) southwest of Johnson City, Tennessee. The plant is about 0.8 km (0.5 mi) southwest of the Erwin city limits. The site occupies about 28 hectares (70 acres). The site is bounded to the northwest by the CSX Corporation (CSX) railroad property and the Nolichucky River, and by Martin Creek to the northeast. The plant elevation is about 9 m (30 ft) above the nearest point on the Nolichucky River.

The area adjacent to the site consists primarily of residential, industrial, and commercial areas, with a limited amount of farming to the northwest. Privately owned residences are located to the east and south of the facility. Tract size is relatively large, leading to a low housing density in the areas adjacent to the facility. The CSX railroad right-of-way is parallel to the western boundary of the site. Industrial development is located adjacent to the railroad on the opposite side of the right-of-way. The site is bounded by Martin Creek to the north, with privately owned, vacant property and low-density residences.

#### *Effluent Releases and Monitoring*

A full description of the effluent monitoring program at the site is provided in a 2002 EA related to the first amendment for the BLEU Project (Ref. 2). Additional information is available in the 1999 EA related to the renewal of the NFS license (Ref. 1). The NFS Erwin Plant conducts effluent and environmental monitoring programs to evaluate potential public health impacts and comply with the NRC effluent and environmental monitoring requirements. The effluent program monitors the airborne, liquid, and solid waste streams produced during operation of

the NFS Plant. The environmental program monitors the air, surface water, sediment, soil, groundwater, and vegetation in and around the NFS Plant.

During the review of the amendment request (Ref. 5), NRC discovered that the stack constructed for the OCB was in a different location than shown in the Supplemental Environmental Report submitted by NFS in 2001 (Ref. 6). NFS confirmed that the location and height of the as-built stacks differ slightly from the descriptions provided previously. However, NFS stated that the differences do not change the results of the radiological and chemical consequence analyses (Ref. 9). The NRC agrees.

Airborne, liquid, and solid effluent streams that contain radioactive material are generated at the NFS Plant and monitored to ensure compliance with NRC regulations in 10 CFR Part 20. Each effluent is monitored at or just before the point of release. The results of effluent monitoring are reported on a semi-annual basis to the NRC in accordance with 10 CFR 70.59.

Airborne and liquid effluents are also monitored for nonradiological constituents in accordance with State discharge permits. For the purpose of this EA, the State of Tennessee is expected to set limits on effluents under its regulatory control that are protective of health and safety and the local environment. A new sewer pretreatment permit was issued to NFS by Erwin Utilities on August 26, 2003 (Ref. 9).

#### *Environmental Impacts of Proposed Action*

A full description of the environmental impacts of the proposed action is provided in a 2002 EA related to the first amendment for the BLEU Project (Ref. 2). The environmental impacts of the proposed action are consistent with the impacts in the 2002 EA.

### *1. Normal Operations*

For the proposed action, construction and processing operations will result in the release of low levels of chemical and radioactive constituents to the environment. Based on the information provided by NFS, the safety controls to be employed for the proposed action appear to be sufficient to ensure planned operations will have no significant impact on the environment.

Radiological Impacts: For normal operations, the effluent air emissions from the OCB and the EPB will be discharged through new stacks at each building. Liquid effluents will be discharged to the sanitary sewer. While effluents from the proposed action will increase in relation to current releases, the total annual dose estimate for the maximally exposed individual from all planned effluents is less than 0.01 milliseivert (mSv) or 1 millirem (mrem). This result is well below the annual public dose limit of 1 mSv (100 mrem) in 10 CFR 20.1301, and the constraint on air emissions to the environment of 0.1 mSv (10 mrem) in 10 CFR 20.1101. OCB and EPB operations are not expected to increase the dose to workers at the NFS facility because the types and quantity of material, and the processing, will be similar to what is already licensed at the site. Surface water quality at the NFS site is currently protected by enforcing release limits and monitoring programs. No significant change in surface water impacts is expected from OCB and EPB operations. The proposed action will not discharge any effluents to the groundwater; therefore, no adverse impacts to groundwater are expected.

The proposed action involves transportation of radioactive feed material to the NFS site and transportation of radioactive waste material from the NFS site. All transportation will be conducted in accordance with the applicable NRC and U.S. Department of Transportation regulations; therefore, no adverse impacts from transportation activities are expected.

Land Use: OCB and EPB operations will be conducted in new buildings constructed on NFS-owned property that has been disturbed previously. The developed area will increase from approximately 75 to 80 percent of 69.9 acres. No adverse impact to land use is expected.

Cultural Resources: There are no National Register or Historic Places listed or eligible properties affected by the proposed action. No adverse impact to cultural resources is expected.

Biotic Resources: For biotic resources, a vacant and previously disturbed field containing no critical habitat will be used. The only Federally endangered species in Unicoi County is the Appalachian elktoe mussel (*Alasmidonta raveneliana*) near the confluence of the Nolichucky River and South Indian Creek. This location is upstream of the NFS site and, therefore, the NRC finds the proposed action is not likely to affect the species. The only Federally threatened species in Unicoi County are the small whorled pagonia (*Isotria medeoloides*) and the Virginia spiraea (*Spiraea virginiana*). A field investigation was conducted in 2002 and neither of these species was found to be present on the site of the proposed action. Therefore, the NRC finds the proposed action is not likely to affect either of these species.

## *2. Potential Accidents*

Under accident conditions, higher concentrations of materials could be released to the environment over a short period of time. An evaluation of potential accidents is provided in Section 5.1.2 of the 2002 EA (Ref. 2). In addition, detailed accident analyses have been performed by NFS in an integrated safety assessment (ISA). The NRC's detailed review of the ISA is ongoing, however preliminary findings indicate that the potential accidents identified in

the ISA are consistent with the previous evaluation. NRC finds that the safety controls to be employed in the proposed action appear sufficient to ensure planned processing will be safe.

### *3. Cumulative Impacts*

An evaluation of cumulative impacts is provided in Section 5.1.3 of the 2002 EA (Ref. 2). The evaluation considers the impacts of the proposed action with the known impacts of the existing facility. After reviewing the updated information provided by NFS, the NRC concludes that the cumulative impacts represent an insignificant change to the existing conditions in the area surrounding the NFS site.

### *Environmental Impacts of No Action Alternative*

Under the no action alternative, NFS would not be able to carry out its contract obligations to produce a commercial product from U.S. Government surplus, weapons-usable, high-enriched uranium. Failure to fulfill its role in the DOE program could cause DOE to select other alternatives for disposition of the surplus material that may be less cost effective and incur greater environmental impacts. For example, the disposal option would incur additional costs and consume available disposal space that may be better utilized for non-reusable wastes. If NFS were not able to fulfill its contract, DOE may transfer the work to other facilities.

Based on its review, the NRC has concluded that the environmental impacts associated with the proposed action are insignificant and, therefore, do not warrant denial of the proposed license amendment. The NRC has determined that the proposed action, approval of the license amendment as described, is the appropriate alternative for selection. Based on an evaluation of the environmental impacts of the proposed license amendment, the NRC has determined that the proper action is to issue a FONSI in the Federal Register.

### *Agencies and Persons Contacted*

On May 31, 2002, the NRC staff contacted the Director of the Division of Radiological Health in the Tennessee Department of Environment and Conservation (TDEC) concerning the 2002 EA (Ref. 2) and the potential impact of the BLEU Project on the environment. Upon conclusion of the consultation process, TDEC had no remaining concerns about potential environmental impacts. On March 12, 2004, the NRC staff contacted the Director of the TDEC Division of Radiological Health concerning the revised environmental impacts in this EA. On April 12, 2004, the Director responded that they had reviewed the draft EA and had no comments (Ref. 7).

On May 22, 2002, the NRC staff contacted the Tennessee Historical Commission (THC), Division of Archeology concerning the 2002 EA (Ref. 2) and the potential affect of the BLEU Project on cultural resources. The consultation concluded that no cultural resources would be affected by the proposed action. On March 11, 2004, the NRC staff contacted the THC concerning the revised environmental impacts in this EA. On March 22, 2004, the THC responded that they had reviewed the draft EA and had no comments (Ref. 8).

On June 6, 2002, the NRC staff contacted the Fish and Wildlife Service (FWS) concerning the 2002 EA (Ref. 2) and the potential affect of the BLEU Project on endangered species. The consultation concluded that no endangered species would be affected by the proposed action. On March 8, 2004, the NRC staff contacted the FWS concerning the revised environmental impacts in this EA. On April 8, 2004, the FWS responded that they had reviewed the draft EA and requested that NRC clarify the finding in the 2002 EA that the proposed action is not likely

to affect any endangered or threatened species in the area. On April 27, 2004, NRC provided a revised EA with requested finding. On May 11, 2004, FWS responded that it concurred with the finding.

#### *References*

1. U.S. Nuclear Regulatory Commission, "Environmental Assessment for Renewal of Special Nuclear Material License No. SNM-124," January 1999, ADAMS No. ML031150418.
2. U.S. Nuclear Regulatory Commission, "Environmental Assessment for Proposed License Amendments to Special Nuclear Material License No. SNM-124 Regarding Downblending and Oxide Conversion of Surplus High-Enriched Uranium," June 2002, ADAMS No. ML021790068.
3. U.S. Department of Energy, "Disposition of Surplus High Enriched Uranium Final Environmental Impact Statement," DOE/EIS-0240, Volume 1, June 1996. This document is available to the public from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.
4. U.S. Nuclear Regulatory Commission, "Environmental Assessment and Finding of No Significant Impact for the BLEU Preparation Facility," September 2003, ADAMS No. ML032390428.
5. B. M. Moore, Nuclear Fuel Services, Inc., Letter to U.S. Nuclear Regulatory Commission, "License Amendment Request for the Oxide Conversion Building and the Effluent Processing Building at the BLEU Complex," October 23, 2003, ADAMS No. ML033420637.

6. B. M. Moore, Nuclear Fuel Services, Inc., Letter to U.S. Nuclear Regulatory Commission, "Supplemental Environmental Report for Licensing Actions to Support the BLEU Project," November 9, 2001, ADAMS No. ML013330459.
7. D. Shults, Tennessee Division of Radiological Health, E-mail to K. Ramsey, U.S. Nuclear Regulatory Commission, "Consultation on Environmental Assessment for Nuclear Fuel Services," April 12, 2004, ADAMS No. ML041050007.
8. H. Harper, Tennessee Historical Commission, Letter to K. Ramsey, U.S. Nuclear Regulatory Commission, "NRC, BLEU Project/Nuclear Fuel Services, Erwin, Unicoi County," March 22, 2004, ADAMS No. ML040930253.
9. B. M. Moore, Nuclear Fuel Services, Inc., Letter to U.S. Nuclear Regulatory Commission, "NFS Response to Request for Additional Information for Oxide Conversion Building and Effluent Processing Building at the BLEU Complex," April 30, 2004, ADAMS No. ML041280552.
10. L. Barclay, U.S. Department of Interior, Fish and Wildlife Service, Letter to U.S. Nuclear Regulatory Commission, May 11, 2004, ADAMS No. ML041450299.

### **III. Final Finding of No Significant Impact**

Pursuant to 10 CFR Part 51, the NRC staff has considered the environmental consequences of amending NRC Materials License SNM-124 to authorize operations in the OCB and EPB. On the basis of this assessment, the Commission has concluded that environmental impacts



associated with the proposed action would not be significant and the Commission is making a finding of no significant impact. Accordingly, the preparation of an EIS is not warranted.

#### **IV. Further Information**

For further details, see the references listed above. Unless otherwise noted, documents may be examined, and/or copied for a fee, at the NRC's Public Document Room (PDR), located at One White Flint North, Room O-1F21, 11555 Rockville Pike, Rockville, Maryland. In addition, documents related to this proposed action will be available electronically for public inspection from the NRC Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at [www.nrc.gov/reading-rm/adams.html](http://www.nrc.gov/reading-rm/adams.html) (the Public Electronic Reading Room). Persons who do not have access to ADAMS, or who encounter problems accessing documents in ADAMS, should contact the PDR reference staff at (800) 397-4209 or (301) 415-4737, or by e-mail to [pdrc@nrc.gov](mailto:pdrc@nrc.gov).

Dated at Rockville, Maryland, this 14<sup>th</sup> day of June 2004.

FOR THE NUCLEAR REGULATORY COMMISSION

**/RA/**

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Gary S. Janosko, Chief  
Fuel Cycle Facilities Branch  
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Office of Nuclear Material Safety  
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