[redacted]

NRC FORM 374

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Nuclear Fuel Services, Inc.	3. License Number SNM-124, Amendment 55
2. 1205 Banner Hill Road Erwin, TN 37650-9718	4. Expiration Date July 31, 2009
	5. Docket No. 70-143 Reference No.

6. Byproduct Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum amount that Licensee May Possess at Any One Time Under This License
A. Uranium enriched up to 100 w/% in the U235 isotope which may contain up to an average of 10^{-6} grams plutonium per gram of uranium, 0.25 millicuries of fission products per gram of uranium, and 1.5×10^{-5} grams transuranic materials (including plutonium), per gram of uranium, as contaminants.	A. As described in Appendix B to Chapter 1 of the NFS license application, excluding pyrophoric forms	A. [redacted]

[redacted]

[redacted]

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B.	Uranium enriched up to 100 w/% in the U233 isotope	B.1 Any form, but only as residual contamination from previous operations	B.1 [redacted]
		B.2 Any form, as received for analysis and/or for input into development studies	B.2 [redacted]
C.	Plutonium	C.1 As counting and calibration standards	C.1 [redacted]
		C.2 As residual contamination and holdup from previous operations.	C.2 As described in the license application and an NFS report to the NRC transmitted by letter dated January 21, 1994 (NFS Document No. 28G94-001), and NFS report dated October 17, 1988 (NFS Document No. 28G88-007)
		C.3 As received for analysis or for input into development studies, any form except pyrophoric	C.3 [redacted]
		C.4 As waste resulting from decontamination and volume reduction of equipment received from other organizations, any form except pyrophoric	C.4 [redacted]

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D. Transuranic Isotopes	D. As waste resulting from processing enriched uranium	D. [redacted]
E. Fission Products	E. As waste resulting from processing enriched uranium	E. [redacted]

9. Authorized place of use: The licensee's existing facilities in Unicoi County, Tennessee, as described in the referenced application.

10. This license shall be deemed to contain two sections: Safety Conditions and Safeguards Conditions. These sections are part of the license, and the licensee is subject to compliance with all listed conditions in each section.

FOR THE NUCLEAR REGULATORY COMMISSION

November 5, 2004

Date: _____ By: /RA/

Gary S. Janosko, Chief
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Washington, DC 20555

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SAFETY CONDITIONS

S-1 For use in accordance with the statements, representations, and conditions in Chapters 1 through 8 of the application submitted by letter dated July 24, 1996, and supplements dated May 9 and November 14, 1997; March 13, March 25, June 23, July 23, August 7, August 14, August 28, September 4, September 11, September 15, September 25, September 28, October 19, October 21, October 22, October 23, November 6, November 13, November 16, November 20, November 24, December 18, and December 21, 1998; January 29, February 4, February 10, February 16, February 24, April 20, April 23, May 21, July 30 (NFS No. 21G-99-0058), July 30 (NFS No. 21G-99-0093), August 13, December 10, December 21, and December 29, 1999; January 25, March 31, July 6, August 18, August 23, September 1, November 3, December 5, December 8, December 14, December 20, and December 27, 2000; January 11, January 12, March 30, May 11, June 29, October 5, and October 25, 2001; February 21, February 28, March 8, March 12, April 3, April 4, August 23, September 13, October 18, December 17, and December 23, 2002; January 23, February 10, February 14, February 27, March 3, March 6, March 10, March 13, April 14, April 16, April 22, July 31, September 26, and October 27, 2003; January 9, and April 5, 2004.

For the Blended Low-Enriched Uranium (BLEU) Preparation Facility (BPF) and Oxide Conversion Building (OCB) and Effluent Processing Building (EPB): May 24, August 16, October 11, October 16, November 8, and December 3, 2002; March 8, April 4, June 20, September 3, September 5, October 23 (Attachment 1), October 31, November 5, December 5, and December 10, 2003, February 6, February 11, February 25, March 12, March 15, March 16, March 17, March 18, March 19, April 30, and May 21, 2004.

S-2 NFS shall not operate the fuel manufacturing processes described in Sections 15.1 and 15.2 of the license application until an Integrated Safety Analysis (ISA) has been performed, including the appropriate nuclear criticality safety evaluations. A summary of the ISA shall be submitted to the NRC, in addition to an application for amendment to the license, at least 90 days prior to the NFS planned restart of operations.

S-3 Deleted by Amendment 5, dated May 2000.

S-4 NFS shall not operate the LEU recovery facility described in Section 15.4 of the license application until an ISA has been performed, including the appropriate nuclear criticality safety evaluations. A summary of the ISA shall be submitted to the NRC, in addition to an application for amendment to the license, at least 90 days prior to the NFS planned restart of operations.

S-5 NFS shall not operate [redacted] described in Section 15.4 of the license application until an ISA has been performed, including the appropriate nuclear criticality safety evaluations. A summary of the ISA shall be submitted to the NRC, in addition to an application for amendment to the license, at least 90 days prior to the NFS planned restart of operations.

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S-6 Deleted by Amendment 2, dated February 2000.

S-7 Deleted by Amendment 2, dated February 2000.

S-8 NFS shall conduct quarterly NCS audits of selected plant activities involving SNM such that SNM processing or storage areas are audited biennially. The purpose of the audits is to determine that: (a) site operations are conducted in compliance with license conditions, operating procedures, and posted limits, (b) administrative controls and postings are consistent with NCSE, (c) equipment and operations comply with NCSE, and (d) corrective actions relative to findings of NCS inspections are adequate.

S-9 Subcritical parameter values based on experiments, unless they are from the ANSI/ANS series 8 standards, shall be not less than that corresponding to k_{eff} of 0.98 or, alternatively, the factors in Section 4.2.3.1 of the license application may be applied for uranium-water systems.

S-10 Notwithstanding the description of setting failure limits in Section 4.2.3.2 of the application, when determining subcriticality based on computer code calculations the failure limit shall be no greater than the value corresponding to: $k_{eff} = .95$ for systems containing uranium enriched in ^{235}U above 20%, $k_{eff} = .95$ for systems above 10% but below 20% enrichment that are not highly moderated, $k_{eff} = .97$ for systems above 10% but below 20% enrichment that are highly moderated, and $k_{eff} = .97$ for systems containing uranium enriched in ^{235}U less than 10%. As one acceptable method, the margin may be based on a validation against applicable benchmark experiments using a one-sided 95% tolerance limit at a 95% confidence level less an additional $0.015 \Delta k_{eff}$. The k_{eff} values of .95 and .97 above are exact limit values, and do not imply that compliance need only be shown to 2 significant figures. Compliance with them shall allow for purely calculational inaccuracies, such as Monte Carlo variance, by meeting the limit with a margin in the conservative direction of at least two standard deviations. Any rounding shall be in the conservative direction.

S-11 Notwithstanding Section 4.2.4.7 of the application, for situations in which it is credible, and not unlikely, that critical masses or concentrations may accumulate in a solution confined to a favorable geometry or poisoned vessel, and then be released to vessels of unfavorable geometry, transfer shall be controlled by one of the following three general provisions for double contingency:

(1) multiple engineered hardware controls capable of preventing unsafe transfer; or

(2) at least one engineered hardware control capable of preventing unsafe transfer plus a determination of safe conditions and actuation of transfer by an individual; or

(3) a design requiring independent actions by two individuals before transfer is possible, each action supported by independent measurements of material to be transferred, and a determination of safe conditions. In this case, physical impediments should be included in the

system design which will prohibit either individual from performing both of the actions intended to be performed independently.

S-12 Prior to August 15, 1999, NFS will implement fire protection procedures to minimize the threat of fire, explosions, or related perils to process control and safety systems which could lead to an unacceptable release of hazardous material related to SNM or radiation that would threaten workers, the public health and safety, or the environment, as committed to in Section 6.2 of the license application.

S-13 Deleted by Amendment No. 4, March 2000.

S-14 The [redacted] will be protected by barriers with an equivalent two hour fire resistance rating.

S-15 Active and administrative controls for flammable liquids and gasses must be operable in the fire area where flammable liquids and gases are present during KAST processing.

S-16 Prior to August 15, 1999, KAST Process fire walls will be upgraded to meet FHA recommendations, as described in NFS Document No. 21G-98-0198, *NFS Response to Request for Additional Fire Safety Information for the KAST Process*, dated December 8, 1998.

S-17 Prior to December 31, 1999, NFS shall protect KAST process areas and special nuclear material vaults from lightning by installing a lightning protection system in accordance with the standard "Lightning Protection Code," NFPA 780.

S-18 Prior to August 15, 1999, fixed combustible gas detectors in the [redacted] shall be capable of alarming locally and at a constantly manned location.

S-19 Prior to December 31, 1999, NFS will upgrade all process area sprinkler systems to alarm at a constantly manned location.

S-20 Deleted by Amendment 24, April 2001.

S-21 NFS will maintain an industrial fire brigade in accordance with industry standards (NFPA 600). NFS will have a proceduralized method for the rapid response of external firefighting resources when sufficient fire brigade staffing is unavailable.

S-22 NFS shall perform the following steps as detailed in the NFS Bulk Chemical Tank Analysis (NFS Document 21G-99-0207).

A. By July 31, 2001, for [redacted], NFS shall:

1. Perform a 100 percent visual internal tank inspection.

2. Provide details of internal nozzle penetrations and welds, add these details to drawing, then recalculate estimated service life.

3. Conduct liquid penetrant examinations of floor-to-shell welds.

4. Perform a magnetic flux leakage inspection of 100 percent of the tank bottom to detect underside corrosion and pitting.

B. By September 1, 2001, NFS shall provide a written plan that details the continued inspection and testing of bulk chemical storage tanks that will provide a documented safety basis for bulk storage tanks.

C. Prior to December 31, 2001, NFS shall conduct a second set of ultrasonic thickness tests for [redacted]. These readings will provide data that will allow the corrosion rate and tank wall thickness to be determined. The [redacted], shall also have an internal inspection and a liquid penetrant examination of the floor-to-shell welds.

D. As required by code, each tank shall have a permanent nameplate attached specifying tank operating conditions. The American Society of Mechanical Engineers, "Boiler and Pressure Vessel Code," Section VII, "Markings," lists necessary information for nameplates.

S-23 NFS shall inform the NRC within 30 days of receipt of a violation notice from the State of Tennessee Division of Air Pollution or Water Pollution Control, or receipt of modified requirements of the state-issued National Pollutant Discharge Elimination System (NPDES) permit.

S-24 The licensee shall maintain and execute the response measures in the Emergency Plan, Revision 7, transmitted by letter dated June 3, 2003, and the proposed revisions to the NFS Emergency Plan to support the Blended Low Enriched Uranium (BLEU) Oxide Conversion Building (OCB) and Effluent Process Building (EPB) dated October 24, 2003, or as further revised by the licensee consistent with 10 CFR 70.32(i).

S-25 NFS may make changes (modifications, additions, or removals) to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel without license amendment, provided that the proposed change does not involve:

(1) the creation of new types of accident sequences that, unless mitigated or prevented, would exceed the performance requirements of 10 CFR 70.61 and have not previously been described in the ISA summary;

(2) the usage of new processes, technologies, or controls for which NFS has no prior experience;

(3) the removal, without at least an equivalent replacement of the safety function, of an item relied on for safety that is listed in the ISA summary;

(4) the alteration of any item relied on for safety, listed in the ISA summary, that is the sole item preventing or mitigating an accident sequence that exceeds the performance requirements of 10 CFR 70.61; and

(5) a change to the conditions of this license or Part I of the license application.

Proposed changes not meeting all of the above criteria shall be deemed to require NRC approval by amendment. As part of the application for amendment, NFS shall perform an ISA for the change and submit either an ISA summary or applicable changes to a prior existing ISA summary. NFS shall also provide any necessary revisions to its environmental report.

Proposed changes requiring revision of applicable safety or environmental bases, but not requiring an amendment to the license in accordance with the above criteria, shall be reviewed and approved by the NFS safety review committee. The internally authorized change documentation shall provide the basis for determining that the change will be consistent with the criteria (1) through (5) above.

For any internally authorized change implemented by NFS without NRC approval pursuant to this license condition, NFS shall submit annually to the NRC applicable changes to the ISA summary of a prior existing ISA. In addition, NFS will submit annually a brief summary of all internally authorized changes not requiring prior NRC approval. NFS will submit by January 30th of each calendar year the revisions to the ISA summary and the summary of all internally authorized changes not requiring NRC approval.

S-26 Prior to engaging in the decommissioning activities specified in Section 1.6.6 of the license application dated November 16, 1998, NFS must determine the status of the procedures and activities planned with respect to 10 CFR 70.38(g)(1). If required, NFS must submit a decommissioning plan to the NRC for review and approval prior to initiating such actions.

S-27 At not more than 1-year intervals from the issuance date of this license, the licensee shall update the demonstration sections of the license application to reflect the licensee's current operations and evaluations. The updates shall, as a minimum, include information for the health and safety section of the application as required by 10 CFR 70.22(a) through 70.22(f) and 70.22(i) and operational data or environmental releases as required by 70.21.

S-28 Deleted by Amendment 31, October 2001.

S-29 Deleted by Amendment 31, October 2001.

S-30 Deleted by Amendment 31, October 2001.

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S-31 Deleted by Amendment 31, October 2001.

S-32 Deleted by Amendment 31, October 2001.

S-33 Deleted by Amendment 31, October 2001.

S-34 Deleted by Amendment 31, October 2001.

S-35 Deleted by Amendment 31, October 2001.

S-36 Deleted by Amendment 31, October 2001.

S-37 Deleted by Amendment 31, October 2001.

S-38 Deleted by Amendment 31, October 2001.

S-39 For individual fire areas in the [redacted], NFS shall complete a nuclear criticality safety analysis demonstrating that a criticality accident resulting from a credible fire, analyzed in the Fire Hazards Analysis, or from the consequences of fire-suppression activities, is highly unlikely. This may be done by: (i) demonstrating that a criticality resulting from an accident sequence initiated by a major fire would be highly unlikely, or (ii) demonstrating that a major fire is highly unlikely. NFS shall also review all NCSAs potentially affected by the installation of automatic fire suppression systems and associated facility modifications to determine their effect on the safety basis. For the analyses specified by this safety condition, a major fire is defined as one which would affect two or more process Areas in [redacted].

S-40 By December 31, 1999, for KAST process structures and equipment, NFS shall classify all items relied on for nuclear criticality safety as either safety-related or configuration-controlled equipment. Safety-related equipment (SRE) is defined as active or passive engineered-controls that are relied on to prevent nuclear criticality in accordance with the double contingency principle, and whose operation can change with time such that the equipment might not perform its function. Configuration-controlled equipment (CCE) is defined as structures, systems, or components for which either:

(i) some characteristic is relied on for double contingency, which characteristic will not change with time as a result of accidents identified in the ISA, or

(ii) the control is supplemented by one or more controls as one leg of the double contingency principle.

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For SRE items, maintenance, calibration, testing, and/or inspection shall be performed in accordance with written, approved procedures to assure continued reliability and functional performance. SRE that has undergone maintenance will be functionally tested, calibrated, or inspected (as applicable) prior to restart.

CCE will be functionally tested, maintained, calibrated, and/or inspected periodically in accordance with written, approved procedures, with the following exceptions:

CE that has no credible mechanism to fail beyond the conditions assumed in the bounding normal case does not require functional testing, calibration, or preventive maintenance.

CCE that is tested by every use and that is used with sufficient frequency to ensure adequate reliability does not require functional testing or preventive maintenance, unless it contains parts that degrade over time.

CCE items will be inspected after initial installation, replacement, and by periodic NCS audits.

S-41 Deleted by Amendment 32, February 2002.

S-42 Deleted by Amendment 5, dated April 2000.

S-43 Deleted by Amendment 22, dated March 2001.

S-44 Deleted by Amendment 22, dated March 2001.

S-45 Deleted by Amendment 32, February 2002.

S-46 By August 1, 2000, NFS shall submit a Criticality Safety Upgrade Program (CSUP) Plan to NRC for review and approval. This CSUP shall address the following elements, at a minimum:

1. All Nuclear Criticality Safety Analyses (NCSAs) performed or revised after May 1, 2000, shall be upgraded as follows:

   (a) the criticality safety basis shall be consolidated in a single integrated and self-consistent document;

   (b) all engineered structures, systems, and components and operator actions relied on to meet the double contingency principle shall be clearly identified for each accident sequence leading to criticality;

   (c) the basis for double contingency shall be clearly documented, including technical documentation of the independence and unlikelihood of control failure;

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(d) normal and credible abnormal operating conditions shall be clearly identified; and

(e) all assumptions credited for criticality safety shall be supported by documentation consisting of a technical demonstration of the adequacy of the assumptions rather than reliance on engineering judgement or historical practices.

2. By August 1, 2001, management procedures defining the criticality safety program shall be upgraded to the following standards:

(c) the NCSAs consist of self-contained safety basis documents, sufficiently detailed to permit independent reconstruction of results by a knowledgeable criticality safety specialist without reliance on additional site-specific or historical knowledge;

(d) the standard technical practices used in designing calculational models are specified in sufficient detail to ensure that the resulting NCSAs are uniform with respect to modeling reflection, determining the optimal range of moderation, treating interactions, accounting for dimensional tolerances, and any bounding approximations in models;

(e) evaluation of accident sequences take potential interaction between fire and chemical safety and criticality safety into account;

(d) the scope, conduct, and documentation of independent reviews of NCSAs are specified;

(e) the applicability of code validation(s) to the specific cases being modeled is evaluated, including a determination of the adequacy of the subcritical margin;

(f) engineered as opposed to administrative controls are used as the preferred method of ensuring criticality safety, wherever practicable.

(g) the basis for using administrative instead of engineered controls is documented as part of the NCSA; and

(h) a problem reporting and corrective action program is established to ensure the effectiveness of the criticality safety program and criticality controls, and to ensure that effective corrective actions and lessons learned are flowed down into appropriate implementing documents. This program shall include the re-evaluation of the unlikelihood of control failure, as part of the double contingency safety basis, as control failure data is generated.

S-47 By July 31, 2001, NFS shall submit to NRC for approval the following information related to the North Site Decommissioning Plan:

(a) area factors for volumetrically-contaminated soils and the technical basis for those area factors,

(b) actual Minimum Detectable Concentrations (MDCs) for the NaI detector and the technical basis for those MDCs,

(c) appropriate investigation levels (ILs) for static and scan survey measurements that will be performed in impacted areas.

S-48 Notwithstanding the Derived Air Concentration (DAC) and Annual Limit on Intake (ALI) listed in Appendix B to 10 CFR Part 20, the licensee may use adjusted DAC values and adjusted ALI values specified in International Commission on Radiation Protection (ICRP), Publication 68 (Annals of the ICRP Volume 24, No.4).

S-49 NFS shall utilize, for setpoint determinations, conservative engineering analyses which account for safety limits, instrument and system accuracies, response times, instrument drift, manufacturer's data and operating experience. The analysis for each safety setpoint shall be a formal calculation and shall be documented for each IROFS interlock and alarm.

S-50 By February 13, 2004, NFS shall submit a revised BPF Integrated Safety Analysis Summary that incorporates changes resulting from NRC review questions documented in NFS letters dated September 3, September 5, October 31, November 5, November 7, December 5, and December 10, 2003.

S-51 The licensee shall submit a revised OCB/EPB Integrated Safety Analysis Summary that incorporates all changes to date, at least fifteen (15) days prior to the NRC's Operational Readiness Review.

SAFEGUARDS CONDITIONS

Section-1.0 -- ABRUPT LOSS DETECTION (For SSNM Only):

SG-1.1 Notwithstanding the requirement of 10 CFR 74.53(b)(1) to have a process detection capability for each unit process, the process units listed in Section 1.1.5.2 of the Plan identified in Condition SG-5.1 shall be exempt from such detection capability, and the licensee's process monitoring system shall be comprised of the control units described in Section 1.3 (and all sub-sections therein) of the above mentioned Plan.

Section-2.0 -- ITEM MONITORING (For SSNM Only):

SG-2.1 Notwithstanding the requirement of 10 CFR 74.55(b) for item monitoring tests for all item categories except those identified by 10 CFR 74.55(c), and notwithstanding statement #8 of Section 2.3.3 of the Plan identified in Condition SG-5.1, the licensee is exempt from [redacted]. Such standards are not, however, exempted from physical inventory requirements.

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Section-3.0 -- ALARM RESOLUTION

SG-3.1 The licensee is authorized to continue material processing operations in Control Units 1, 3, 4, 5, and 15 under process monitoring alarm conditions. During the continuation of processing operations, the measures contained in Section 3.1.1 of the Plan identified in Condition SG-5.1 shall be implemented.

Section-4.0 -- QUALITY ASSURANCE (SSNM & LEU):

SG-4.1 Notwithstanding the requirements of 10 CFR 74.31(c)(2) for LEU and 10 CFR 74.59(d)(1) for SSNM to maintain a system of measurements to substantiate both the element and fissile isotope content of all SNM received, inventoried, shipped or discarded, SNM measured by the licensee for U-233, U-235, or Pu-239 by non-destructive assay techniques need not be measured for total element if the calculated element content is based on the measured isotope content which, in turn, is traceable to an isotopic abundance measurement at the area of generation.

SG-4.2 Notwithstanding the requirement of 10 CFR 74.59(e)(8) to establish and maintain control limits at the 0.05 and 0.001 levels of significance for all HEU-related measurements, the licensee may use one and two scale divisions as being equivalent to the 0.05 and 0.001 control levels, respectively, for mass measurements.

SG-4.3 Notwithstanding Section 4.5.1 of the Plan identified in Condition SG-5.1, which states that a physical inventory of SSNM is conducted at an interval of at least every six calendar months with no more than 185 days elapsing between any two consecutive inventories, the licensee is granted an extension of time from April 3, 2000, to June 2, 2000, for conducting its SSNM physical inventory. This condition automatically expires on June 5, 2000.

SG-4.4 Notwithstanding the requirement of 10 CFR 74.59(f)(2)(viii) to remeasure, at the time of physical inventory, any in-process SSNM for which the validity of a prior measurement has not been assured by tamper-safing, the licensee may book for HEU physical inventory purposes:

(1.) [redacted] process holdup quantities determined by NDA measurements performed prior to the start of an inventory, in accordance with the controls described in Sections 4.5.2.3.1 and 4.5.2.3.2 of the Plan identified in Condition SG-5.1;

(2.) pre-listed feed material to the [redacted] process that is introduced into process prior to the start of an inventory, in accordance with the controls described in Section 4.5.2.3.2 of the Plan identified in Condition SG-5.1; and

(3.) [redacted] holdup quantities determined by the most recent NDA measurements, in accordance with the controls described in Section 4.5.2.3.1 of the Plan identified in Condition SG-5.1.

SG-4.5 Notwithstanding the requirements of 10 CFR 74.59(f)(1) and 74.59(f)(2)(viii) to measure and inventory all SSNM, the licensee may determine process exhaust ventilation system inventory quantities in accordance with Section 4.5.3.5 of the Plan identified in Condition SG-5.1.

SG-4.6 The restriction of 10 CFR 74.51(d)(2) is hereby removed, and based on process monitoring performance in MBA-6 acceptable to the NRC, the licensee is authorized to conduct HEU physical inventories in accordance with the requirements of 10 CFR 74.59(f)(1), provided HEU scrap recovery operations in MBA-5 are restricted to the last 60 calendar days of each physical inventory period.

SG-4.7 Notwithstanding the requirement of 10 CFR 74.59(d)(1) to substantiate the uranium and U-235 content of SSNM transferred between areas of custodial responsibility, the licensee may transfer scrap materials from MBA-6 to MBA-5 on estimated values provided (1) such estimates are based on historical factors (with a unique factor for each scrap category) which are updated at least once every six months, and (2) that the estimated transfer values are corrected upon obtaining "first dissolution plus residue" measurements.

SG-4.8 The SNM content of liquid waste discarded from collection tanks shall be analyzed and recorded at measured values. The measurement methods must have a greater sensitivity than the concentration of the sample aliquot analyzed, except when the quantity discarded does not exceed 50 grams U-235 per month from Plant I (HEU) and does not exceed 10 grams U-235 per month from MBA-4 (LEU) through those discard batches where the sample aliquot concentration is less than the sensitivity of the method.

SG-4.9 Notwithstanding the statement in Section 5.9, of the Plan identified in Condition SG-5.2, pertaining to bias corrections to inventory difference (ID) values, the licensee shall comply with Section 4.3.1 of such Plan with respect to determining any bias corrections to IDs.

SG-4.10 Notwithstanding the requirements of 10 CFR 74.59(e)(8) relative to actions to be taken when replicate measurement data exceed a 0.001 control limit, the licensee shall comply with Section 4.4.1.7.3.4 of the Plan identified in Condition SG-5.1.

SG-4.11 Notwithstanding the requirement of 10 CFR 74.59(e)(4) that allows the pooling of data which has been shown to be not significantly different on the basis of appropriate statistical tests, the licensee may pool data from equivalent scales without testing.

SG-4.12 Notwithstanding the requirement of 10 CFR 74.59(e)(5) to evaluate all program data to establish random error variances, limits for systematic error, etc., the licensee may randomly select a partial quantity of bulk measurement program data, as described in Section 4.4.4(3) of

the Plan identified in Condition SG-5.1, provided the partial data set is not statistically different from the total data population whenever the impact on SEID is greater than 1.0 percent.

SG-4.13 Not withstanding the requirement of 10 CFR 74.59(f)(1)(i) to calculate the SEID associated with each HEU inventory difference (ID) value, the licensee need not determine such SEID for MBA-7 whenever its ID is less than 300 grams U-235.

SG-4.14 Notwithstanding the requirement of 10 CFR 74.31(c)(3) and of 74.59(e)(3)(i) to measure control standards for all measurement systems for the purpose of determining bias, and notwithstanding the requirement of 10 CFR 74.31(c)(4) and of 74.59(e)(8) to maintain a statistical control system to monitor such control standard measurements, the licensee need not measure nor monitor such control standards for point calibrated, bias-free, systems. To be regarded as bias-free, a measurement system must be calibrated by one or more measurements of a representative standard(s) each time process unknowns are measured, and the measurement value assigned to a given unknown is based on the associated calibration.

SG-4.15 All SNM not in transit shall be physically located within an MBA or ICA, except as specified in Condition SG-4.15.1.

SG-4.15.1 The requirement of Condition SG-4.15 shall not apply to HEU or LEU contained in, or precipitated from, measured liquid or gaseous waste discards.

SG-4.16 Solutions generated from the use of sinks, eye washers, safety showers, drinking fountains, etc., located within HEU MAAs shall be collected and measured prior to discarding.

SG-4.17 All HEU-bearing liquid effluents that are routed to the Waste Water Treatment Facility (WWTF) shall be measured for total uranium in the WWTF prior to commingling with LEU. Each WWTF HEU input batch measurement shall serve as an overcheck to the corresponding summation of accountability values. If for any material balance period, the WWTF total cumulative HEU over-check value [redacted], an investigation shall be conducted and documented as to the cause and corrective action taken, and the appropriate NRC safeguards licensing authority shall be notified within 30 days after the start of the associated physical inventory. The WWTF input overcheck measurement system shall be subject to all appropriate requirements of the Measurement Control Program as specified in Section 4.4 of the Plan identified in Condition SG-5.1.

SG-4.18 Notwithstanding the requirement of 10 CFR 74.15 to include limit of error data on DOE/NRC Form-741 for all SNM shipments, the licensee is exempt from including such data on 741 Forms associated with waste burial shipments.

SG-4.19 Whenever a SNM Material Superintendent or designated SNM Custodian is summoned to an MAA exit point to assist in resolving whether an item or container should be allowed to exit to the protected Area, in accordance with the currently approved "Physical Safeguards Plan," the

Superintendent or Custodian shall document the basis for any decision allowing the item or container to leave the area.

SG-4.20 The licensee is exempted from calculating the standard error of inventory difference (SEID) and measurement system biases associated with LEU physical inventories provided that the calculated inventory difference does not exceed 1,000 grams U-235.

SG-4.21 Notwithstanding Section 7.1 of the Plan identified in Condition SG-5.2, which states that "confirmatory measurements of scrap receipts are performed after the scrap is dissolved," the term *"scrap receipts"* shall not apply to receipt materials whose SNM content can be determined on the as-received-material by weighing, sampling and analyses with a measurement uncertainty (at the 95% C.L.) of less than 2.00 percent (based on a single sample).

SG-4.22 Notwithstanding the heading "Typical MC&A Procedures" for Table 3.5 of the Plan identified in Condition SG-5.2, all procedures listed in Table 3.5 shall be officially designated as "Critical MC&A Procedures", and any revisions to these procedures shall be subject to the same review and approval requirements (as specified in Section 3.5 of the Plan) that applied to the original procedures.

SG-4.23 Notwithstanding statements contained in Section 4.2.4 of the Plan identified in Condition SG-5.2, if the normal minimum number of control standard measurements per week, day, or shift of system use (depending on type of measurement system) does not generate at least 25 control standard measurements for a given LEU measurement system during any inventory period in which the active inventory is greater than 9,000 grams U-235, the licensee shall nevertheless generate at least 16 control standard measurements for each key measurement system utilized during the inventory period.

SG-4.24 Deleted by Amendment 3, March 2000. This Condition expired May 15, 1999.

SG-4.25 Deleted by Amendment 16, January 2001. This Condition expired July 8, 2000.

SG-4.26 Deleted by Amendment 21, March 2001. This Condition expired February 11, 2001.

SG-4.27 Deleted by Amendment 28, June 2001. This Condition expired April 14, 2001.

SG-4.28 Notwithstanding the commitments of Section 4.5.1 of the Fundamental Nuclear Material Control (FNMC) Plan identified in Condition SG-5.1 to submit a completed Strategic Special Nuclear Material Physical Inventory Summary Report on NRC Form 327 not later than 45 days from the start of the physical inventory, the licensee is exempted from the above stated requirements and shall have 21 additional days to complete the May 2002 physical inventory report. This condition automatically expires on July 23, 2002.

SG-4.29 Notwithstanding the commitments in Section 4.7 of the Fundamental Nuclear Material Control (FNMC) Plan identified in Condition SG-5.1 to perform receipt verification measurements within

30 days, the licensee shall have until August 31, 2003, to fulfill the above stated commitment relative to the shipment of highly-enriched uranium material identified in the July 23, 2003, request letter.

SG-4.30 Deleted by Amendment 48, February 2004. This condition expired October 2003.

SG-4.31 Deleted by Amendment 48, February 2004. This condition expired November 2003.

SG-4.32 Notwithstanding the commitments in Section 4.7.2.1 of the Fundamental Nuclear Material Control Plan identified in Condition SG-5.1 to perform material receipt measurements from each material lot, the licensee may use the original receipt values with a limited confirmatory measurement relative to the received material identified in the October 1, 2004, request letter. This condition shall automatically expire on completion of the final shipment of the subject oxide material.

SG-4.33 Notwithstanding the commitments in Section 4.5.3.7 of the Fundamental Nuclear Material Control Plan identified in Condition SG-5.1 to perform material measurements for physical inventories, the licensee may use a material inventory measurement modification with regard to a quantity of partially processed scrap material identified in the October 20, 2004, request letter. This condition shall automatically expire on completion of the final processing of the subject scrap material.

Section-5.0 --- FNMC PLANS AND SPECIAL ISSUES IN PLAN APPENDICES:

SG-5.1 In order to achieve the performance objectives of 10 CFR 74.51(a) and maintain the system capabilities identified in 10 CFR 74.51(b), the licensee shall follow its "Fundamental Nuclear Material Control Plan" with respect to all activities involving strategic special nuclear material, except as noted in License Condition SG-5.5. The Plan, as currently revised and approved, consists of:

General Discussion ---------- Rev. 12 (dated April 2002)
Sec. 1 -- Process Monitoring ---------- Rev. 13 (dated February 2004)
Sec. 2 -- Item Monitoring ---------- Rev. 4 (dated April 2002)
Sec. 3 -- Alarm Resolution ---------- Rev. 5 (dated December 2002)
Sec. 4 -- QA & Accounting ---------- Rev. 12 (dated March 2003)
Annex A ---------- Rev. 5 (dated March 2003)
Annex B ---------- Rev. 1 (dated August 1998)
Annex C ---------- Rev. 1 (dated August 1998)
Annex D ---------- Rev. 2 (dated October 2000)

Revisions to this Plan shall be made only in accordance with, and pursuant to, either 10 CFR 70.32(c) or 70.34.

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SG-5.2 In order to achieve the performance objectives of 10 CFR 74.31(a) and maintain the system capabilities identified in 10 CFR 74.31(c), the licensee shall follow its "Fundamental Nuclear Material Control Plan for SNM of Low Enriched Uranium" with respect to all activities involving SNM of low strategic significance. The Plan, as currently revised and approved, consists of:

Section 1 ----------Rev. 5 (dated October 2003)
Section 2 ----------Rev. 3 (dated January 2002)
Section 3 ----------Rev. 4 (dated January 2002)
Section 4, 5 and 6----------Rev. 3 (dated January 2002)
Section 7 and 8----------Rev. 2 (dated January 2002)
Section 9 ----------Rev. 1 (dated February 1993)
Annex ----------Rev. 4 (dated January 2002)

Revisions to this Plan shall be made only in accordance with, and pursuant to, either 10 CFR 70.32(c) or 70.34.

SG-5.3 Notwithstanding the requirement of 10 CFR 74.59(f)(1)(i) to estimate the standard error associated with SSNM inventory difference values, and notwithstanding the requirements of 10 CFR 74.59(e)(3) through (e)(8), the licensee may, in lieu of said requirements, follow Appendix G of the Plan identified in SG-Condition 5.1 with respect to plutonium measurements and measurement control associated with the plutonium decommissioning project.

SG-5.3.1 With regard to the plutonium decommissioning project (described in Appendix G of the Plan identified in Condition SG-5.1), the licensee shall comply with the following:

(a) For plutonium accountability measurements, the maximum measurement uncertainty (at the 95% confidence level) of measurement values equal to or greater than 100 grams Pu shall not exceed plus or minus 10.0%. For measurement values less than 100 grams Pu, but equal to or greater than 25 grams Pu, the maximum measurement uncertainty shall not exceed plus or minus 20.0% (at the 95% C.L.).

(b) For net weight measurements utilized for establishing "nanocuries Pu per gram waste" values (which in turn are used for establishing the category of waste), the maximum measurement uncertainty (at the 95% C.L.) shall not exceed plus or minus 2.00%.

(c) Sufficient control measurements shall be generated and documented so as to demonstrate compliance with 5.3.1(a) and (b) above.

(d) For each inventory period during which plutonium decommissioning activities are conducted, the measurement uncertainty associated with the total quantity of plutonium in item form generated and measured during the period shall be derived from all relevant measurement control data generated during that inventory period.

(e) For each inventory period during which plutonium decommissioning activities are

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conducted, plutonium "additions to" and "removals from material in process" (ATP and RFP) shall be calculated. Any measured Pu quantity, in item form, which is generated from existing residual holdup shall be regarded as an ATP at the time of its generation. Any measured Pu quantity, in item form, which is tamper-safe sealed and which will not undergo any additional processing (such as washing, compaction, etc.) prior to shipment off site shall be regarded as an RFP upon obtaining such status. The limit for total plutonium measurement uncertainty for each inventory period shall be the larger of (1) 250 grams plutonium or (2) 10.0 percent of the larger of ATP or RFP.

(f) The licensee shall investigate any non-zero inventory difference, since a non-zero ID will be (for this operation) indicative of an item(s) discrepancy.

SG-5.3.2 Storage of plutonium items generated during plutonium decommissioning activities shall be in accordance with the commitments contained in the licensee's Plan identified in Condition SG-6.1.

SG-5.4 Operations involving special nuclear material which are not described in the appropriate Plan identified by either Condition SG-5.1 or SG-5.2 shall not be initiated until an appropriate safeguards plan (describing all new and/or modified security and MC&A measures to be implemented) has been approved by the appropriate NRC safeguards licensing authority.

SG-5.5 Notwithstanding the requirements of 10 CFR 74.51(b) and (d), 74.53, and 74.59(d)(3), during periods of curtailed SSNM activities limited to (1) use of less than five (5.000) formula kilograms of SSNM contained in encapsulated or tamper-safe sealed standards; (2) use of less than five (5.000) formula kilograms of SSNM contained in materials associated with R&D activities and/or laboratory services; (3) vault storage of HEU oxides in item form except for samples utilized for independent receipt measurement; (4) storage of low level waste materials destined for offsite disposal; and (5) decontamination and decommissioning operations involving residual holdup and site remediation; the licensee is exempt from the above mentioned regulations and shall, in lieu of these regulations, follow sections 1.0 through 4.0 of its "Fundamental Nuclear Material Control Plan Applicable for Periods of Limited HEU Processing Activities." This Plan, as currently revised and approved, consists of:

General Discussion --- Revision 1 (dated October 1994)
Section 1 ---------- Revision 1 (dated October 1994)
Section 2 ---------- Revision 1 (dated October 1994)
Section 3 ---------- Revision 1 (dated October 1994)
Section 4 ---------- Revision 0 (dated February 1994)

During such periods of limited HEU processing, the licensee need not follow the Plan identified in Condition SG-5.1. Whenever the possession and use limitations defined above in this condition are not applicable, the Plan identified herein shall be regarded as null and void, and the SG-5.1 Plan shall be in full force.

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Section-6.0 -- PHYSICAL PROTECTION REQUIREMENTS FOR STRATEGIC SPECIAL NUCLEAR MATERIAL

SG-6.1 The licensee shall follow the physical protection plan entitled "NFS Physical Protection Plan for Protection Of Category 1 High Enriched Uranium (Strategic Special Nuclear Material), Revision 0," dated October 26, 2004, and as it may be further revised in accordance with the provisions of 10 CFR 70.32(e).

SG-6.2 The licensee shall follow the safeguards contingency plan titled "NFS Safeguards Contingency Response Plan, Revision 0," dated October 26, 2004; and as may be further revised in accordance with the provisions of 10 CFR 70.32(g).

SG-6.3 The licensee shall follow the guard training and qualification plan titled "NFS Site Security Training Plan, Revision 0," dated October 26, 2004; and as may be further revised in accordance with the provisions of 10 CFR 70.32(e).

SG-6.4 Notwithstanding the above Safeguards License Conditions (SG-6.1, SG-6.2, SG-6.3), upon possession of less than Category I levels of special nuclear material, the licensee shall follow the measures described in the physical protection plans titled "Physical Security Plan for the Protection of Special Nuclear Material of Moderate Strategic Significance," Revision 5, dated June 23, 1994 (letter dated June 22, 1994), and Revision 6, dated February 6, 1996; and in the "Physical Security Plan for Special Nuclear Material of Low Strategic Significance," Revision 2, dated May 26, 2004; and as they may be further revised in accordance with the provisions of 10 CFR 70.32(e).

TRANSPORTATION CONDITIONS

Section-1.0 -- TRANSPORTATION SECURITY MEASURES:

TR-1.1 The licensee shall follow the measures described in the physical security plan titled "Physical Security Plan for the Protection of Special Nuclear Material of Moderate Strategic Significance, Revision 4," dated October 1991 (letter dated December 20, 1991), and as it may be further revised in accordance with the provisions of 10 CFR 70.32 (e).