Nuclear Fuel Services, Inc.
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Erwin, TN 37650

(423) 743-9141

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21G-07-0137
GOV-01-55-04
ACF-07-0317

October 31, 2007

Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

References:
1) Docket No. 70-143; SNM License 124
2) Letter from B.M. Moore to NMSS NRC, Amendment Request for Processing UF6 in the CD Line Facility at the NFS Site, dated August 31, 2007 (21G-07-0086/TAC L32653)

Subject: Submittal of Redacted Version of Amendment Request for Processing UF6 in the CD Line Facility at the NFS Site

Dear Sir:

Per a request from your staff, Nuclear Fuel Services, Inc. (NFS) hereby submits a redacted version of the request to amend the referenced license to authorize processing UF6 in the CD Line Facility (Attachment 1).

If you or your staff have any questions, require additional information, or wish to discuss this, please contact me, or Mr. Rik Droke, Licensing and Compliance Director at (423) 743-1741. Please reference our unique document identification number (21G-07-0137) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

BM Moore

B. Marie Moore
Vice President
Safety and Regulatory

NMSS01

RPD/pdj
Attachment

copy:
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth Street, SW
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Atlanta, GA 30303

Mr. Manuel Crespo
Project Inspector
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Atlanta, GA 30303

Mr. Steve Burris
U.S. Nuclear Regulatory Commission
Senior Resident Inspector

ATTACHMENT 1

Redacted Version of Amendment Request for Processing UF6 in the CD Line Facility at the NFS Site

Nuclear Fuel Services, Inc.
1205 Banner Hill Road
Erwin, TN 37650

(423) 743-9141

21G-07-0086
GOV-01-55-04
ACF-07-0197

August 31, 2007

Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

References:
1) Docket No. 70-143; SNM License 124
2) Letter from T. S. Baer to NRC, Applicant's Environmental Report for Renewal of Special Nuclear Materials License No. SNM-124, May 2,1997 (21G-97-0059)
3) Letter from B. M. Moore to NRC, Supplemental Environmental Report for Licensing Actions to Support the BLEU Project, dated November 9, 2001 (21G-01-0261)
4) Letter from B. M. Moore to NRC, Updated Decommissioning Cost Estimate as Required by 10 CFR 70.25(e), dated December 1, 2006 (21G-06-0211)
5) Letter from B. M. Moore to NRC, Reply to RAI Concerning NFS' Updated Decommissioning Cost Estimate, dated May 23, 2007 (21G-07-0071)
6) Letter from NRC to B. M. Moore, Acceptance of Updated Decommissioning Cost Estimate, dated June 27, 2007 (TAC L32599)

Subject: License Amendment Request for Processing UF_6 in the CD Line Facility at the NFS Site

Dear Sir:

Nuclear Fuel Services, Inc. (NFS) hereby requests an amendment to the referenced license to authorize processing of special nuclear materials in the form of UF_6 in the CD Line (CDL) Facility (Building 301) at the NFS Site. The purpose of CDL process operations is to convert Department of Energy (DOE) highly-enriched uranium (HEU) in the form of UF_6 to either U oxide form (U_3O_8), or to uranyl nitrate solution for subsequent purification and downblending in the adjacent BLEU Preparation Facility (BPF) (Building 333). The final form depends on the enrichment.

The HEU is currently stored in 5A or smaller sample cylinders (2S, 1S, and P-990 Cold Traps) and sample tubes (Hoke) with varying amounts of UF_6 and UF_4. The higher enriched material ($\geq$94 wt. % ^{235}U) from the 5A and 2S cylinders is sublimated and converted to UO_2F_2 solution, precipitated to ADU cake, calcined to U_3O_8 oxide, containerized, stored temporarily at NFS in Erwin, and then shipped to the DOE Y-12 facility in Oak Ridge for longer term storage. Sublimation of the UF_6 creates new types of accident sequences that have not been previously described in an ISA Summary; thus, per License Condition S-25(1), an amendment is needed to approve this process.

The lower enriched material (< 94 wt. % ^{235}U) from 5A and 2S cylinders and the enriched material from other sample cylinders and sample tubes are leached in nitric acid, filtered and pumped to the adjacent BPF for preparation for down-blending to $\leq$ 5 wt. % ^{235}U. These operations do not involve UF_6 sublimation; thus, they are not part of the amendment request.

Page changes to Parts I and II of the referenced license are contained in Attachment 1. Changes to portions of the referenced license concerning NFS' organization and administration; health physics, environmental protection and nuclear criticality safety programs; decommissioning activities; and emergency preparedness were not required.

A summary of the proposed changes to License SNM-124 is as follows.

Chapter 6, Section 6.5 – Specific License Conditions: Due to removal of unused equipment from Building 301 in preparation for installation of the CD Line processes, Sections 6.5.1 and 6.5.2 were deleted because these processes no longer exist. Remaining sections were renumbered.

Chapter 7, Section 7.2 – Financial Assurance Information: Section 7.2.1.1 was revised to add a reference to Appendix C to Chapter 9 as the location for contract language for the U. S. Government assumption of liability for decommissioning NFS' facilities related to CDL.

Chapter 9, Section A – General Information: Section 9.2 was updated to add a reference to Appendix C. Minor changes were required to Figure 9.2 *Plant Layout and Property Boundaries* to update the building descriptions for several buildings including Building 301 where the CD Line processes will be located. The License History in Table 9.1 was also updated.

Chapter 9, Appendix C: A new Appendix was added to provide contract language which sets forth the U. S. Government assumption of liability for decommissioning NFS' facilities related to CDL.

Chapter 10, Section A – Site Layout: Minor editorial changes to this section were necessary. Section 10.1.21 was added to describe process operations that would be present in the CD Line Facility.

The Safety and Safeguards Review Council (SSRC) has reviewed and approved the proposed changes. For your convenience, vertical lines in the margin of affected license pages denote changes, and complete chapters or sections have been included to better manage revision control.

As required under 10 CFR 70.61 and License Condition S-25, the contents of the license amendment request include applicable ISA Summaries. Attachment 2 contains the ISA Summary for CDL, and Attachment 3 contains the NFS Site ISA Summary with changes for CDL.

As required in Section 7.2.3 of the referenced license, a decommissioning cost estimate is included (Attachment 4) for the CD Line Facility. The estimate was prepared using the methodology presented in References 4 and 5, and approved by NRC in Reference 6.

The NFS Physical Protection Plan and the Fundamental Nuclear Material Control Plan were reviewed, and no changes were necessary. The Emergency Plan already contains a postulated accident and Emergency Response measures for a UF_6 release that bounds potential accidents from the processes proposed for the CD Line Facility; therefore, no changes are necessary. The NFS Environmental Report, as supplemented for the BLEU Project, was also reviewed, and no changes were necessary (References 2 and 3).

The drawings enclosed herewith have the following statement affixed:

> *"This drawing and all information contained thereon is the property of Nuclear Fuel Services, Inc. and shall not be used or disclosed for any purpose other than that for which it has been furnished without the express written consent of NFS."*

Notwithstanding the language of this restriction, NFS acknowledges that reproduction and controlled distribution of submitted documents, in accordance with NRC regulations and requirements, is necessary in order for the NRC to carry out its legal and regulatory responsibilities. Further, NFS acknowledges that reproduction and controlled distribution of these drawings by a third party authorized by the NRC is allowable by this language. Therefore, it is NFS' position that the enclosed drawings may be reproduced and distributed in a controlled manner, by a third party authorized by the NRC, for NRC's purposes and use without violation of the statement above.

Information contained herein in Attachments 1, 2, and 3 contains sensitive information, is marked as "Official Use Only," and is not suitable for public release. Information contained in Attachment 4 is considered proprietary information, as set forth in the enclosed affidavit; therefore, NFS requests that this information be withheld from public disclosure. A redacted version of this submittal suitable for public disclosure will be provided under a separate cover letter.

If you or your staff have any questions, require additional information, or wish to discuss this, please contact me, or Mr. Rik Droke, Licensing and Compliance Director at (423) 743-1741. Please reference our unique document identification number (21G-07-0086) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

B M Moore

B. Marie Moore
Vice President, Safety and Regulatory

JKW/pdj
Attachments

copy:
Regional Administrator
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61 Forsyth Street, SW
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Mr. Steve Burris
U.S. Nuclear Regulatory Commission
Senior Resident Inspector

AFFIDAVIT

TRADE SECRETS OR COMMERCIAL INFORMATION

I, B. Marie Moore, Vice President of Safety & Regulatory at Nuclear Fuel Services, Inc. (NFS), that to the best of my knowledge and beliefs, make the following representation contained herein:

A. The following document(s) which Nuclear Fuel Services, Inc. (NFS) wishes to have withheld from public disclosure is:

Attachment 4 "Decommissioning Cost Estimate" to Letter (21G-07-0086) dated August 31, 2007:
License Amendment Request for the CD Line Facility at the NFS Site

B. The information contained in the document(s) cited in A above has been held in confidence by Nuclear Fuel Services, Inc. (NFS), in that it contains trade secrets or commercial information as specified in Title 10, Code of Federal Regulations, Part 2.390(a). The basis for requesting that this document(s) be withheld from public disclosure is explicitly marked on the cover page to each of the aforementioned documents and/or the top of each affected page, as appropriate, in accordance with 10 CFR 2.390(b)(i)(B).

C. The information contained in the document(s) cited in A above is the intellectual property of Nuclear Fuel Services, Inc. (NFS), and as such is customarily held in confidence by Nuclear Fuel Services, Inc. (NFS). As such, Nuclear Fuel Services, Inc. (NFS) has customarily submitted privileged and confidential information of this type to the Nuclear Regulatory Commission (NRC) and to its predecessor, the Atomic Energy Commission (AEC), in confidence.

D. The information contained in the document(s) cited in A above has not been made available to public sources by Nuclear Fuel Services, Inc. (NFS), nor has Nuclear Fuel Services, Inc. (NFS) authorized that it be made available. In accordance with Nuclear Fuel Services, Inc. (NFS) policies governing the protection and control of information, proprietary information contained herein has been made available, on a limited basis, to others outside NFS only as required and under suitable agreement providing for nondisclosure and limited use of the information.

E. The public disclosure of the information contained in the document(s) cited in A above is likely to cause substantial economic harm to the competitive advantage held by Nuclear Fuel Services, Inc. (NFS). The basis for withholding said information is that it contains distinguishing aspects of a process, methodology, or component(s), the exclusive use of

which provides a competitive advantage for NFS in product optimization or marketability.

F. The proprietary information that Nuclear Fuel Services, Inc. (NFS) requests to be withheld from public disclosure is contained in the entire document(s) as so marked.

BM Moore 8/31/07

B. Marie Moore Date
Vice President, Safety & Regulatory
Nuclear Fuel Services, Inc.

I certify the above named person appeared before me and executed this document on this the 31st day of August, 2007.

PAMELA DIANNE JONES
STATE OF TENNESSEE NOTARY PUBLIC
UNICOI COUNTY

State of Tennessee Notary Public

My commission expires: 09/28/2010

ATTACHMENT 1

Page Changes to SNM-124

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[redacted]

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SPECIAL PROCESSES

6.1 Proprietary Information

Descriptions of special processes or unique operations involving proprietary information will be submitted separately in accordance with 10 CFR, Part 2.

6.2 Occupational Safety

It is NFS' policy to implement an occupational safety program, including chemical safety and fire protection, that has been designed to incorporate current applicable guidance provided by various recognized standard setting bodies, including:

- U.S. Department of Labor – Occupational Safety & Health Administration (OSHA) and National Institute on Occupational Safety and Health (NIOSH)
- National Fire Protection Association (NFPA)
- American Nuclear Insurer (ANI)
- American Society of Safety Engineers (ASSE)
- American Industrial Hygiene Association (AIHA)
- American Governmental Council of Industrial Hygienists (AGCIA)
- U.S. Nuclear Regulatory Commission (NRC)
- U.S. Environmental Protection Agency (EPA)
- American National Standards Institute (ANSI)

Guidance provided by these organizations is routinely reviewed and compared with NFS practice, and NFS programs are modified as appropriate. Thus, the occupational safety program is dynamic.

NFS maintains a written policy on occupational safety and health. This policy is implemented through a series of program documents and implementing procedures addressing radiation protection, chemical safety, fire protection, and industrial safety. The radiation protection program is addressed in Chapter 3.

The vice president of the safety function has overall authority and responsibility for occupational safety and health. The various aspects of the program are delegated to individuals within the safety organization having the requisite qualifications for each safety discipline.

Licensed activities are conducted in accordance with approved written procedures that incorporate occupational safety and health instructions where appropriate.

The overall objective of the occupational safety and health program is to assure the safety and health of all individuals in the workplace and to assure that applicable regulations, guides, standards, and license requirements are implemented for all processes and operations. To this end, the occupational safety and health program will be implemented through a series of program documents and implementing procedures that are reviewed and updated regularly as work activities and regulatory requirements change, in an effort to continually strive toward improvement in the program.

The purpose of the chemical safety activity is to protect the general public, the environment, plant workers, and to assure that applicable regulations and license commitments are followed. This is accomplished by managing the safe storage and use of hazardous chemicals that: 1) are integrated into the processing of radioactive materials; 2) are generated by chemical reactions during the processing of radioactive materials; or, 3) can be reasonably expected to endanger the health and safety of operators who must control SNM. Responsibility for daily coordination of the chemical hygiene program is delegated to an individual with knowledge and experience in chemical safety. Periodic continuing education opportunities are provided to this individual to maintain expertise with current accepted practices and regulatory requirements. The chemical safety program associated with SNM processes is implemented through approved program elements and procedures to address facility chemical hazards and regulatory requirements. These program elements include design considerations, chemical safety evaluations, administrative controls, safety audits and assessment, designation and control of safety related equipment, and incident investigations. These program elements are implemented for new processes, systems and components designed and installed after 1999. Chemical safety program elements include:

- Design considerations for new and/or modified processes, systems and components, taking into consideration concerns such as (1) leak protection to minimize the effects of potential leaks through utilization of welded connections, double containment, flange guards, or other features for systems handling hazardous chemicals or for systems required to handle materials at extreme conditions (such as temperature or pressure); (2) piping layouts for joints, flanges, and valves to minimize potential damage to equipment and to minimize personnel

injury resulting from potential leaks; and (3) compatibility of materials to ensure that materials of construction are compatible with the materials being handled.

- Chemical safety evaluations will be conducted during the design of new and modified SNM processes to identify the hazards associated with the use and storage of hazardous chemicals. These evaluations are included in Integrated Safety Analyses (ISA), Process Hazard Analyses (PHA), or Internally Authorized Changes (IAC). The type of review instituted for a specific process is conducted in accordance with the NFS Configuration Management Program. Prior to operational start-up of new SNM processes involving potentially hazardous chemicals, Operational Readiness Reviews are conducted to the level appropriate at the direction of the vice president of the safety function.

- Implementation of administrative controls will be documented in approved training packages, specific instructions, and/or approved procedures. Material Safety Data Sheets (MSDS') will be procured for potentially hazardous chemicals used in the SNM processing facilities. MSDS' will be utilized to determine storage, handling, and personal protective requirements.

- Routine program audits and assessments for chemical safety involving SNM processes will be conducted in accordance with Chapter 2, Section 2.8.1. Findings will be tracked until closed.

- Equipment designated as "safety related" (SRE) by the ISA, PHA, or IAC process will be maintained and functionally tested in accordance with approved procedures to ensure reliability and availability of systems important to chemical/radiation safety.

- Incident investigations will be conducted, as directed by the vice president of the safety function, for incidents involving hazardous chemicals and SNM which resulted or may have resulted in adverse health and safety consequences.

The fire protection program incorporates provisions to protect the general public, property, and the environment from fires and related perils, and to maintain a safe work environment for employees, subcontractors, and visitors. Responsibility for daily coordination of the fire protection program is delegated to an individual with knowledge and experience in fire safety. Periodic continuing education opportunities are provided to this individual to maintain expertise with current accepted practices and regulatory requirements.

The vice president of the safety function serves as the Authority Having Jurisdiction (AHJ) for the fire protection program. The objectives of the fire protection program are

described in the NFS fire protection program document which utilizes operating procedures for its implementation. NFS is committed to compliance with its existing fire protection procedures and with additional procedures as they are developed to further enhance the program. Improvements in the fire safety program will continue to be developed and implemented to address facility fire hazards and regulatory requirements, and will include the following:

- Ensuring through use of engineering controls, employee training and fire fighting capabilities, that fire does not cause an unacceptable release of hazardous material that will threaten the public health and safety or the environment;

- Establishing fire controls and protection measures consistent with National Fire Protection Association (NFPA), *Life Safety Code*, that will provide an acceptable degree of life safety to employees, contractors, and visitors. Structures, systems, and components (SSCs) utilized by NFS to detect and extinguish fires include smoke and heat detection devices, wet and dry pipe sprinkler systems, halon system, hose houses, fire hydrants, and fire extinguishers. The fire response system can be activated through detection devices or manual pull stations.

- Performing routine inspection, testing, and maintenance of fire protection SSCs in accordance with approved procedures developed to meet applicable criteria of NFPA 25 and 72;

- Providing design and operational control to ensure that process control and safety systems are not damaged by fire or related perils;

- Ensuring that property damage from fire and related perils does not exceed levels established by NFS;

- Maintaining internal and external fire fighting capabilities commensurate with the expected fire risk for the facility; and,

- Maintaining an industrial fire brigade in accordance with industry standards (NFPA 600) and proceduralizing methods for the rapid response of external firefighting resources when sufficient fire brigade staffing is unavailable.

6.3 Emergency Utilities

Emergency power will be provided by on-site power generators for the following: the Criticality Alarm System; security functions; and ventilation equipment for the plutonium operating facilities. Emergency power generators are tested for operability on a weekly

frequency. Emergency lighting is provided by battery-powered lights located throughout the Plant to provide for the egress of workers.

The electrical power supply system for the BLEU Complex (UNB, OCB, EPB, and related facilities located within the BLEU Complex) includes backup power generation and uninterruptible power supply (UPS) equipment. To ensure system availability, the following measures (as described in written procedures) shall be applied to the specified equipment:

- Diesel backup generator – periodic functional testing; periodic battery checks; configuration control.
- Transfer switch – periodic functional testing; configuration control.
- UPS – periodic functional testing; periodic battery checks; configuration control.

6.4 Radioactive Waste Management

Solid wastes are segregated for recoverable uranium or for waste disposal. Process wastes, for which it has been determined that recovery is not justified, are packaged in accordance with the requirements of the state, DOT, and NRC Regulations. The packages are then transported in accordance with DOT regulations to a licensed waste processor or to a licensed burial site. All activities conducted in the packaging and shipping of radioactive waste are performed in accordance with approved written procedures.

6.5 Specific License Conditions

Conditions in this section are primarily for specific exceptions to the other conditions in Part I. Such an exception is normally the result of a unique operational change or some other unusual situation and, thus, must be approved by the NRC. This section may also contain conditions issued by the NRC as a result of other licensing activities.

6.5.1 Carbon Dioxide Fire Suppression System in KAST Uranium Recovery Facility

A carbon dioxide (CO_2) fire suppression system shall be maintained and operable in selected areas of the KAST Uranium Recovery Facility to mitigate the risk of criticality arising from a combustible liquid fire. Maintenance and testing of the suppression system shall be conducted in accordance with applicable portions of NFPA 12, "Standard

on Carbon Dioxide Extinguishing Systems." In conjunction with the installation of this system, employee training on the associated emergency procedures and equipment shall be conducted to enhance the safety of personnel who may be working in the facility. Should the CO_2 fire suppression system become inoperable, continued process operations involving combustible liquids within the solvent extraction area of the KAST Uranium Recovery Facility shall require instituting compensatory measures in accordance with requirements specified in the NFS procedure relating to impairments for fire protection equipment.

6.5.2 Enrichment Blending System

A system for performing the blending of a high-enriched UNH solution with a natural, depleted, or slightly enriched UNH solution to produce a low-enriched UNH solution may be operated. The blended product will be discharged into a large geometry vessel. Rather than using "dual analysis," the system will implement at least one in-line measurement of the ^{235}U concentration of the blended solution prior to discharge into the large geometry vessel.

The maximum enrichment measured shall be used throughout the rest of the system. Engineering and procedural controls shall be utilized to prevent the solution in the tank from exceeding the criticality control limit for $g^{235}U$/liter. The controls shall meet the double contingency principle as stated in Section 4.1.1. One element of control which will be utilized is that the only time solution can be transferred to the high-enriched feed columns is when the blend tank is empty.

Limiting conditions shall be placed on certain parameters for the blending operation. These operational parameters are: grams uranium per liter for the two feed solutions; enrichment of the two feed materials; and, volume of the two feed solutions.

The limiting conditions of operation for the operational parameters shall be set based on Curve C of Figure 6.1. Curve C defines the limiting condition of operation for the blend tank. It is derived by taking 85% of Curve B and limited to a maximum of 6% enrichment. Curve B depicts the conditions where $K_{eff} + 2\sigma = 0.95$.

The limiting condition of operation (LCO) for each operational parameter shall be determined by varying each parameter independently from its nominal value and determining the value for that parameter where the final tank conditions are at or below Curve C of Figure 6.1. While varying the parameter of interest to determine its limiting condition of operation, the other parameters shall be set at their operational limits to give the most conservative conditions.

The nominal values for the operational parameters are those values which will result in the final desired product. Operational limits for the parameters are determined based on quality criteria and the capabilities of the process equipment.

The equations listed below shall be used to calculate the final tank conditions. Operational parameters will be independently set at their limiting condition of operations (LCO) value, and those values will be input to these equations to verify that the final conditions in the blend tank do not exceed Curve C.

The product solution enrichment (E3), gU/liter (C3), and $g^{235}U$/liter ($C3^1$) are determined using the following equations:

$$E3 = (E1xC1xV1 + E2xC2xV2) / (C1xV1 + C2xV2)$$

$$C3 = (C1xV1 + C2xV2) / (V1 + V2)$$

$$C3^1 = C3xE3$$

Where:

E1= wt. fract. ^{235}U in U for HEU blend stream

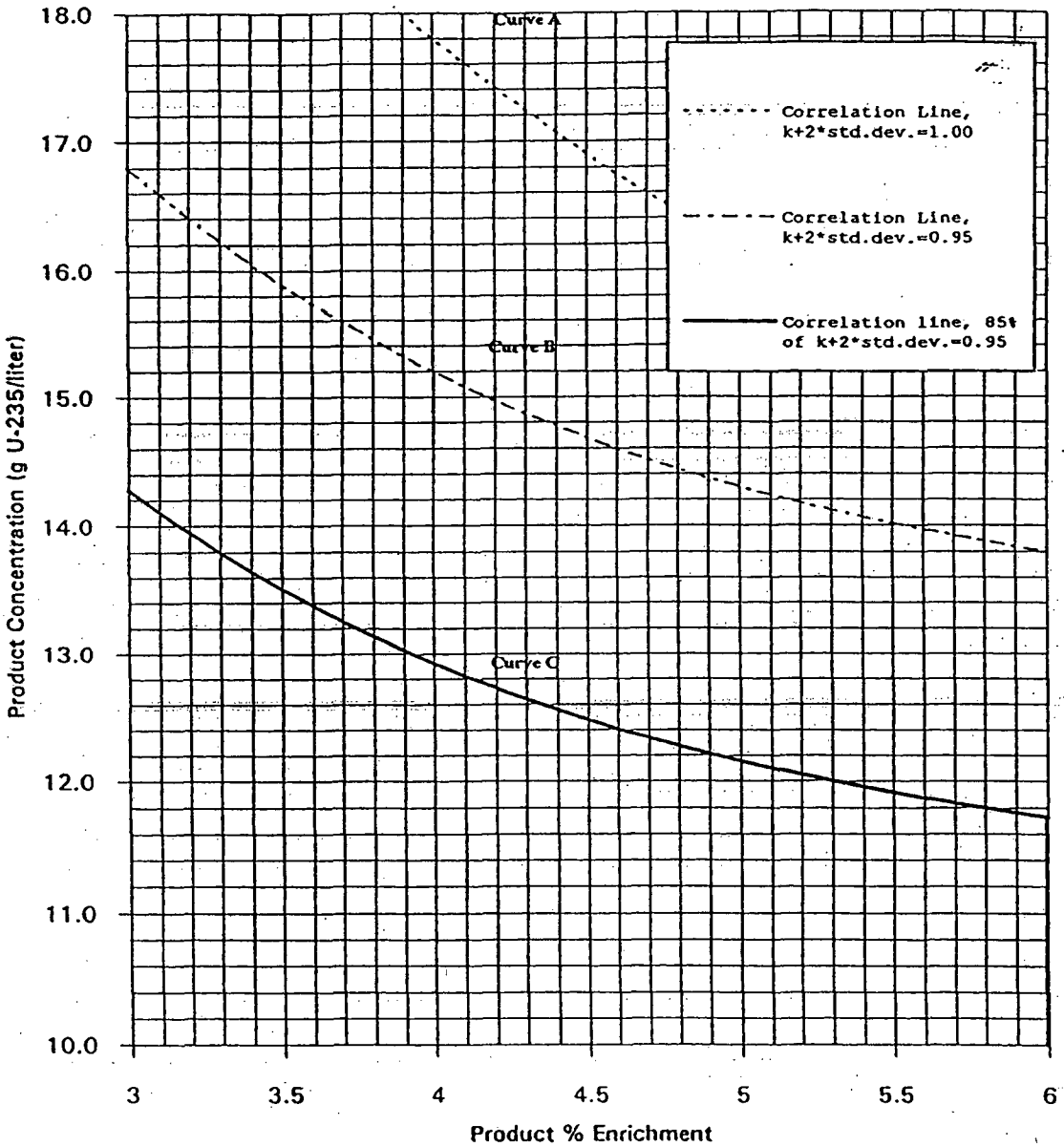
E2= wt. fract. ^{235}U in U for other blend stream

E3= wt. fract. ^{235}U in U for product LEU solution

V1= Liters of HEU blend solution

V2= Liters of other blend solution

Figure 6.1:
Curves for Defining Limiting Conditions of Operation for the Enrichment Blend



C1= gU/liter in HEU blend solution

C2= gU/liter in other blend solution

C3= gU/liter in product LEU solution

$C3^1$= $g^{235}U$/liter in product LEU solution

6.5.3 UNH Blend/Hold Tanks

Uranyl Nitrate Hexahydrate (UNH) solutions produced by an NFS process or received in authorized shipments may be transferred into large geometry vessels for storage or final blend adjustments. For any enrichment no greater than 20 Wt.% U-235, limiting conditions corresponding to 85% of the concentration which has a k_∞ value of 0.95 will be applied. Concentration limits may be found in Table 6.1.

The only authorized activities involving the UNH solutions in these tanks (e.g., sampling, blending, dilution) will not increase the U-235 concentrations above the limits in Table 6.1.

Table 6.1: Limiting Conditions of Operations for UNH Blend/Hold Tanks

Enrichment (Wt% U-235)	U-235 Concentration at k_∞=1.0 (g/l)	U-235 Concentration at k_∞=0.95 (g/l)	U-235 Concentration at 85% of k_∞=0.95 Value (g/l)
1.96	There are no restrictions for UNH solutions with enrichments ≤1.96 wt.% U-235 (Reference Table 2, ANSI/ANS-8.1-1983).		
3	19.07	16.20	13.77
4	16.83	14.65	12.45
5	15.76	13.86	11.78
6	15.11	13.37	11.37
7	14.69	13.04	11.08
8	14.37	12.79	10.87
9	14.13	12.61	10.72
10	13.94	12.46	10.59
11	13.78	12.33	10.48
12	13.65	12.23	10.40
13	13.54	12.14	10.32
14	13.45	12.07	10.26
15	13.36	12.00	10.20
16	13.29	11.94	10.15
17	13.23	11.89	10.11
18	13.17	11.84	10.07
19	13.12	11.80	10.03
20	13.07	11.77	10.00

DECOMMISSIONING PLAN

7.1 General Information

NFS will decommission plant facilities and grounds in a timely manner and in accordance with applicable NRC regulations and guidance. Portions of the facility and grounds no longer in use, or in need of decontamination to protect the environment, may be decontaminated on a project-by-project basis prior to the end of plant life at NFS' discretion. This decommissioning-related decontamination is authorized by Part I, Section 1.6.6 of this license. In each instance for which release of a plant area from this license is sought, a final survey and release plan will be developed for NRC review and approval.

The following decommissioning plan was approved by the NRC and authorizes decommissioning and decommissioning-related activities:

> North Site Decommissioning Plan. July 1999 (as well as associated addendums, amendments, and revisions).

7.2 Financial Assurance Information

7.2.1 U.S. Government Funding

7.2.1.1

Due to NFS contracts to manufacture items containing radioactive material for the U.S. Department of Energy (USDOE), the U.S. Government has agreed to pay expenses incurred in decommissioning NFS' facilities and grounds. Copies of the relevant clauses from the NFS/USDOE Contracts which set forth the U.S. Government assumption of liability for decommissioning NFS' facilities are included as Appendices A and C to Chapter 9.

7.2.1.2

Due to NFS contracts to manufacture items containing radioactive materials, pursuant to the U.S. Department of Energy (USDOE) and Tennessee Valley Authority (TVA) Interagency Agreement, the U.S. Government has agreed to pay expenses incurred in decommissioning of certain NFS equipment and facilities. A copy of the relevant clauses from the USDOE/TVA Interagency Agreement which sets forth the U.S. Government assumption of liability for decommissioning NFS' equipment and facilities is included in Appendix B to Chapter 9.

7.2.2 NFS Financial Assurance for KAST/BAST Equipment

In order to provide financial assurance for decommissioning the KAST/BAST equipment that is not covered by U.S. Government funding, as specified in the NFS/USDOE Contract Clause H.025(a)(4) in Appendix A to Chapter 9, NFS has established a surety method meeting the requirements of 10 CFR 70.25(f)(2). A Performance Bond (Bond No. 4637) was issued by ACSTAR Insurance Company on September 23, 1993, to provide financial assurance for decommissioning this equipment.

7.2.3 Additional NFS Financial Assurance

In order to provide financial assurance for decommissioning activities that are not covered by U.S. Government funding or by the surety method described in Section 7.2.2, NFS will utilize one or more of the methods authorized in 10 CFR 70.25(f). Such decommissioning activities are described in Clause H.025(a) of the NFS/USDOE Contract DE-AC12-90SN39106, Mod. No. A018 (effective March 1, 1992). This clause is provided in Appendix A to Chapter 9 of the license.

For these activities, NFS shall comply with 10 CFR 70.25(e) and submit decommissioning cost estimates and descriptions of the methods for assuring funds. The cost estimates and methods descriptions shall be submitted to the NRC, and the method(s) of assurance implemented, prior to introducing licensed material specific to those activities into premises or equipment associated with those activities.

7.2.4 NFS Escrow Agreements

The following listing includes a description of and reference documents for the various surety documents for NFS' Financial Assurance obligations.

1) Escrow Account with First Tennessee Bank, Johnson City, TN, dated December 11, 1996, for additional equipment installed in Building 233 to support the conversion of the Rocky Flats UNH material to U oxide; reference document: NFS letter (21G-97-003) dated January 8, 1997, to Michael Weber, Chief, Licensing Branch, Division of Fuel Cycle Safety and Safeguards, NMSS.

2) Escrow Account with First Tennessee Bank, Johnson City, TN, dated January 27, 1997, for additional equipment installed in Building 230 for the UF_6 Cylinder Cleaning; reference document: NFS letter (21G-97-0104) dated July 29, 1997, to Michael Weber, Chief, Licensing Branch, Division of Fuel Cycle Safety and Safeguards, NMSS.

3) Escrow Account with First Tennessee Bank, Johnson City, TN, for newly installed equipment in Building 233 associated with the dissolution and conversion of uranium-aluminum to various forms; reference document: NFS letter (21G-97-0122) dated September 25, 1997, to Michael Weber, Chief, Licensing Branch, Division of Fuel Cycle Safety and Safeguards, NMSS.

4) Escrow Account with First Tennessee Bank, Johnson City, TN, for the new Downblending and Uranium Oxide Conversion equipment installed in Building 230; reference document: NFS letter (21G-98-0033) dated March 6, 1998, to Director, Office of Nuclear Materials Safety and Safeguards.

7.2.5 "Getty Notes" Commitments

NFS will provide prompt written notification to the NRC of any request for payments on the "Getty Notes," for payments of dividends, or for other transfer of assets that is not in accordance with the following commitments made by NFS Services, Ltd., to the NRC:

a. Nuclear Fuel Services, Inc., will not be required by NFS Services, Ltd., to repay in calendar year 1987 more than three (3) million dollars or in any following calendar year through 1991 to repay more than 33 1/3 percent of the unpaid principal amount (principal amount = $18,801,140) of notes payable to Getty Oil Company and Skelly Oil Company and purchased by NFS Services, Ltd., (the "Getty Notes"). Any permitted payment on the "Getty Notes" which is not made in any calendar year may be made in a subsequent calendar year in addition to the 33 1/3 percent. Nuclear Fuel Services, Inc., will not be required to make any payment on the "Getty Notes" which will cause the current liabilities reflected on the most recent balance sheet of Nuclear Fuel Services, Inc., to exceed the current assets reflected on that balance sheet.

b. Provided that the restrictions on payment of the "Getty Notes" imposed by the Settlement Agreement, Stipulation, and Order among Nuclear Fuel Services, Inc., Getty Oil Company, and the New York State Energy Research and Development Authority, dated February 18, 1982, are removed so that payments may be made on those notes, subject to restrictions imposed by the Commission in a. above, NFS Services, Ltd., agrees that it will not cause Nuclear Fuel Services, Inc., to pay dividends or otherwise transfer assets to the owners in any period prior to January 1, 1993, in which Nuclear Fuel Services, Inc., holds a substantial Navy contract, except with the prior approval of the NRC.

7.2.6 Financial Statements

Nuclear Fuel Services, Inc., shall provide annually appropriate financial statements to the NRC.

7.3 Planned Decommissioning Activities

Decommissioning activities planned at NFS will be performed in compliance with Title 10, Code of Federal Regulations (CFR) Parts 20 and 70. Decontamination activities planned NFS involve the removal of contaminated soil and sediments located on the NFS plant site. Contaminated materials (primarily soil, debris, and waste materials) will be excavated from the Radiological Burial Grounds, the Pond 4 Area, and Ponds 1, 2, and 3 (i.e., the North Site) under the NRC-approved plan referenced in Section 7.1.

7.4 Schedules

NFS has submitted a decommissioning schedule for the decommissioning-related activities. Future revisions to this schedule will be submitted to the NRC.

7.5 Cost Estimates

NFS will provide updated to the decommissioning cost estimates in accordance with 10 CFR 70.25.

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GENERAL INFORMATION

A. General Information

9.1 Corporate Information

Nuclear Fuel Services, Inc., (NFS) has its principal offices in Erwin, Tennessee. Chapter 11 discusses the relationship and responsibilities of the Corporate organization as it relates to safety.

9.2 Financial Qualification

As a result of the transfer of ownership of Nuclear Fuel Services, Inc., to NFS Services, Ltd., from Texaco, NFS Services, Ltd., was required to provide details to the Nuclear Regulatory Commission which demonstrate its financial capability to operate and decommission the Erwin facility. The financial arrangements to assure that decommissioning funds will be available are set forth in Chapter 7 and are reflected in the Contract language provided in Appendices A, B, and C of this Chapter.

9.3 Summary of Operating Objective and Process

Reference Sections 1.4 and 1.5 of Part I, which provide a summary of special nuclear material possession limits and authorized activities.

9.4 Site Description

Reference Chapter 3 of the Environmental Report (December 1996), which was approved by the NRC concurrently with the license renewal dated July 2, 1999.

Reference Chapter 3 of the Supplemental Environmental Report (November 2001) for a description of the plant expansion associated with construction and operation of BLEU Complex, which is comprised of the Uranyl Nitrate Building (UNB), the BLEU Prep. Facility (BPF), the Oxide Conversion Building (OCB), and Effluent Processing Building (EPB). These expanded operations were approved by the NRC in License Amendments #39 (Federal Register Vol. 56, No. 131, p. 45555, dated July 9, 2002), #47 (Federal Register Vol. 68, No. 207, p. 61235, dated October 27, 2003), and #51 (Federal Register Vol. 69, No. 117, p. 34198, dated June 18, 2004), respectively.

9.5 Location of Buildings on Site

Locations of buildings on the NFS plant site are shown and discussed in Chapter 10, "Facility Description."

9.6 Maps and Plot Plans

Figure 9.1 shows the location of the NFS plant site in relation to the state, the county, and the general environs. Figure 9.2 shows the plant layout.

9.7 License History

The license history is shown in Table 9.1.

Figure 9.1
Location Map of the Nuclear Fuel Services Plant, Erwin, Tennessee

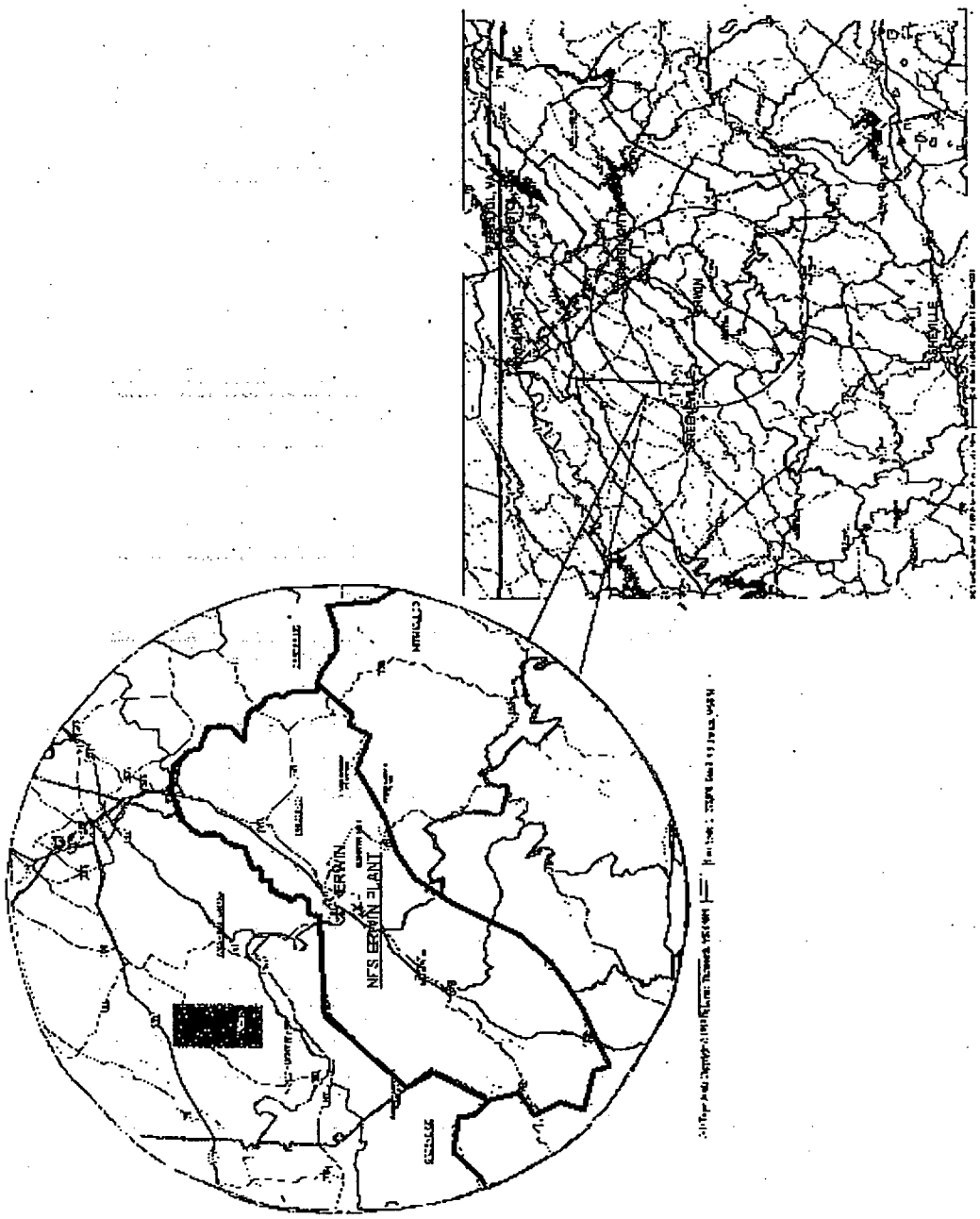

Figure 9.2
Plant Layout and Property Boundaries

Table 9.1
License History

SNM-124 was most recently renewed by the NRC on July 2, 1999. The following amendments have been issued subsequent to that renewal.

Amendment Number	Subject	Effective Date
1	Authorization to Operate KAST Fuel Process Areas 100-900, A-C, and Auxiliary Systems	08/03/1999
2	Authorization to Allow Use of QC Vault and to Delete License Conditions S-6 and S-7	02/04/2000
3	Authorization to Delay Conducting Physical Inventory Pursuant to 10 CFR 70.34	04/03/2000
4	Authorization to Delete License Condition S-13	04/03/2000
5	Authorization to Operate KAST Uranium Recovery Areas D-J	05/05/2000
6	Revisions to the Fundamental Nuclear Material Control Plan	05/16/2000
7	Authorization to Delay Conducting Physical Inventory Pursuant to 10 CFR 70.34	06/02/2000
8	Clarification of Possession Limits for Pu Residual Contamination, Special Air Sampling, and Internal Exposure Assessments	06/13/2000
9	Bulk Chemical Storage Tanks Analysis	07/03/2000
10	Authorization to Adjust Annual Limit on Intake (ALI) and Derived Air Concentration (DAC)	08/11/2000
11	Addition of Industrial Park Facility	09/13/2000
12	Authorization to Adjust Liquid Effluent Discharge Limits and NRC Correction of Previous Amendments	10/27/2000
13	Revision to Fundamental Nuclear Material Control Plan and Change to Safeguard Condition SG-4.16	11/30/2000
14	Revision of License Conditions S-39 and S-41	12/13/2000
15	Approval of NFS Site Security Training Plan, Revision 15, Safeguards Contingency Response Plan, Revision 0, and Emergency Plan, Revision 4	12/22/2000
16	Approval of Request for Time Extension to Conduct a Physical Inventory	01/15/2001
17	Revision of License Condition SG-6.1	01/30/2001
18	Revision of License Condition S-28	01/30/2001

Amendment Number	Subject	Effective Date
19	Revision of License Condition S-25	02/28/2001
20	Amendment to License Condition S-1	03/01/2001
21	Approval of Request for Time Extension to Submit the Physical Inventory Summary Report	03/26/2001
22	Deletion of License Conditions S-43 and S-44	03/26/2001
23	Authorization to Amend License Condition S-41 for Extension of Compensatory Measures from April 30, 2001 to June 30, 2001	04/24/2001
24	Deletion of License Condition S-20 and Review of 04/27/2001 Revised Safety Demonstration (S-27)	04/27/2001
25	Amend License Conditions for Safety Related Equipment	06/04/2001
26	Revision of License Condition S-22	06/04/2001
27	Approval of North Site Decommissioning Plan	06/19/2001
28	Revisions to HEU FNMC Plan, License Condition SG-5.1	06/27/2001
29	Authorization to Extend Safety Condition S-41 to July 31, 2001	06/29/2001
30	Authorization to Extend Deadline for Safety Conditions S-28, S-29, S-31, S-32, S-33, S-34, S-36, and S-37 to November 1, 2001	07/18/2001
31	Approval of ISA Plan and Deletion of License Conditions S-28 through S-38	10/30/2001
32	Deletion of License Conditions S-41 and S-45	02/22/2002
33	Revisions to HEU FNMC Plan, License Condition SG-5.1	03/29/2002
34	Approval of Emergency Plan, Revision 5	05/03/2002
35	Time Extension to Submit the Physical Inventory Summary Report	07/19/2002
36	Revised Fundamental Nuclear Material Control Plan	08/30/2002
37	Revised Appendix A to Chapter 5 of North Site Decommissioning Plan	03/31/2003
38	Authorization to Reduce Source Term at the Site Through Soil Removal	05/07/2003
39	Authorize Use of UNB and Increased Possession Limit	07/07/2003
40	Authorize Use of ICRP 68 Values	08/21/2003
41	Approve Time Extension to Perform Receipt Measurements	08/29/2003
42	Approve Time Extension to perform Receipt Measurements	09/15/2003
43	Approve Revision 4 to NFS Physical Protection Plan	10/10/2003
44	Approve Time Extension to Perform Independent Assessment of MC&A Program	10/24/2003

Amendment Number	Subject	Effective Date
45	Approve Exemption from Decommissioning Financial Assurance Requirements for Specific Equipment	11/13/2003
46	Approve Time Extension to Perform Receipt Measurements	12/31/2003
47	Authorize Use of BLEU Prep. Facility	01/13/2004
48	Approve Revisions to FNMC Plan	02/19/2004
49	Approve Organizational Changes to Chapter 2	03/13/2004
50	Approve Revisions to HEU FNMC Plan	05/25/2004
51	Approve Operation of the BLEU OCB/EPB	07/30/2004
52	Remove Sampling Requirements for Banner Spring Branch	09/13/2004
53	Approve Time Extension to Perform Receipt Measurements	10/15/2004
54	Administrative Change – Revision of Physical Protection Plan, Safeguards Contingency Plan, and T&Q Plan	10/29/2004
55	Approve Modification of Certain Material Inventory Measurements	11/05/2004
56	Approve Revision to FNMC Plan	12/08/2004
57	Approve Time Extension to Perform Receipt Measurements	01/10/2005
58	Approve Administrative Changes to Air Sampling and Bioasssay Programs	01/13/2005
59	Approve Deletion of License Conditions S-2, S-4, and S-5	01/28/2005
60	Approve Updated Schedule for North Site Decommissioning	02/29/2005
61	Approve Revised Date for Annual Update of Safety Demonstration Section	06/17/2005
62	Approve Possession Limit Increase	06/28/2005
63	Approve Revision 1 of the Physical Protection Plan	08/11/2005
64	Approve Changes to Certain Administrative Programs	08/24/2005
65	Approve Revisions to FNMC Plan	11/16/2005
66	Approve Changes to the Physical Protection Plan	11/28/2005
67	Approve Changes to Procedure Reviews by SSRC	12/12/2005
68	Approve Changes to FNMC Plan, and Replacement of Table 5.1	12/21/2005
69	Approve Final Status Survey Method for Subsurface Soils	02/15/2006
70	Approve Extension of Safeguards Condition SG-4.34	04/13/2006
71	Approve One-Time Exemption From Physical Inventory Deadline	06/06/2006

Amendment Number	Subject	Effective Date
72	Approve Change to Required Experience of Discipline Vice-President	07/03/2006
73	Approve Exemption of Low-Level Waste Shipments From Certain Physical Security Requirements	07/17/2006
74	Authorize Use of Shipper's Quantities to Resolve Shipper-Receiver Difference	08/08/2006
75	Incorporate Changes to Chapter 3	01/05/2007
76	Approve Extension of Safeguards Condition SG-4.34	04/11/2007
77	Approve Administrative Changes to Part I of SNM-124	05/09/2007

EXCERPTS FROM DOE PRIME CONTRACT

No. DE-AC24-05OH20192

Assigned to BJC Subcontract No. 23900-SC-SM292F

Assigned to LPP Subcontract No. LPP05SC009

Assigned to CDM Subcontract No. 1205-001-014-CS

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Assigned to CDM Subcontract No. 1205-001-014-CS

Decontamination and Decommissioning

As part of the consideration for the Services provided by SUBCONTRACTOR under this subcontract ("Services"), BJC and the Government hereby assume the obligation to pay the expenses incurred in decommissioning NFS' facilities (which were purchased solely for performance of the Services) as required by NFS' License with the Nuclear Regulatory Commission (NRC). BJC and the Government's liability for said payments is subject to the availability of appropriated funds at the time a contingency occurs. When said event occurs, BJC and the DOE will pursue the necessary funding; however, nothing in this subcontract shall be construed as implying that the Congress will, at a later date, appropriate funds sufficient to meet said deficiencies.

Payments of decommissioning expenses shall only be made for decommissioning activities, which have been approved by the NRC. In incurring such expenses, the SUBCONTRACTOR shall use reasonable and prudent fiscal and operational judgments to reduce the overall cost of decommissioning activities. Any disagreement between the parties concerning this provision shall be considered a dispute within the terms of the "Resolution of Disputes" clause of this subcontract.

This provision shall survive the completion of the subcontract and shall continue until decommissioning is completed as determined by the NRC or any successor agency, or until alternative arrangements are agreed by the parties, in separate contracts, or otherwise.

FACILITIES DESCRIPTION

A. Site Layout

10.1 Site Layout

The Nuclear Fuel Services (NFS) site is located in Erwin, Tennessee. The facilities within the site consist of numerous small buildings, the majority of which are within the Protected Area fencing. The administration buildings and guardhouses are glass/concrete structures and structures made of local brick; the process and process support buildings are predominantly constructed of precast concrete panels and white painted cement block. Metal "Butler-style" buildings are also used to house process support facilities such as respirator cleaning and testing, offices, decommissioning activities, and equipment and supplies storage.

Buildings within the plant have been designated with numbers and names as shown in Figure 9.2. Descriptions of the principal activities for each building are provided in the following sections. Buildings layouts and more detailed process descriptions are included in separate safety documentation submitted to the NRC.

10.1.1 Warehouse Facilities

Warehouse and material storage facilities include the Industrial Park Facility (IPF) Warehouse (see Appendix 10.1-A to this Section), Buildings 300, 310, 311, southeast portion of 304, south and east sections of 306, 135, 133, 132, and the UNB (Bldg. 510) located within the BLEU Complex. No unstable or radioactively contaminated chemicals are stored in these buildings such that release to the environs is probable.

10.1.2 Maintenance Facilities

The maintenance facilities reside in Buildings 120, 121, and the east section of 306. The plant's main maintenance facility is in Buildings 120 and 121.

10.1.3 Materials Staging and Medical Facility

Building 350 is a multi-function facility which includes medical facilities (e.g., medical records, examining rooms, Fitness-for-Duty testing facility, and emergency decontamination), the in vivo counting facility, and the shipping/receiving staging area.

10.1.4 Building 220

Building 220 contains offices and an analytical laboratory.

10.1.5 Service Building and NDA Laboratory

Building 100 contains change rooms, lunch rooms, First-Aid Station, office area, vending food storage, laundry facility, and NDA Laboratory.

10.1.6 Research and Development Laboratories

The Research and Development (R&D) Laboratories are located in Buildings 105, 110, and 131. These buildings contain facilities for conducting engineering studies and process evaluations for environmental remediation projects and for new business opportunities for NFS. These studies and evaluations may involve separating hazardous material and radioactive material, recovering resources from hazardous and/or radioactive waste, and treating hazardous and/or radioactive waste material. They may also involve R&D of chemical and radioactive material processing and manufacturing technology in support of new business development. These laboratories also conduct laboratory analyses in support of the engineering studies, as well as for customer and NFS process or waste materials. These activities are also licensed by the State of Tennessee.

10.1.7 Respirator Facility

Building 104 houses the respirator facility which includes a respirator laundry; an inspection, testing, and quality assurance area; a fit-test facility; and offices for individuals involved in these activities.

10.1.8 Building 111

Building 111 is used for the storage and staging of decommissioning materials in support of ongoing decontamination and decommissioning activities. The facility may also be used for the receipt, storage, and handling of materials separately licensed by the State of Tennessee.

10.1.9 Administration Buildings

Buildings 105, 130 (east annex), 120 (north end), 305, 320, and 345 house offices and computer facilities. Buildings 325 and 340 are the main security check points for vehicles and persons entering and leaving the site's Protected Area.

10.1.10 Central Analytical Laboratory

Building 105 and the northwest portion of Building 303 contain the plant's Central Analytical Laboratory. This laboratory handles samples from all plant processing facilities (HEU, LEU, natural U, and depleted U), scrap recovery facilities, waste water treatment facilities, and select environmental monitoring programs.

10.1.11 Plant Utilities

Building 130 houses non-radioactive plant utility services. This building contained uranium processes in the past, and covered fixed radioactive contamination exists. The utilities located in this building are compressed air, deionized water, and steam.

10.1.12 Production Facility

This facility is comprised of seven buildings, which make up the majority of the 300 Complex. Buildings 302, 303, 304, 306, and 307 contain unit operations which produce a classified product containing highly enriched uranium. Building 303 also contains offices, change rooms, a security alarm station, and a portion of the Central Analytical Lab. Building 304 contains process support equipment, non-radioactive chemical process storage warehouse, U-metal conversion pilot process, and a mixed waste treatment process. Building 306 contains process chemical tanks, process support equipment, process ventilation scrubbing equipment, vault-type storage area, shipping and receiving area, and equipment maintenance area. Building 308 contains the process ventilation fans for this facility. Building 309 contains the gaseous effluent sampling equipment for the main plant stack. The processes in these buildings are more fully described in safety documentation separately submitted to the NRC.

10.1.13 Waste Water Treatment Facility

Waste water treatment is conducted in Buildings 330 and 335. Building 330 contains the process for treating liquid effluents generated by the process facilities, R&D laboratories, laundry, decommissioning activities, and analytical laboratory. The effluents are treated to meet the requirements of a National Pollutant Discharge Elimination System permit issued to NFS by the State of Tennessee and 10 CFR Part 20. Treated effluent is discharged to the Nolichucky River. Building 335 processes groundwater from the site. The groundwater is treated to meet the requirements of a pretreatment permit issued to NFS by the Erwin Publicly Owned Treatment Works (POTW) and 10 CFR Part 20. Treated groundwater is discharged to the Erwin POTW.

10.1.14 Motor Pool (Bldg. 420)

Building 420 is for storage and maintenance of large earth-moving equipment.

10.1.15 Uranyl Nitrate Building (Bldg. 510)

Uranyl Nitrate liquid is stored in Building 510. This building contains 25 storage tanks, 1 receipt tank, and 1 uranyl nitrate tank for a capacity of approximately 270,000 gallons. Support facilities for unloading the Uranyl Nitrate liquid containers are part of this building. Liquid is stored until required by the Oxide Conversion Building (OCB) (Bldg. 520) process.

10.1.16 Guard/Security Building (Bldg. 540)

The Guard/Security Building (GDB) contains no radiological controlled material and is strictly a support facility.

10.1.17 BLEU Preparation Facility (Bldg. 333)

The BLEU Preparation Facility (BPF) houses the processes to convert HEU materials to pure HE uranyl nitrate solution, a process to prepare blendstock (N uranyl nitrate solution), and a process to mix the HE uranyl nitrate and blendstock solution to form a LE uranyl nitrate solution (product). Building 333 also houses a uranium recovery system. The LE uranyl nitrate solution is transferred to the Uranyl Nitrate Building after verification that the solution meets the product specifications.

10.1.18 Oxide Conversion Building (Bldg. 520)

Low-enriched uranyl nitrate liquids stored at the Building 510 are transferred to and converted into uranium oxides at Building 520. In addition, natural uranium oxide is dissolved in Building 520 and transferred to Building 510 for storage and shipping.

10.1.19 Effluent Processing Building (Bldg. 530)

Process waste streams generated at the OCB are treated at the Building 530 prior to discharge and/or disposal in accordance with applicable regulator requirements.

10.1.20 Security Ready Room (Bldg. 107)

Building 107 contains work and equipment storage areas for security personnel.

10.1.21 CD Line Facility (Bldg. 301)

The CD Line Facility houses processes to convert HEU materials in the form of UF_6 to uranium oxides or to uranyl nitrate solution for subsequent purification and downblending in the adjacent BPF.