R2/E52

Westinghouse
Electric Company LLC

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NRC-01-36

September 07, 2001

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

Dear Sir:

SUBJECT: CHANGED PAGES; LICENSE NUMBER SNM – 1107; DOCKET 70-1151

Westinghouse Electric Company hereby submits six copies of revision 20.0 of the Application for Renewal of a Special Nuclear Materials License for the Columbia, South Carolina Fuel Fabrication Facility. The changes are identified by marginal lines. The substance of the changes includes the following:

1. changed the word "coating" to "addition" and specified a minimum number of diesel-powered standby generators needed to meet the electrical requirements of the site [page number 1.0],
2. updated the organizational structure [page numbers 1.4, 1.5, 2.0, 2.2, 2.3, 2.5],
3. changed reference for additional corporate information to the worldwide web [page number 1.5],
4. updated site plan and key [page numbers 1.9 and 1.10],
5. added reference to the new Corrective Action Process (CAPs) – which has incorporated the intent of the Safety Margin Improvement Program [page number 3.0],
6. updated regulatory training requirements to require refresher training on an annual basis, to allow electronic copies of the training manual, and to provide flexibility in the delivery method for supplementary instruction [page numbers 2.4 and 3.12],
7. updated Radiation Work Permits (RWP) to include Radiation and Chemical Work Permits (RCWP) and added chemical permit criterion 5.2.1 (b.5) [page numbers 5.1 and 5.2],
8. revised the radiation dose equivalent calculation methods to use the annual limit on intake (ALI) and derived air concentration (DAC) values based on dose coefficients published by the International Commission on Radiological Protection (ICRP) as published in ICRP Publication No. 68 [page numbers 5.1, 5.3, 5.4, 5.5, 5.8, 5.9, 5.10, 5.11],
9. revised ventilation system requirements based on a new safety evaluation [page number 5.2]

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10. corrected grammatical errors [page number 5.7],
11. add another dosimeter type to the list of personnel monitoring devices [page number 5.8],
12. to enable a conservative method of assigning respirator protection factors, and to increase the frequency of respirator fit tests [page number 5.10],
13. deleted named reference to American Nuclear Insurers [page number 8.2],
14. added an authorization to use ICRP 68 [page number 12.4] and,
15. added an exemption to enable Westinghouse to submit Part 70 communications electronically to the NRC per the August 6, 2001 letter from Melvin N. Leach "Electronic Information Exchange (EIE) System" [page number 12.6].

If you have any questions, please contact me at (803) 647-3338.

Sincerely,

WESTINGHOUSE ELECTRIC COMPANY

Robert A. Williams for:

Nancy Blair Parr
Licensing Coordinator

Docket 70-1151
License SNM-1107

cc: U. S. Nuclear Regulatory Commission
ATTN: Mr. Donald E. Stout
Licensing Section 1, Licensing Branch

Enclosures

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CHAPTER 1.0

GENERAL INFORMATION

1.1 FACILITY AND PROCESS DESCRIPTION

The Columbia Fuel Fabrication Facility (CFFF) of Westinghouse Nuclear Fuel will be primarily engaged in the manufacture of fuel assemblies for commercial nuclear reactors. The manufacturing operations to be authorized by this license will consist of receiving low-enriched, less than or equal to 5.0 w/o U235, uranium hexafluoride; converting the hexafluoride to produce uranium dioxide powder; and processing the uranium dioxide through pellet pressing and sintering, fuel rod loading and sealing, and fuel assembly fabrication. These operations will be governed by the technically sound radiation and environmental protection, nuclear criticality safety, industrial safety and health, SNM safeguards, and quality assurance controls described in detail in this License Application.

Two general systems are used to convert uranium hexafluoride to uranium dioxide powder--Integrated Dry Route (IDR) and Ammonium Diuranate (ADU). IDR conversion equipment has been designed to receive and process uranium in enrichments up to 5.0 w/o U235, through fuel rod loading. ADU conversion equipment has also been designed to receive and process uranium in enrichments up to 5.0 w/o U235, through fuel assembly fabrication and shipping. These operations are supported by absorber addition, laboratory, scrap recovery, and waste disposal systems. Additional details concerning the facility and process systems are presented in the Site Safeguards documents described in Paragraph 1.1.1(e) of this Section, and in the SITE EMERGENCY PLAN described in Chapter 9.0 of this License Application.

1.1.1 SITE UTILITIES AND SERVICES

(a) Electrical Supply

The CFFF will be served by a single, 115,000 volt, electrical supply line. A minimum of four diesel-powered standby generators will be installed and maintained to meet the emergency electrical power requirements of the site in the event of a temporary outage of the normal supply source. Emergency power will be automatically provided to crucial process equipment; emergency lighting systems; cooling system pumps; all fire alarm, hazard alarm, and other designated safety alarm systems; Conversion Control Room alarms; health physics sampling systems; and, emergency ventilation systems, including scrubbers.

(b) Water Supply

1.2 INSTITUTIONAL INFORMATION

This application requests a ten year renewal of License SNM-1107, Docket 70-1151, which authorizes the receipt, possession, storage, use, and transfer of Special Nuclear Material at the Westinghouse Electric Company's Columbia Fuel Fabrication Facility (CFFF). Westinghouse Electric Company LLC is controlled and owned by British Nuclear Fuels plc (BNFL). In accordance with the requirements of 10 CFR 70.22(a)(1), the following additional information is submitted:

1.2.1 APPLICANT AND STATE OF INCORPORATION

Westinghouse Electric Company LLC
Delaware

1.2.2 LOCATION OF THE PRINCIPAL OFFICE

Monroeville, Pennsylvania

1.2.3 NAMES (CITIZENSHIP) AND ADDRESSES OF PRINCIPAL OFFICERS

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Westinghouse Energy Center
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Pittsburgh, Pennsylvania 15230-0355

Stephen R. Tritch (USA)
Senior Vice President, Westinghouse
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William C. Whitehead
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P. O. Drawer R
Columbia, South Carolina 29250

Robert E. Monley, Sr.
CFFF Plant Manager
Westinghouse Columbia Site
P. O. Drawer R
Columbia, South Carolina 29250

1.2.4 COMPANY CONTACT FOR LICENSING MATTERS

Griff Holmes
Manager, Environmental Health and Safety
Westinghouse Energy Center
P. O. Box 355
Pittsburgh, Pennsylvania 15230-0355

1.2.5 SITE CONTACT FOR LICENSING MATTERS

Nancy B. Parr
Licensing Project Manager
Westinghouse Columbia Plant
P. O. Drawer R
Columbia, South Carolina 29250

1.2.6 ADDITIONAL INFORMATION

Additional corporate financial and business information can be found on the worldwide web at www.westinghouse.com.

1.3 SITE DESCRIPTION

The Columbia Fuel Fabrication Facility (CFFF) is located near Columbia, South Carolina and is situated on an approximately 1,158 acre site in Richland County, some 8 miles southeast of the city limits of Columbia (see Figure 1.1 and Figure 1.2) along South Carolina Highway 48. The region around the site is sparsely settled, and the land is characterized by timbered tracts and swampy areas, penetrated by unimproved roads.

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CHAPTER 2.0

MANAGEMENT ORGANIZATION

2.1 ORGANIZATIONAL RESPONSIBILITIES AND AUTHORITIES

The Westinghouse Electric Company is comprised of several businesses. One of these businesses is Westinghouse Nuclear Fuel (hereinafter referred to as "Nuclear Fuel"), which encompasses commercial activities directly related to the development, manufacturing, and marketing of products contributing to the use of nuclear reactors for electrical power generation.

2.1.1 ORGANIZATIONAL OPERATING UNITS

Within Nuclear Fuel, the primary domestic responsibility for the design, development, and manufacture of commercial nuclear reactor fuel rests with U. S. Manufacturing. The Vice President of U. S. Manufacturing reports directly to the Senior Vice-President of Nuclear Fuel. Within U. S. Manufacturing, the primary responsibility for all commercial nuclear reactor fuel manufacturing activities rests with the Columbia Fuel Fabrication Facility (CFFF); the CFFF Plant Manager reports to the Vice President of U. S. Manufacturing. Figure 2.1 illustrates the general structure of the Company organization.

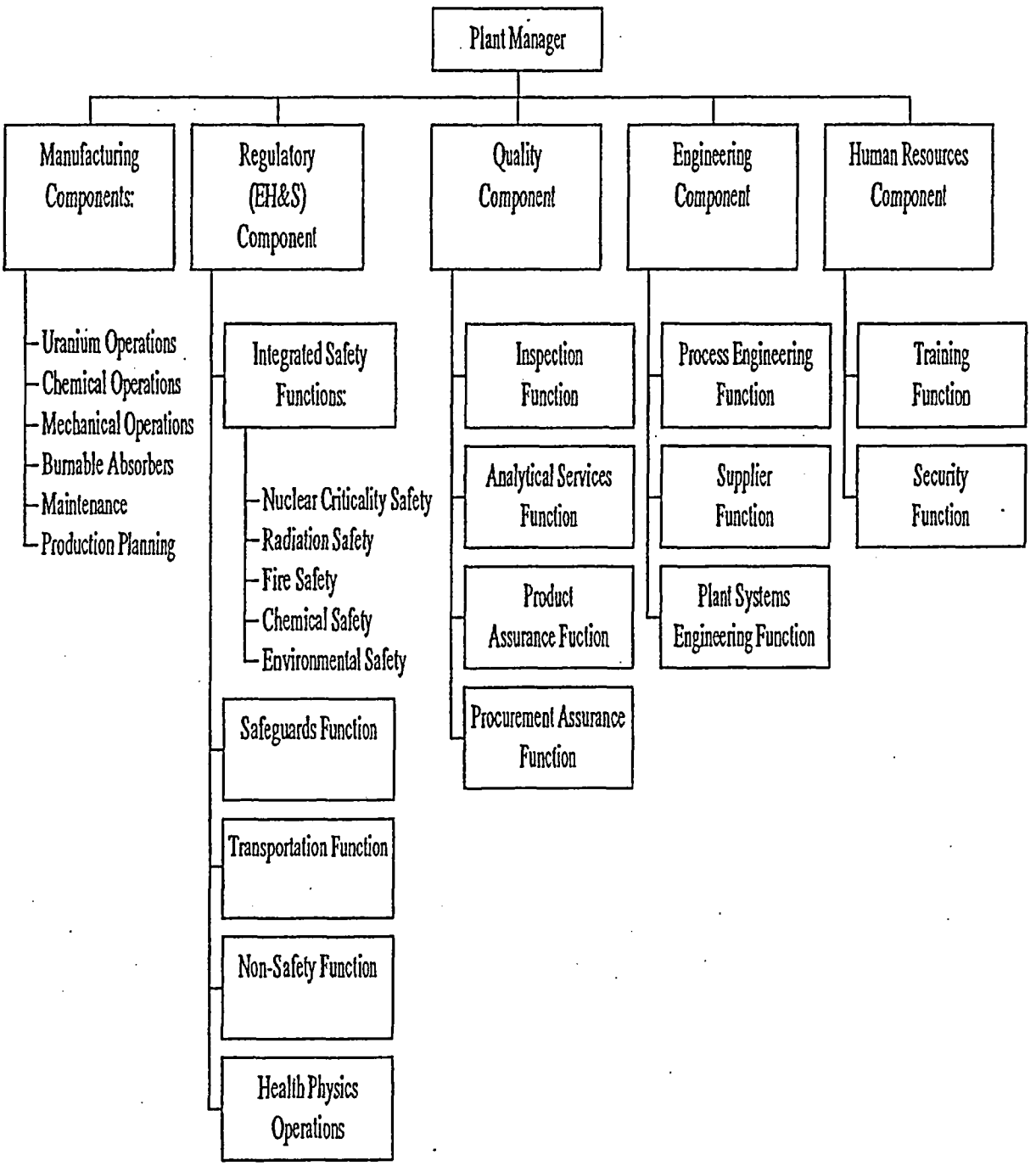
The ultimate responsibility for all CFFF activities associated with the manufacture of commercial nuclear reactor fuel -- including environmental protection, health, safety, quality, and safeguards -- rests with the Plant Manager. The site organization consists of several staff Components reporting directly to the Plant Manager. One of these Components is the Regulatory Component, or Environment, Health and Safety (EH&S), that has the responsibility for overall coordination and implementation of the Columbia Plant environmental protection, health, safety, and safeguards programs. Figure 2.2 illustrates the general structure of the CFFF organization.

2.1.2 POSITIONS AND ACTIVITIES WITHIN ORGANIZATIONAL OPERATING UNITS

Each Westinghouse management position is covered by a written description, presenting in detail its scope, purpose, duties, responsibilities, difficulties, and requirements. The description identifies the incumbent's authority for decisions which may be made

Figure 2.2

CFFF ORGANIZATION



unilaterally, and those requiring higher management approval. It delineates relationships with other functions, and specifies responsibilities for managing personnel, and for the control and maintenance of managed facilities and equipment. Position descriptions are reviewed and approved by two higher levels of line management. A Management Position Committee, which consists of key members of the Nuclear Fuel staff, reviews and evaluates such positions. These reviews determine that all key functions are covered, inter-relationships are clear, and conflicts are eliminated. Persons are selected to fill these management positions by evaluating their capability to perform the various activities specified in the position description. Two higher levels of management, at a minimum, must approve each selection or change of a management incumbent. Continuing quality performance of managers is assured through a formal program of annual review.

Operations at the Columbia Fuel Fabrication Facility are in accordance with the general operating philosophy and procedures that are employed in all Westinghouse plants and facilities. Briefly, this philosophy provides that total responsibility for all phases of operations, including environmental protection, health, integrated safety, quality, and safeguards follows the usual lines of organizational authority. Advisory and service groups are provided to assist line management in the analysis of operations within their control, and to provide measurements, determinations and information which aid in the analysis of specific operations and situations; however, such service and staff assistance in no way relieves an individual line manager from accountability for high quality operation of the function and facility, or for ascertaining and assuring, through appropriate management channels, that adequate service is provided. Basic policies and procedures are established by line management with the review and approval of cognizant staff groups; and, within the framework of these policies and procedures, the responsibility for making decisions at the operating level rests with the first level manager. A first level manager has the basic responsibility for operating controlled activities in a safe and prudent manner.

First level managers are responsible for providing operating instructions for the guidance and direction of subordinate personnel. Written procedures or manuals are prepared, which become the bases for performing specific operations. The first level manager cannot make unilateral changes in such written instructions, or in posted limits, without review and approval of cognizant staff groups. First level managers are also responsible for assuring that personnel under their jurisdiction receive adequate training.

The Regulatory Component presents an orientation to new employees. Fundamental radiation safety rules and policies, use of protective clothing and personnel monitoring devices, prevention of internal exposure, limiting exposure to external radiation, nuclear criticality safety, and plant emergency procedures are among the topics discussed. To acquaint the new employee with basic regulations, selected parts of Title 10, Code of Federal Regulations, are covered. Primary emphasis is placed upon 10 CFR Parts 19 and 20. The cognizant first level manager assigns an experienced employee the responsibility of indoctrinating and training a new employee in the proper procedures and precautions for performing each specific job. The first level manager then evaluates the progress of the new employee and gradually increases job assignments until complete requirements of the job description are fulfilled. Failure to achieve minimum performance requirements is cause

for a change in assignment, or for release from employment. Periodic reinforcement instruction is conducted, on the job, by the employee's first level manager and/or by personnel from the Regulatory Component. As the need arises, changes in regulations, changes in operating conditions and/or procedures, and changes in administrative policies are covered.

To assure that all employees, who are not members of the emergency response organization, are aware of actions to take during an emergency situation, annual training is provided. To keep emergency response personnel aware of actions they must take during an emergency situation, emergency drills and exercises are conducted in alternate years. After each drill or exercise is evaluated, appropriate first level managers are informed of any shortcomings disclosed, and they subsequently instruct their personnel regarding any remedial actions required.

At the CFFF, all personnel involved in operation of the facility will have the right to question, and/or request review of, the safety of any operating step or procedure. Further, a cognizant Regulatory Component staff member on duty will have the responsibility and authority to prohibit, through the cognizant first level manager, any operation which is believed to involve undue immediate hazard. Such terminated operations will remain in safe-shutdown until the situation is reviewed with cognizant management, and there is a consensus resolution of the methods and procedures to be used.

2.1.3 POSITION ACCOUNTABILITY AND REQUIREMENTS

Administrative and managerial controls will be in effect at all times to assure that decisions related to the operation of the licensed activity are made at the designated level of accountability, by individuals meeting the necessary technical requirements.

(a) Plant Manager

The Plant Manager will have overall accountability for all nuclear fuel manufacturing activities at the Columbia Fuel Fabrication Facility. This individual will direct all activities of licensed operations and staff functions, either personally or through designated management personnel. This individual will also coordinate any necessary support activities, obtained from higher Westinghouse management; and, will perform all assigned management functions in accordance with Westinghouse policies and higher management directives.

The minimum requirements for the position of Plant Manager will be a baccalaureate degree, or equivalent; and, five years of management experience in a nuclear facility. The Plant Manager will have broad general knowledge concerning the regulatory aspects of policies and procedures in effect at the Columbia Fuel Fabrication Facility.

(b) Component Managers

Component Managers will have specific accountability for engineering, manufacturing, regulatory, and quality operations and activities involving licensed materials. The Manufacturing Component will conduct the operations and maintenance activities required for production of nuclear fuel. The Engineering Component will provide design services related to processes and facilities used by the Manufacturing Component. The Quality Component will provide assurance, inspection, and analytical services in support of the Manufacturing Component. (The Regulatory Component is described in Paragraph (c) of this subsection.) Component Managers will plan, direct, and control such activities personally, or through other management personnel; and, will perform all assigned management duties in accordance with Westinghouse policy and higher management directives. A Component Manager may be responsible for more than a single work area; and, will be directly accountable for the safe operation and control of activities in the work area(s) and for the protection of the environment, as influenced by the activities conducted. With appropriate support from cognizant service groups, they will be responsible for environmental protection, health, integrated safety, quality, and safeguards, in all areas over which they have authority.

First Level Managers will supervise operating personnel. They will fulfill their responsibilities by assuring that all operations under their control are carried out in accordance with the radiation protection limits, nuclear criticality safety controls, processing procedures, schedules, and other instructions supplied by higher management.

All Component Managers will be knowledgeable in the operating procedures applicable to their work areas. Each Manager will have demonstrated proficiency in application of the licensed activity's environmental and radiological protection programs, as they relate to controls and limitations on work activities, in assigned radiation and radioactive materials areas. Each Manager of work areas where uranium is handled will have demonstrated proficiency in the application of the areas' nuclear criticality safety controls. All Managers will be knowledgeable in the occupational safety and health procedures applicable to their areas of responsibility.

The minimum requirements for a Position of Component Manager, above the First Level, will be a baccalaureate degree, or equivalent, with a science or engineering emphasis; and, two years of experience in a nuclear facility. A First Level Manager will have demonstrated management capabilities by a continuing record of quality work accomplishments.

(c) Regulatory Component Managers and Engineering Functions

The Regulatory Component will be that organizational component of the licensed activity with the responsibility for environmental pollution control, radiation protection, nuclear criticality safety, occupational safety and health, and emergency planning; and, for evaluating the effectiveness of these programs. The Regulatory

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CHAPTER 3.0

CONDUCT OF OPERATIONS

A basis for total quality conduct of operations at the Columbia Fuel Fabrication Facility (CFFF) will be the Corrective Action Process (CAPs). This program will be a structured oversight process that maintains management awareness, and enables monitoring of issues that impact safety, customer confidence, product quality and cost effective production. A responsible individual will be assigned accountability for each CAPS issue. CAPS commitments will be followed to management-approved completion by the responsible individual specifically assigned accountability for each particular initiative. This program will be a documented demonstration of CFFF Managements' strong commitment to evaluate, on a continuing basis, opportunities to improve Plant safety.

3.1 CONFIGURATION MANAGEMENT

To assure that design changes will not adversely impact on environmental protection, health, safety, quality, and/or safeguards programs at the Columbia Fuel Fabrication Facility (CFFF), a formal review process will be established to analyze new systems and components, or modifications to existing systems and components, in order to reliably predict performance under normal operating conditions and potential process upsets. Structured hazard analyses, as conducted in accordance with Chapter 4.0 of this License Application, will specifically include analysis of verified drawings under configuration management.

3.1.1 CONFIGURATION MANAGEMENT PROGRAM AND PROCEDURE

The CFFF Configuration Management Program will embrace an approved procedure for implementation of proposed additions or changes to facility systems. The procedure will define the review and approval process to assure the impacted systems will continue to meet or exceed regulatory specification requirements of baseline safety assessments. The procedure will specify documentation required to maintain a current record of existing system conditions.

3.1.2 CONFIGURATION MANAGEMENT IMPLEMENTATION

The Configuration Management Program will be a major sub-element of the Safety Margin Improvement Program described in the introduction to this Chapter. Configuration

Radiation workers will receive regulatory refresher training on an annual basis. The training will consist of:

- Providing each employee with a current revision of the Integrated Safety Training Manual or access to electronic versions of the training manual.
- Presenting each employee supplementary instruction on general regulatory issues; and,
- Requiring each employee to successfully pass an examination.

The Training Manual will include such subjects as:

- ALARA;
- General health physics practices;
- Health physics rules and recommendations;
- Area-specific health physics practices;
- General nuclear criticality safety practices;
- Area-specific nuclear criticality safety practices;
- Industrial safety and hygiene, and fire safety, practices;
- Chemical Area work practices;
- Radiation risks;
- Emergency planning; and,
- Safeguards.

Employees who are absent from the facility during scheduled regulatory refresher training will receive such training within one month of their return to work.

(b) Training and Qualification of Nuclear Criticality Safety Function Engineers

Nuclear Criticality Safety Function Engineers will develop skills and abilities directed by the cognizant Regulatory Component Manager, who will evaluate fundamental development methodologies for applicability and utilization on a case-by-cases basis. Examples of development methods include:

- A nuclear criticality safety short course;
- Westinghouse auditing certification;
- American Nuclear Society Standards development and review;
- Facility criticality safety handbook development and review;
- A structured hazards analysis course;
- A structured human factors course; and,
- Criticality safety calculations certification.

Demonstrated performance of Nuclear Criticality Safety Function Engineers skills and abilities will be formally reviewed and documented by the cognizant Regulatory

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personnel exposures for identifiable categories of workers or types of operations; (2) if such concentrations or quantities in effluents, or exposures, might be lowered in accordance with the ALARA concept; and (3) if equipment for effluent and exposure control is being properly used, maintained, and inspected. The ALARA Report will include review of related audits and inspections performed during the reporting period; and will summarize data from the following areas: effluent releases, environmental monitoring, inplant airborne radioactivity, personnel exposures, bioassay results, and unusual occurrences.

5.1.4 Implementation of the ALARA program, including commitments in Subsections 5.1.2 and 5.1.3, will satisfy the requirement (10CFR20.1101(c)) for an annual review of the radiation protection program content and implementation.

5.2 RADIATION CHEMICAL WORK PERMITS (RCWP)

5.2.1 CRITERIA

(a) Specific requirements of the Radiation Chemical Work Permit (RCWP) program will be documented in an approved procedure.

(b) A Radiation Chemical Work Permit will be required for all work for which radiation protection requirements are not covered by operating procedures and one, or more, of the following conditions is met:

(b.1) Release of detectable contamination outside of a Contamination Controlled Area might result in contamination of personnel or equipment by the work under consideration.

(b.2) The average local concentration of radioactive contaminants is predicted to exceed 50-percent of Derived Air Concentration (DAC) values based on the dose coefficients published in International Commission on Radiological Protection (ICRP) Publication No. 68, - as a result of the work under consideration.

(b.3) The deep dose equivalent is predicted to exceed 100 millirem in a week, as a result of the work under consideration.

(b.4) The Total Effective Dose Equivalent is predicted to exceed 10-percent of the 10CFR20 limit, as a result of the work under consideration.

(b.5) The work involves the use of a chemical that has not been previously used at the Columbia Site or the chemical is being used in a manner not previously approved by Environment Health and Safety.

(c) RCWP's will be requested by the responsible department, and such requests will be

submitted to the Regulatory Component for evaluation, preparation and approval. The Regulatory Component will specify applicable protection requirements for the work to be performed. Approvals from the Regulatory Affairs Component and the cognizant first level manager will be obtained prior to starting the activity.

(d) Only personnel who have completed appropriate safety training as detailed in Subsection 3.4.2 of this License Application -- will be assigned to perform work under an RCWP.

(e) A copy of the Radiation Chemical Work Permit will be made available to personnel working under the RCWP, and the work will be conducted as specified in the approved permit.

5.3 VENTILATION SYSTEMS

5.3.1 Ventilation systems will be designed and operated to assure adequate control of process-generated radioactive dust and particulate matter. Air flows will be typically maintained from non-chemical process areas to Chemical Areas. Whenever adverse air flows are detected, corrective actions will be taken as soon as practicable.

5.3.2 Ventilation systems servicing laboratory-type hoods, production hoods, and/or other primary enclosures where uncontained nuclear material is handled, will provide a minimum face velocity of 100-linear-feet per minute at all openings during work operations. Face velocity measurements will be made, and documented, on at least a quarterly basis when such equipment is in operation. Maintenance corrective actions will be performed on systems failing to meet velocity criteria, or else the operation will be terminated until minimum control velocity can be restored.

5.3.3 When containment of uranium dust by conventional ventilation hoods is not possible, or is impractical, gloveboxes may be used. Ventilation systems for gloveboxes, and similar enclosed devices, will be designed and operated with a nominal negative internal pressure with respect to room air. Gloveboxes will be equipped with instrumentation for measuring differential pressure, and such instrumentation will be checked to verify proper operation.

When positive-pressure atmospheric control is required for moisture control, product quality or other approved purpose; and when ceramic pellets are in positive-pressure gloveboxes, the following criteria shall apply:

(a) Gloveboxes will be designed for high integrity confinement.

(b) Gloveboxes will be operated with a nominal positive internal pressure. In-plant air sampling will further verify containment of radioactive material.

(c) Internal atmospheres will be continuously re-circulated through HEPA filters.

(d) Alarms will be provided, to indicate when pressure exceeds the pre-set positive pressure limit.

(e) An interlock, or other pressure relief device, will be provided to exhaust the glovebox with a sufficient factor of safety to ensure its continuing integrity.

5.3.4 Ventilation hoods and gloveboxes will be constructed primarily of metal, using glass and/or fire resistant plastic for viewing areas. Plastics will conform to a Class-I fire rating.

5.3.5 Ducts will be designed to minimize accumulations of nuclear material, and will be inspected on a routine basis commensurate with the potential for material accumulations.

5.3.6 Exhausts from gloveboxes, hoods, local exhaust enclosures, and similar devices, when employed for radiation protection purposes, will be passed through HEPA filtration. The HEPA filters will be replaced, either on a routine schedule, or when airborne activity concentrations, hood velocities, differential pressure drops, or particulate penetration measurements indicate that replacement is necessary. The maximum differential pressure permitted across a HEPA filter will be 8-inches of water for negative pressure systems and 4-inches of water for positive pressure systems.

5.3.7 Exhausts from in-plant, recirculating process-air cleaning systems, including gloveboxes, hoods, local exhaust enclosures, and similar devices, will either have their HEPA filters penetration tested, or will be sampled for airborne radioactivity concentrations, on at least a quarterly basis; and, maintenance will be performed on systems found to exceed 25% Derived Air Concentration (DAC). The DAC values will be based on the dose coefficients published in ICRP Publication No. 68.

5.3.8 Ventilation control facilities, equipment, and systems, as necessary to minimize exposures to radioactive materials will be developed and utilized.

5.3.9 Gloveboxes, ventilation hoods, or other containment devices will be installed and used whenever they are determined to be necessary as a result of radiation protection measurements or evaluations.

5.3.10 The effectiveness of the final HEPA filters, in process ventilation equipment and containment systems, will be determined by in-situ testing, using particulate penetration methods, or other testing means, selected by the Radiation Safety Function. Such testing will be performed following each filter change.

5.3.11 Adequacy of ventilation and containment controls within the licensed activity will be determined by continuous air sampling. The action levels in Subparagraph 5.4.1(i) will

be used as guidance to determine adequacy of ventilation and containment.

5.4 AIR SAMPLING

5.4.1 WORK AREA AIR SAMPLING

(a) All areas where exposed radioactive materials are handled will be sampled for airborne radioactive particulate matter using a combination of fixed location general area air samplers, fixed location breathing zone representative air samplers, or portable air samplers. The type of sampling employed, and location of samplers, will be determined by the Radiation Safety Function.

(b) Fixed location air samplers used for the purposes of assessing and assigning operator intake will be located in or around the breathing zone of operator work stations where uranium handling operations are performed, or where short term operations occur frequently. Breathing zone representativeness of these samplers will be established when the samplers are initially installed. Samplers will be re-examined for representativeness annually, or whenever substantive equipment or process changes are made (in accordance with Section 3 of Regulatory Guide 8.25, "Air Sampling in the Workplace.") Representativeness studies will be performed in accordance with methods and acceptance criteria described in Table 2 of Regulatory Guide 8.25. DAC and Annual Limit on Intake (ALI) values used will be based on the dose coefficients published in ICRP Publication No. 68

(c) Fixed location air samplers will be located where potential airborne contamination hazards exist; such that, deterioration in ventilation controls, containment controls, or operating procedures resulting in significant increases in airborne radioactivity concentrations will be detected so corrective actions can be instituted.

(d) All new operations or substantive modifications to existing equipment will be evaluated by the Regulatory Component, or sampled using portable samplers to assess the need for fixed location sampling stations.

(e) Lapel samplers may be used on a limited basis to supplement other air sampler measurements where work stations are not defined, or for special studies.

(f) Continuous, alarming air monitors may be used on a qualitative basis to provide early warning for operators in the event of a significant airborne release.

(g) Work-area air samples will be changed out at least once each working shift and allowed time for natural activity decay before processing during production operations, unless a documented evaluation by the Radiation Safety Function demonstrates that another schedule is justified. Samples will be analyzed using calibrated counting equipment; and, airborne activity concentrations calculations

will account for filter collection efficiency, self-attenuation, and counter efficiency. Analyses will include radiological counting of the samples to determine radiological concentrations in the work areas.

(h) Air samples suspected of reflecting releases and significantly elevated concentrations will be counted as soon as practicable following sample change out, to determine radioactivity concentration.

(i) All work-area sampling programs will provide for investigation, special sampling, and/or increased sampling frequency if the activity concentration outside of containment structures (not directly resulting from a specific known cause) exceeds the following action levels (where DAC values used will be based on the dose coefficients published in ICRP Publication No. 68).

- A single sample collected for 8 hours or longer exceeds 250% DAC.
- The monthly average for a sample location exceeds 100% DAC.

Operations or equipment will be shut-down, and immediate corrective action will be taken, at locations where a single air sample exceeds 1000% DAC.

5.4.2 Fixed in-plant air and gaseous effluent sampling systems will be subject to surveillance by the Radiation Safety Function. Such surveillance will assure that flow meters are working and properly adjusted, that the vacuum system is intact, and that filter media has been properly installed.

5.4.3 Air flow measurement devices on the fixed in-plant air sampling system, the gaseous effluent sampling system, and environmental air samplers, will be verified annually for proper operation, and will be replaced as required.

5.5 CONTAMINATION CONTROL

5.5.1 CONTAMINATION SURVEYS

Contamination surveys will be performed on a continuing basis, to evaluate the potential spread of radioactive contamination.

(a) Contamination surveys will be performed with sufficient frequency to assure that maximum acceptable limits are not exceeded. Maximum acceptable limits, and minimum survey frequencies for floors and other readily accessible surfaces will be as specified in Figure 5.1 Specific portions of a Contamination Controlled Area may be assigned higher limits and/or frequencies, provided a documented evaluation by the Radiation Safety Function has demonstrated that collective protective measures for the subject area will assure compliance with licensed and regulatory requirements. Examples include areas where contamination does not represent the

5.5.2 ACCESS

Access to areas in which radioactive materials are used or stored will be controlled. Convenient change rooms and step-off pads will be provided at access points, to prevent the spread of contamination from Contamination Controlled Areas.

(a) Personnel will be authorized to enter Contamination Controlled Areas, by virtue of management approval in accordance with the CFFF Physical Security Plan, only after completing required radiation protection training.

(b) Access points to Contamination Controlled Areas will be established through change rooms and step-off pads. Each such access point will define a contaminated side and an uncontaminated side, with a step-off area provided between the two sides.

(c) Each access point to the Contamination Controlled Area will be posted in accordance with 10CFR20.1902, except for 10CFR20.1902(e). In lieu thereof, a sign bearing the legend "Every container or vessel in this area may contain radioactive material" may be posted at entrances to each such area in which radioactive materials are used, or stored.

(d) Access to Contamination Controlled Areas, including the Chemical Manufacturing Area and other areas involved in the processing and storage of unencapsulated (e.g., a sealed source; or, a strong, tight container such as a shipping package) radioactive material will require the use of protective clothing.

(e) Protective clothing will be provided for personnel entering the Contamination Controlled Area. This will include labcoats, coveralls, shoecovers, safety shoes, and/or other specified garments -- consistent with an individual's work assignment. Street clothing, of persons to be dressed completely in protective clothing, will be stored on the uncontaminated side of the change line. Used protective clothing will be stored on the contaminated side of the change line until collected for laundering. Contamination limits for protective clothing will be consistent with the limits in Figure 5.1

(f) Personnel survey instruments will be provided in change rooms and at step-off pads, for use by personnel leaving Contamination Controlled Areas. Instruments will be checked for proper operation daily, during production operations, by the Radiation Safety Function.

(g) Instructions will be posted at exit points from Contamination Controlled Areas, which describe survey techniques, procedures for decontamination, and what to do in event of survey instrument malfunction.

5.6 *EXTERNAL EXPOSURE*

5.6.1 PERSONNEL MONITORING DEVICES

Film, Thermoluminescent (TLD), Optically Stimulated Luminescent (OSL) or other equivalent dosimeters provided by a commercial supplier which is NVLAP certified, and capable of detecting and measuring beta-gamma and x-radiation, will be provided to individuals specified by the Radiation Safety Function. These badges or dosimeters will be evaluated at least quarterly, or more frequently as specified by the Radiation Safety Function. In addition, neutron detection capability will be available, for use as specified by the Radiation Safety Function, and will be evaluated at least quarterly.

5.7 *INTERNAL EXPOSURE*

A bioassay program will be maintained to evaluate the effectiveness of material control and personnel protection programs, to evaluate intakes exceeding action levels specified in Subsection 5.7.3, and to assess dose used to determine compliance with applicable occupational dose equivalent limits (diagnostic bioassay only). Samples will be analyzed by a qualified laboratory.

The bioassay program shall comply with the guidance provided in Regulatory Guide 8.9, July 1993, "Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program" using ALI and DAC values based on the dose coefficients published in ICRP Publication No. 68.

The primary method of assessing and calculating intake and Committed Effective Dose Equivalent (CEDE) will be by the measurement of breathing zone representative air sampling results. Committed Effective Dose Equivalent and Committed Dose Equivalent values will be calculated using ALI and DAC values based on the dose coefficients published in ICRP Publication No. 68.

5.7.1 INVITRO BIOASSAY

(a) Routine urinalysis samples will be collected for the purpose of tracking and evaluating potential long-term accumulation and retention of radioactive material in individuals. The Radiation Safety Function will perform evaluations of statistically meaningful results and prescribe subsequent actions to be taken based on these evaluations.

(b) Work activity restrictions will be imposed, and diagnostic bioassay samples will be requested, when air sampling indicates exposures exceeding the action levels in Subsection 5.7.3 may have occurred. Such bioassay measurements, invivo measurements, air sampling measurements or any combination of these measurements will be used to assess intake and dose used to demonstrate

compliance with the occupational dose equivalent limits in 10CFR20.

5.7.2 INVIVO BIOASSAY

(a) Routine uranium lung burden evaluations will be performed for the purpose of tracking and evaluating potential long term accumulation and retention of radioactive material in individuals. Evaluations of air sample data, operator stay-time, routine invitro (fecal and urine) sampling, or any combination of these methods will be performed to evaluate potential uranium lung burden for individuals not able to be invivo counted (i.e., claustrophobic individuals). The Radiation Safety Function will perform evaluations of statistically meaningful results and prescribe subsequent actions to be taken based on these evaluations.

(b) Diagnostic uranium lung burden analysis will be performed when an individual exceeds the intake or dose action levels specified for nontransportable uranium exposures specified in Subsection 5.7.3. Invivo measurements, invitro bioassay measurements, air sampling measurements or any combination of these measurements will be used to assess intake and dose used to demonstrate compliance with the occupational dose equivalent limits in 10CFR20.

5.7.3 RADIATION EXPOSURES

(a) Individuals likely to receive greater than 10% of the applicable Annual Limit on Intake (ALI) values based on the dose coefficients published in ICRP Publication No. 68 will be monitored for intakes of radioactive material. Suitable and timely measurements of radioactive material in the air of the work area, measurements of radionuclides in the body, measurements of radionuclides excreted from the body, or any combination of airborne concentration, invivo and invitro bioassay measurements will be used to monitor intakes to individuals.

(b) Committed Dose Equivalent (CDE), Committed Effective Dose Equivalent (CEDE), and Total Effective Dose Equivalent (TEDE) occupational doses will be calculated using ALI values based on the dose coefficients published in ICRP Publication No. 68.

(c) Intakes to soluble/transportable compounds of uranium will be limited to less than 10 milligrams uranium per week per individual.

(d) Work restrictions and diagnostic evaluations will be performed when an individual receives a single intake of greater than 40 DAC-Hours exposure to insoluble/no-transportable compounds of uranium or 20 DAC-Hours exposure to

soluble/transportable compounds of uranium (which corresponds to approximately 5 milligrams intake to soluble/transportable compounds of uranium @ 3.5 weight % U-235 enrichment). DAC – hour, DAC and ALI values shall be based on the dose coefficients published in ICRP Publication No. 68.

(e) Work activity restrictions will be imposed when an individual exceeds 80% of applicable limits; i.e., 0.8 ALI, 1600 DAC-Hours, 4.0 REM CEDE for inhalation exposures to Class W and Y uranium, 4.0 REM TEDE, 4.0 REM DDE, 40 REM CDE, etc.). Dose values, DAC hour, DAC, and ALI values shall be based on the dose coefficients published in ICRP Publication 68.

5.8 RESPIRATORY PROTECTION

A policy statement will be written on respirator usage and will include the following:

5.8.1 Engineering controls and administrative procedures will be provided to minimize the need for respiratory protection.

5.8.2 Respiratory protection equipment will be used in accordance with written procedures, and individuals using respiratory protection will be trained in accordance with the criteria in 10CFR20, Subpart H.

5.8.3 Only respirators certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA) will be used.

5.8.4 Protection factors from Appendix A, 10CFR20 or more conservative protection factors based on the results of quantitative fit tests will be used when assigning actual intakes.

5.8.5 Personnel authorized to use respiratory protection equipment will be fit-tested annually.

5.8.6 Personnel authorized to use respiratory protection equipment will be trained in the applicable requirements biennially.

5.8.7 Personnel will be required to test respirators for operability immediately prior to each use.

5.8.8 Written policies and procedures will cover the following:

(a) respirator selection, fitting, issuance, maintenance and testing;

(b) supervision and training of personnel;

(c) monitoring, including air sampling and bioassay;

(d) recordkeeping;

(e) determination by a physician prior to the initial fitting of respirators, and periodically at a frequency determined by a physician, that the individual user is medically fit to use the respiratory protection equipment;

(f) use of process or other engineering controls, instead of respirators;

(g) routine, nonroutine and emergency use of respirators; and

(h) periods of respirator use and relief from respirator use.

5.9 INSTRUMENTATION

5.9.1 RADIATION PROTECTION INSTRUMENTS

Instruments used for radiation protection measurements will have capabilities as follows; however, more than one instrument may be utilized to cover the specified range:

(a) Portable Survey Instruments -- Alpha, 100 to 1.0E06 disintegrations per minute; Beta-Gamma, 0.1-millirem per hour to 300-REM per hour; neutron, 0.5 to 5 mREM per hour.

(b) Laboratory Assay Instruments -- Alpha, 10-percent of Derived Air Concentrations (DAC) values based on the dose coefficients published in ICRP publication No. 68, for sampling periods of 8-hours or more.

Radiation protection instruments will be calibrated on a routine schedule established by the Radiation Safety Function. The schedule will require calibration following initial instrument acquisition; and, thereafter, at minimum, following major repairs, semiannually, or the manufacturer's recommendation, whichever is lesser. Alpha counting instruments used in the Radiation Safety Function Laboratory will be checked each working day, when in use, to determine background activity; and, a calibrated source will be counted to assure proper instrument functioning. A voltage plateau, defining the proper counting voltage for each such laboratory alpha counting instrument, will be determined quarterly. Instrument calibration records will be maintained for a period of at least three years.

Operability of portable survey instruments will be determined prior to each use.

5.10 SUMMING INTERNAL AND EXTERNAL EXPOSURES

5.10.1 RADIATION DOSES

(a) Internal and external occupational radiation doses will be combined in accordance with criteria in 10CFR20 and applicable guidance contained in Regulatory Guide

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(j) Approved procedures, as described in Section 3.4 of this License Application, will prescribe the housekeeping practices for the facility. Good housekeeping techniques will be practiced at the facility as an integral part of the Westinghouse total quality culture.

8.1.2 ADMINISTRATIVE CONTROLS

(a) Program management will follow the organizational responsibilities and authorities structure described in Section 2.1 of this License Application.

(b) Plant audits and inspections of fire protection will be performed at two levels, as follows:

(b.1) Formal monthly audits, supplemented by informal inspections, as described in Section 3.6 of this License Application, will include fire safety. Safety observers will also perform formal and informal inspections, of specified process areas, that include fire protection, combustible loading, and housekeeping status.

(b.2) Independent fire protection, prevention, and brigade inspections of the facility will be performed at least every two years. Action plans will be developed to address findings arising from such inspections.

8.1.3 BUILDING CONSTRUCTION

(a) The construction standards for the facility manufacturing areas were those in place when the areas were originally constructed. The building structural members were built using non-combustible, or limited combustible materials. When the building structure is modified or expanded, prevailing NFPA code requirements will be met.

(b) Fire response areas will subdivide specified processes and materials involving fire hazards, to confine fire to its area of origin and prevent its spread. In particular, the following building units will be such areas:

- Solvent extraction;
- Boiler rooms;
- Incinerator;
- Warehousing areas (MRO Storeroom, Product Storeroom);

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films, and/or similar items retained for record purposes. No licensed controls shall be required for final disposition of such records, and they may randomly be mingled with, and/or disposed of as, other records, provided:

- Prior to transfer from contamination control areas at the licensed activity, a documented survey instrument measurement shall conclude that the following limits are not exceeded: Average uranium-alpha contamination of 220-disintegrations-per-minute per 100-square-centimeters; Maximum uranium-alpha contamination of 2200-disintegrations-per-minute per 100-square-centimeters. Average beta-gamma emitter contamination of 660-disintegrations-per-minute per 100-square-centimeters; Maximum beta-gamma emitter contamination of 6600-disintegrations-per-minute per 100-square-centimeters.

- Such records shall be kept in locations that are used primarily for record storage and/or disposal.

12.1.8 AUTHORIZATION TO RELEASE FOR UNRESTRICTED USE

Licensed activity materials and equipment may be released from contamination areas on-site to clean areas on-site, or from on-site possession or use to unrestricted possession or use off-site; provided, such releases are subject to all applicable conditions of the NRC Staff's April 1993 document entitled; GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT PRIOR TO RELEASE FOR UNRESTRICTED USE OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE, OR SPECIAL NUCLEAR MATERIAL.

12.1.9 AUTHORIZATION TO USE ICRP 68

DAC and ALI values based on the dose coefficients published in ICRP Publication No. 68 may be used in lieu of the DAC and ALI values in Appendix B of 10 CFR Part 20 in accordance with internal procedures.

12.2 EXEMPTIONS

12.2.1 EXEMPTIONS FROM PRIOR COMMITMENTS

All commitments made to NRC Staff prior to the approval date of this License Application shall be no longer binding upon Westinghouse, following approval of this License Application, unless re-imposed as License Conditions.

- Each such area shall be remote from other operations with special nuclear material.

- Each such area shall be administratively limited to 1000 grams of U235; and, for chemistry laboratories, an additional 5 grams of U233.

Low concentration storage areas in which containers have uranium in quantities representing no more than 350 grams of U235 per package and no more than 5 grams of U235 in any 10 liters of package; or, no more than 50 grams of U235 per package and no more than an average of 5 grams of U235 per 10 liters of package -- provided that:

- Each such area shall be under nuclear isolation with respect to other areas where special nuclear material is more concentrated.

Storage areas in which the only special nuclear material present is contained in approved shipping containers -- provided that:

- The maximum number of containers permitted in each such area shall be unlimited for low specific activity packages; or, 250 Fissile Class I packages; or, a quantity of Fissile Class II packages totaling no more than 50 transport units; or, one approved shipping quantity of Fissile Class III packages.

- Each such storage array shall be under nuclear isolation with respect to other special nuclear material.

12.2.6 EXEMPTION FROM PACKAGED RADIOACTIVE MATERIAL MONITORING REQUIREMENTS

Notwithstanding the requirements of 10 CFR 20.205(b) to monitor the external surfaces of packaged radioactive material receipts for radioactive contamination, the licensed activity is exempted from such requirement relative to flatbed trailer shipments of fuel assemblies received from the General Electric Company for interim storage purposes only, provided the constraints, conditions and controls committed to in a letter, dated November 30, 1993, (identification # NRC-93-036), are satisfied; and further provided that the total number of such fuel assemblies stored at the site at any given time does not exceed 250.

12.2.7 EXEMPTION FOR ELECTRONIC SUBMISSIONS

Not withstanding the requirements of 10CFR 70.5, communications or reports concerning the regulations in Part 70 and any application filed under these regulations may be submitted electronically.

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