CHAPTER 7.0

CHEMICAL SAFETY PROGRAM

7.1 CHEMICAL SAFETY PROGRAM STRUCTURE

The Columbia Fuel Fabrication Facility (CFFF) maintains a Chemical Safety Program for the site which provides adequate protection against chemical hazards related to the storage, handling and processing of licensed materials. A primary purpose of the Chemical Safety Program is to assure that workers, the public and the environment are adequately protected from the chemical hazards of licensed materials. Chemical safety is also an element of the Integrated Safety Analysis (ISA) program described in Chapter 4.0 of this license application. CFFF chemical safety commitments related to compliance with 10CFR70 Subpart H requirements, including Process Descriptions, Process Theory, Accident Sequences, Accident Consequences and IROFS are described in Chapter 4.0 of this License Application.

7.1.1 Program Basis

7.1.1.1 Chemical Safety Program activities are implemented through approved procedures at the CFFF. Equipment and facilities important to the chemical safety of licensed materials and to protect health and minimize danger to life or property are described in detail in the CFFF ISA and ISA Summary.

7.1.1.2 Other key elements of the Chemical Safety Program include the following attributes:

- The CFFF commits to having written procedures defining the Authority and Responsibility for Safety.
- A Hazard Communication Program is implemented to ensure that hazardous chemicals used at the CFFF are evaluated for their hazards and that this information, along with information about appropriate protective measures is transmitted to employees.
- An Energy Isolation and Lock Out Tag Out (LOTO) Program is implemented to protect employees and contractors from injuries that may result from the unexpected start up of equipment or the release of stored energy.
- Procedures also exist to provide information and guidance on selection of Chemical Personal Protection Equipment (PPE) to minimize the potential for chemical exposure injuries and illness.
- In areas where chemicals are stored, handled, or used, emergency eyewash and safety shower stations are installed to provide clean water to wash chemicals from the face, skin, and eyes of individuals who are exposed to these materials.

7.1.2 Program Practices

7.1.2.1 The CFFF Chemical Safety Program is designed to assure that processes and operations comply with applicable federal and state regulations pertaining to chemical safety.

7.1.2.2 The Chemical Safety Program is implemented to assure that hazards associated with the risk posed by chemicals used at the CFFF are evaluated, and that appropriate measures are taken to assure operations are performed in a safe manner.

7.1.2.3 Appropriate facilities, equipment, and procedures for the safe storage and handling of hazardous chemicals are maintained at the CFFF. Face velocity requirements for enclosures whose primary control function relates to chemical fumes, mists, and dusts are specified by the Chemical Safety Function.

7.1.2.4 Employees using hazardous chemicals are specifically trained in procedures for safe handling and disposal of them.

7.1.2.5 The Chemical Safety Program includes evaluations of:

(a) Potential physical, chemical, and/or fire hazards;

(b) Development and implementation of safety programs and procedures designed to minimize accidents and injuries to employees;

(c) Purchase and maintenance of protection and monitoring equipment; and,

(d) Maintenance of appropriate records and reports.

7.1.2.6 The Site Emergency Plan and Implementing Procedures, described in Chapter 9.0 of this License Application, detail the manner in which the CFFF responds to any accidental release of hazardous chemicals.

7.1.3 Performance and Documentation of Analyses

7.1.3.1 Hazard and Operability (HAZOP) Analysis, What-If/Checklist, and/or other recognized methods are used to systematically evaluate the safety of chemical operations at the CFFF. The hazard evaluation method selected is based on the complexity of the process being analyzed.

7.1.3.2 Hazards to be evaluated are based on the nature of the chemicals involved, the process conditions (flow, temperature, pressure, concentration, etc.), personnel experience, and information about previous incidents in the facility. The evaluation is used to ensure that adequate safety margin is present in each chemical process. For areas where additional safety controls might be required,

an action plan is developed for increasing the safety margin of the process, in accordance with CFFF priorities and resources.

7.1.3.3 The physical design and implementation of chemical operations at the CFFF is evaluated to identify deviations from the intended operation, which could result in potential hazards or operational concerns. These hazards include the following, when applicable:

(a) Potential for criticality safety incidents;
(b) Potential to violate a License commitment;
(c) Potential for personnel exposure or injury; and/or,
(d) Potential for radioactive contamination, release of chemicals to the atmosphere, fire or explosion.

7.1.3.4 Chemical Safety Analysis

(a) Analysis Performance

(1) The Chemical Safety Analysis is a comprehensive assessment of each component within a defined system. The analysis identifies controls required to maintain a sufficient margin of safety.

(2) Chemical accident sequences are analyzed using the accident flow diagram format. In this format, the analyst traces each sequence through the diagram (starting with the initiating event) to arrive at a consequence of interest. Each identified pathway defines an initiating event and protective measure failures that collectively represent an accident sequence.

(3) All relevant chemical hazard exposure pathways are included in the Chemical Safety Analysis.

(b) Analysis documentation

(1) The Chemical Safety Analysis is one of the ISA safety analyses described in Chapter 4.0 of this License Application. The level of detail for a particular analysis is based on the complexity of the initial system, and subsequent proposed changes to the system. Thus, the scope and content of a Chemical Safety Analysis are customized to reflect the particular characteristics and needs of the system being analyzed.

(2) Chemical Safety Analyses are maintained current through implementation of the Configuration Management program described in Sections 3.1 and 4.1 of this License Application. If a Chemical Safety Analysis is required for a proposed change, it is performed to the current standards required for the baseline

analysis. Summary details of the change, including required approvals, are documented on a Configuration Change Control Form that is linked to the applicable Baseline ISA, thus providing a substantially complete "living" framework for the facility chemical safety basis.

7.1.4 Audits and Assessments

Audits and assessments are conducted to compare established chemical safety standards to CFFF performance. These audits and assessments are performed in accordance with the requirements in Chapter 3.0, Section 3.6, of this License Application.

7.1.4.1 Program assessments take the form of program audits. Specific portions of the Chemical Safety Program, evaluated during a particular assessment, are based on previous internal audit findings, external audit findings, NRC inspection activities, current operating conditions, and the time since the last assessment. The Chemical Safety Program is assessed on a triennial frequency. Results of the assessments are documented and maintained for NRC Staff review and inspection.

7.1.4.2 Process assessments take the form of compliance audits that evaluate implementation of chemical safety requirements (*e.g.*, personal protective equipment, following procedures and postings, *etc.*) for CFFF operations (*i.e.*, Site and Structures, ADU Conversion, Solvent Extraction, *etc.*) The frequency of these audits is based on previous internal audit findings, NRC inspection results, incidents (those reported, and those requiring notification), configuration management activities, and the time since the last assessment. The complete set of operations making up the CFFF ISA is assessed on a five year frequency. Results of the assessments are documented and maintained for NRC Staff review and inspection.

CHAPTER 8.0

FIRE SAFETY PROGRAM

8.1 FIRE SAFETY PROGRAM STRUCTURE

The Columbia Fuel Fabrication Facility (CFFF) maintains a robust Fire Safety Program for protection of the site. A primary purpose of this Fire Safety Program is to assure that the opportunity for fires in and about the facility is kept As Low As Reasonably Achievable (ALARA). Fire protection is achieved by combinations of fire protection measures and systems. Such measures and systems are designed and maintained in accordance with industry standards and prudent industry practices. The standards and practices most often consulted are those of the National Fire Protection Association (NFPA).

8.1.1 Basic Fire Protection

8.1.1.1 Fire Safety Program management organization, authorities, and responsibilities conform to the structure presented in Chapter 2.0 of this License Application. The Authority Having Jurisdiction (AHJ) at the CFFF for fire safety program implementation is held by the Fire Safety Function unless mandated by local regulation, where the specifically required AHJ is utilized (e.g., Richland County Fire Marshall).

8.1.1.2 The CFFF is designed to provide protection against fires and explosions that could affect the safety of licensed materials and thus present an increased radiological risk.

8.1.1.3 Fire alarm pull stations are strategically located throughout the facility. Areas with potential fire hazards are equipped with appropriate fire detection and/or suppression systems. Criticality concerns/controls restrict the use of water for fire suppression in identified plant areas.

8.1.1.4 The Security Function is responsible for announcing alarms and alerting personnel to fire incidents through use of the facility public address system. Following announcement of an alarm, instructions are provided to personnel with any necessary protective actions to be taken.

8.1.1.5 An approved cutting and welding procedure, a welder training program, and hot work permits are provided to control torch use activities.

8.1.1.6 Flammable liquids are retained in containers and/or cabinets designed for such purpose, and additional precautions are taken as specified by the Fire Safety Function. Non-routine use of flammable materials is controlled by the same precautions used for routine use of such materials.

8.1.1.7 Periodic emergency drills are conducted as part of the Emergency Management Program described in Chapter 9.0 of this License Application. An emergency exercise, that includes facility evacuation, is conducted on a biennial basis. At times prescribed by the Fire Safety Function, a fire scenario is included as part of such an exercise.

8.1.1.8 Review and control of modifications to the facility or processes to minimize fire hazards are implemented as described in Section 3.1 of this License Application.

8.1.1.9 A fire protection preventive maintenance program is in place, and relevant documentation is maintained for the maintenance activities, as described in Section 3.2 of this License Application. Inspection, testing, and maintenance of fire protection equipment is covered by this program.

8.1.1.10 The current CFFF fire hazard analyses are found in the Pre-Fire Plans for the various areas of the facility and in the ISA Fire Safety Analyses, as described in Chapter 4.0 of this License Application. Fire safety controls, instruments, and services are included in the Quality Assurance Program as described in Section 3.3 of this License Application.

8.1.1.11 Basic fire protection training is covered in new-hire and contractor orientation programs as described in Section 3.4 of this License Application. An Emergency Response team is given extensive additional training.

8.1.1.12 Approved procedures, as described in Section 3.4 of this License Application, define reporting guidelines and investigation requirements for fire incidents.

8.1.1.13 Approved procedures also prescribe the housekeeping practices for the facility. Good housekeeping techniques are practiced at the facility as an integral part of the Human Performance culture described in Section 3.5 of this License Application.

8.1.1.14 The Fire Safety Program is periodically evaluated through audits and self-assessments, as described in Section 3.6 of this License Application. Resolution of significant findings is tracked by the Corrective Action Program, as described in Section 3.8 of this License Application.

8.1.1.15 A formal system is provided to enable reporting of fire incidents to First Level Management for action, as described in Section 3.7 of this License Application.

8.1.1.16 Fire Safety Program records are maintained, as described in Section 3.9 of this License Application.

Details of these and other Fire Safety Program elements are presented in the balance of this Section.

8.1.2 Building Construction

The construction standards for the CFFF manufacturing areas were those that prevailed at the time the areas were originally constructed. The building structural members were built using non-combustible, or limited combustible materials. Whenever the building structure is expanded, or otherwise modified, prevailing NFPA code requirements are addressed.

These areas will conform to the following, as specified by the Fire Safety Function:

(a) location and manning requirements;
(b) fire barrier ratings;
(c) fire detection requirements;
(d) sprinkler, or other fire suppression method, specifications;
(e) container and containment specifications;
(f) wiring grades;
(g) combustible material inventory controls; and/or,
(h) housekeeping practices.

8.1.2.1 To minimize exposure to fire risk, the facility employs guidance from applicable NFPA standards.

8.1.2.2 To enable rapid personnel egress from buildings in the event of a fire, the facility employs guidance from the NFPA 101 standard.

8.1.2.3 Electrical installations and wiring also conform to applicable industry standards, e.g., NFPA 70.

8.1.2.4 Lightning protection of steel buildings is maintained by use of grounding straps, and equipment specified by the Fire Safety Function is also grounded.

8.1.3 Ventilation Systems

8.1.3.1 Facility heating and ventilation systems are designed for fire protection.

8.1.3.2 Space heating furnaces are built to industry and NFPA 70 standards.

8.1.3.3 Fire barrier penetrations employ fire dampers designed to specifications.

8.1.3.4 Automatic closing is required for fire doors and dampers.

8.1.3.5 UL listed final HEPA filters are used.

8.1.4 Process Fire Safety

8.1.4.1 Principal chemicals used at the facility are evaluated for their fire hazards, and their control is specified by the Fire Safety Function. In particular, the following chemicals are so controlled:

(a) Ammonium hydroxide;
(b) Hydrogen;
(c) Nitric acid;
(d) Sulfuric acid;
(e) Natural gas; and
(f) Fuel oil - diesel.

Uses of such chemicals conform to the following items as specified by the Fire Safety Function:

- hazard recognition by handlers;
- training in safe handling and spill prevention techniques;
- storage;
- containment;
- maintenance;
- leak testing; and/or,
- safety shut-off valve verifications,

8.1.4.2 Processes involving use of flammable gases are not introduced to the facility until they are evaluated, and their controls have been specified by the Fire Safety Function. In particular, the following controls are applied to flammable gas processes:

(a) Construction, installation, operation and maintenance of bulk gas storage, loading and dispensing systems are in accordance with prudent industry practice;

(b) Combustible gas analysis is performed prior to hot (open flame) work, as specified on work permits;

(c) Sintering furnaces are provided with flame curtains designed to continually burn off excess hydrogen gas upon release of furnace atmosphere. Process interlocks are employed to assure proper operation of the flame curtains; and,

(d) Sintering furnaces have been upgraded to meet the NFPA 86 standards in effect at the time of the upgrade.

8.1.4.3 Processes involving use of flammable and combustible liquids are not introduced to the facility until they are evaluated, and their controls have been

specified by the Fire Safety Function. In particular, the following controls are applied to flammable and combustible liquid processes:

(a) Flammable and combustible liquid storage systems are designed and maintained as specified by the Fire Safety Function;

(b) Construction, installation, operation and maintenance of bulk liquid storage, loading and dispensing systems are in accordance with prudent industry practice;

(c) Above ground storage tanks are provided with emergency relief vents in accordance with industry standards;

(d) Supports for aboveground storage tanks are protected from potential exposure to fires; and,

(e) Indoor storage of flammable and combustible liquids is evaluated, and appropriate fire extinguishers are kept immediately available.

8.1.4.4 The fire hazard in handling of uranium oxides has been evaluated. Non-combustible materials are specified for powder handling systems where the potential for spontaneous exothermic reaction needs to be considered. Where high density polypropylene containers are used for storage and transport of active uranium oxides, operators are trained to recognize hazardous powder characteristics and are instructed on how to monitor for exothermic reactions in such containers.

8.1.4.5 Machining operations on combustible metals at the facility are evaluated for their fire hazards, and appropriate controls are specified by the Fire Safety Function. In particular, the following operations involving potential for zirconium metal fines are controlled by approved procedures:

(a) Fuel rod repair stations;
(b) Final fuel assembly loaders;
(c) Laser welders;
(d) Zirconium grid strap production areas;
(e) Mechanical development laboratories; and,
(f) Tool rooms.

Such areas conform to containment, ventilation, filtration and/or fire extinguisher requirements, as specified by the Fire Safety Function.

8.1.4.6 The Facility Incinerator

The facility incinerator is isolated from the rest of the facility by a rated fire barrier. Incinerator exhaust is passed through a water media for cooling and dust separation. The

exhaust is then routed through a filtration and sampling system prior to release to the environment.

8.1.4.7 Boilers and boiler-furnaces are evaluated, and their controls are specified by the Fire Safety Function. In particular, the following controls have been applied:

(a) Boilers are contained in non-fire-rated boiler houses that are physically separated from manufacturing buildings;

(b) Fuel storage tanks are separated from boiler houses; and, fuel lines are marked for identification and are located to minimize damage potential; and,

(c) Construction and operation of boiler-furnaces is in accordance with industry standards.

8.1.4.8 Stationary combustion engines are evaluated, and their controls are specified by the Fire Safety Function. In particular, the following controls have been applied:

(a) Stationary combustion engines are located in rooms constructed of non-combustible materials;

(b) Engine exhaust systems are designed to prevent ignition of combustible material by contact with hot metal surfaces, or by leaking exhaust gases or sparks;

(c) Engine rooms are configured such that process-generated dusts and flammable vapors cannot enter;

(d) Engine rooms are ventilated to minimize accumulation of combustible vapors. The ventilation systems are automatically activated when engines are started;

(e) Back-up generator areas located inside the main building are protected by a sprinkler fire suppression system; and,

(f) Fire pump storage tanks are constructed in accordance with industry standards.

8.1.4.9 Hoods and gloveboxes have been evaluated for fire hazards, and their controls are specified by the Fire Safety Function. In particular, the following controls have been applied:

(a) Hoods and gloveboxes are constructed primarily of metal, using glass and/or fire resistant plastic for viewing areas. The plastic conforms to a Class-I fire rating; and,

(b) Explosive mixtures in gloveboxes are prevented, using inert gas or dry air atmospheres when required.

8.1.4.10 Fire protection methods for laboratories handling radioactive materials are in accordance with industry standards.

8.1.5 Fire Detection and Alarm Systems

8.1.5.1 Automatic fire detectors are installed in areas with a substantial combustible loading and/or in areas with infrequent occupancy, as specified by the Fire Safety Function, unless such areas are covered by automatic fire suppression systems.

8.1.5.2 Plant hydrogen systems have been evaluated as documented in the ISA and it has been determined by the Fire Safety Function that the potential for leakage is minimal and/or sufficient dilution air is present to prevent formation of explosive mixtures. Therefore, no automatic flammable vapor/gas detectors are installed.

8.1.5.3 Audible fire alarms are installed in locations throughout the facility, and supplementary visual alarms are installed in high noise areas, as specified by the Fire Safety Function. These alarms are supervised by a continuously manned, central control station that monitors the fire detection system and zone status.

8.1.5.4 Manual fire alarm actuators (pull-boxes) are installed in specified locations throughout the facility, as specified by the Fire Safety Function.

8.1.6 Fire Suppression Equipment and Services

8.1.6.1 Fire Suppression Equipment

(a) Selection of equipment for suppression of fire takes into account the severity of the hazard, the type of activity to be performed, the potential consequences of a fire, and the potential consequences of use of the suppression equipment (*e.g.*, risk of an accidental criticality, or substantial electrical hazard).

(b) Multiple 6-inch fire hydrants, with 2.5-inch hose connectors, are installed at strategic locations about the facility site.

(c) Multiple 1.5-inch standpipes are strategically located throughout the facility. Standpipe and hose systems are selected and designed in accordance with industry standards. Standpipe and hose systems have readily accessible hose outlet locations.

(d) Automatic sprinkler systems are selected and designed in accordance with industry standards. Automatic sprinkler systems are specifically excluded from areas where moderation control is specified by the Nuclear Criticality Safety Function as a principle controlled parameter, and/or in areas with a high concentration of energized electrical equipment.

(e) Portable fire extinguishers, with sufficient capacity and the proper type of suppression agent, are available and maintained throughout the facility. Portable fire extinguishers are selected and deployed in accordance with industry standards.

8.1.6.2 Fire Suppression Services

(a) Water supply for fire protection systems is assured. The 10-inch water main that supplies process and drinking water to the site also supplies two water tanks, with a combined capacity of 450,000 gallons available for use in fire fighting. The tanks are equipped with automatic fill capability to maintain water level.

(b) Fire pump installations are designed to deliver water to hydrants, standpipes, and sprinkler systems.

(c) Back-up power for fire pumps is provided. Diesel pumps are test-started on a weekly frequency, and two sets of batteries are provided for back-up starting. Emergency response personnel are trained to start the pumps manually.

(d) The water distribution system is designed such that failure of a single component will not disable the supply of fire suppression water to the facility.

8.1.7 Emergency Response Team

8.1.7.1 The Emergency Response Team is organized, and fire fighting equipment is maintained, as part of the Emergency Management Program described in the Site Emergency Plan and Procedures, as presented in Chapter 9.0 of this License Application.

8.1.7.2 Training to enable high quality performance of duties in response to facility fires is provided to the Team as part of the Emergency Management Program described in the Site Emergency Plan and Procedures, as presented in Chapter 9.0 of this License Application.

8.1.8 Pre-Fire Plans

8.1.8.1 The CFFF maintains ready for use, and for inspection by Regulatory Agencies, comprehensive Pre-Fire Plans that provide the strategic and tactical information needed by fire-fighting personnel when responding to an emergency.

8.1.8.2 Pre-Fire Plans include the following information:

(a) Division of the facility into logical planning areas.
(b) Site sketches that identify:

- Locations of areas;
- Response Team assembly points;
- Assembly point coverage areas; and,
- Locations of fire hydrants.

(c) Assignment of basic Response Team responsibilities, and Team checklists.
(d) Listings of fire detection and protection devices.
(e) Details of:

- Area description;
- Expected occupancy;
- Potential locations for trapped occupants;
- Potential disabled personnel that might require emergency assistance;
- Information about area utilities;
- Construction information;
- Schedule for Plan updates;
- Basic information on hazardous materials in the area;
- Fire-fighting strategy considerations; and
- Supplementary information (e.g. water drainage and smoke ventilation) specified by the Fire Safety Function.

8.1.8.3 Pre-Fire Plans (and revisions to the Plans) are prepared and maintained by the Fire Safety Function. Copies of the Plans are made available for use by the off-site fire department most likely to respond to a call for assistance.

8.1.9 Fire Hazard Analyses

8.1.9.1 Performance and Documentation of Analyses

(a) Analysis Performance

(1) The Fire Safety Analysis is a comprehensive assessment of each component within a defined system. The analysis

identifies controls required to maintain a sufficient margin of safety.

(2) Fire accident sequences are analyzed using the accident flow diagram format. In this format, the analyst traces each sequence through the diagram (starting with the initiating event) to arrive at a consequence of interest. Each identified pathway defines an initiating event and protective measure failures that collectively represent an accident sequence.

(b) Analysis documentation

(1) The Fire Safety Analysis is one of the ISA safety analyses described in Chapter 4.0 of this License Application. The level of detail for a particular analysis is based on the complexity of the initial system, and subsequent proposed changes to the system. Thus, the scope and content of a Fire Safety Analysis are customized to reflect the particular characteristics and needs of the system being analyzed.

(2) Fire Safety Analyses are maintained current through implementation of the Configuration Management program described in Sections 3.1 and 4.1 of this License Application. If a Fire Safety Analysis is required for a proposed change, it is performed to the current standards required for the baseline analysis. Summary details of the change, including required approvals, are documented on a Configuration Change Control Form that is linked to the applicable Baseline ISA, thus providing a substantially complete "living" framework for the facility fire safety basis.

8.1.10 Audits and Assessments

Audits and assessments are conducted to compare established fire safety standards to CFFF performance. These audits and assessments are performed in accordance with the requirements in Chapter 3.0, Section 3.6, of this License Application.

8.1.10.1 Program assessments take the form of program audits. Specific portions of the Fire Safety Program, evaluated during a particular assessment, are based on previous internal audit findings, external audit findings, NRC inspection activities, current operating conditions, and the time since the last assessment. The Fire Safety Program is assessed on a triennial frequency. Results of the assessments are documented and maintained for NRC Staff review and inspection.

8.1.10.2 Process assessments take the form of compliance audits that evaluate implementation of fire safety requirements (*e.g.*, control of combustible materials, following procedures and postings, *etc.*) for CFFF operations (*i.e.*, Site and Structures, ADU Conversion, Solvent Extraction, *etc.*) Frequencies of audits are based on previous internal audit findings, NRC inspection results, incidents (those reported, and those requiring notification), configuration management activities, and the time since the last assessment. The complete set of operations making up the CFFF ISA is assessed on a five year frequency. Results of the assessments are documented and maintained for NRC Staff review and inspection.

CHAPTER 9.0

EMERGENCY MANAGEMENT PROGRAM

The Columbia Fuel Fabrication Facility (CFFF) maintains a comprehensive Emergency Management Program with facilities, equipment and processes for protecting workers, the public and the environment. This program ensures control of licensed material, capability to evacuate personnel, and availability of emergency measures and facilities. The program is documented in an approved Site Emergency Plan and Procedures. This program ensures compliance with the requirements of ANSI/ANS-8.23(1997) for nuclear criticality accident emergency planning and response with the exception that CFFF shall comply with Section 8.3 evacuation drill requirements on a biennial frequency. This biennial frequency is consistent with the exercise guidance provided in section 7.3.1 of Regulatory Guide 3.67. At minimum, the Plan and Procedures are reviewed annually to ensure that the overall emergency preparedness program is being properly maintained.

9.1 EMERGENCY MANAGEMENT PROGRAM STRUCTURE

9.1.1 Site Emergency Plan

CFFF emergency preparedness practices are described in the latest revision of the Site Emergency Plan, submitted to NRC Staff, approved in accordance with applicable regulations, and maintained as prescribed by regulatory requirements. The Plan addresses the following emergency preparedness criteria:

(a) Facility Description;
(b) Engineered Safeguards for Abnormal Operations;
(c) Types of Accidents and Classifications;
(d) Response Management System;
(e) Mitigation of Consequences and Assessment of Releases;
(f) Emergency Response Facilities and Equipment;
(g) Maintaining Emergency Preparedness Capability;
(h) Records and Reports;
(i) Safe Shutdown, Recovery, and Plant Restoration; and,
(j) Hazardous Chemicals.

9.1.2 Emergency Procedures

Implementing procedures, approved in accordance with CFFF policy, contain detailed instructions on emergency response and emergency personnel activities based on practices required by the Site Emergency Plan. These procedures clearly define duties, responsibilities, action levels, and actions to be taken by each functional individual or group in response to emergency situations. Copies of Emergency Procedures, and subsequent changes to them, are issued to personnel responsible for emergency response activities. The procedures address the following emergency preparedness criteria:

(a) Emergency Response Organization;
(b) Emergency Response Team;
(c) Equipment and Supplies;
(d) Evacuation, Accountability, and General Response;
(e) Classification;
(f) Communication;
(g) Notification;
(h) Biological Threat;
(i) Bomb Threat (Package or Object);
(j) Bomb Threat (Telephone or Correspondence);
(k) Civil Disturbance;
(l) Criticality;
(m) Explosion;
(n) Fire;
(o) Hazardous Material Release;
(p) Hazardous Weather;
(q) Loss of Utilities;
(r) Oil Spill;
(s) Radioactive Powder or Liquid Release;
(t) Transportation Accident; and,
(u) UF_6 Release.
(v) Local Law Enforcement Agency Incident Response Plan; and,
(w) Notification Guidelines for NRC and Other Agencies.

CHAPTER 10.0

ENVIRONMENTAL PROTECTION

10.1 ENVIRONMENTAL PROTECTION PROGRAM STRUCTURE

The Columbia Fuel Fabrication Facility (CFFF) maintains an Environmental Protection Program for the site. A primary purpose of the Environmental Protection Program is to assure that exposure of the public and the environment to hazardous materials used in facility operations are kept well below permissible limits.

The CFFF prepared an Environmental Evaluation Report, dated March 1975, that was subsequently updated in revisions dated April 1983, April 1990 and December 2004. Also, an extensive update of much of the information in the March 1975 report was documented in an Integrated Safety Analysis (ISA) and ISA Summary titled "CFFF Site and Structures." Annual reviews of Environmental Protection Program data are documented in the ALARA Reports described in Chapter 5.0 of this License Application.

10.1.1 Effluent Air Control

For operations that might result in exhausting radioactive materials to unrestricted areas, the adequacy of air effluent controls is determined by representative stack sampling, to demonstrate compliance with applicable regulations. Such sampling is performed continuously during production operations involving licensed materials. Samples are collected and analyzed daily.

If radioactivity in gaseous effluents exceeds 1,500 microcuries per calendar quarter, a report is prepared and submitted to NRC Staff within 30-days of the end of the quarter in which the excess occurred. This report identifies the cause of exceeding the limit and the corrective actions taken to reduce release rates. The report is submitted to NRC Headquarters with a copy to NRC Region II. Subsequently, if any parameters important to a dose assessment in the original report are found to have changed, a follow-up report is submitted within 30-days of disclosure which describes the changes in parameters and includes an estimate of the resultant change in dose commitment.

In the event that a calculated Total Effective Dose Equivalent (TEDE) to any member of the public in a calendar year could exceed a limit of 100 millirem, immediate steps are taken to reduce emissions to levels that will bring the TEDE back below the limit.

10.1.2 Liquid Waste Treatment

Liquid waste treatment facilities, with sufficient capacity and capability to enable holdup, treatment, sampling, analysis, and discharge of liquid wastes in accordance with applicable regulations, are provided and maintained in proper operating condition.

Control of radioactivity in the process liquid waste stream is achieved by operation of two treatment systems in series:

(a) A continuous in-line gamma spectroscopy monitor and quarantine tank filtration system within the chemical controlled area of the main Plant building; and,

(b) An Advanced Wastewater Treatment Facility (for removing uranium to ALARA levels) that is external to the building.

The first system is installed following quarantine tanks, diversion tanks, and filtration operations. This system assures that the process liquid waste stream, being transferred from the internal chemical controlled area to the external treatment area, meets the discharge limit in approved operating procedures. This limit is nominally less than 30 parts per million uranium (equivalent to 7.2 E-05 microcuries per milliliter at a specific activity of 2.4 microcuries per gram of uranium). When the liquid has successfully passed the scan for discharge from the first system, it is transferred from the in-plant final pump-out tank to the second system for further uranium removal.

The second system assures that uranium in the discharge is removed to a nominal limit of less than 0.5 parts per million uranium (equivalent to 1.2 E-06 microcuries per milliliter at a specific activity of 2.4 microcuries per gram of uranium). Approved operating procedures implement ALARA principles and assure that applicable 10CFR20 discharge limits are met.

Miscellaneous liquid wastes are filtered and sampled on a batch basis to assure uranium is effectively removed to levels that will enable conformance to ALARA goals.

Quiescent settling in the North, South, East, and West Lagoons further reduce uranium levels in liquid wastes prior to final discharge to the Congaree River. A continuous, proportional sample of the liquid effluent released to Congaree River is collected. A 30-day composite of this sample is analyzed for recording the gross alpha and beta activity and isotopic uranium content of the final discharge.

If the CFFF's NPDES Permit is revoked, or if Permit conditions are revised, NRC Headquarters and Region II Staff are promptly notified.

10.1.3 Solid Waste Disposal

Solid waste disposal preparation facilities, with sufficient capacity and capability to enable processing, packaging, and transfer of solid wastes to licensed treatment or disposal sites, in accordance with applicable regulations, are provided and maintained in proper operating condition.

10.1.4 Environmental Monitoring

The CFFF environmental monitoring program includes the sampling criteria presented in Figure 10.1. Action levels for sample results are established by approved procedures. (Note: For wells found not to contain water at the time of sampling, an evaluation is performed by the Environmental Protection Function to determine if alternate well data can be used to represent the dry well; or, if a new well must be dug.) Typical program analytical sensitivities are as presented in Figure 10.2. Locations of air, vegetation and soil monitoring stations are as presented in Figure 10.3. Locations of monitoring wells are as presented in Figure 10.4. Surface water monitoring stations are located at the following locations:

- Entrance – Sample obtained from entrance side of flood gate valve that controls flow from Mill Creek Swamp into Upper Sunset Lake. GPS Coordinates: N-33°52'59.72 W-80°55'56.32
- Exit – Sample obtained from exit side of flood gate valve that controls flow from Sunset Lake Swamp into the canal.
  GPS Coordinates: N-33°52'16.94 W-80°55'28.52
- Pond (Gator) – Sample obtained from surface of pond.
  GPS Coordinates: N-33°52'47.54 W-80°55'17.46
- Spring – Sample obtained from the surface of pond.
  GPS Coordinates: N-33°52'47.54 W-80°55'17.46
- Spillway – Sample obtained from between Lower Sunset Lake and Sunset Lake Swamp. GPS Coordinates: N-33°52'34.72 W-80°55'14.58
- Causeway – Sample obtained from concrete flume connecting Upper and Lower Sunset Lakes. GPS Coordinates: N-33°52'43.55 W-80°55'24.
- Roadway – Sample is obtained from Plant side of roadway, where Control Valve A/B stream and Control Valve D/E stream connect. This is before the stream flows into Control Valve C. GPS Coordinates: N-33°52'52.88 W-80°55'20.68

These sampling criteria, sensitivities, and/or locations can be changed without prior NRC Staff approval provided:

(a) A documented evaluation by the Environmental Protection Function demonstrates that the changes will not decrease the overall effectiveness of the environmental monitoring program; and,

(b) The changes are submitted to NRC Staff as part of the subsequent updates of this License Application to enable opportunity to inspect the evaluation.

10.1.5 Periodic Reporting of Surveillance Data

Quantities of radioactive material in air and liquids released from the facility are reported to NRC Staff, in accordance with applicable regulatory guidance and regulations, on a semiannual basis.

10.1.6 Off-Site Dose Control

Figure 10.2 Typical Environmental Programs Radiological Analytical Sensitivities

TYPE OF SAMPLE	ANALYSES	TYPICAL QUANTITY	NOMINAL MINIMUM DETECTION LEVEL
Air Particulates	Alpha	571 Cubic Meters	2.0E-15 Microcuries Per Milliliter
Surface Water	Alpha	1 Liter	2.2E-9 Microcuries Per Milliliter
	Beta	1 Liter	2.5E-8 Microcuries Per Milliliter
Well Water	Alpha	1 Liter	2.2E-9 Microcuries Per Milliliter
	Beta	1 Liter	2.5E-8 Microcuries Per Milliliter
River Water	Alpha	1 Liter	2.2E-9 Microcuries Per Milliliter
	Beta	1 Liter	2.5E-8 Microcuries Per Milliliter
Sediment	Alpha	100 Grams	1.0 Picocuries Per Gram
	Beta	100 Grams	3.0 Picocuries Per Gram
	Uranium	100 Grams	0.5 Picocuries Per Gram
Soil	Alpha	100 Grams	1.0 Picocuries Per Gram
	Beta	100 Grams	3.0 Picocuries Per Gram
	Uranium	100 Grams	0.5 Picocuries Per Gram
Vegetation	Alpha	100 Grams	1.0 Picocuries Per Gram
	Beta	100 Grams	3.0 Picocuries Per Gram
Fish	Alpha	30 Grams	1.0 Picocuries Per Gram
	Beta	30 Grams	3.0 Picocuries Per Gram
	Uranium	1 Kilogram	0.5 Picocuries Per Gram

Figure 10.3 Locations of Air, Vegetation and Soil Monitoring Stations

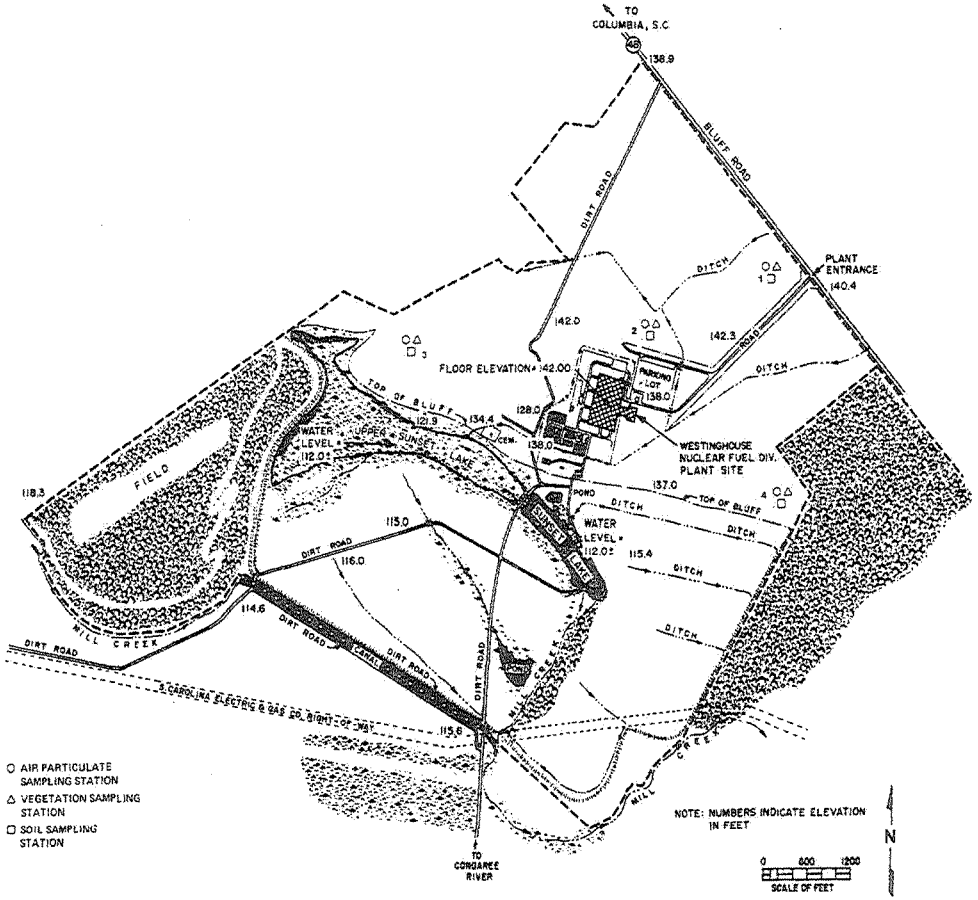
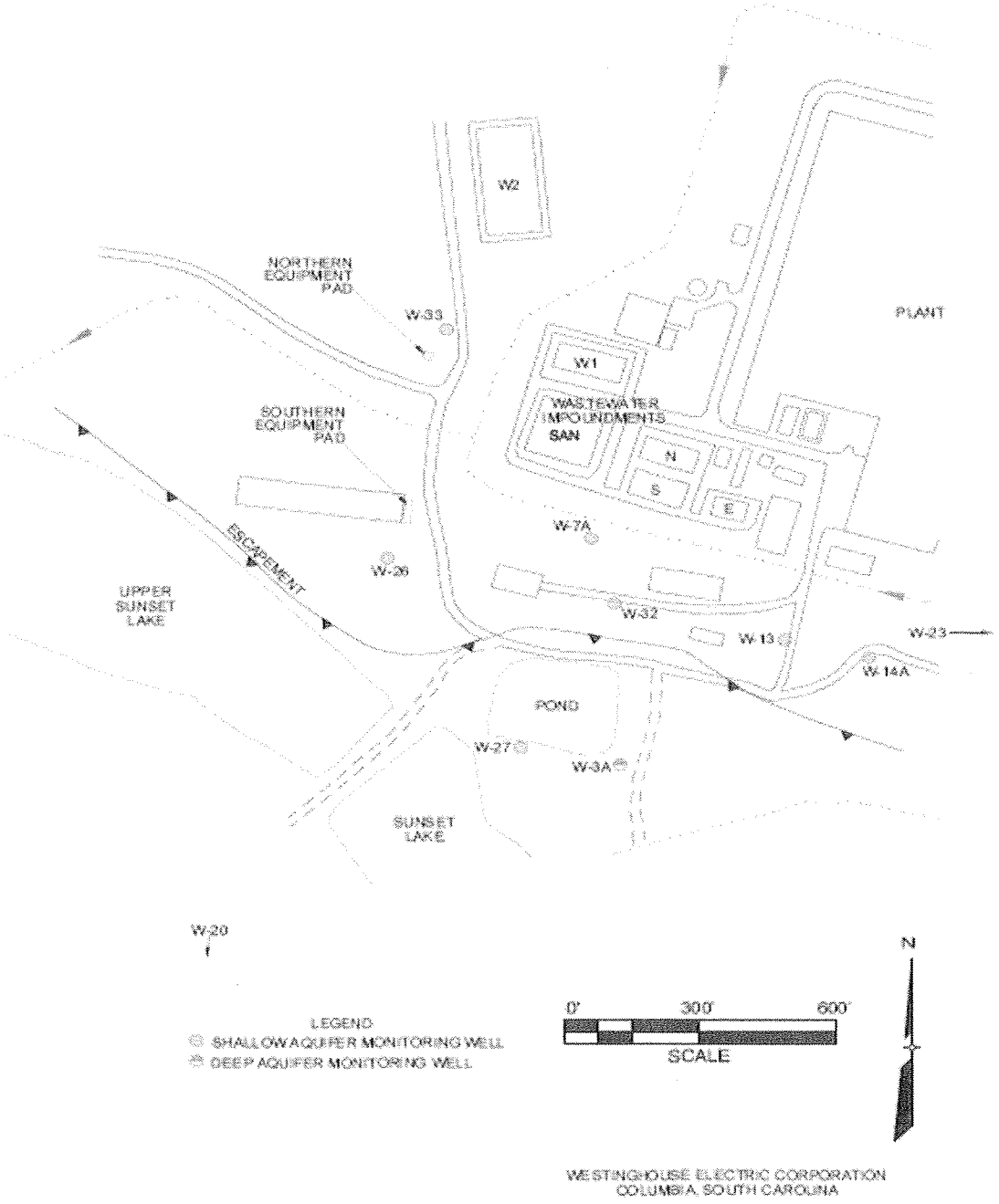


Figure 10.4 Locations of Monitoring Wells



10.1.7 Performance and Documentation of Analyses

10.1.7.1 Environmental Protection Analysis

Analysis Performance:

The Environmental Protection Analysis is a comprehensive assessment of each component within a defined system. The analysis identifies controls required to maintain a sufficient margin of safety.

Environmental accident sequences are analyzed using the accident flow diagram format. In this format, the analyst traces each sequence through the diagram (starting with the initiating event) to arrive at a consequence of interest. Each identified pathway defines an initiating event and protective measure failures that collectively represent an accident sequence.

Analysis Documentation:

The Environmental Protection Analysis is one of the ISA safety analyses described in Chapter 4.0 of this License Application. The level of detail for a particular analysis is based on the complexity of the initial system, and subsequent proposed changes to the system. Thus, the scope and content of an Environmental Protection Analysis are customized to reflect the particular characteristics and needs of the system being analyzed.

Environmental Protection Analyses are maintained current through implementation of the Configuration Management program described in Sections 3.1 and 4.1 of this License Application. If an Environmental Protection Analysis is required for a proposed change, it is performed to the current standards required for the baseline analysis. Summary details of the change, including required approvals, are documented on a Configuration Change Form that is linked to the applicable Baseline ISA, thus providing a substantially "living" framework for the facility Environmental Protection basis.

10.1.8 Audits and Assessments

10.1.8.1 Audits and assessments are conducted to compare established environmental protection standards to CFFF performance. These audits and assessments are performed in accordance with the requirements in Chapter 3.0, Section 3.6, of this License Application.

Program assessments take the form of program audits. Specific portions of the Environmental Protection Program, evaluated during a particular assessment, are based on previous internal audit findings, external audit findings, NRC inspection activities, current operating conditions, and the time since the last assessment. The Environmental Protection Program is assessed

on a triennial frequency. Results of the assessments are documented and maintained for NRC Staff review and inspection.

Process assessments take the form of compliance audits that evaluate implementation of environmental protection requirements (*e.g.,* effluent controls, following procedures and postings, *etc.*) for CFFF operations (*i.e.,* Site and Structures, ADU Conversion, Solvent Extraction, *etc.*). Frequency of audit is based on previous internal audit findings, NRC inspection results, incidents (those reported, and those requiring notification), configuration management activities, and the time since the last assessment. The complete set of operations making up the CFFF ISA is assessed on a five year frequency. Results of the assessments are documented and maintained for NRC Staff review and inspection.

10.1.8.2 The Regulatory Component performs a triennial audit of vendors used to analyze environmental samples. Such audits are also performed if substantive program anomalies are disclosed. The audits consider the need for "spike" and/or "replicate sample" submittals, as part of evaluation of a vendor's capability and quality control effectiveness.

CHAPTER 11.0

DECOMMISSIONING PLANNING

11.1 DECOMMISSIONING PLANNING STRUCTURE

To assure adequate financial resources are available to decommission the Columbia Fuel Fabrication Facility (CFFF) at the end of its useful life, a conceptual decommissioning plan (*Cost Estimate to Terminate License SNM-1107*), and a decommissioning funding plan and financial assurance mechanism, have been prepared and are maintained current.

11.1.1 Conceptual Decommissioning Plan

In support of the *Cost Estimate to Terminate License SNM-1107*, a dedicated document file is maintained. This file includes the following record categories:

(a) Correspondence Chronological File;
(b) Historic Conceptual Plan(s) and Cost Estimate(s);
(c) Historic Facility Radiological Information;
(d) NRC Guidance Documents;
(e) EPA Guidance Documents;
(f) Decommissioning Plan Shell;
(g) Current Conceptual Plan and Cost Estimate; and,
(h) Financial Assurance.

The file includes a records log-out/return process that provides for information on:

(a) Date;
(b) Out to; and,
(c) File number or name out.

Each record category is clearly marked "Warning, these decommissioning records must not be removed or destroyed without the written approval of the Regulatory Component."

Copies of the most recent *Cost Estimate to Terminate License SNM-1107* are maintained by the Engineering Component and the Regulatory Component.

The *Cost Estimate to Terminate License SNM-1107* is reviewed for need to update on a triennial basis, and is submitted to the NRC.

The documents required by this section of the license application are maintained as records in accordance with Section 3.9 of this License Application.

11.1.2 Decommissioning Funding Plan and Financial Assurance Mechanism

(a) Decommissioning Funding Plan

The decommissioning funding plan is a cost estimate for decommissioning the CFFF at the end of its useful life. The decommissioning cost estimate is submitted to NRC Staff for acceptance and acknowledgement in accordance with prevailing requirements or directives.

(b) Financial Assurance Mechanism

Westinghouse has established a financial assurance mechanism, to support the projected cost of CFFF decommissioning, in accordance with the provisions of 10CFR70.25. The financial assurance mechanism is submitted to NRC Staff for acceptance and acknowledgement in accordance with prevailing requirements or directives.

CHAPTER 12.0

AUTHORIZATIONS AND EXEMPTIONS

12.1 AUTHORIZATIONS

12.1.1 Authorization to Make Changes to License Commitments

(a) CHANGES REQUIRING PRIOR APPROVAL

Westinghouse shall not make changes to the License Application that decrease the effectiveness of commitments, without prior NRC approval. For these changes, Westinghouse will submit to the NRC, for review and approval, an application to amend the License. Such changes will not be implemented until approval is granted.

(b) CHANGES NOT REQUIRING PRIOR APPROVAL

Upon documented completion of an Integrated Safety Analysis for a facility or process, as described in Chapter 4.0 of this License Application, Westinghouse may make changes in the facility or process as presented in the License Application, or conduct tests or activities not presented in the Application, without prior NRC approval, subject to the following conditions:

1. There is no degradation in the safety commitments in the License Application.

2. The change, test, or activity does not impair the Westinghouse ability to meet all applicable Federal regulations.

3. The change, test, or activity does not conflict with any condition specifically stated in the License.

Records of such changes shall be maintained, including technical justification and management approval, in dedicated datapacks to enable NRC inspection upon request at the facility. A report containing a description of each such change, and appropriate revised pages to the License Application, shall be submitted to the NRC within three months of implementing the change.

12.1.2 Authorization for Leak-Testing Sealed Plutonium Sources

The following procedure shall be authorized for leak-testing sealed plutonium sources at the licensed activity:

- Each sealed plutonium source in use shall be leak-tested at least semi-annually. In absence of a certificate from the supplier indicating that such a test has been

performed within six month prior to transfer to the licensed activity, the subject sealed plutonium source shall not be put into use until leak-tested.

- Sealed plutonium sources that are stored, and are not being used, shall be exempt from the leak-test requirement. Such stored sources shall be leak-tested prior to any use in, or transfer from, the licensed activity unless such a test has been performed within the six months preceding the date of use or transfer.

- The leak-test shall be capable of detecting the presence of 0.005-microcuries, or more, of alpha contamination on a smear-test sample. The smear-test sample shall be taken directly from the sealed source, or from appropriate accessible surfaces of the device in which the source is mounted or stored.

- Records of leak-test results shall be kept in units of microcuries, or other units directly convertible to microcuries by multiplication using a recognized constant; and, the records shall be maintained for review by the NRC Staff.

- If a leak-test reveals the presence of 0.005-microcuries limit, the licensed activity shall file a report with the NRC Staff Headquarters which describes the subject source, the leak-test results, the extent of any related contamination, the apparent cause of failure, and corrective actions taken. A copy of this report shall also be sent to the NRC Region II Staff.

12.1.3 Authorization for Possession at Reactor Sites

The licensed activity may possess unirradiated fuel assemblies, at nuclear reactor facilities anywhere within the United States, for the purpose of loading them into shipping packages, and delivery to an authorized carrier for transport in accordance with the regulations. Operations incident to such loading shall be subject to the control of a licensed activity representative, approved by the Manager of the Regulatory Component, who shall assure that the completed transport package complies with all requirements of the regulations.

For such operations, the licensed activity shall be exempted from conditions of Title 10, Code of Federal Regulations, Part 70.24; *Criticality Accident Requirements*, provided:

- As finished fuel assemblies are removed from their approval storage facilities, they shall be constrained in an arrangement that is no more reactive than that which they will assume in the shipping package.

- The total number of fuel assemblies in process at any one time shall not exceed the maximum authorized contents of the packaging being loaded.

- If two fuel assemblies are in movement at the same time, a 12-inch minimum edge-to-edge separation shall be maintained between them; and, only one fuel assembly at a time shall be loaded into the shipping package.

- Loaded packages shall be stored in the approved shipping array, pending delivery to a carrier.

- No more than the maximum number of packages authorized for a single shipment shall be loaded and possessed, in conduct of such operations by the licensed activity, at any one location.

12.1.4 Authorization for Use at Off-Site Locations

(WITHDRAWN)

12.1.5 Authorization for Transfer of Hydrofluoric Acid

Pursuant to Title 10 Code of Federal Regulations, Part 20.2002; *Method for Obtaining Approval of Proposed Disposal Procedures*, aqueous hydrofluoric acid containing trace quantities of uranium may be transferred to non-licensed receivers provided the following conditions are met:

- Prior to first unrestricted sale or other transfer of the subject material to each receiver, a detailed plan for such sale or transfer shall be submitted to the NRC Staff for review and approval.

- Prior to transfer of the hydrofluoric acid from Westinghouse, each shipment must be representatively sampled and analyzed; and the following maximum permissible concentrations shall not be exceeded: A uranium enrichment of 5 w/o U-235; A uranium concentration of 3-parts-per-million by weight; and, an HF concentration, in the acid solution, of 55-percent by weight.

- Particular attention shall be paid to each sale or transfer to assure that the hydrofluoric acid is not to be used for any purpose resulting in human consumption.

12.1.6 Authorization for Transfers as Non-Regulated Material

Pursuant to Title 10, Code of Federal Regulations, Part 20.2002; *Method for Obtaining Approval of Proposed Disposal Procedures*, industrial waste treatment products from the licensed activity, such as calcium fluoride and other homogenous mixtures in which the mean concentration of uranium constituents does not exceed 60-picocuries per gram, may be released without continuing NRC licensing controls, to receivers for off-site calcium fluoride drying and briquette manufacturing, or for cement or brick manufacturing, or to

disposition at a chemical disposal site or industrial landfill. Calcium fluoride so released to off-site manufacturers shall contain a minimum of 60-percent solids. Prudent efforts shall be made to reduce the radioactive contents of all such transferred materials to level as low as reasonably achievable.

A sampling plan shall be implemented to characterize the industrial products in accordance with NUREG/CR-2082; *Monitoring For Compliance With Decommissioning Termination Survey Criteria*, as follows:

- The estimation of the population mean for uranium concentration shall be representative of the industrial products being transferred;

- The sample size used to calculate the mean uranium concentration value shall be determined such that the 95-percent confidence limit for the value is less than 25-percent of the value;

- The sampling plan is to provide a minimum confidence level of 95-percent that the true mean uranium concentration value, determined for the industrial to be transferred, is less than the maximum permissible limit of 30-picocuries per gram of dry material.

- Records pertaining to the release of such materials, including identities of receivers, shall be maintained for review by the NRC Staff.

12.1.7 Authorization to Release Contaminated Records

The licensed activity may abandon or dispose of small quantities of radioactive materials that are present as minor contamination on certain papers, notebooks, computer print-outs, 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 facility, 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-per-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 material 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 Exemption 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.

12.2.2 Exemption from Individual Container Posting

Notwithstanding the requirement of paragraph (a) of Title 10, Code of Federal Regulations, Part 20.1904, *Labeling Containers*, the licensed activity shall be exempted from the requirement that "each container of licensed material bears a durable clearly visible label" provided, in lieu thereof, a sign bearing the legend "EVERY CONTAINER OR VESSEL IN THIS AREA MAY CONTAIN RADIOACTIVE MATERIAL" is posted at each entrance to areas for buildings in which radioactive materials are used or stored, from areas in which such materials are not used or stored. Regarding storage of radioactive material outside the Fuel Manufacturing Building, the number of posted buildings and size of posted areas shall be minimized to the extent practicable, consistent with manufacturing and storage requirements.

12.2.3 Exemption from Respirator Use Reporting

Notwithstanding the requirement of paragraph (d) of Title 10, Code of Federal Regulations, Part 20.1703, *Use of Individual Respiratory Protection Equipment*, since use of respiratory protection has been ongoing at the Columbia Fuel Fabrication Facility, continuing use shall be exempted from the requirement to "notify, in writing, the Regional Administrator of the appropriate Nuclear Regulatory Commission Regional Office listed in Appendix D at least 30-days before the date that respiratory protective equipment is first used" under provisions

of the April 30, 1995 License Renewal Application approval and under provisions of the March 23, 2007 License Renewal Application approval.

12.2.4 Exemption from Shallow-Dose Equivalent Tissue Depth

Notwithstanding the requirement of Title 10, Code of Federal Regulations, Part 20.1003, *Definitions, "Shallow-Dose Equivalent"*, the licensed activity shall be exempted from the requirement that the Shallow-Dose Equivalent is taken as the dose equivalent at a tissue depth of 0.007-centimeter (7 mg/cm^2), when this dose equivalent is measured for the finger. In lieu thereof, for finger doses, the Shallow-Dose Equivalent shall be taken as the dose equivalent at a tissue depth of 0.038-centimeter (38 mg/cm^2). This applies to both the assessment of finger doses and for determining compliance with the finger dose limit.

12.2.5 Exemption from Criticality Monitoring System Requirements

Notwithstanding the requirement of Title 10, Code of Federal Regulations, Part 70.24, the licensed activity shall be exempted from the "monitoring system" requirements in the areas, and under the conditions specified below:

Office and conference room areas, chemistry laboratories, metallurgical laboratories, development laboratories, health physics counting rooms, and machine shop – provided that:

- Each such area shall be remote from other operations with special nuclear material.
- Each such area shall be administratively limited to 1000 grams of U_{235}; and, for chemistry laboratories, an additional 5 grams of U_{233}.

Low concentration storage areas in which containers have uranium in quantities representing no more than 350-grams of U_{235} per package and no more than 5 grams of U_{235} in any 10 liters of package; or, no more than 50-grams of U_{235} per container and no more than an average of 5 grams of U_{235} per 10 liters of package – provided that:

- Each such area qualifies for appropriate nuclear isolation with respect to other areas where special nuclear material is more concentrated.

The limits established above represent values that are below the maximum subcritical limits as established in numerous technical references, including LA-12809, ARH-600, LA-10860, ANSI/ANS-8.1-1998, and the limits presented in the *Handbook for the Conduct of Nuclear Criticality Safety Activities at the Columbia Fuel Fabrication Facility.* These limits apply to all aspects of the operation, including expected upset conditions.

Storage areas in which the only special nuclear material present is contained in authorized packages as defined in 49CFR173 – provided that:

- The maximum number of containers permitted in each such area shall be unlimited for low specific activity packages.

- The maximum number of packages bearing FISSILE labels stored in any one storage area must be limited so that the total sum of the criticality safety indices in any individual group of such packages does not exceed 100. Groups of such packages must be stored so as to maintain a spacing of at least 6m (20 feet) from all other groups of such packages.

12.2.6 Exemption from Packaged Radioactive Material Monitoring Requirements

Notwithstanding the requirement 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

Notwithstanding 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.

12.2.8 Exemption From the Transportation Requirements for Certain Fissile Material

The licensed activity is exempt from fissile material classification and from the fissile material package standards of 10CFR71.55 and 10CFR71.59 for the transport of certain bulk materials contaminated with U_{235}. Concentration limits, stated as the ratio of U_{235} to non-fissile material, are established that provide control parameters adequate to ensure nuclear criticality safety for shipments.