

**GE HITACHI NUCLEAR ENERGY AMERICAS, LLC  
VALLECITOS NUCLEAR CENTER**

**SUNOL, CALIFORNIA**

**DECOMMISSIONING FUNDING PLAN**

**February 6, 2017**

**NRC Material License**

**License SNM-960**

**Docket 70-754**

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## 1.0 INTRODUCTION AND SUMMARY

GE Hitachi Nuclear Energy Americas, L.L.C. (GEH) operates a nuclear facility located in Sunol, California. For the purpose of this document, the facility, Vallecitos Nuclear Center, is identified as VNC.

This Decommissioning Funding Plan (DFP) is prepared and submitted pursuant to 10CFR 70.25 to demonstrate financial capability to support decommissioning associated with NRC Special Nuclear Material license SNM-960 activities conducted at VNC. It was prepared in general accordance with NUREG-1757, *Consolidated NMSS Decommissioning Guidance, Volume 3: Financial Assurance, Recordkeeping, and Timeliness*.

This DFP includes:

- Site location and facility descriptions,
- Operational features relevant to decommissioning,
- General decommissioning criteria,
- The technical approach for decontamination, dismantlement, waste management and final release activities,
- Key assumptions used for development of the cost estimates,
- Facility-specific cost estimates for decommissioning, and
- Adjustment of cost estimate and funding level.

These estimates were originally developed in 2012 with an independent third-party engineering firm experienced in preparing DFPs and completing decommissioning-related services for the nuclear industry. Methods employed to validate the level of effort required for decommissioning and amounts of wastes expected to be generated include a site reconnaissance and measurements, scaling factors from building volumes and footprints, interviews with site personnel, and comparisons to previous other decommissioning projects. The accuracy and appropriateness of the methods used to estimate costs of decommissioning have been demonstrated to be reasonable based on work performed by GEH on similar installations. The estimates are based on existing facility conditions and consider interim decontamination and dismantlement activities that have been completed.

In addition, 10 CFR 70.25(e)(2) lists eight events to be considered during a DFP update. Of these, waste inventory and disposal cost increases were the only ones that occurred since the prior VNC funding plan revision and these were updated in the current document. There were no changes required to the submitted information for the other six events (spills of radioactive material producing additional residual radioactivity, facility modifications, changes in authorized possession limits, actual remediation costs that exceeded previous cost estimate, onsite disposal and use of a settling pond).

A summary of the cost estimate is provided in Table 1.1. Details behind the cost estimate are provided in Section 6. A description of how the cost estimate will be adjusted over time is provided in Section 7. Financial assurance for decommissioning

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## 2.0 SITE LOCATION AND FACILITY DESCRIPTION

The primary purpose of the GE – Hitachi Nuclear Energy Americas LLC (GEH) Vallecitos Nuclear Center (VNC) Special Nuclear Material (SNM) operation is research and development, engineering studies and storage of irradiated LWR fuel and components previously subjected to engineering tests and evaluations awaiting transfer to DOE. The SNM-960 authorized activities are co-located with the licensed activities for DPR-1 Vallecitos Boiling Water Reactor (VBWR), TR-1 GE Test Reactor (GETR), DR-10 Empire State Atomic Development Agency Vallecitos Experimental Superheat Reactor (EVESR), all in safe store, and R-33 Nuclear Test Reactor (NTR). The principal currently performed activity on site is the by-product material activities covered under the State of California license CA 0017 01 including sealed source manufacture and research and development

VNC is located near the center of the Pleasanton quadrangle of Alameda County, California. The site is east of San Francisco Bay, approximately 35 air miles east-southeast of San Francisco and 20 air miles north of San Jose. The site is indicated on the area map, Figure 1.1. The properties surrounding the site are primarily used for agriculture and cattle raising, with some residences, which are mostly to the west of the property. The nearest sizeable towns are Pleasanton, with a population of approximately 72,000, located 4.1 miles to the north-northwest and Livermore with a population of approximately 84,000, located 6.2 miles to the northeast. A United States Veterans Administration hospital with a population of approximately 500 is located about 4 miles to the east.

The site is on the north side of Vallecitos Road (State Route 84), which is a two and four-lane paved highway. A Union Pacific railroad line lies about two miles west of the site. There is light industrial activity within a 10-mile radius of the plant. San Jose (20 miles south), Oakland (30 miles northwest) and San Francisco (35 miles northwest) are major industrial centers.

The property boundary is fenced and posted “No Trespassing”. The front of the site is fenced with 8-foot commercial chain-link fencing which wraps around to the west past Building 103 and terminates to the rear at a major ditch and to the east completely around Buildings 102 and 102A. A security gate at the entrance provides access control to the site. Hillside Storage is also fenced with 8-foot commercial chain link fencing. The Waste Evaporator Plant (WEP) is not fenced due to the small quantities of material processed there.

The site is located in the Livermore Upland physiographic area. The majority of the site is undeveloped with hills ranging in elevation from 600 to 900 feet above mean sea level. Approximately 135 acres located in the southwest corner of the property and

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situated between the 400 and 600-foot topographic contours are developed. The property is not located within a 100-year flood zone.

Geological faults exist in the East Bay area. Earth tremors are an occasional occurrence in all parts of the Bay Area. The VNC site property contains a branch of the Hayward fault. Very small tremors can be measured daily using very sensitive instruments, however, very seldom are tremors of a magnitude that they are noticed. The VNC facilities were built to building codes in effect at the time of construction that account for this seismic activity. There have been no significant damages at the VNC site from any of the earth tremors to date.

Seasonal rainfall in the area is responsible for one other minor environmental related threat to the site in that certain parts of the year are particularly dry. During these dry periods the grasses become dormant and dry and are subject to grass fires. At VNC cattle are pastured on a large portion of the site to keep the grasses to a minimum. Firebreaks are plowed along roadways. The use of vehicles on rural parts of the property is controlled and the site fire brigade is trained to combat grass fires and incipient stage building fires. The local fire departments are also well-trained and equipped to deal with these potential fire dangers.

The property on which the buildings are located is drained by ditches leading to Vallecitos Creek. This creek discharges to Arroyo de la Laguna near the north end of Sunol Valley, two or three miles southwest of the property.

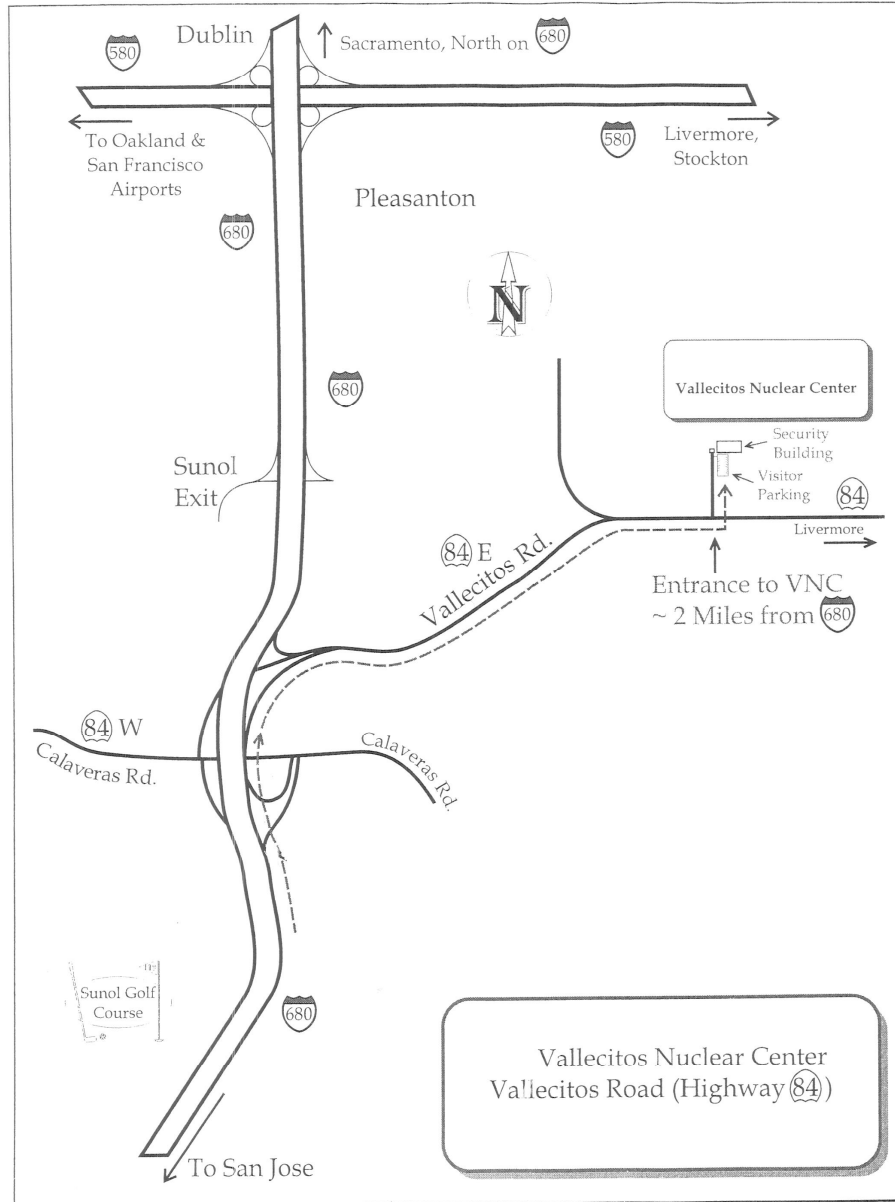
Pacific Gas and Electric supply electrical power to the main site substation for distribution to each building on the site.

A sewage treatment system is provided in the southwest corner of the site. Liquid effluent from this system is disposed to site land.

Industrial wastewater is processed in a system of surface impoundments and used as irrigation water for grasslands on site. Wastewater containing radioactive materials is evaporated to reduce the volume and then solidified for disposal in a licensed disposal facility.

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**Figure 2.1  
Area Map (Not to Scale)**



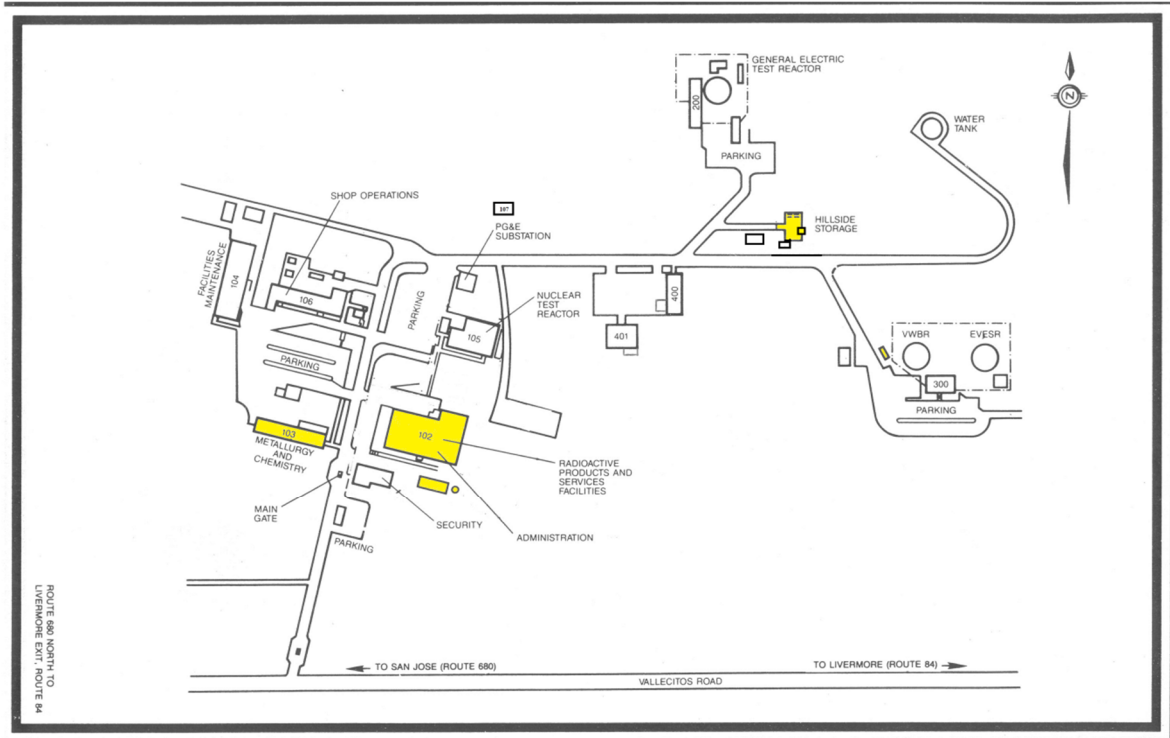
## 2.1 Facility Included in Decommissioning Funding Plan

General descriptions of the principal buildings and laboratories on the overall VNC site are described in this section. Principal buildings are those buildings that typically appear on site drawings. Detailed discussions of the facilities, processes and equipment used for SNM-960 activities follow in subsequent sections. They are not discussed in detail here because this section is intended to provide a general overview of the site. The current locations of these facilities are shown in Figures 2.2, 2.3 and 2.4.

As discussed further below, there are four principal facilities covered by the SNM-960 license at the VNC site: (1) the Radioactive Materials Laboratory (RML) (Buildings 102 and 102A); (2) the Metallurgy, Chemistry and Ceramics Laboratory (Building 103); (3) the Hillside Storage Facility (Building 241); and (4) the Waste Evaporation Plant (WEP) (Buildings 304 and 349).

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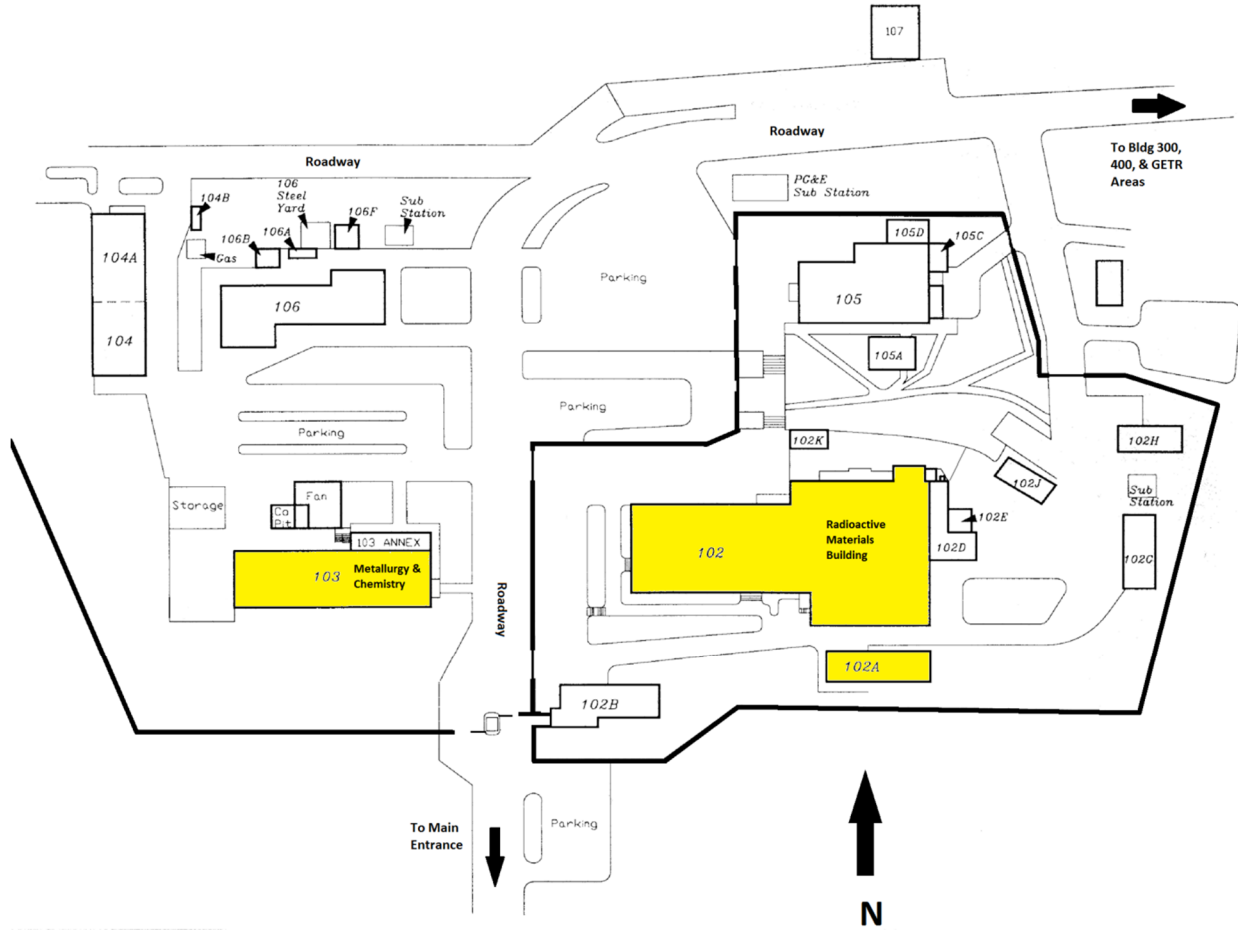
**FIGURE 2.2  
 Vallecitos Nuclear Center  
 (Not to Exact Scale)**



Note: Yellow shaded areas denote principal SNM-960 licensed activity

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**Figure 2.3  
 100 Area And Surroundings  
 (Not to exact scale)**



Note: Yellow shaded areas denote principal SNM-960 licensed activity

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**Figure 2.4  
Hillside Material Storage Facility**

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Note: The yellow shaded area denotes principal SNM-960 licensed activity

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## Radioactive Materials Laboratory (RML) - Buildings 102 & 102A

The first of the four principal SNM 960 licensed facilities on site is the RML. Previously SNM work on reactor fuel was performed in this building, however, the irradiated SNM has been removed to Hillside Facility for storage. Building 102 contains the hot cells and related activities. Building 102A contains the ventilation equipment. See Photos 2.1 and 2.2. Currently the work at the RML involves by-product materials under a California license. Infrequently, however, there is the potential that small quantities of irradiated fuel are handled for engineering evaluation under SNM-960. The Hot Cells are highly shielded work cells that are operated with remote manipulators. The Radio Chemistry Laboratory within the RML is a laboratory area for performing radiochemical analysis on samples prepared in the RML. The Maintenance Shop includes decontamination, hot shop work and manipulator repair. The Waste Compactor processes dry active waste that is placed in drums or casks for disposal or storage. In addition, there is a Storage Pool in the RML which is outside the scope of SNM-960 materials. Additional details of the RML activities are provided in Section 4.3.1.



Photo 2.1 – Building 102 east side

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Photo 2.2 – Building 102A east side

### 2.1.1 Metallurgy, Chemistry, and Ceramics Laboratory– Building 103

The second of the four principal facilities supporting SNM-960 work is the Metallurgy, Chemistry, and Ceramics Laboratory (Building 103). This two-story building consists of offices and laboratories, variously equipped with laboratory apparatus designed to handle quantities of radioactive materials that are typically less than 1gm <sup>235</sup>U. The functions served by this facility are analytical chemistry services, and research and development. See Photos 2.3 and 2.4.

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Photo 2.3 – Building 103 southeast corner view

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Photo 2.4 – Building 103 typical lab room

### 2.1.2 Hillside Storage Facility

The third of the four principal facilities supporting SNM-960 work is the Hillside Storage Facility, which is located approximately midway between the deactivated VBWR and GETR areas. See Figure 2.4. Solid irradiated nuclear fuel and materials generated from the engineering evaluations and analytical work are stored in this facility. The Hillside Storage Facility includes earth-shielded horizontal tubes for storing liners and additional above ground space for lower level waste or other materials. See photo 2.5

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Photo 2.5 - Hillside Storage

### 2.1.3 Waste Evaporator Plant (WEP) – Buildings 304 and 349

The fourth of the four principal facilities supporting SNM-960 work is the WEP (Buildings 304 & 349), which is located adjacent to the deactivated VBWR site. See photo 2.6. The WEP is used to evaporate, concentrate and solidify liquid radioactive wastes generated at VNC prior to transfer to authorized waste disposal firms or waste burial sites. Such wastes may contain minute quantities of SNM associated with SNM-960 activities

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Photo 2.6 – WEP view of southside and 30,000 gallon tank

## 2.2 Other Facilities on the VNC Site

There are other facilities located on the VNC site that are excluded from this DFP and are covered by other NRC licenses. These include the VBWR license DPR-1, GETR license TR-1, and Empire State Atomic Development Agency Vallecitos Experimental Superheat Reactor (EVESR) license DR-10. All of these test and production reactors are in SAFESTOR status and will remain so until ongoing nuclear activities are terminated and the entire site can be decommissioned. The Nuclear Test Reactor (NTR) license R-33 is an active test reactor engaged primarily in neutron radiography under a separate NRC license.

### 2.2.1 Building 106 Engineering Shop Building

Building 106 is not one of the principal SNM-960 facilities. It contains Engineering Shop Operations, which includes various maintenance shops (e.g., machine, carpentry, electric, maintenance support), and instrument calibration facilities. The only SNM-960 activity in this building involves handling plated plutonium calibration sources used for calibrating instruments.

### 2.2.2 Building 104 Warehouse and Training Building (non SNM-960)

Building 104 is used for warehousing and training and no activity associated with SNM-960 is conducted in it.

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**2.2.3 Building 105 NTR Building (test quantities SNM-960)**

Just north of Building 102 is Building 105. The principal facilities located in this building are the operational Nuclear Test Reactor, engaged primarily in neutron radiography under a separate NRC license (R-33). Small test quantities of SNM may be transferred for irradiation studies.

**2.2.4 Building 107 RCRA Waste Storage Building (non SNM-960)**

Building 107 is the Hazardous Waste and Chemical Storage Building. No radioactive materials or SNM-960 licensed activities are allowed in this building. Activities in this building and the materials stored here pose no threat to the safe handling of nuclear material associated with SNM-960 authorized activities.

**2.2.5 Reactors and Auxiliary Facilities (non SNM-960)**

The ESADA-Vallecitos Experimental Superheat Reactor (EVESR), the VBWR, and the GETR are deactivated.

**2.2.6 400 Area Offices and Laboratories (Laboratory quantity SNM-960)**

The 400 Area consists of two buildings, 400 and 401. It is devoted to offices, and non-radioactive materials laboratories, and SNM reference standards used for instrument calibrations.

**2.2.7 Site Basin System**

The VNC water discharge permit allowed GEH to discharge wastewater and single-pass cooling water to the Basin systems. The water was sampled for radioactivity and discharged from the Site. The pipeline travels the west side of the Site and runs from GETR to the Basins. This system will be characterized as a part of the test reactor decommissioning to confirm the absence of any radioactive material.

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### **3.0 OPERATIONAL FEATURES RELEVANT TO DECOMMISSIONING**

Air sampling systems and criticality/radiation alarm systems are available to provide information concerning airborne uranium concentration and radiation levels. These systems provide data for radiation exposure evaluations of personnel working inside radiation control areas.

The various building air filtration systems that consist of HEPA filters and scrubbers provide a high degree of environmental safety and control during plant operations. Stack sampling systems provide continuous monitoring for assurance that no contamination above regulatory limits is released to the environment. These systems will remain operational during decommissioning until it is necessary to shut the systems down to permit removal of them.

Radiation protection equipment currently used to measure and evaluate radiological samples will be available during decommissioning.

A fire protection system will be available throughout the decommissioning operations. As needed, this consists of fire alarm boxes, sprinkler systems, hoses, extinguishers, pumps, and [[

]] Personnel fire protection equipment such as respiratory protection equipment and rain gear will be maintained and available, as required.

Additionally, fire response capability by outside agencies is available as needed.

The in-plant communication systems consisting of public address, telephone, and radio will be maintained during decommissioning.

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## 4.0 TECHNICAL APPROACH FOR DECONTAMINATION, DISMANTLEMENT, WASTE MANAGEMENT, AND FINAL RELEASE

Archival records of modifications and/or incidents relative to radioactive or hazardous materials contamination will be reviewed to identify information that may be important to the decommissioning activities.

For areas where radioactive material is currently or previously used, surveys will be performed with instrumentation capable of detecting surface contamination above release limits. In addition, core samples will be taken as necessary at intervals in the areas to monitor for any contamination. Prior to release of the areas, contamination will be reduced to releasable levels or recovered and shipped for burial.

### 4.1 General Decommissioning Guidelines

- It is the intent of GEH to decommission the facility so as to reduce the level of radioactivity remaining in the facility to residual levels that are suitable for unrestricted release in accordance with the criteria for decommissioning in 10CFR 20.1401 and 20.1402, and for NRC license termination pursuant to 10CFR 70.38. The level of radioactivity remaining will be suitable for unrestricted release in a manner that will not require stabilization and long term surveillance programs.
- Release criteria for building surfaces and soils will be established and approved as part of the development and approval of the Decommissioning Plan.
- Decommissioning activities will include the cleaning and removal of radioactive and hazardous waste contamination that may be present on materials, equipment and structures. Cleaning effectiveness will be assured by verification.
- A reasonable effort will be made to eliminate residual contamination as part of the decommissioning activities in accordance with the provisions of “As Low As Reasonably Achievable” (ALARA).
- Radioactivity on equipment or surfaces will not be covered by paint, plating, or other covering material unless contamination levels are below the limits specified in Decommissioning Plan prior to applying the covering. Other limits may be applied at the time of decommissioning to assure compliance with dose based limits.
- The radioactivity on the interior surfaces of pipes, drain lines, and ductwork shall be determined by making measurements at traps, and other appropriate

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access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location that the surfaces are inaccessible for purposes of measurement will be presumed to be contaminated in excess of the limits.

- Special requests may be made to NRC to authorize the release of premises, equipment, or scrap having surfaces contaminated in excess of the limits specified. This may include, but may not be limited to, special circumstances such as razing of buildings or transferring of premises or equipment to another organization continuing work with radioactive materials.
- Radiation exposure limits will be consistent with allowable limits specified in 10CFR 20.
- Shipments of radioactive materials associated with decommissioning will conform to the applicable regulations of Title 49 Code of Federal Regulations for transporting hazardous materials.
- Prior to release for unrestricted use, a comprehensive radiation survey will establish that contamination levels and dose rates are within the limits approved in the Decommissioning Plan.
- Independent reviews of the premises will be made to verify that hazardous waste and radioactive contamination have been removed to acceptable levels and that the premises meet regulatory release limits.

## 4.2 General Decontamination and Cleaning Methods

Removal of radioactive material from contaminated surfaces will be accomplished in three ways: (1) physical cleaning of the surface, (2) using chemicals to dissolve surface films containing radioactive materials or (3) removing the surface of the structure itself.

Physical cleaning methods include sweeping, vacuuming, hand wiping, sandblasting, and washing with various cleansing agents. Chemical decontamination methods use acid or basic solutions to dissolve residual contamination from surfaces. This technique is usually applied to wet processing systems, such as pumps, piping, and storage tanks. If physical cleaning and chemical decontamination techniques do not reduce contamination levels on equipment and/or building surfaces to acceptable radioactivity release levels, or are unfeasible, it will be necessary to either use more extensive methods, such as sandblasting or scraping that physically removes surface layers, or to remove the item for burial.

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Removal of contamination from sealed porous surfaces, such as painted walls and floors, asphalt, tank exteriors, and other surfaces, will be accomplished using a variety of techniques. For removable contamination, vacuuming or simple sweeping compounds are often effective. For more fixed contamination, various cleansing compounds combined with hand wiping, hand scrubbing, and/or power scrubbing techniques will be utilized.

Degreasing agents may be used in removing contamination films from surfaces. Organic solvents have an advantage of not being corrosive to equipment and electrical connections.

Variable pressure, high or low-velocity liquid jets can be effective for some types of decontamination work. The device can be operated by one person, at pressures up to 30,000 psi, using a hand-held jet lance. Typical tools and equipment used for dismantlement and decontamination are listed in Table 4.1.

**Table 4.1 Typical Dismantlement Tools and Equipment**

- Oxyacetylene Torch
- Guillotine Pipe Saw
- Tube Cutter
- Ratcheting Pipe Cutter
- Reciprocating Saw
- Nibbler
- Assorted Tools (Impact Wrenches, Bolt Cutters, etc.)
- High-Velocity Liquid Jet
- Low-Velocity Liquid Jet
- Hydraulic Concrete Surface Spalling Device
- Concrete Drills
- Electric/Pneumatic Hammers
- Portable A Frames
- Portable Wash Tanks
- Portable Greenhouse Erection Kit
- Portable Spray Cleaning Booth
- Portable Power Brushes
- Portable Abrasive Blasting Unit

Chemical solutions identified as decontamination agents and compatible with the available waste treatment processes and with materials used in the system may be used during decontamination. Consideration will be given to cost and environmental impact.

Concrete surfaces in the plant which are contaminated to a depth of a few centimeters and that cannot be cleaned to an acceptable release level by surface wiping or washing techniques will be physically removed and packaged for disposal. Several criteria will be considered in selecting a concrete removal method. The selected method will facilitate

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control of airborne contamination and minimize the potential for personnel exposure to radioactivity. The size and weight of removed materials will be controlled to facilitate packaging and shipping for disposal.

### 4.3 Facility Specific Decommissioning Considerations

The following is a listing of the buildings and facilities that will require some level of decommissioning.

#### 4.3.1 Radioactive Materials Laboratory (RML) - Buildings 102 & 102A

Significant radiation and radioactive contamination levels are present in the Hot Cells. The radionuclides consist of high-energy gamma emitters, beta-emitters and alpha-emitters. Some of the alpha may be at a TRU concentration that could result in a classification Class B waste. The less-contaminated processing cells will be decommissioned first to gain remote handling experience and to refine and develop techniques and tools adaptable for remote use.

Decommissioning will entail the use of remote handling manipulators in all the hot cells. Any radioactive material will be removed and relocated to the Hillside Material Storage Facility or shipped to an authorized recipient. All other material and equipment in the hot cells will be removed and shipped as either Class A or Class B waste. The main hot cells may require a robot unit for removal of the final portions of the cell. This can be accomplished without manned-entry and if cost effective can save significant time in the whole schedule. The cell walls can be diamond-wire cut and removed in large sections for commercial disposal. Radioactive material stored in the pool, dry pit, shops, laboratories, and small buildings/structures adjacent to the main building will be removed and transferred to an authorized waste disposal facility.

Although there are no current records indicting such, there is a possibility for subsurface contamination from the below grade pool and a previously removed underground storage tank. Soil samples will be taken to confirm the presence or absence of radioactive contamination. As a conservative measure, removal and disposal of up to 2,000 ft<sup>3</sup> of contaminated subsurface soil is included in this DFP.

The contents of the storage pool will be removed and disposed of as radioactive waste. The pool water may be processed at the Waste Evaporation Plant (WEP). This activity will be scheduled while one of the hot cells is still available to handle any very high-level capsule/source stored in the pool, and so the WEP can still process the contaminated water. The areas will be remediated as necessary based on the survey results. The hot cell and Building 102 laboratories are exhausted using the HEPA ventilation system on the second floor of Building 102A. The HEPA filters, ducts, blower fan-motors, backup generator are housed in this building. Most of the items will be disposed of as radioactive waste. The ventilation system will be decommissioned after the hot cell

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decontamination has been completed and there is no longer any need to maintain any negative airflow.

#### **4.3.2 Metallurgy, Chemistry, and Ceramics Laboratory– Building 103**

This building houses both administrative offices and analytical laboratories. Radioactive material was handled in laboratories on both the first and second floor. Some SNM and millicurie quantities of various radionuclides were used during the different tests and experiments conducted. Contaminated aqueous solutions were collected or discharged via the laboratory sink drains to the holding tanks in the basement.

Although there is no known subsurface contamination associated with Building 103, soil samples will be taken to confirm the presence or absence of radioactive contamination.

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The decommissioning will involve the removal and disposal of:

- laboratory equipment,
- remaining radioactive material and SNM,
- shielded storage containers/facility,
- miscellaneous support equipment,
- holding tanks, and
- soil below the basement, if necessary.

#### 4.3.3 Hillside Material Storage Facility – Building 241

The most significant work associated with the Hillside Material Storage Facility and building decommissioning is the removal of the waste material presently stored in the facility. The waste material is [[

]]

The waste removal process consists of two primary tasks: Waste process development and preparation, and shipment of waste packages. Because disposal of the waste material is the responsibility of the US Department of Energy, disposal costs are not applicable to this DFP.

Waste process development and preparation includes development of procedures and associated design review. The costs in the planning and preparation phase include the design and fabrication of waste shipping racks, and completion of an engineering assessment for certification of the waste packages.

The preparation, packaging and shipping of the waste packages is more substantial effort. This work effort will consist of [[

]]

After completion of the waste material removal process, the [[ ]] will be surveyed. The support buildings may contain slight contamination and decommissioning/removal will not be difficult. [[

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#### 4.3.4 Waste Evaporator Plant (WEP) – Buildings 304 and 349

Building 349 houses the WEP facility, process equipment, storage and process tanks, and an office. The WEP will be used for aqueous waste processing for the VNC Site. Ion exchange resins and solidification of evaporator bottoms are routinely performed tasks. No additional aqueous waste liquid is anticipated during the decommissioning of the remaining facilities.

Decommissioning tasks include removal and disposal of any process equipment, solidification equipment, tanks, and any remaining support equipment.

It is expected that a small area outside the building contains known subsurface contamination associated with the WEP. Soil samples will be taken to confirm the presence or absence of radioactive contamination. Samples will be taken in the sump area, the solidification areas, and the adjacent tank farm. As a conservative measure, removal and disposal of up to 4,995 ft<sup>3</sup> of contaminated soil from this area is included in this DFP.

#### 4.4 Radiological and Industrial Safety

During decommissioning activities, worker exposures and potential release pathways will be controlled and monitored in accordance with internal procedures, license conditions and regulatory requirements. Many aspects of current programs used for production will be maintained.

A criticality accident alarm system (CAAS), provides real-time monitoring pursuant to regulatory requirements and will continue to be operationally maintained to assure that the system will provide an alarm in the unlikely event a criticality occurs. The CAAS will remain active as long as the monitoring system is needed. An interim emergency response plan will be prepared prior to the start of the decommissioning activities.

Another safety system that will be essential during decontamination is the fire alarm system with fire alarm boxes strategically placed throughout the site. After being triggered, the system currently sends out a coded alarm that identifies the area of the fire. Activities during decommissioning such as cutting, dismantling and non-routine trash accumulation will make this safety system essential.

Necessary environmental monitoring programs established during the operation of the plant will continue during the decommissioning activities to assure that contaminants are being contained. Samples currently are taken at the stack release points, from soil around the site, at the dam or discharge point, and from wells around the site. These samples will be analyzed for specific contaminants. A history of data has been

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generated to provide a reference point for the evaluation of the effectiveness of the environmental monitoring program during decommissioning.

Radiation exposure to employees will be monitored through existing programs, such as issuance of personnel monitoring devices, air sampling of airborne contamination, and routine bioassays. These programs will continue to be maintained to meet the regulatory requirements specified in 10CFR 20.

Workers who are trained in radiation protection practices and contamination control techniques will perform decontamination activities. Protective clothing will be available in sufficient quantities to allow for personnel contamination control. Various types of respirators will be available to provide the degree of protection necessary for the decontamination job being performed, ranging from half-mask respirators to supplied air hoods or masks.

For jobs requiring dismantlement of heavily contaminated items, isolation tents with portable blowers and high efficiency particulate air (HEPA) filters may be utilized. Tenting techniques may also be employed for decontamination activities where significant dusting potential exists.

#### **4.5 Waste Management**

Contaminated material will have to be removed during decommissioning. If these materials cannot be treated or decontaminated to acceptable levels, they will be properly packaged and shipped to an authorized disposal site or disposed of in a manner authorized by the NRC.

Contaminated waste materials that will be generated during decommissioning include:

- Process equipment, tanks, and hoods, piping, ducts, and fixtures
- HEPA and roughing filters
- concrete rubble,
- soil, and
- miscellaneous noncombustible materials (pumps, motors, and other equipment).

All shipments of radioactive material will be made in compliance with federal, state, and local regulations. DOT and NRC transportation regulations establish container requirements, dose rate limits and handling procedures to ensure the safety of the public and transportation workers during shipment of radioactive materials. Current federal regulations applicable to the transport of radioactive materials are:

- 10CFR 49 - Department of Transportation regulations governing the transport of hazardous materials.
- 10CFR 71 - NRC regulations governing the packaging and shipment of radioactive materials.

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In addition, for highway transport, state agencies regulate vehicle sizes and weights and, in some cases, transportation routes and times of travel.

All hazardous waste will be packaged in safe containers commensurate with the hazard involved in order to meet regulatory packaging, shipping, and burial requirements. Materials handling will be done according to procedures for transfer, storage, preparation and shipping.

#### **4.6 Final Release**

As areas/buildings are being decontaminated, contamination surveys will be made to determine the degree to which decontamination has been effective. Upon completion of all decommissioning activities a final site survey will be performed to determine the level of residual material. It is intended to demonstrate that applicable limits have been achieved, and that the premises may be released for unrestricted use in a manner that will not necessitate stabilization and long term surveillance programs.

A detailed survey report will be prepared which identifies the premises, describes the scope of the survey, and reports the findings of the survey in specified units. A copy of this survey report will be submitted to the NRC and the State of California RHB requesting release of the site for unrestricted use.

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## 5.0 KEY DECOMMISSIONING AND COST ESTIMATE ASSUMPTIONS

Assumptions relative to the decommissioning cost estimate are as follows:

1. The plant will have had normal operations in the interim prior to decommissioning, i.e., no unplanned events have occurred to substantially disrupt the condition of the facility at the time of decommissioning.
2. Decommissioning activities will take place promptly on cessation of operations without multiyear storage-for-decay periods.
3. An independent third-party contractor will perform decommissioning activities.
4. This estimate covers only those costs associated terminating NRC License Number SNM-960. It does not address any non-radiological contaminated hazardous materials including asbestos that may be on site, or the removal of non-radiological contaminated buildings, systems, or components, or preparing the site for beneficial reuse.
5. Dismantling will be programmed and time phased to maintain waste segregation, decontamination and monitoring capabilities for as long as required.
6. Decommissioning activities will include consideration of the latest technology for decontamination techniques and equipment in order to utilize those features that are the most cost effective and efficient.
7. Decommissioning costs are calculated in 2016 dollars.
8. Decommissioning activities will take place over a four-year period, approximately broken down as follows:
  - a. 18 months of pre-planning activities, site characterization and preparing the Decommissioning Plan for submittal to the NRC for review and approval;
  - b. 18 months to conduct the decommissioning activities; and
  - c. 12 months to perform the Final Status Survey and prepare the final report for review and approval by the NRC followed by termination of the license.
9. A contingency factor of 25% is applied.
10. Insurance for the facility is based on actual insurance premiums.
11. Planning and preparation costs include preparation of documentation for regulatory agencies, submittal of decommissioning plan to NRC, development of work plans, procurement of special equipment, staff training, and characterization of radiological condition of the facility.
12. All Class A waste including mixed waste will be trucked to a radioactive material disposal site in Utah in top loading intermodals.
13. Assumed mode of transportation for waste is by truck.
14. The estimate does not include credit for material scrap value.

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15. Lab fees include sample transport, testing and analysis at an offsite third party laboratory.
16. The cost of regulatory licensing and inspection services includes reviews, approvals, ongoing inspections and final license termination and is estimated based on the current hourly rate of \$272 established by the NRC. The fees also include ORISE and NRC costs to review the final site survey. Any future increases in NRC staff hourly rates should be well bounded by the 25% contingency but will be factored into future cost estimates.
17. Restoration of contaminated areas on facility grounds and site stabilization are assumed to not be required.
18. [[

]] GEH plans to continue operations until the latter of 1) such time that DOE can take the material or 2) other operations are no longer viable.

19. Class B waste will be disposed at the [[  
]]
20. At the end of facility operations, all operational waste, spent fuel material and sealed sources will be removed as part of the operations phase.
21. Insurance and utility rates are based on actual current rates.
22. With respect to subsurface material containing residual radioactivity, there are no known areas of confirmed soil or groundwater contamination associated with licensed activities covered by this DFP. Restoration of contaminated areas on facility grounds and site stabilization are assumed to not be required. Nonetheless, as a conservative measure, this DFP includes the removal and disposal of soil and concrete [[

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Conducting subsurface soil characterization activities beneath these buildings with ongoing facility operations is impractical. It is not feasible to perform accurate subsurface characterization without risking a breach of barriers that contain radioactivity, disrupting operationally essential equipment or potentially exacerbating the migration of contaminants already in the environment. In fact, attempting additional subsurface characterization in this area would be contrary to 10 CFR 20.1406(c) that requires a licensee to conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface. In addition, due to the absence of shallow groundwater in these areas, the majority of subsurface contamination (by volume and concentration) is likely located directly around or under the structure that leaked where it cannot be safely or adequately accessed for characterization purposes.

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23. For contaminated concrete areas, it is assumed that one inch would be removed and for asphalt areas, four inches of asphalt would be removed to decontaminate the area. If specific information is available at the time of this estimate that indicates that contamination has migrated more or less deeply into the surfaces, those actual number will be used.
24. This project does not include any buried piping running between the on-site research reactors and the evaporator facility. It is assumed that no buried piping exists between the buildings associated with this license.

## 6.0 DECOMMISSIONING COST ESTIMATES

The estimated total cost for the decommissioning of the facilities licensed under SNM-960 is \$48.0 million (in 2016 dollars). The bases for the decommissioning cost estimate are provided in the Tables 6.1 through 6.8. The estimated total cost is based on the assumptions stated in Section 5 of this plan and assumes an efficient decommissioning activity, but a conservative 25-percent contingency is added to allow for unforeseen problems that might arise during the activity.

The current DCE presents each of the major decommissioning components as similar as practicable to those in NUREG – 1757.

These estimates were originally developed in 2012 with an independent third-party engineering firm experienced in preparing DFPs and completing decommissioning-related services for the nuclear industry. Methods employed to validate the level of effort required for decommissioning and amounts of wastes expected to be generated include a site reconnaissance and measurements, scaling factors from building volumes and footprints, interviews with site personnel, and comparisons to previous other decommissioning projects. The accuracy and appropriateness of the methods used to estimate costs of decommissioning have been demonstrated to be reasonable based on work performed by GEH on similar installations. The estimates are based on existing facility conditions and consider interim decontamination and dismantlement activities that have been completed.

The accuracy and appropriateness of the methods used to estimate costs of decommissioning have been demonstrated to be reasonable based on work performed by GEH on similar installations.

Since 2003 GEH has engaged in liability-reduction activities across its facilities. These efforts have further validated that the prepared estimates are conservative and reasonable. In these activities the projected actual costs have consistently been in line with the estimated cost. These include the removal of over 10,000 cubic feet of debris from the former vaporization area of the Wilmington, NC facility, the removal of more than 1,000,000 cubic feet of soil like material from the Wilmington facility, the removal of over 13,000 cubic feet of material from the Vallecitos Boiling Water Reactor (VBWR) in

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Vallecitos, CA and the removal of over 26,000 cubic feet of material from the process canyons in Morris, IL. Contract labor and the management model described herein were used to complete these projects and the costs were comparable to the expected cost for labor, packaging, shipment and burial of the materials. The planning and professional cost associated with the future decommissioning of the sites was unaffected by this experience and continued to accrete due to inflation over the period of material removal.

The decommissioning activities have been divided into three phases. The first of these is the Planning and Preparation Phase. This phase consists of preparing a characterization survey plan for the areas included in the license. Once this plan is approved, the characterization survey will be performed. A characterization report will be prepared based on the results of the survey and will be used for further planning and document preparation. All documents associated with the decontamination and dismantling activities will be prepared as part of this phase. This includes the decommissioning plan, work plans, operating procedures and other operational documents. This phase will also include the procurement of long lead-time equipment and operational supplies.

The second phase is the Decontamination and Dismantling Phase that consists mainly of the actual operations necessary to render the facilities to a state where they can be released from regulatory control. This will include the remedial radiation surveys to ensure that all release criteria have been met. This phase includes the activities associated with the mobilization of workers to the site to perform the decontamination and dismantling activities. This will include training and establishing work areas, safety controls and appropriate administrative areas.

The third phase is the Final Survey Phase. This will be the formal survey to ensure that all regulatory requirements have been met. It will involve a radiological survey of all areas associated with the decommissioning activities. It will also include the demobilization of workers and equipment from the site. During this phase, all associated documents involved with the termination of the license will be prepared and submitted to the regulatory authority.

The facilities have been divided into ten (10) work areas based on physical conditions, radiological conditions and logistical considerations. These areas are as follows:

- Building 102A
- Building 102, Hot Cells 1-8
- Building 102, Hot Cells 9-11
- Building 102, Rest of 1<sup>st</sup> Floor
- Building 102, Basement
- Building 102, Outside Area
- Building 103

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Withhold from Public Disclosure Pursuant to 10CFR 2.390**

- Building 304
- Building 349
- Hillside Material Storage (Building 241)

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**Table 6.1 Descriptions of Facilities**

| <b>Facility/Areas</b>                                | <b>Class A Waste - Debris (ft<sup>3</sup>)</b> | <b>Class A Waste - Soil-like Debris (ft<sup>3</sup>)</b> | <b>Class A Waste - Oversize Debris (ft<sup>3</sup>)</b> | <b>Class B Waste (ft<sup>3</sup>)</b> |
|--|--|--|---|---------------------------------------|
| Building 102, Hot Cells 1-8 and Operating Area       | [[   |  | ..  | ..                                    |
| Building 102, Hot Cells 9-11 and Operating Area      |  |  |   |                                       |
| Building 102, Rest of building, including subsurface |  |  |   |                                       |
| Building 102, Basement                               |  |  |   |                                       |
| Building 102, Outside                                |  |  |   |                                       |
| Building 102A  |  |  |   |                                       |
| Building 103   |  |  |   |                                       |
| Building 304   |  |  |   |                                       |
| Building 349   |  |  |   |                                       |
| Hillside Storage Area                                |  |  |   |                                       |
| Hillside Building                                    |  |  |   |                                       |
| TOTALS   |  |  |   |                                       |
| Class A Total  |  |  |   |                                       |

Mixed Waste - ~1% of Class A - Debris (ft<sup>3</sup>)

]]

|

**Table 6.2 Planning and Preparation (Work Days)**

| Activity                             | Project Leader | RSO / CHP | Labor Superintendent | Waste Broker | Rad. Engineer | Licensing /MC&A | Ind. Safety Engineer | RP Tech | Clerical | Security | Crew Leader | Craft Labor |
|--------------------------------------|----------------|-----------|----------------------|--------------|---------------|-----------------|----------------------|---------|----------|----------|-------------|-------------|
| Characterization Planning            | [[             |           |                      |              |               |                 |                      |         |          |          |             |             |
| Characterization Survey              |                |           |                      |              |               |                 |                      |         |          |          |             |             |
| Characterization Report              |                |           |                      |              |               |                 |                      |         |          |          |             |             |
| Decommissioning Document Preparation |                |           |                      |              |               |                 |                      |         |          |          |             |             |
| NRC Review Support                   |                |           |                      |              |               |                 |                      |         |          |          |             |             |
| Totals                               |                |           |                      |              |               |                 |                      |         |          |          |             | ]]          |



**Table 6.3 Decontamination or Dismantling of Radioactive Facility Components (Work Days)**

| Activity                    | Project Leader | RSO / CHP | Labor Superintendent | Waste Broker | Rad. Engineer | Licensing/MC&A | Ind. Safety Engineer | RP Tech | Clerical | Security | Crew Leader | Craft Labor |
|-----------------------------|----------------|-----------|----------------------|--------------|---------------|----------------|----------------------|---------|----------|----------|-------------|-------------|
| Preparation/Mobilization    | [[             |           |                      |              |               |                |                      |         |          |          |             |             |
| Equipment/Component Removal |                |           |                      |              |               |                |                      |         |          |          |             |             |
| Totals                      |                |           |                      |              |               |                |                      |         |          |          |             | ]]          |

**Table 6.4 Final Radiation Survey (Work Days)**

| Activity                | Project Leader | RSO / CHP | Labor Superintendent | Waste Broker | Rad. Engineer | Licensing/MC&A | Ind. Safety Engineer | RP Tech | Clerical | Security | Crew Leader | Craft Labor |
|-------------------------|----------------|-----------|----------------------|--------------|---------------|----------------|----------------------|---------|----------|----------|-------------|-------------|
| Final Radiation Surveys | [[             |           |                      |              |               |                |                      |         |          |          |             |             |
| Demobilization          |                |           |                      |              |               |                |                      |         |          |          |             |             |
| Prepare Final Documents |                |           |                      |              |               |                |                      |         |          |          |             |             |
| Totals                  |                |           |                      |              |               |                |                      |         |          |          |             | ]]          |

**Table 6.5 Total Work Days by Labor Category**

| Activity                        | Project Leader | RSO / CHP | Labor Superintendent | Waste Broker | Rad. Engineer | Licensing/MC&A | Ind. Safety Engineer | RP Tech | Clerical | Security | Crew Leader | Craft Labor |
|---------------------------------|----------------|-----------|----------------------|--------------|---------------|----------------|----------------------|---------|----------|----------|-------------|-------------|
| Planning and Preparation Totals | [[             |           |                      |              |               |                |                      |         |          |          |             |             |
| Decon/ Dismantlement Totals     |                |           |                      |              |               |                |                      |         |          |          |             |             |
| Final Radiation Survey Totals   |                |           |                      |              |               |                |                      |         |          |          |             |             |
| Totals                          |                |           |                      |              |               |                |                      |         |          |          |             | ]]          |

**Table 6.6 Worker Unit Cost Schedule**

| Title                 | Hourly Rate | Daily Rates |
|-----------------------|-------------|-------------|
| Project Leader        | [[          |             |
| Crew leader           |             |             |
| RSO / CHP             |             |             |
| Labor Superintendent  |             |             |
| Waste broker          |             |             |
| Security              |             |             |
| Radiological engineer |             |             |
| Licensing / MC&A      |             |             |
| Clerical              |             |             |
| Ind Safety Engineer   |             |             |
| Craft labor           |             |             |
| Radiological Tech     |             | ]]          |

**Table 6.7 Total Labor Costs by Major Decommissioning Task  
(Thousands of \$)**

| Activity                        | Project Leader | Labor Superintendent | RSO / CHP | Waste Broker | Rad. Engineer | Licensing / MC&A | Ind. Safety Engineer | RP Tech | Crew Leader | Clerical | Security | Craft Labor | Totals |
|---------------------------------|----------------|----------------------|-----------|--------------|---------------|------------------|----------------------|---------|-------------|----------|----------|-------------|--------|
| Planning and Preparation Totals | [[             |                      |           |              |               |                  |                      |         |             |          |          |             |        |
| Decon/ Dismantlement Totals     |                |                      |           |              |               |                  |                      |         |             |          |          |             |        |
| Final Radiation Survey Totals   |                |                      |           |              |               |                  |                      |         |             |          |          |             |        |
| Totals                          |                |                      |           |              |               |                  |                      |         |             |          |          |             |        |

**Grand Total:**

]]

**Table 6.8 Packaging, Shipping, and Disposal of Radioactive Wastes**

| Waste Type                | Waste Volume (ft <sup>3</sup> ) | Number Containers | Container Type | Container Cost <sup>1</sup> (thousands of \$) | Container Loading Cost <sup>2</sup> (thousands of \$) | Transportation Cost <sup>3</sup> (thousands of \$) | Burial Cost (\$/ft <sup>3</sup> ) | Total Burial Cost (thousands of \$) | Total Disposal Cost (thousands of \$) |
|---------------------------|---------------------------------|-------------------|----------------|---|---|--|-----------------------------------|-------------------------------------|---------------------------------------|
| Debris                    | [[                              |                   |                |   |   |  |                                   |                                     |                                       |
| Soil and Soil-like Debris |                                 |                   |                |   |   |  |                                   |                                     |                                       |
| Oversize                  |                                 |                   |                |   |   |  |                                   |                                     |                                       |
| Mixed Waste               |                                 |                   |                |   |   |  |                                   |                                     |                                       |
| Class B                   |                                 |                   |                |   |   |  |                                   |                                     |                                       |
| Totals                    |                                 |                   |                |   |   |  |                                   |                                     |                                       |

1. Container cost: Intermodal [[ ]]
2. Container loading cost based on [[ ]]
3. Transportation cost based on [[ ]]

## 7.0 ADJUSTMENT OF COST ESTIMATES AND FUNDING LEVEL

The cost estimates included in this DFP are reviewed, and if necessary, adjusted annually. This review considers: the status of any ongoing or planned dismantlement/cleanup activities; the status of any ongoing or planned facility modifications; operational events that may impact future decommissioning; changes in regulatory requirements and industry guidance; etc.

Every three years a more detailed review is performed and the DFP updated in accordance with the requirements of 10CFR 70.25(e). This review validates assumptions used to prepare the plan including labor rates, labor categories, waste volumes, waste categories, analytical costs, waste disposal options, waste disposal rates, transportation and packaging costs, utility costs, taxes, insurance costs, etc.

The cost estimate is internally reviewed and adjusted annually as part of the required annual demonstration that the parent company continues to meet all of the financial tests of 10CFR 30, Appendix A. The cost estimate is updated to reflect completed decommissioning activities, current contamination levels, inflation, changes in waste disposal costs, prices of goods and services, changes in decommissioning techniques, and any other relevant changes in facility conditions.

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## 8.0 CERTIFICATION OF FINANCIAL ASSURANCE

The current decommissioning cost is estimated to be \$48.0 million (2016). This cost is considered to be small compared to the total assets of the GE Corporation. Therefore, it is unlikely GE would be unable to meet the financial commitment generally associated with the decommissioning activities outlined and estimated above.

The Corporate commitment to provide the resources for the decommissioning activities is documented in a letter shown in Figure 8.1 and its attachments, which was updated and provided to the NRC on March 18, 2016. This letter is updated annually.

In addition, in accordance with 10CFR 30 Appendix A.III.D, GEH has established a Master Standby Trust Agreement with [[ ]] for the benefit of the NRC in the case of default or inability to direct decommissioning activities by the guarantor(GE Corporation).

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| GE HITACHI NUCLEAR ENERGY AMERICAS, LLC | PAGE DATE | 02/06/17 | Page |
| SNM-960 DECOMMISSIONING FUNDING PLAN    | REVISION  | 3        | 8.1  |

## Figure 8.1 Parent Guarantee Documentation



GE  
1115 Eastman Turnpike  
Fairfield, CT 06424  
USA

March 18, 2016

U.S. Nuclear Regulatory Commission  
Director, Office of Nuclear Material Safety and Safeguards  
11555 Rockville Pike  
Rockville, MD 20852

U.S. Nuclear Regulatory Commission  
Director, Office of Nuclear Reactor Regulation  
11555 Rockville Pike  
Rockville, MD 20852

Subject: General Electric Company Parent – Guarantee of Funds for Decommissioning: Updated Letter from Chief Financial Officer to Demonstrate Financial Assurance

I am the chief financial officer of the General Electric Company, 1 River Road, Schenectady, N.Y. 12345, a corporation. This letter provides an update of this firm's financial assurance of decommissioning funding for certain licenses, as specified in 10 CFR Parts 50, 70 and 72.

This firm guarantees, through the parent company guarantee submitted herewith to demonstrate compliance under 10 CFR Parts 50, 70 and 72, the decommissioning of certain facilities owned or operated by subsidiaries of this firm. I hereby certify that General Electric Company is currently a going concern and that it possesses a positive tangible net worth in the amount of \$16,004,000,000. The current cost estimates or certified amounts for decommissioning, so guaranteed, are shown in Attachment 1.

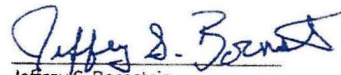
The General Electric Company is required to file a Form 10-K with the U.S. Securities and Exchange Commission for the latest fiscal year. The fiscal year of the General Electric Company ends on December 31. The figures on the Financial Test II (Attachment 2) that are marked with an asterisk are derived from the General Electric Company's independently audited, year-end financial

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| <b>GE HITACHI NUCLEAR ENERGY AMERICAS, LLC</b> | <b>PAGE DATE</b> 02/06/17 | <b>Page</b> |
| <b>SNM-960 DECOMMISSIONING FUNDING PLAN</b>    | <b>REVISION</b> 3         | <b>8.2</b>  |



statements and footnotes for the latest completed fiscal year, ended December 31, 2015. A copy of the most recent financial statement is enclosed.

I hereby certify that the content of this letter and attachments are true and correct to the best of my knowledge.



Jeffrey S. Bornstein  
Senior Vice President and Chief Financial Officer  
March 18, 2016

Effective date of Parent Guarantee: March 18, 2016

Attachments:

1. List of Licensed Facilities
2. Financial Test II
3. Parent-Company Guarantee
4. Special Auditors' Report
5. General Electric Co. Financial Statements

CC:

Matthew G Louis, Vice President-Escrow Unit  
The Bank of New York Mellon  
101 Barclay Street, 7 East  
New York, NY 10286

**Attachment 1**  
**LIST OF LICENSED FACILITIES**

| Name of Facility   | License Number | Location of Facility  | Current Cost Estimate |
|--|----------------|---|-----------------------|
| Global Nuclear Fuel-Americas, LLC<br>Wilmington Fuel Manufacturing Facility          | SNM-1097       | 3901 Castle Hayne Rd.<br>Wilmington, NC 28401                       | \$238,400,000         |
| GE Reuter Stokes, Inc.<br>GE Reuter Stokes Facility                                  | SNM-1826       | 8499 Darrow Road<br>Twinsburg, OH 44087                             | \$ 1,700,000          |
| GE-Hitachi Nuclear Energy Americas, LLC<br>Vallecitos Nuclear Center (VBWR reactor)  | DPR-1          | Vallecitos Nuclear Center<br>6705 Vallecitos Rd.<br>Sunol CA 94566  | \$ 10,700,000         |
| GE-Hitachi Nuclear Energy Americas, LLC<br>Vallecitos Nuclear Center (NTR reactor)   | R-33           | Vallecitos Nuclear Center<br>6705 Vallecitos Rd.<br>Sunol, CA 94566 | \$ 4,800,000          |
| GE-Hitachi Nuclear Energy Americas, LLC<br>Vallecitos Nuclear Center (GETR reactor)  | TR-1           | Vallecitos Nuclear Center<br>6705 Vallecitos Rd.<br>Sunol, CA 94566 | \$ 20,600,000         |
| GE-Hitachi Nuclear Energy Americas, LLC<br>Vallecitos Nuclear Center (EVESR reactor) | DR-10          | Vallecitos Nuclear Center<br>6705 Vallecitos Rd.<br>Sunol, CA 94566 | \$ 14,000,000         |
| GE-Hitachi Nuclear Energy Americas, LLC<br>Vallecitos Nuclear Center                 | SNM-960        | Vallecitos Nuclear Center<br>6705 Vallecitos Rd.<br>Sunol, CA 94566 | \$ 46,100,000         |
| GE-Hitachi Nuclear Energy Americas, LLC<br>Morris Operation                          | SNM-2500       | Morris Operation<br>7555 East Collins Rd.<br>Morris, IL 60450       | \$ 93,200,000         |
|  |                | Total   | \$429,500,000         |

U.S. NRC  
 March 18, 2016

Attachment 2

FINANCIAL TEST II

(10 CFR Part 30 App. A Section II A.2)

GENERAL ELECTRIC COMPANY PARENT-COMPANY GUARANTEE OF DECOMMISSIONING FUNDING FOR GLOBAL NUCLEAR FUEL (AMERICA), LLC, GE-Hitachi Nuclear Energy Americas LLC and GE REUTER STOKES, INC.

|     |  |            |                               |
|-----|--|------------|-------------------------------|
| 1.  | Current decommissioning cost estimates or certified amounts:   |            | <i>(Dollars in Thousands)</i> |
| 1.  | Decommissioning amounts covered by this parent company guarantee   |            | <u>\$ 429,500</u>             |
| 2.  | All decommissioning amounts covered by other NRC or Agreement State parent company guarantees or self-guarantees   |            | <u>\$ 49,400</u>              |
| 3.  | All amounts covered by parent company guarantees, self-guarantees, or financial tests of other Federal or State agencies (e.g., EPA)   |            | <u>\$ 201,627</u>             |
|     | TOTAL  |            | <u>\$ 680,527</u>             |
| 2.  | Current bond rating of most recent unsecured issuance of this firm<br>Rating <u>AA+</u><br>Name of rating service <u>Standard &amp; Poor's</u>   |            |                               |
| 3.  | Date of issuance of bond: <u>28/05/15</u>  |            |                               |
| 4.  | Date of maturity of bond: <u>28/05/27</u>  |            |                               |
| *5. | Tangible net worth** (if any portion of estimates for decommissioning is included in total liabilities on your firm's financial statements, you may add the amount of that portion to this line) |            | <u>\$ 16,004,000</u>          |
| *6. | Total assets in United States (required only if less than 90 percent of firm's assets are located in the United States)  |            | <u>\$ 177,300,000</u>         |
|     |  | <u>Yes</u> | <u>No</u>                     |
| 7.  | Is line 5 at least \$21 million?   | <u>X</u>   | ___                           |
| 8.  | Is line 5 at least 6 times line 1?   | <u>X</u>   | ___                           |
| 9.  | Are at least 90 percent of firm's assets located in the United States? If not, complete line 10  | ___        | <u>X</u>                      |
| 10. | Is line 6 at least 6 times line 1?   | <u>X</u>   | ___                           |
| 11. | Is the rating specified on line 2 BBB or better (if issued by Standard & Poor's) or Baa or better (if issued by Moody's)?  | <u>X</u>   | ___                           |

\* Denotes figures derived from financial statements

\*\* Tangible net worth is defined as net worth minus intangible assets. Tangible net worth is not adjusted for the net book value of the nuclear facilities and sites and the related decommissioning reserves because decommissioning reserves exceed the net book value of the related nuclear facilities and sites.

U.S. NRC  
March 18, 2016

**Attachment 3**

**GENERAL ELECTRIC COMPANY PARENT-COMPANY GUARANTEE  
OF DECOMMISSIONING FUNDING  
FOR GLOBAL NUCLEAR FUEL-AMERICAS, LLC, GE-HITACHI NUCLEAR ENERGY  
AMERICAS, LLC, AND GE REUTER STOKES, INC.**

Guarantee made this 18th day of March, 2016, by the General Electric Company, a corporation organized under the laws of the State of New York herein referred to as "guarantor", to the U.S. Nuclear Regulatory Commission (NRC), beneficiary, on behalf of our subsidiaries Global Nuclear Fuel-Americas, LLC, Wilmington Fuel Manufacturing Facility, 3901 Castle Hayne Road, Wilmington, NC 28401, GE-Hitachi Nuclear Energy Americas, LLC, Headquarters, 3901 Castle Hayne Road, Wilmington, NC 28401, and GE Reuter Stokes, Inc., 8499 Darrow Road, Twinsburg, OH, 44087.

**Recitals**

1. The guarantor has full authority and capacity to enter into this guarantee under its bylaws, articles of incorporation, and the laws of the State of New York, its State of incorporation. Guarantor has approval from its Board of Directors to enter into this guarantee.
2. This guarantee is being issued to comply with regulations issued by the NRC, an agency of the U.S. Government, pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974. NRC has promulgated regulations in Title 10, Chapter I of the Code of Federal Regulations, Parts 50, 70, and 72, which require that a holder of, or an applicant for, a reactor, materials, or interim storage facility license issued pursuant to 10 CFR Part 50, 70, or 72, as applicable, provide assurance that funds will be available when needed for required decommissioning activities.

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|--|---------------------------|-------------|
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| <b>SNM-960 DECOMMISSIONING FUNDING PLAN</b>    | <b>REVISION 3</b>         | <b>8.6</b>  |

3. The guarantee is issued to provide financial assurance for decommissioning activities for the Global Nuclear Fuel-Americas, LLC, Wilmington Fuel Manufacturing Facility, 3901 Castle Hayne Road, Wilmington, NC 28401, NRC License No. SNM-1097; GE-Hitachi Nuclear Energy Americas, LLC, Vallecitos Nuclear Center, 6705 Vallecitos Road, Sunol, CA 94566, NRC License Nos. DPR-1, R-33, TR-1, DR-10, and SNM-960; GE-Hitachi Nuclear Energy Americas, LLC, Morris Operation, 7555 East Collins Road, Morris, IL 60450, NRC License No. SNM-2500; and GE Reuter Stokes Facility, 8499 Darrow Road, Twinsburg, OH 44087, NRC License No. SNM-1826.

The decommissioning cost estimate for these facilities is \$429,500,000.

4. The guarantor meets or exceeds the financial test criteria in Financial Test II (10 CFR Part 30 App. A Section II.A.2) and agrees to comply with all notification requirements as specified in 10 CFR Part 50, 70 and 72 and Appendix A to 10 CFR Part 30.

The guarantor meets the following financial test:

- (i) A current rating for its most recent uninsured, uncollateralized, and unencumbered bond issuance of AAA, AA, A, or BBB (including adjustments of + and -) as issued by Standard & Poor's, or Aaa, Aa, A or Baa (including adjustment of 1, 2, or 3) as issued by Moody's; and
- (ii) Tangible net worth at least six times the amount of the decommissioning funds being assured by a parent company guarantee for the total of all nuclear facilities or parts thereof; and
- (iii) Tangible net worth of at least \$21 million; and
- (iv) Assets located in the United States amounting to at least 90 percent of total assets or at least six times the costs covered by financial tests.

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| <b>GE HITACHI NUCLEAR ENERGY AMERICAS, LLC</b> | <b>PAGE DATE</b> 02/06/17 | <b>Page</b> |
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5. The guarantor has majority control of the voting stock for the following licensees covered by this guarantee: Global Nuclear Fuel-Americas, LLC, Wilmington Fuel Manufacturing Facility, 3901 Castle Hayne Road, Wilmington, NC 28401, NRC License No. SNM-1097; GE-Hitachi Nuclear Energy Americas, LLC, Vallecitos Nuclear Center, 6705 Vallecitos Road, Sunol, CA 94566, NRC License Nos. DPR-1, R-33, TR-1, DR-10, and SNM-960; GE-Hitachi Nuclear Energy Americas, LLC, Morris Operation, 7555 East Collins Road, Morris, IL 60450, NRC License No. SNM-2500; and GE Reuter Stokes Facility, 8499 Darrow Road, Twinsburg, OH 44087, NRC License No. SNM-1826.
6. Decommissioning activities as used below refer to the activities required by 10 CFR Parts 50, 70, or 72, as applicable, for decommissioning of the facilities identified above.
7. For value received from Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc., pursuant to the guarantor's authority to enter into this guarantee, the guarantor guarantees to the NRC that if any of the licensees fails to perform the required decommissioning activities, as required by License Nos. SNM-1097, DPR-1, R-33, TR-1, DR-10, SNM-960, SNM-2500 or SNM-1826, the guarantor shall:
  - (a) carry out the required activities, or
  - (b) set up a trust fund in favor of the above identified beneficiary in the amount of the current cost estimates for these activities.

In accordance with 10 CFR 30 Appendix A.III.D., GE-Hitachi Nuclear Energy Americas, LLC and Global Nuclear Fuel Americas LLC have established upfront standby trust funds with The Bank of New York for the benefit of the NRC.

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8. The guarantor agrees to submit revised financial statements, financial test data, and a special auditor's report and reconciling schedule annually within 90 days of the close of the parent guarantor's fiscal year.
9. The guarantor agrees that if, at the end of any fiscal year before termination of this guarantee, it fails to meet the financial test criteria, the licensees shall each send within 90 days of the end of the fiscal year, by certified mail, notice to the NRC that the licensee intends to provide alternative financial assurance as specified in 10 CFR Part 50, 70, or 72, as applicable. Within 120 days after the end of the fiscal year, the guarantor shall establish such financial assurance if Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc., have not done so.
10. Independent of any notification under paragraph 9 above, if the NRC determines for any reason that the guarantor no longer meets the financial test criteria or that it is disallowed from continuing as a guarantor for the facility under License Nos. SNM-1097, DPR-1, R-33, TR-1, DR-10, SNM-960, SNM-2500 or SNM-1826 the guarantor agrees that within 30 days after being notified by the NRC of such determination, an alternative financial assurance mechanism as specified in 10 CFR Part 30, 40, 70, or 72, as applicable, shall be established by the guarantor in the name of Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc. unless Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc. have done so.
11. The guarantor also agrees to notify the beneficiary promptly if the ownership of an associated licensee or the parent firm is transferred and to maintain this guarantee until the new parent firm or the licensee provides alternative financial assurance acceptable to the beneficiary.
12. The guarantor agrees that if it determines, at any time other than as described in Recital 9,

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that it no longer meets the financial test criteria or it is disallowed from continuing as a guarantor, it shall establish alternative financial assurance as specified in 10 CFR Part 30, 40, 50, 70, 72, as applicable, within 30 days, in the name of Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc., unless these licensees have done so.

13. The guarantor as well as its successors and assigns agree to remain bound jointly and severally under this guarantee notwithstanding any or all of the following: amendment or modification of license or NRC-approved decommissioning funding plan for that facility, the extension or reduction of the time of performance of required activities, or any other modification or alteration of an obligation of the licensee pursuant to 10 CFR Part 50, 70 or 72.
14. The guarantor agrees that all bound parties shall be jointly and severally liable for all litigation costs incurred by the beneficiary, NRC, in any successful effort to enforce the agreement against the guarantor.
15. The guarantor agrees to remain bound under this guarantee for as long as Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc., must comply with the applicable financial assurance requirements of 10 CFR Part 50, 70, or 72, as applicable, for the previously listed facilities, except that the guarantor may cancel this guarantee by sending notice by certified mail to the NRC and to Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc., such cancellation to become effective no earlier than 120 days after receipt of such notice by both the NRC and Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc., as evidenced by the return receipts.
16. The guarantor agrees that if Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy

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Americas, LLC, or GE Reuter Stokes, Inc., fails to provide alternative financial assurance as specified in 10 CFR Part 50, 70 or 72, as applicable, and obtain written approval of such assurance from the NRC within 90 days after a notice of cancellation by the guarantor is received by both the NRC and Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc., from the guarantor, the guarantor shall provide such alternative financial assurance in the name of Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc., or make full payment under the guarantee.

17. The guarantor agrees that it is subject to Commission orders to make payments under the guarantee agreement.
18. The guarantor agrees that if the guarantor admits in writing its inability to pay its debts generally, or makes a general assignment for the benefit of creditors, or any proceeding is instituted by or against the guarantor seeking to adjudicate it as bankrupt or insolvent, or seeking dissolution, liquidation, winding-up, reorganization, arrangement, adjustment, protection, relief, or composition of it or its debts under any law relating to bankruptcy, insolvency, or reorganization or relief of debtors, or seeking the entry of an order for relief or the appointment of a receiver, trustee, custodian, or other similar official for the guarantor or for any substantial part of its property, or the guarantor takes any action to authorize or effect any of the actions stated in this paragraph, then the Commission may:
  - a) Declare that the financial assurance guaranteed by the parent company guarantee agreement is immediately due and payable to the standby trust set up to protect the

U.S. NRC  
March 18, 2016

public health and safety and the environment, without diligence, presentment, demand, protect or any other notice of any kind, all of which are expressly waived by guarantor; and (b) Exercise any and all of its other rights under applicable law.

19. The guarantor agrees to notify the NRC, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of Title 11 (Bankruptcy) of the United States Code (U.S.C.), or the occurrence of any other event listed in recital 17 of this guarantee and by or against the guarantor; the licensee; an entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensees as property of the estate; or an affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee. This notification must include: a description of the event, including major creditors, the amounts involved, and the actions taken to assure that the amount of funds guaranteed by the parent company guarantee for decommissioning will be transferred to the standby trust as soon as possible; if a petition of bankruptcy was filed, the identity of the bankruptcy court in which the petition for bankruptcy was filed; and the date of filing of any petitions.
20. The guarantor expressly waives notice of acceptance of this guarantee by the NRC or by Global Nuclear Fuel-Americas, LLC, GE-Hitachi Nuclear Energy Americas, LLC, and GE Reuter Stokes, Inc.. The guarantor also expressly waives notice of amendments or modification of the decommissioning requirements and of amendments or modification of the respective licenses.

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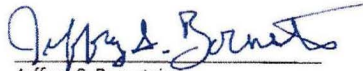
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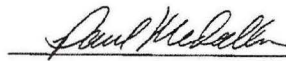
21. If the guarantor files financial reports with the U.S. Securities and Exchange Commission, then it shall promptly submit them to the NRC during each year in which this guarantee is in effect.

I hereby certify that this guarantee is true and correct to the best of my knowledge.

General Electric Company

Witness

  
Jeffrey S. Bornstein  
Senior Vice President and Chief Financial Officer

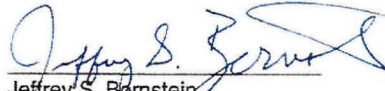


**PAUL MEDALLA**  
NOTARY PUBLIC  
MY COMMISSION EXPIRES 5/3/18

CERTIFICATION

I, Jeffrey S. Bornstein, Senior Vice President and Chief Financial Officer of the General Electric Company, do hereby certify that the attached Minute #10855 entitled "Execution of Contracts and Other Instruments" is a true and correct copy of a portion of the minutes of the meeting of the board of Directors of General Electric Company held on April 26, 1988, which minutes were approved by the Board of Directors at its meeting on May 27, 1988, and revised on November 6, 2009.

Dated this 18th day of March 2016



Jeffrey S. Bornstein  
Senior Vice President and Chief Financial

Officer

ATTEST:



Attesting Secretary

|   |                    |      |
|---|--------------------|------|
| GE HITACHI NUCLEAR ENERGY AMERICAS, LLC | PAGE DATE 02/06/17 | Page |
| SNM-960 DECOMMISSIONING FUNDING PLAN    | REVISION 3         | 8.14 |

**EXECUTION OF CONTRACTS AND OTHER INSTRUMENTS**

I, Eliza W. Fraser, an Attesting Secretary of General Electric Company, do hereby certify that the following is a true and correct copy of a delegation of authority to execute contracts and other instruments on behalf of General Electric Company pursuant to a resolution duly adopted by the Board of Directors on April 26, 1988:

"RESOLVED, that (A) Any contract, lease, license, assignment, bond or other obligation, conveyance, power of attorney, guarantee, proxy, court pleading, release, tax return and related documents, or other instruments may be executed on behalf of this Company by the Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, a Senior Vice President, a Vice President reporting directly to the Chairman or a Vice Chairman of the Board, the Comptroller, the Treasurer, the Secretary, or any Vice President who is a corporate staff officer of the Company, all of the above-named individuals being hereinafter called "Authorized Persons."

I further certify that Jeffrey S. Bornstein is Senior Vice President and Chief Financial Officer of General Electric Company, and by reason of holding said position pursuant to the above quoted Board of Directors resolution has full authority to execute contracts and other instruments which relate to General Electric Company.

Witness my hand and seal of the General Electric Company this 18th day of March, 2016.

  
\_\_\_\_\_  
Attesting Secretary





KPMG LLP  
 Stamford Square  
 3001 Summer Street  
 Stamford, CT 06905-4317

**Independent Accountants' Report  
 on Applying Agreed-upon Procedures**

The Board of Directors  
 General Electric Company:

We have performed the procedures enumerated below, which were agreed to by management of General Electric Company (the "Company"), solely to assist you in the filing of selected financial information included in the "Financial Test II" of your letter dated March 18, 2016 to the United States Nuclear Regulatory Commission (the "Letter"). The Company's management is responsible for the selected financial information. This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of management of General Electric Company. Consequently, we make no representations regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose

The procedures and associated findings are as follows:

- 1) Tangible Net Worth – We recalculated the dollar amount of the Company's tangible net worth at December 31, 2015, \$16,004,000,000, as the difference between Total GE Shareowners' Equity at December 31, 2015, \$98,274,000,000, and the sum of Goodwill, \$65,526,000,000, and Other Intangible Assets, \$16,744,000,000, at December 31, 2015, each reflected in the Statement of Financial Position on page 132 of the Company's 2015 Annual Report on Form 10-K. We then compared the dollar amount of the Company's tangible net worth at December 31, 2015, to the amount shown in Item 5 of the Letter and found them to be in agreement.
- 2) Total Assets in the United States – We compared the Company's Total Assets in the United States at December 31, 2015, \$177,300,000,000, as shown in Item 6 of the Letter, to a schedule prepared by the Company entitled "Working Capital and Geographic Assets" and found them to be in agreement.
- 3) Are At Least 90% of the Company's Assets Located in the United States – We divided the Company's Total Assets in the United States at December 31, 2015, \$177,300,000,000, as shown in Item 6 of the Letter, by the Company's Total Assets at December 31, 2015, \$492,692,000,000, reflected in the Statement of Financial Position on page 132 of the Company's 2015 Annual Report on Form 10-K, and found that the Company's Total Assets in the United States were less than 90% of the Company's Total Assets. Accordingly, we agree with the Company's response of "No" in Item 9 of the Letter.
- 4) Tangible Net Worth Greater than Maximum Potential Future Payments – We calculated the difference between the amount calculated in procedure 1 above to the total "Maximum Potential

KPMG LLP is a Delaware limited liability partnership,  
 the U.S. member firm of KPMG International Cooperative  
 ("KPMG International"), a Swiss entity

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Future Payments” related to off-balance sheet transactions such as contractual obligations to fund investment or guarantees, revolving lines of credit, credit support, indemnification agreements and other indemnification commitments as disclosed in Note 21 and Note 22 of the Company’s 2015 Annual Report on Form 10-K. “Maximum Potential Future Payments” is defined as the sum of contractual obligations to fund investments or guarantees, revolving lines of credit, credit support, indemnification agreements and other indemnification commitments. We noted the Tangible Net Worth of the Company per procedure 1 is greater than the “Maximum Potential Future Payments” as disclosed in the Company’s 2015 Annual Report on Form 10-K by \$14,687,000,000 (\$16,004,000,000 less \$1,317,000,000).

- 5) Bond Rating – We obtained the bond rating, for the Company’s most recent uninsured, uncollateralized, and unencumbered bond issuance as issued by Standard and Poors on December 1, 2015 The Standard and Poors rating was “AA+.” No differences were noted from requirements within Section II.A of 10 CFR Part 30, Appendix C.

We were not engaged to, and did not, conduct an examination, the objective of which would be the expression of an opinion on the selected financial information included in the Letter. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the use of management of the Company, and is not intended to be and should not be used by anyone other than these specified parties

**KPMG LLP**

March 18, 2016

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