



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

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LICENSEE: Siemens Power Corporation (SPC)
Richland, Washington

SUBJECT: SAFETY EVALUATION REPORT: APPLICATION DATED APRIL 14, 1994, WASTE
COMPACTION

Background

By letter dated April 14, 1994, Siemens Power Corporation (SPC) requested an amendment to its license to include the compaction of low-level radioactive waste at its Richland facility. This amendment is necessary to allow the licensee to contract with the Scientific Ecology Group (SEG) to perform waste compaction using SEG's Superpack mobile compacting system on SPC's site.

Discussion

During its operating lifetime, the Richland Manufacturing Facility of SPC has accumulated a large number of waste materials on the site. In August 1993, SPC prepared a Waste Management Engineering Plan that describes a comprehensive program to reduce the inventory of wastes on site and to manage and minimize the volume of wastes generated during current operations. In a letter dated March 1, 1994, from L. Maas of SPC to R. Burnett of NRC, SPC presented a projected schedule for reduction of the waste inventory from the current 134,000 cubic feet to 26,000 cubic feet by September 1997.

The Waste Management Engineering Plan and the inventory reduction schedule consist of a number of elements, including upgraded waste segregation, inspection, and packaging procedures; implementation of the waste quality control program to verify waste composition; restart of the Solid Waste Uranium Recovery incinerator; and use of waste compaction for volume reduction prior to shipment to the burial site for disposal.

To meet the goals of the Plan and schedule, SPC has requested a license amendment to allow the compaction of waste on site. In the past, SPC has sent waste to a Washington State-licensed facility in Richland for waste compaction; however, this other facility is unable to process the volume of wastes SPC requires to be processed on SPC's schedule. For this reason, SPC has contracted with SEG to bring its Superpack mobile waste compactor to SPC's facility to perform waste compaction on site.

The Superpack unit is an ultra-high pressure supercompaction system consisting of a 2,200-ton hydraulic press and a hydraulic/control module that houses the hydraulic motive system and the control console. The compactor is designed to process 52- and 55-gallon drums into "pellets," such that 3 to 5 pellets will fit into a 55-gallon drum.

The Superpack system may be operated inside an existing building on the site, or it may be operated outdoors in the trailers in which the units are transported. For this reason, there will be no construction impact associated with this amendment.

The Superpack is equipped with a HEPA filtration system and a liquid drainage system. SPC will in-place test the HEPA filters after the unit is set up for operation to assure 99.95 percent efficiency in removing 0.8 micron particles. SPC will also provide isokinetic sampling downstream of the HEPA's to measure gross alpha and beta/gamma emissions. Although the waste drums should not contain liquids, a liquid drainage system will collect any liquids that drain from the drums during compaction. With these controls and monitoring of gaseous emissions, there is expected to be no significant increase in effluents released from the site. Any gaseous and liquid emissions will be reported in the licensee's semiannual effluent reports.

The system is fabricated in accordance with national codes and standards applied to hydraulic and electrical equipment. The Safety Analysis Report, prepared by SEG and submitted with the amendment application, includes analyses of the consequences from three possible failures of the safety systems, including the following:

- Failure of the HEPA filtration system
- Failure of the liquid drainage system
- Hydraulic and electrical fire potential

The air collection and filtration system operates whenever the press is in service. Loss of filtration pressure on the HEPA filtration media will automatically shut down the hydraulic system through control interlocks. In the case of rupture of the HEPA filtration media, the safety analysis assumes that 1 gram of U-235 at 3 percent enrichment would be released. This is 1 percent of the maximum amount (100 grams) of U-235 allowed in a drum. The resulting exposure to an off-site individual is estimated to be 0.4 mrem/year, calculated using the COMPLY code.

SEG also evaluated the consequences from failure of the liquid collection system. The wastes to be compacted are expected to be dry, however, some of the containers may contain small amounts of liquids. The failure analysis assumes that 5 gallons of liquid is present in an uncompacted drum, and this liquid would overflow the liquid drainage channel onto the ground. Such a spill would be visible and easily detected by the operators, and could be cleaned up promptly with no off-site exposure.

The potential for an hydraulic or electrical fire is reduced by several design features, including hydraulic fluid cooling and leak detection systems, physical separation of the fluid pumping system from the waste processing area of the press, and providing electrical fire-rated extinguishers. In addition, the fire protection program that is used at the entire SPC site will also cover the waste compaction processing area.

Based on the controls and protections that are provided and the accident analysis, the staff has determined that there is no significant increase in the potential for or consequences from radiological accidents.

The radiological protection program used in the manufacturing processes at the site will also be applied to SEG employees operating the waste compactor. Staff has determined that this program is adequate to protect operators of the waste compactor.

To assure criticality safety for this operation, SPC limits the amount of U-235 in the compactor to 100 grams of U-235, as measured by the nondestructive assay (NDA) counter described in the Fundamental Nuclear Material Control (FNMC) Plan. In addition, the liquids drain will prevent the accumulation of liquids. Therefore, because multiple failures are required in order for a criticality event to occur, i.e., an error in the mass measurement and the failure of the liquids drain, the staff concludes that the operation may be performed safely. Finally, the waste drum storage pads where the compaction process is likely to be performed are covered by the site nuclear criticality alarm system, required by 10 CFR 70.24(a), in accordance with Safety Condition S-4 of the license, incorporated as Amendment 14 issued on November 20, 1992, and SPC's letter dated December 15, 1992.

Categorical Exclusion

The addition of waste sorting and compaction to the activities authorized under SNM-1227 is an amendment that results in a change in process operations or equipment. NRC staff has determined that the following conditions have been met:

- (i) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite,
- (ii) There is no significant increase in individual or cumulative occupational radiation exposure,
- (iii) There is no significant construction impact, and
- (iv) There is no significant increase in the potential for or consequences from radiological accidents.

Accordingly, pursuant to 10 CFR 51.22(c)(11), neither an environmental assessment nor an environmental impact statement is warranted for this action.

Conclusion/Recommendation

Based on the discussion, the staff concludes that approval of this amendment will not adversely affect the protection provided for the health and safety of SEG and SPC employees, the public, or the environment. Therefore, approval of this amendment is recommended.

The Region IV Principal Inspector has no objection to this proposed action.

Principal Contributors

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