

July 1, 1997

SECY-97-138

FOR: The Commissioners

FROM: L. Joseph Callan /s/
Executive Director for Operations

SUBJECT: TERMINATION OF FORT ST. VRAIN NUCLEAR GENERATING
STATION
OPERATING LICENSE

PURPOSE:

To inform the Commission that the decommissioning process has been completed at the Public Service Company (PSC) of Colorado's Fort St. Vrain Nuclear Generating Station (FSV), Unit 1, located in the town of Platteville in Weld County, Colorado. The staff plans to release the site for unrestricted use and terminate the Nuclear Regulatory Commission Nuclear Power Facility License No. DRP-34 (NRC Docket File No. 50-267).

BACKGROUND:

FSV was a high-temperature, gas-cooled reactor owned and operated by PSC. FSV is located approximately 56.3 km (35 miles) north of Denver and 5.6 km (3.5 miles) northwest of the town of Platteville in Weld County, Colorado. FSV had a capacity of 330 MWe. The nearest sizeable population center is the town of Greeley, approximately 22.5 km (14 miles) northeast of FSV.

The PSC-owned site consists of 11,320 m² (2798 acres). Approximately 2.59 km² (1 mi²) within the site area are designated as the exclusion area. The closest distance from the reactor building to the nearest exclusion area boundary is about 588.2 m (1935 feet).

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On December 5, 1988, PSC notified NRC that it elected to terminate FS operations early because of economic considerations associated with the ongoing high operating costs at the plant and low-plant availability.

On November 23, 1992, the staff issued an "Order Approving the

Decommissioning
Plan and Authorizing Decommissioning of the Facility." The
decommissioning of
FSV was completed in 1996.

When the license termination requirements in 10 CFR Part 50 were revised
in
1996, FSV was not "grandfathered." Therefore, the staff followed the
procedure of revised 10 CFR 50.82(a)(9)(iii) and (a)(10), and published a
Notice accepting the decommissioning plan (DP) as a termination plan, and
reapproving it. The Notice offered an opportunity for a hearing, but
there
was no request. However, in accordance with 10 CFR 50.82(a)(9)(iii), a
public
meeting was held on December 3, 1996, in the vicinity of the plant, and
no
comments on the termination plan or requests for a hearing were received.
Pursuant to 10 CFR 50.82(a)(11), the staff has concluded that the
decommissioning has been performed in accordance with the approved plan,
and
that the termination survey and associated documentation demonstrate that
the
site is suitable for unrestricted release.

DISCUSSION:

The PSC selected the decontamination/dismantlement option as the
decommissioning alternative, and proceeded to decontaminate and dismantle
FSV
to the extent necessary to ensure removal of radioactive materials and to
allow release of the facility and site for unrestricted use. The
contamination and activation levels were low at FSV because the plant had
a
relatively short operating history of approximately 447 full-power days,
since
1979, when commercial operation was initiated.

The major dismantlement and decontamination activities performed during
decommissioning were divided into three primary work areas:
(1) decontamination and dismantlement of the prestressed concrete reactor
vessel (PCR); (2) decontamination and dismantlement of the contaminated
balance-of-plant (BOP) systems; and (3) final site radiation survey. The
total cumulative occupational exposure for the entire decommissioning
project
was 3.79 Sv (379 person-rems). In support of the FSV decommissioning
activities, the NRC conducted 24 inspections at FSV, and all open
inspection
and allegations issues have been closed. The most recent inspections
(inspections conducted from February 1996 through January 1997) focused
on
supporting the final radiation survey review.

Regarding primary work area (1), the PCRV was dismantled using a diamond-wire cutting technique. The diamond-wire cutting system consisted of a wire with collars containing a diamond matrix, made to length for each individual cut, and a hydraulic pulley to drive the system to circulate the wire. The diamond wire was routed to envelop the cut area.

Regarding primary work area (2), radiological surveys of the facility have shown that contamination was primarily confined to equipment and structural areas within the PCRV. Over 90 percent of the contamination was contained in the activated and contaminated portions of the PCRV, with the remainder contained in BOP systems. Radioisotopes in activated components included primarily tritium, carbon-14, iron-55, cobalt-60, nickel-59, nickel-63, manganese-54, europium-152, and trace amounts of other isotopes. The plant has had no history of contamination from alpha-emitting nuclides.

Regarding the work area (3), the residual radioactivity criteria for unrestricted release of the facility were established in the approved DP and consistent with the guidelines of Table 1 of NRC Regulatory Guide 1.86 (i.e., 5000 dpm/100 square centimeters average total beta activity; 15,000 dpm/100 square centimeters maximum total beta activity; and 1000 dpm/100 square centimeters removable beta activity). In addition, an average gamma dose rate criterion of 5 μ R per hour above background at a distance of 1 meter from accessible surfaces in the facility buildings and outdoor areas was established, with any individual gamma exposure measurement not to exceed 10 μ R per hour above background radiation. Residual concentrations of radionuclides remaining in the soil, sediment, and ground water are below the concentrations that would provide a total effective dose equivalent of 10 mrem/yr to an exposed individual.

The licensee conducted termination surveys to assess residual radioactive contamination levels at the facility. The FSV termination survey program performed over 400,000 survey measurements in over 11,000 survey hours in a phased approach. Phase 1 of the overall termination survey covered buildings outside of the restricted area, small miscellaneous buildings inside the restricted area, the turbine building, and turbine/reactor building systems. Phase 2 surveyed the reactor building, and Phase 3 surveyed the PCRV

inside
surfaces and embedded piping, affected plant systems (external to the
PCR),
open land areas, and miscellaneous buildings and systems. The licensee
completed the final overall radiological survey in October 1996. The
final
survey report documented the level of residual radioactivity remaining at
the
facility and affirmed that the residual radioactivity met unrestricted
use
criteria established by the NRC, and that the site was suitable for
release
for unrestricted use.

As part of the confirmatory survey, NRC staff and Oak Ridge Institute for
Science and Education (ORISE) conducted a series of in-process
inspections to
verify the FSV survey methodology and accuracy. This was accomplished
during
three site visits from February 1996 through October 1996. In addition,
NRC
contracted with the Department of Energy's Environmental Measurement
Laboratory (EML) to support the confirmatory survey. As part of the in-
process inspections, side-by-side measurements were conducted in areas
with
various levels of radioactivity. The results of the ORISE and EML
confirmatory survey measurements affirmed the licensee's final survey
results.

As part of the confirmatory survey, NRC and ORISE reviewed several survey
groups/survey units that had been surveyed by the licensee. Surface
scans and
direct surface activity measurements were performed in each survey unit.
Data
reduction was performed on the collected direct measurements to allow
comparison with the licensee's data. Confirmatory survey activities in
survey
units generally identified no locations of elevated direct radiation.
Comparison of scan results, from the survey units evaluated, showed
general
agreement with the licensee's results, which demonstrated that the
licensee's
final survey program was acceptable. In addition, the NRC inspection
team
performed a quality assurance (QA) audit during the inspections conducted
from
February 1996 through October 1996. NRC evaluated final survey packages
to
determine if the packages were prepared in accordance with the licensee's
survey procedures, and evaluated the PSC records management program
related to
record retention. NRC determined that the licensee was effective in

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implementing the final survey procedures, the survey packages were thorough and documented adequately, and PSC had implemented an adequate records management program. NRC findings related to the review of the termination radiation survey and the QA inspection are documented in NRC Inspection Reports 50-267/96-01 through 50-267/96-05, and 50-267/97-01.

CONCLUSIONS:

The staff has completed its review of the FSV Project Termination Survey Final Report. The licensee's final survey report documented the level of residual radioactivity remaining at the facility and affirmed that the residual radioactivity met unrestricted use criteria established by NRC, and that the site is suitable for release for unrestricted use.

On the basis of the decommissioning activities conducted by the licensee, the staff's review of the licensee's termination survey final report, the results of the NRC inspections, and the results of NRC confirmatory surveys, the staff concludes that the decommissioning process is complete and the site is suitable to be released for unrestricted use. Therefore, unless otherwise directed by the Commission, the staff plans to terminate the FSV license ten days after the date of this paper.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

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for Operations