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October 9, 1991
Fort St. Vrain
Unit No. 1
P-91291

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

ATTN: Dr. Seymour H. Weiss, Director
Non-Power Reactor, Decommissioning and
Environmental Project Directorate

Docket No. 50-267

SUBJECT: FSV Decommissioning Fire Protection Plan

REFERENCE: PSC letter, Crawford to Weiss, dated November 5, 1990 (P-90318)

Dear Dr. Weiss:

This letter submits the Fort St. Vrain (FSV) Decommissioning Fire Protection Plan (D/FPP) for the Nuclear Regulatory Commission's review and approval. Public Service Company of Colorado committed to submit this D/FPP in the FSV Proposed Decommissioning Plan (the Referenced letter). The Attachment to this letter is an Executive Summary of the D/FPP.

If you have any questions related to the D/FPP, please contact Mr. M. H. Holmes at (303) 480-6960.

Very truly yours,

A Clegg Crawford

A. Clegg Crawford
Vice President
Nuclear Operations

ACC:JRJ/km

Attachment

Enclosure

A006
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cc: Regional Administrator, Region IV (2 copies)

Mr. J. B. Baird
Senior Resident Inspector
Fort St. Vrain

Mr. Robert M. Quillin, Director
Radiation Control Division
Colorado Department of Health
4210 East 11th Avenue
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Attachment
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Executive Summary of FSV Decommissioning Fire Protection Plan

The Decommissioning Fire Protection Plan (D/FPP) establishes controls to prevent significant fires from occurring and minimize radioactive releases to the environment in the event a significant fire does occur during decommissioning. This D/FPP is markedly different from the preceding FSV fire protection plan, since there will not be any irradiated fuel in the Reactor Building during decommissioning. Thus, the primary nuclear safety concerns of the preceding fire protection plan - reactor shutdown, decay heat removal, fission product retention, and primary coolant containment - are not applicable during decommissioning. While a fire during decommissioning could result in release of radioactive contamination or activation products, the safety threat does not approach that associated with irradiated fuel, when severe fires could potentially result in loss of core cooling, loss of containment functions and the uncontrolled release of fission products to the environment.

10 CFR 50.48 and 10 CFR 50 Appendix R focus on assuring that one of the redundant shutdown trains survives any postulated fire, such that the core can be safely shut down, cooled down and fuel failure prevented. In fact, 10 CFR 50.48 and 10 CFR 50, Appendix R, only apply to operating nuclear power plants. Criterion 3, "Fire Protection," of the General Design Criteria (10 CFR 50 Appendix A), only applies to structures, systems and components classified as important to safety and, as such, will not apply during the decommissioning of FSV since no structures, systems and components are relied upon to protect the health and safety of the public from the effects of a fire once all the fuel is removed from the Reactor Building.

Although the fire protection regulations cease to govern the defueled FSV plant, PSC is committed to implement an effective defense-in-depth fire protection plan during decommissioning to prevent fires from starting, rapidly detect fires that do occur, control and promptly extinguish such fires, and minimize the release of radioactivity to the environment. PSC has utilized the applicable guidance of Branch Technical Position (BTP) 9.5-1 in developing the D/FPP.

The Decommissioning Engineering Manager will be responsible for implementation of the D/FPP requirements, while the Shift Supervisor will be responsible for directing the fighting of a fire and will obtain the services of off-site fire departments as necessary. The D/FPP does not contain provisions for an on-site fire brigade. The response time of the off-site fire departments is adequate to control and suppress large fires.

FSV Administrative Procedure P-8, which currently establishes restrictions to control combustible materials in the plant, will remain in effect and will control combustibles in the plant during decommissioning. The D/FPP requires the implementation of a Hot Work Permit (HWP) for any decommissioning activity involving an ignition source such as a cutting torch or a spark producing tool. A trained fire watch with appropriate extinguishers and a post-work watch period are also required. The HWP system will address fire prevention, detection and suppression consistent with the D/FPP.

The decommissioning fire detection system will be identical to the fire detection system which is currently in effect and which was in effect while the reactor was operating. Automatic detection is provided in all unoccupied spaces where a significant threat of fire exists and in all accessible Reactor and Turbine Building spaces. The fire detection system consists of ionization smoke detectors, photoelectric detectors, linear beam detectors, thermal detectors, and heat activated devices, powered from non-interruptible buses, and complies with applicable NFPA codes.

The decommissioning fire suppression systems are the same as those currently in effect, with the exception that Halon will not be utilized for fire suppression in the Three Room Control Complex or Building 10. Fires in these areas no longer pose a threat to nuclear safety and suppression by means of manual hoses, portable extinguishers, and the existing manually actuated fixed water spray systems in the 480 Volt Switchgear Room and the Auxiliary Electric Room, is considered adequate. The potential for electric cable fires or transformer fires will be reduced during decommissioning due to the minimal loads that will be operating and therefore the reduced heat generation. During decommissioning, both firewater pumps will be operable, as will the hose stations, fixed water spray systems, deluge spray systems and yard hydrants. The full flooding CO_2 system will continue to provide protection for the emergency diesel generator rooms. The fire suppression systems noted above meet the applicable NFPA requirements.

Fire areas will no longer be required to assure separation of shutdown/cooldown trains or to comply with regulations, once fuel is removed from the Reactor Building. Fire areas have been retained, nearly identical to the existing fire areas, to limit the spread of fires. The Control Room is no longer a separate fire area, but is part of the Turbine Building/Three Room Control Complex/Building 10 fire area. Fire Protection Operability Requirements (FPORs) govern the operability of the fire doors, dampers and penetration seals of the 25 decommissioning fire areas to assure the associated barriers are effective in limiting the spread of fire.

An in-depth fire hazards analysis was performed, based on the decommissioning fire areas. The Fire Hazards Analysis (Section DFP.3) identifies the combustibles in each fire area, barriers to prevent the spread of postulated fires, the means of detecting a fire in each fire area, and describes the primary and backup fire suppression systems provided to protect each fire area.

The worst case fire scenario is analyzed in Section 3.4.6 of the Proposed Decommissioning Plan and involves 230 irradiated graphite side spacer blocks, in LSA waste containers, that are in a fire whose source of combustion is 300 gallons of diesel fuel. The fire is postulated to occur when the fuel tanks of a tractor-trailer rupture just outside of the Reactor Building truck bay, and the diesel fuel collects and burns under the trailer holding the irradiated graphite blocks. While the graphite blocks themselves will not sustain combustion, the postulated diesel fuel fire produces temperatures at which graphite oxidation can occur (> 750°F) and it is conservatively assumed that 50% of the graphite is oxidized. The resultant activity release produces worst case doses 100 meters from the postulated fire of 121 mrem whole body and 215 mrem maximum organ dose (lungs). These doses are a small fraction of the EPA Protective Action Guidelines. An FPOR specifies controls on storage and separation of irradiated graphite blocks to assure the consequences of such postulated fires could not exceed those identified above.

In conclusion, while the potential consequences of fires at the defueled FSV plant are much less severe than those with fuel present, due to the removal of fission products from the core, the D/FPP is very similar to the existing fire protection program. Due to the combustible control program, controls for hot work, extensive fire detection capabilities, as well as available suppression systems, with off-site fire departments on call for primary fire fighting, PSC considers that this D/FPP meets the objectives of a defense-in-depth plan in which significant fires are prevented from occurring, but any that could occur will be rapidly and accurately detected, controlled and promptly suppressed. The controls in this plan provide a high degree of assurance that any releases of radioactivity will be limited, and resulting dose consequences at the 100 meters Emergency Planning Zone will not exceed a small fraction of the EPA Protective Action Guidelines.