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February 18, 2009
JAFP-09-0025

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Subject: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
License No. DPR-59

Request for Exemption from 10 CFR 50 Appendix R Section III.G.2 Requirements Based on Manual Actions

Reference: 1. NRC Regulatory Issue Summary 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions", June 30, 2006

Dear Sir or Madam:

In response to RIS 2006-10, the James A. FitzPatrick Nuclear Power Plant (JAF) reviewed cases where operator manual actions were credited for safe shutdown of the plant during an Appendix R fire. Based on this review, it was determined that a specific exemption in accordance with 10 CFR 50.12 had not been requested for one credited manual action. This letter submits JAF's request for exemption in accordance with 10 CFR 50.12.

Should you have any questions concerning this letter, please contact Mr. Joseph Pechacek at (315) 349-6766.

This letter contains no new commitments.

Very truly yours,

Joseph Pechacek
Licensing Manager

JP:ed

Enclosure I: Request for Exemption from Requirements of Appendix R Section III.G.2

cc: Next page

A006
NRR

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Enclosure I to JAFP-09-0025

Request for Exemption
from
Requirements of Appendix R Section III.G.2

JAFP-09-0025
Enclosure I
REQUEST FOR EXEMPTION FROM 10 CFR 50 APPENDIX R, SECTION III.G.2

EXEMPTION REQUESTED

In accordance with the requirements of 10 CFR 50.12, the James A. FitzPatrick (JAF) Nuclear Power Plant requests an exemption from the requirements of 10 CFR 50, Appendix R, Section III.G.2 to the extent that one train of systems necessary to achieve and maintain hot shutdown is not maintained free of fire damage for a fire occurring in the Reactor Building (Fire Area 10).

BACKGROUND

The criteria for granting specific exemptions from 10 CFR 50 Regulations are specified in 10 CFR 50.12. In accordance with 10 CFR 50.12(a)(1), the NRC is authorized to grant an exemption upon determining that the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security.

Regulatory Issue Summary (RIS) 2006-10 (Reference 1) documents the NRC position relative to the use of operator manual actions as part of a compliance strategy to meet the requirements of 10 CFR 50, Appendix R, Section III.G.2. The NRC requires that plants which credit manual actions for Section III.G.2 compliance obtain specific NRC approval for the manual action via the exemption process in accordance with the requirements of 10 CFR 50.12.

In response to RIS 2006-10, JAF performed a review of all Operator Actions credited in the Appendix R Safe Shutdown Analysis (Reference 2). As a result of this review it has been determined that one fire area (Fire Area 10) contains an Operator Manual Action that is considered not allowed per 10 CFR 50, Appendix R, Section III.G.2.

BASES FOR EXEMPTION REQUEST

Fire Area 10 Description

Fire Area 10 consists of the west side of the Reactor Building, Elevation 272'; and the southwest quadrant of the Reactor Building, Elevation 300'.

The west side of the Reactor Building at Elevation 272' (Attachment 1) is separated from the Primary Containment (Fire Area 14) and the Steam Tunnel (Fire Area 1E) by three-hour rated fire barriers north of column 3. The balance of the barrier separating Fire Areas 9 and 10 (south of column 3) is a water spray curtain. The north wall and a portion of the west wall are three-hour rated fire barriers separating this portion of Fire Area 10 from the Administration Building (Fire Area 1A). A portion of the floor on the west side of Fire Area 10 is a three-hour rated fire barrier separating it from the West Crescent (Fire Area 18) and small portion of the West Cable Tunnel (Fire Area 1C). Another portion of the floor separating Fire Area 10 from the Torus Room (Fire Area 15) is a two-foot thick reinforced concrete barrier containing unsealed penetrations. These unsealed penetrations have been previously approved by the NRC (Reference 3). The ceiling, north of the centerline of the reactor, is a three-hour rated fire barrier separating Fire Area 10 from Fire Areas 1A and 8. The south wall at the Containment Air Dilution Shack (Fire Area YARD, Fire Zones CAD-1 and CAD-2) is three-hour rated. There is also a three-hour rated enclosure around the stairs to the west crescent that separates Fire Area 10 from Fire Area 18.

BASES FOR EXEMPTION REQUEST (continued)

The southwest quadrant at Elevation 300' (Attachment 2) is separated from Fire Area 8 on the north and Fire Area 9 on the east by a water spray curtain. The southwest quadrant is separated from the Primary Containment (Fire Area 14) by a three hour fire barrier. The south and west walls are outside barriers. The ceiling is a fire barrier separating Fire Areas 9 and 10. A water spray curtain is installed in the southwest stairwell leading up to Fire Area 9 on Elevation 326'-9" above.

Any fire barrier deficiencies have been evaluated in accordance with NRC Generic Letter 86-10 and found to be acceptable based on the fire hazards and fire protection features present. All automatic water spray curtain systems used as fire area boundaries have been approved for use by the NRC (Reference 4).

The entire Reactor Building, except elevation 369'-6" contains area wide ionization smoke detectors installed in accordance with NFPA 72E – 1978. The entire Reactor Building also has manual hose stations installed in accordance with NFPA 14 - 1978 and portable fire extinguishers installed in accordance with NFPA 10 - 1990. The water spray curtains separating Fire Area 10 from adjacent fire areas are automatically actuated by rate compensation heat detectors. Per the JAF Fire Hazards Analysis (Reference 5), the fire severity in Fire Area 10 is approximately 35 minutes and consists primarily of fire retardant electrical cable insulation.

Post-Fire Safe Shutdown

For a fire in Fire Area 10 JAF relies on the use of "B" side low pressure emergency core cooling systems (i.e. Core Spray and Residual Heat Removal) that require reactor depressurization utilizing the Automatic Depressurization System (ADS). There are eleven DC operated Safety/Relief Valves (SRVs) (02RV-71A, -71B, -71C, -71D, -71E, -71F, -71G, -71H, -71J, -71K, and -71L), of which seven are designated as ADS Valves (02RV-71A, -71B, -71C, -71D, -71E, -71G, and -71H) automatically controlled by relay logic circuits. The remaining four valves (02RV-71F, -71J, -71K, and -71L) are manually controlled. For each valve, one of the two solenoids (i.e., A1 - L1 excluding I1) is operable from the Control Room Panel 09-4. The other solenoid on each valve (i.e. A2 - L2 excluding I2) is operated from the Local SRV Control Panel 02ADS-071 located in Fire Area 8 (Reactor Building, Elevation 300' North) (Attachment 3). The X1 and X2 solenoids are completely redundant and are powered from two redundant DC power sources.

The seven ADS valves are operated by seven control switches in the Control Room, which can be set to either "OPEN" or "AUTOMATIC" position. The manual valves are operated by four control switches from the Control Room, which can be set to either "OPEN" or "CLOSED" position. All eleven valves can be operated manually by switches on the Local SRV Control Panel 02ADS-071.

Due to potential cable damage associated with the X1 solenoids for a fire in Fire Area 10, control of the SRVs from the Control Room may be lost. If this occurs, the ability to control the SRVs will occur at the Local ADS Control Panel (02ADS-071) utilizing the X2 solenoids, which are completely redundant to the X1 solenoids and are maintained free of fire damage. Utilizing this shutdown strategy, one operator is sent to the Local SRV Control Panel to standby and will operate the SRVs following established Abnormal Operating Procedures

BASES FOR EXEMPTION REQUEST (continued)

(AOP) per the direction of the Shift Manager. In this instance safe shutdown of the plant still takes place from the Control Room which classifies this as a normal shutdown area.

Although the ability to operate the SRVs from the Control Room may be lost, all the cables and components required to operate the SRVs from the Local SRV Control Panel remain free of fire damage for a fire in Fire Area 10. The Operator dispatched to the Local ADS Control Panel has two separate and distinct paths available to reach the panel, neither of which requires travel through Fire Area 10. These travel paths are both designated travel paths when performing alternate shutdown from outside the Control Room, therefore adequate eight hour emergency lighting exists for the route and to support operating the switches at the panel.

The first path involves leaving the Control Room and traveling west through the Administration Building to the north west corner of the Reactor Building on the 300' elevation. The second path involves leaving the Control Room and traveling down into the Relay Room and out the Relay Room west doorway into the Administration Building at elevation 286', down the stairway to elevation 272' and proceeding south to the Reactor Building northeast entrance. The Operators would then travel up the northeast stairwell to the Reactor Building 300' elevation north side.

The modification which added this shutdown feature was proposed as part of the original safe shutdown analysis and was reviewed and accepted by the NRC in an SER dated April 26, 1983 (Reference 6) and is discussed in an SER dated September, 5 1995 (Reference 7).

INSPECTION PROCEDURE 71111.05T FEASIBILITY CRITERIA

The manual operator action discussed above has been reviewed against the evaluation criteria contained in the NRC Fire Protection (Triennial) Inspection Procedure (Reference 8) to demonstrate feasibility.

Diagnostic Instrumentation

One of the immediate actions taken by the Operators for a fire in Fire Area 10 is to bypass the electric lift function of the X1 solenoids. By making this an immediate action in the safe shutdown procedure (AOP-28) (Reference 9) it ensures the solenoids are bypassed before spurious operation of the SRVs could occur due to cable damage. The instrumentation available to monitor Reactor Pressure Vessel (RPV) level and pressure in the Control Room is not adversely impacted by a fire in Fire Area 10. The local SRV panel has open and closed indication for all of the SRVs. This allows the Operator staged at the panel to continuously monitor the position of the valves.

Environmental Considerations

Radiation Levels: The operator action required for a fire in Fire Area 10 takes place at the Local SRV Panel 02ADS-071 which is located on the Reactor Building 300' elevation north side. This area is designated as Fire Area 8 and is separated from Fire Area 10 on one side by a water spray curtain and the floor by a 3 hour fire rated barrier. There are no components present in Fire Area 10 that, due to fire damage, would result in an increased radiological hazard in the area of the Local SRV Panel.

INSPECTION PROCEDURE 71111.05T FEASIBILITY CRITERIA (continued)

Emergency Lighting: The Local Control Panel for operating the SRVs (02ADS-071) was installed as a part of a modification to comply with 10 CFR 50 Appendix R, Section III.G.3. Responding to this panel is part of the JAF alternate shutdown strategy and the distinct travel paths from the Control Room to the Local SRV Control Panel have adequate emergency lighting as discussed earlier. For this reason, the Operator paths and the panel are provided with adequate emergency lighting to ensure the Operators can perform their safe shutdown function.

Temperature and Humidity Conditions: Fire Area 8, where the SRV Panel is located, is separated from Fire Area 10 by a water spray curtain on one side on the 300' elevation and a small portion of the floor in the northwest corner separates the two fire areas by a three hour fire rated barrier. If a fire occurred in Fire Area 10, it would not increase the temperature and humidity conditions in Fire Area 8 beyond an acceptable level for the Operator to control the SRVs from the Local Control Panel. Due to the large volume of the Reactor Building, the heat generated by a fire in Fire Area 10 would be rapidly dissipated throughout the Reactor Building via open stairwells and equipment hatches and would accumulate at the ceiling of the Refuel Floor (369'-6" Elevation). If the heat generated by a fire in Fire Area 10 were sufficient enough to actuate all of the water curtain boundaries protecting Fire Area 10 from the adjacent fire areas, it is expected that heat would be contained within Fire Area 10.

Smoke and Toxic Gases: The smoke and toxic gases that would be produced as the result of a fire in Fire Area 10 would not be expected to accumulate in Fire Area 8 due to the volume of Fire Area 10 and the Reactor Building in general. The floor of Fire Area 8 is three hour fire rated and all penetrations are sealed to the equivalent rating of the barrier. This will ensure that no smoke and hot gases would propagate from a fire on the 272' elevation up through the floor to the 300' elevation (Fire Area 8).

The water curtain boundary separating Fire Area 8 and Fire Area 10 on the 300' elevation is actuated by rate compensation heat detectors. If a fire were to produce a sufficient quantity of hot gases in the vicinity of the water spray curtain it would be actuated and would preclude the spread of smoke and toxic gases into Fire Area 8. If a fire occurred that generated a substantial quantity of smoke, but did not provide enough heat to activate the water spray curtain, some smoke would be expected to enter Fire Area 8. Any smoke entering Fire Area 8 would remain near the high ceiling (approximately 25' above the floor) and would be expected to rise to the upper elevations of the Reactor Building via the open stairwells and equipment hatches. Smoke entering this area would not reach a level to preclude an Operator from operating the SRVs at the Local SRV Control Panel.

Staffing

A sufficient number of Operators are available to perform all the duties associated with performing safe shutdown from outside the Control Room (AOP-43) (Reference 10) plus the five member fire brigade. This scenario is the most demanding from a staffing stand point because it requires Operators to be stationed at six individual locations throughout the plant, while the five member fire brigade is fighting the fire. Therefore, this number is the basis for the minimum number of Operators maintained on site at all times. Because safe shutdown for a fire in Fire Area 10 is considered normal shutdown (AOP-28) and is performed from the Control Room, the number of Operators required is less than the number required to perform shutdown from outside the Control Room. For a fire in Fire Area 10, one Operator is required

INSPECTION PROCEDURE 71111.05T FEASIBILITY CRITERIA (continued)

to stand by at the Local SRV Control Panel, 02ADS-071 and operate the SRVs per the direction of the Shift Manager.

Communications

Because 02ADS-071 was installed for the sole purpose of performing safe shutdown of the plant during a fire, it is equipped with a head set and dedicated shutdown communication system. This allows the Operator stationed at the panel to be in constant communication with the Control Room. The safe shutdown communication system is unaffected by a fire in Fire Area 10.

Special Tools

There are no special tools required to operate the SRVs at the Local Control Panel. The Local Control Panel was installed for the sole purpose of operating the SRVs during an Appendix R fire. The panel contains a breaker to energize the panel and then each SRV can be operated by a switch when requested by the Shift Manager. The panel is locked, but all operators carry the keys to access the panel. Part of the Operations Shift Turnover (Reference 11) is to ensure all on coming Operators have their required keys.

Training

The Operations staff receives training on AOP-28 and AOP-43 actions during initial training and then on an annual basis thereafter. The Operations staff also performs annual walkthroughs of the safe shutdown procedures.

Accessibility

There are no special access requirements needed for an Operator to go to the Local SRV Control Panel and operate the SRVs. The panel is located at the floor level in an area of the plant open for normal access. The panel is locked at all times, but all on shift operators carry the key necessary to gain entry to the panel.

Procedures

The steps necessary to achieve and maintain safe shutdown for a fire in Fire Area 10 are contained in AOP-28, Attachment 5. AOP-28 is the procedure used for "normal" shutdown during a plant fire at JAF. The procedure is structured such that each Fire Area has an individual attachment to provide Operations the necessary information to achieve and maintain safe shutdown during a fire. The procedure contains steps for the Operators to place the electric lift function of the X1 series SRV solenoids in "BYPASS" to prevent spurious operation and to dispatch an Operator to the Local SRV Panel to operate the SRVs as directed by the Shift Manager.

Verification and Validation

The steps in AOP-28 have been verified and validated on several occasions to ensure the actions are feasible. In addition, the Operations Staff perform walkthroughs of the procedure on a periodic basis. The manual actions in question (operating the SRVs from 02ADS-071)

INSPECTION PROCEDURE 71111.05T FEASIBILITY CRITERIA (continued)

were approved by the NRC as part of the JAF alternate shutdown strategy (Reference 6). Although in this scenario the plant is being shutdown from the Control Room, the actions performed at the Local Panel are the same.

DEFENSE IN DEPTH

In accordance with 10 CFR 50 Appendix R, the JAF Fire Protection Program extends the concept of defense-in-depth to fire protection in fire areas important to safety, with the following objectives:

- to prevent fires from starting;
- to detect rapidly, control, and extinguish promptly those fires that do occur;
- to provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

JAF has administrative controls in place to strictly control ignition sources (Reference 12) and transient combustibles (Reference 13). Controls are also in place to ensure fire barrier breaches are tracked (Reference 14) and the required compensatory measures are established in accordance with the Technical Requirements Manual (TRM) (Reference 15). The Reactor Building is protected throughout (with the exception of the Refuel Floor, elevation 369') by early warning ionization smoke detectors. These detectors will ensure any fire occurring in the Reactor Building is detected in its incipient stages and the Fire Brigade is dispatched to extinguish the fire. If the detection systems are out of service for any reason, compensatory measures are established in accordance with the TRM. The Reactor Building also contains manual fire hose stations and portable fire extinguishers throughout to support manual fire extinguishment.

CONCLUSION

The manual operator action required for a fire in Fire Area 10 consists of operating the SRVs from the Local SRV Control Panel in the Reactor Building 300' elevation. Although the use of this action is not allowed by 10 CFR 50, Appendix R Section III.G.2 it is being performed at a panel specifically installed and designated for use during an Appendix R fire event. The required components, cables and power supplies required to operate the SRVs from the local panel are maintained free of fire damage for a fire occurring in Fire Area 10.

A fire occurring in Fire Area 10 will have no adverse impact on the ability of the Operator to respond to the local control panel or manually operate the SRV switches at the direction of the Shift Manager.

The defense-in-depth approach to fire protection at JAF makes it unlikely that a fire would occur, but if one does occur it would be rapidly detected and extinguished before any substantial equipment or cable damage were to occur.

REFERENCES

1. NRC Regulatory Issue Summary 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions", June 30, 2006

2. JAF-RPT-FPS-01975, "10CFR50 Appendix R Safe Shutdown Analysis Report", Revision 2

3. NRC Letter and SER, Robert A. Capra to Ralph E. Beedle, "Issuance of Exemptions from Requirements of 10 CFR 50, Appendix R, for the James A. FitzPatrick Nuclear Power Plant (TAC No. M83969)", September 10, 1992

4. NRC Letter and SER, Domenic B. Vassallo to C. A. McNeill, "Exemption Requests – 10 CFR 50.48 Fire Protection and Appendix R to 10 CFR 50", January 11, 1985

5. JAF-RPT-04-00478, "JAF Fire Hazards Analysis", Revision 2

6. NRC Letter and SER, Domenic B. Vassallo to J. P. Bayne, "Alternate Safe Shutdown Capability, Modifications and Exemptions to Meet Appendix R of 10 CFR Part 50 – Fire Protection", April 26, 1983

7. NRC Letter and SER, C. E. Carpenter, Jr. to William J. Cahill, Jr., "Safety Evaluation of Safe Shutdown Capability Reassessment for James A. FitzPatrick Nuclear Power Plant (TAC No. M84780)", September 5, 1995

8. NRC Inspection Procedure, Attachment 71111.05T, "Fire Protection (Triennial)", April 21, 2006

9. AOP-28, "Operation During Plant Fires", Revision 18

10. AOP-43, "Plant Shutdown From Outside the Control Room", Revision 33

11. ODSO-4, "Shift Turnover and Log Keeping", Revision 100

12. EN-DC-127, "Control of Hot Work and Ignition Sources", Revision 5

13. EN-DC-161, "Control of Combustibles", Revision 3

14. AP-14.04, "Fire Penetration Breach Permit", Revision 6

15. "Technical Requirements Manual", Revision 35

ATTACHMENTS

1. Sketch of Reactor Building, Elevation 272' – West

2. Sketch of Reactor Building, Elevation 300' – West

3. Sketch of Reactor Building, Elevation 300' – East

ENCLOSURE I TO JAFP-09-0025
ATTACHMENT 1

REACTOR BUILDING – WEST – ELEVATION 272'

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ENCLOSURE I TO JAFP-09-0025
ATTACHMENT 2

REACTOR BUILDING – WEST – ELEVATION 300'

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ENCLOSURE I TO JAFP-09-0025
ATTACHMENT 3

REACTOR BUILDING – EAST – ELEVATION 300'

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