REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.:	**84-8022**
SRP Section:	**09.05.01 – Fire Protection Program**
Application Section:	**9.5.1**
Date of RAI Issue:	**07/16/2015**

Question No. 09.05.01-18

On page 9.5-20 of the application the applicant states:

> The fire safe shutdown analysis (FSSA) is performed according to the following assumptions:
>
> a. The FSSA includes the effects of the worst-case spurious actuation.

On DCD Tier 2, page 9.5-5, the applicant states:

> "Possible fire induced failures, including multiple spurious actuations, are addressed in post-fire safe-shutdown circuit analysis in accordance with the guidance of NRC RG 1.189, Rev. 2, which stipulates that any and all possible failures and spurious actuations caused by the failures, including combinations of multiple failures or operations that could prevent safe-shutdown, be addressed in the analysis."

The applicant is requested to reconcile the discrepancy identified above.

Response – (Rev.1)

The paragraph of page 9.5-20 means the FSSA includes the effects of the worst-case single spurious actuation and multiple spurious actuations.

The sentence in DCD Tier 2 section 9.5.1.3.2, page 9.5-20 will be revised as follows;
a. The FSSA includes the effects of the worst-case single spurious actuation and multiple spurious actuations.

Impact on DCD

DCD Tier 2 section 9.5.1.3.2, page 9.5-20 will be revised as indicated in the Attachment.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

c. A description of major electrical and mechanical equipment located within the fire area/zone.

d. Evaluation of the design basis fire, which is defined as the fire that would occur when all combustible materials within the fire area are ignited.

e. Evaluation of the effect on SSC important to safety due to inadvertent operation of fire suppression system.

9.5.1.3.2 Safe Shutdown Analysis

single spurious actuation and multiple spurious actuations.

The fire safe shutdown analysis (FSSA) is performed according to the following assumptions:

a. The FSSA includes the effects of the worst-case ~~spurious actuation.~~

b. Fire is not postulated to be concurrent with simultaneous, coincidental failures of safety systems, other plant accidents, or the most severe natural phenomena.

c. Fire renders all equipment in any fire area (excluding the control room and reactor containment) inoperable, recognizing post-fire reentry for repairs and operator actions is not possible, according to the enhanced fire protection criteria of NRC RG 1.189.

d. Inside containment, cables for safe shutdown are separated to the extent practicable. In areas where the redundant safe shutdown cables do not meet the separation criteria of NRC RG 1.189, at least one division is free of fire damage by fire protection measures.

The following design basis objectives are met in order to provide reasonable assurance that the safe shutdown performance goals are satisfied:

a. Maintain RCS pressure boundary integrity

b. Provide reasonable assurance of the reactivity control function maintains cold shutdown conditions

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Question No. 09.05.01-19

10 CFR 50.48, “Fire protection,” states:

(a) (1) Each holder of an operating license issued under this part or a combined license issued under part 52 of this chapter must have a fire protection plan that satisfies Criterion 3 of appendix A to this part. This fire protection plan must:

(i) Describe the overall fire protection program for the facility;

(ii) Identify the various positions within the licensee's organization that are responsible for the program;

(iii) State the authorities that are delegated to each of these positions to implement those responsibilities; and

(iv) Outline the plans for fire protection, fire detection and suppression capability, and limitation of fire damage.

(2) The plan must also describe specific features necessary to implement the program described in paragraph (a)(1) of this section such as--

(i) Administrative controls and personnel requirements for fire prevention and manual fire suppression activities;

(ii) Automatic and manually operated fire detection and suppression systems; and

(iii) The means to limit fire damage to structures, systems, or components important to safety so that the capability to shut down the plant safely is ensured.

On DCD Tier 2, page 9.5-21, the applicant states:

> "In addition, in the final FHA and FSSA, a detailed post-fire safe shutdown circuit analysis is included, uses a methodology that is similar to NEI 00-01, Rev. 3 (Reference 19)."

The staff note that the NRC has not endorsed NEI 00-01 Revision 3.

The applicant is requested to perform an evaluation for the effects of multiple spurious actuations due to a fire that is consistent with NEI 00-01, Revision 2, as modified in Regulatory Guide 1.189, Revision 2, or, if an alternative approach is used, justify how the alternative approach complies with NRC regulations.

Response – (Rev.1)

NEI 00-01, Revision 3 is issued to reconcile the resolution methodology proposed in Revision 2 with the exceptions taken to Revision 2 by the NRC in Regulatory Guide 1.189 Revision 2 and to provide clarification to the criteria to address licensee in-process questions. Revision 3 also provides an update to the Generic MSO Lists in Appendix G. The list changes are as a result of the initial assessment of Appendix G by the Expert panels at individual plants.

The MSO analysis has been performed basically in accordance with the methodology provided in NEI 00-01 regardless of revision of the report. There is no technical difference of the NEI 00-01 methodology used in APR1400 DCD between Rev. 2 and Rev. 3, which endorsed by RG 1.189, Rev. 2.

The followings two items are only additionally considered in the APR1400 MSO analysis with respect to NEI 00-01, Rev. 2:

- The list of potential MSO scenarios in Appendix G of NEI 00-01 has been increased, and
- The MSO scenarios have been classified as "required" or "important."

Although latest revision of NEI 00-01 is referred to DCD, APR1400 MSO analysis has not been performed using the method not endorsed in USNRC Regulatory Guide 1.189, Rev. 2.

The statement in DCD Tier 2, page 9.5-21 will be revised as follows;

"In addition, in the final FHA and FSSA, a detailed post-fire safe shutdown circuit analysis is included, uses a methodology that is endorsed in USNRC Regulatory Guide 1.189, Rev.2"

Impact on DCD

The statement in DCD Tier 2, page 9.5-21 will be revised as indicated in the Attachment.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

c. Provide reasonable assurance that reactor coolant makeup is available to maintain reactor coolant level within the level indication of the pressurizer

d. Maintain RCS decay heat removal function

e. Provide direct reading of process variables necessary to perform and control reactivity, reactor coolant pressurizer level, and decay heat removal

f. Maintain support functions (process cooling, lubrication) for equipment required for safe shutdown

The FSSA demonstrates that one success path of two safety SSCs that is used to bring the reactor to safe shutdown conditions remains free of fire damage. As required by NRC RG 1.189, fire barriers, physical separation with no intervening combustibles, and/or automatic detection and suppression provide this protection. The FSSA is included in Appendix 9.5A.

For an MCR fire, the RSR is used as alternative shutdown capability. A fire in the MCR is the only fire scenario that requires the RSR to be used. Shutdown from the MCR is accomplished for fires originating in all other fire areas. For the MCR fire, both shutdown paths (i.e., Division I and Division II) are available to safely shut down and maintain cold shutdown from the RSR. Subsection 7.4.1 contains a discussion of the transfer of control from the MCR to the RSR. Each of these systems includes adequate controls and instrumentation in the MCR and at the RSR to provide reasonable assurance that safe shutdown can be achieved. Subsection 7.4.1 describes the instrumentation and controls in the RSR that are required to bring the plant to safe shutdown conditions.

The COL applicant is to provide a milestone for completing a final FHA and FSSA on the basis of the final plant cable routing, fire barrier ratings, fire loading, ignition sources, and equipment arrangement. The initial FHA and FSSA for design certification state the assumptions and requirements. The final FHA and FSSA include evaluation results of them based on final design data. In addition, in the final FHA and FSSA, a detailed post-fire safe shutdown circuit analysis is included, uses a methodology that is ~~similar to NEI 00-01, Rev. 3 (Reference 19).~~ endorsed in USNRC Regulatory Guide 1.189, Rev.2. The final FHA and FSSA are carried out and documented as part of the update for the COL application and maintained in the licensing basis for the site (COL 9.5(4)).

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APR1400 Design Certification

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Question No. 09.05.01-30

On DCD Tier 2 page 9.5A-343, the applicant provides the fire hazard analysis for Fire Area F000-RW which is the radwaste area in the compound building. Within the radioactive release analysis portion, the applicant states:

> "This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected."
>
> "The radioactive laundry system treats all liquid wastes within the refueling water area that have the potential for radioactive contamination (e.g., personnel decontamination, contaminated laundry waste). The treatment process is conducted in steel containers and monitored. Therefore, in case a fire accident occurs in the CPB, no significant release is expected; any release is below the 10 CFR Part 100 limits."
>
> "Burning of filters could result in releases of radioactive products, but this is within the radiological design basis since all filters are in closed metal tanks or containers and all air leaving this area passes through charcoal filters that are monitored by radiation detectors. Charcoal filters are also protected by deluge systems."

The first paragraph states that this area is not a radiological area. The second and third paragraph indicate that radioactive material is located in this area. The staff has also noted this inconsistency in other portions of the fire hazard analysis.

The applicant is requested to review DCD Tier 2 Section 9.5A-3, "Fire Hazard Analysis Results," and DCD Tier 2, Table 9.5A-2, "Fire Hazard Analysis Summary," and:

1. Correctly indicate if the fire area is or is not a radiological area.
2. Reconcile any differences between DCD Tier 2 Section 9.5A-3 and DCD Tier 2 Table 9.5A-2

Response – (Rev.1)

For the fire area where it is a radiological area then the first paragraph in “Radioactive Release Analysis” will be deleted. And the differences between DCD Tier 2 Section 9.5A-3 and DCD Tier 2 Table 9.5A-2 identified will be included into DCD.

Impact on DCD

DCD Tier 2, page 9.5A-~~21~~, 39, 40, 87, 89, 102, 104, 153,166, 182, 183, 293, 334, and 344 will be revised as indicated on the attached markup.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

Fire Protection System Integrity

Because no automatic suppression systems are installed in this area, an evaluation of the inadvertent actuation effect of an automatic suppression system is not applicable.

Safe Shutdown Analysis

The design basis fire would occur if all of the combustibles in this area burned. This fire area is separated from the adjacent fire areas with 3-hour-rated fire barriers, and the equipment in this area is Division I ~~and is not needed for safe shutdown. Therefore, a complete loss of Division I equipment in the event of a fire in this area would not affect the plant safe shutdown.~~

A complete loss of safe shutdown equipment in this area is acceptable because redundant safe shutdown equipment, located in a separate fire area in Division II, is available for safe shutdown.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

Significant release is not expected because the charcoal filters in the AB exhaust ACUs provide reasonable assurance that the potential for the release of radioactive materials is eliminated; any release is below the 10 CFR Part ~~100~~ 20 limits.

9.5A.3.2.15 F055-A42A: Charging Pump Room A

Figure 9.5A-1 shows the location of fire area F055-A42A.

Fire Protection Adequacy Evaluation

The fire area is enclosed with 3-hour-rated concrete walls except the floor and has 3-hour-rated fire doors. Penetrations and openings are sealed for fire confinement. HVAC ductwork that passes through barriers is equipped with a fire damper. The floor of this area is basemat that is not required to be rated, according to NRC RG 1.189.

Combustible materials in this area are listed in Table 9.5A-2. The fire loading of the fire area F055-A42C is 2.28×10^5 kJ/m^2 (2.01×10^4 Btu/ft^2), and the expected duration of fire

is 15 minutes. Three-hour-rated fire barriers provide adequate separation from adjacent fire areas, and the fire is contained within the fire area.

A fire in this area is detected by a smoke detector and is extinguished manually using a water hose or portable extinguisher in accordance with NFPA 72, 14, and 10. Based on the expected fire hazards in this area, the 3-hour-rated boundaries of this area provide sufficient containment of any unsuppressed fire that can be expected to occur. On this basis, the fire protection that is provided for this fire area is adequate.

This fire area is served by the AB controlled area HVAC system. Any HVAC ductwork that passes into the area is provided with automatically closing fire dampers at the fire area boundaries. Smoke migration into the area is mitigated by sealed penetrations and openings in the fire area boundaries. After the fire, smoke is removed from the fire area by an exhaust ACU.

Fire Protection System Integrity

Because no automatic suppression systems are installed in this area, an evaluation of the inadvertent actuation effect of an automatic suppression system is not applicable.

Safe Shutdown Analysis

The design basis fire would occur if all of the combustibles in this area burned. This fire area is separated from adjacent fire areas with 3-hour-rated fire barriers, and equipment in this area is Division I. Therefore, a complete loss of Division I is acceptable because a redundant division of equipment, which is located in a separate fire area, is available for safe shutdown.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

A fire in this area is detected by a smoke detector and is extinguished manually using a water hose or portable extinguisher in accordance with NFPA 72, 14, and 10. Based on the expected fire hazards in this area, the 3-hour-rated boundaries of this area provide sufficient containment of any unsuppressed fire that can be expected to occur. On this basis, the fire protection that is provided for this fire area is adequate.

This fire area is served by fuel handling area HVAC system. Any HVAC ductwork that passes into the area is provided with automatically closing fire dampers at the fire area boundaries. Smoke migration into the area is mitigated by sealed penetrations and openings in the fire area boundaries. After the fire, smoke is removed from the fire area by an exhaust ACU.

Fire Protection System Integrity

Because no automatic suppression systems are installed in this area, an evaluation of the inadvertent actuation effect of an automatic suppression system is not applicable.

Safe Shutdown Analysis

The design basis fire would occur if all of the combustibles in this area burned. This fire area is separated from the adjacent areas with 3-hour-rated fire barriers, and equipment in this area is Division I. Therefore, a complete loss of Division I equipment is acceptable because redundant trains of equipment, which are located in a separate fire area, are available for safe shutdown.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

Potential for release of radioactive materials is not significant because combustion products are exhausted through HEPA filters in the fuel building HVAC system. In addition, the redundant spent fuel pool cooling pump is available to maintain cooling of the radioactive spent fuel pool; any release is below the 10 CFR Part ~~100~~ limits. 20

shutdown equipment. Therefore, the capability to safely shut down the plant would not be affected by the design basis fire in this area.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

The filters in the ACU may contain radioactive materials only if filters have been used for radiological events for the time within the allowable limit. However, the likelihood that the radioactive smoke would be released is low because the fire would be extinguished by the water spray nozzles for the charcoal filters, which are in the filter housing. Thus, no significant release is expected; any release is below the 10 CFR Part ~~100~~ limits. 20

9.5A.3.2.54 F100-AEEA: 480V Class 1E MCC 01A Room

Figure 9.5A-4 shows the location of fire area F100-AEEA, which comprises the following zones:

Z100-A12A 480V Class 1E MCC 01A Room

Z100-A18A MUX N1 Room

Fire Protection Adequacy Evaluation

The fire area is enclosed with 3-hour-rated concrete walls and has 3-hour-rated fire doors. Penetrations and openings are sealed for fire confinement. HVAC ductwork that passes through barriers is equipped with a fire damper.

Combustible materials in this area are listed in Table 9.5A-2. The fire loading of fire area F100-AEEA is 4.32×10^5 kJ/m^2 (3.81×10^4 Btu/ft^2), and the expected duration of fire is 29 minutes. Three-hour-rated fire barriers provide adequate separation from adjacent fire areas, and the fire is contained within the fire area.

A fire in this area is detected by smoke detectors and is extinguished manually using a water hose or portable extinguisher in accordance with NFPA 72, 14, and 10. Based on

the expected fire hazards in this area, the 3-hour-rated boundaries of this area provide sufficient containment of any unsuppressed fire that can be expected to occur. On this basis, the fire protection that is provided for this fire area is adequate.

This fire area is served by the AB controlled area HVAC system. Any HVAC ductwork that passes into the area is provided with automatically closing fire dampers at the fire area boundaries. Smoke migration into the area is mitigated by sealed penetrations and openings in the fire area boundaries. After the fire, smoke is removed from the fire area by an exhaust ACU.

Fire Protection System Integrity

Because no automatic suppression systems are installed in this area, an evaluation of the inadvertent actuation effect of an automatic suppression system is not applicable.

Safe Shutdown Analysis

The design basis fire would occur if all of the combustibles in this area burned. This fire area is separated from the adjacent fire area with 3-hour-rated fire barriers and equipment located in this area is not needed for safe shutdown. Therefore, a complete loss of equipment is acceptable.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

The filters in the ACU may contain radioactive materials only if filters have been used for radiological events for the time within the allowable limit. However, the likelihood that the radioactive smoke would be released is low because the fire would be extinguished by the water spray nozzles for the charcoal filters, which are in the filter housing. Thus, no significant release is expected; any release is below the 10 CFR Part 100 limits.

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equipment in this area are all Division I. Therefore, a complete loss of Division I equipment is acceptable because a redundant division of equipment, which is located in a separate fire area, is available for safe shutdown.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

The filters in the ACU may contain radioactive materials only if filters have been used for radiological events for the time within the allowable limit. However, the likelihood that the radioactive smoke would be released is low because the fire would be extinguished by the water spray nozzles for the charcoal filters, which are in the filter housing. Thus, no significant release is expected; any release is below the 10 CFR Part ~~100~~ limits. 20

9.5A.3.2.65 F120-A25A: HVAC Chase

Figure 9.5A-5 shows the location of fire area F120-A25A.

Fire Protection Adequacy Evaluation

The fire area is enclosed with 3-hour-rated concrete walls, except the wall to the out-of-doors, and has 3-hour-rated fire doors. Penetrations and openings are sealed for fire confinement. HVAC ductwork that passes through barriers is equipped with a fire damper. The walls of this area are exterior walls that are not required to be rated, according to NRC RG 1.189.

Combustible materials in this area are listed in Table 9.5A-2. The fire loading of fire area F120-A25A is 3.15×10^4 kJ/m^2 (2.78×10^3 Btu/ft^2), and the expected duration of fire is 2 minutes. Three-hour-rated fire barriers provide adequate separation from adjacent fire areas, and the fire is contained within the fire area.

A fire in this area is extinguished manually using portable extinguisher in accordance with NFPA 10. Based on the expected fire hazards in this area, the 3-hour-rated boundaries of

A fire in this area is detected by a smoke detector and is extinguished manually using a water hose or portable extinguisher in accordance with NFPA 72, 14, and 10. Based on the expected fire hazards in this area, the 3-hour-rated boundaries of this area provide sufficient containment of any unsuppressed fire that can be expected to occur. On this basis, the fire protection that is provided for this fire area is adequate.

During normal operation, cold shutdown, and refueling, the MCR air-handling units and the MCR exhaust fan are actuated to perform ventilation and air conditioning inside the MCR envelope. In case of a fire generating smoke within the MCR, the smoke removal is accomplished by using control room area smoke removal fan.

Fire Protection System Integrity

Because no automatic suppression systems are installed in this area, an evaluation of the inadvertent actuation effect of an automatic suppression system is not applicable.

Safe Shutdown Analysis

The capability to safely shut down the plant would not be affected by a fire in this area because redundant trains are separated by 3-hour-rated fire barriers.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

The filters in the ACU may contain radioactive materials only if filters have been used for radiological events for the time period within the allowable limit. However, the likelihood that the radioactive smoke would be released is low because the fire would be extinguished by the water spray nozzles for the charcoal filters, which are in the filter housing. Thus, no significant release is expected; any release is below the 10 CFR Part ~~100~~ limits.

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9.5A.3.2.103 F174-A25C: HVAC Area

Figure 9.5A-8 shows the location of fire area F174-A25C.

Safe Shutdown Analysis

The design basis fire would occur if all of the combustibles in this area burned. This fire area is separated from the adjacent fire areas with 3-hour-rated fire barriers, and the equipment in this area is Division II ~~and is not needed for safe shutdown~~. ~~Therefore, a complete loss of Division II equipment in the event of a fire in this area would not affect the plant safe shutdown.~~

A complete loss of safe shutdown equipment in this area is acceptable because redundant safe shutdown equipment, located in a separate fire area in Division I, is available for safe shutdown.

Radioactive Release Analysis

~~This fire area is not a radiological area.~~ ~~The piping systems in the fire area do not contain fluids with radiological content.~~ ~~Therefore, a radioactive release due to a fire in this area is not expected.~~

Significant release is not expected because the charcoal filters in the AB exhaust ACUs provide reasonable assurance that the potential for the release of radioactive materials is eliminated; any release is below the 10 CFR Part ~~100~~ 20 limits.

9.5A.3.3.2 F050-A02D: Safety Injection Pump Room D

Figure 9.5A-1 shows the location of fire area F050-A02D.

Fire Protection Adequacy Evaluation

The fire area is enclosed with 3-hour-rated concrete walls except the floor and has 3-hour-rated fire doors. Penetrations and openings are sealed for fire confinement. HVAC ductwork that passes through barriers is equipped with a fire damper. The floor of this area is basemat that is not required to be rated, according to NRC RG 1.189.

Combustible materials in this area are listed in Table 9.5A-2. The fire loading of fire area F050-A02D is 1.86×10^4 kJ/m^2 (1.64×10^3 Btu/ft^2), and the expected duration of fire is 1 minute. Three-hour-rated fire barriers provide adequate separation from adjacent fire areas, and the fire is contained within the fire area.

A fire in this area is detected by a smoke detector and is extinguished manually using a water hose or portable extinguisher in accordance with NFPA 72, 14, and 10. Based on

Fire Protection System Integrity

Because no automatic suppression systems are installed in this area, an evaluation of the inadvertent actuation effect of an automatic suppression system is not applicable.

Safe Shutdown Analysis

The design basis fire would occur if all of the combustibles in this area burned. This fire area is separated from the adjacent fire areas with 3-hour-rated fire barriers, and the equipment in this area is Division II ~~and is not needed for safe shutdown. Therefore, a complete loss of Division II equipment in the event of a fire in this area would not affect the plant safe shutdown.~~

A complete loss of safe shutdown equipment in this area is acceptable because redundant safe shutdown equipment, located in a separate fire area in Division I, is available for safe shutdown.

Radioactive Release Analysis

Significant release is not expected because the charcoal filters in the AB exhaust ACUs provide reasonable assurance that the potential for the release of radioactive materials is eliminated; any release is below the 10 CFR Part ~~100~~ 20 limits.

9.5A.3.3.14 F055-A54B: Auxiliary Charging Pump Room

Figure 9.5A-1 shows the location of fire area F055-A54B.

Fire Protection Adequacy Evaluation

The fire area is enclosed with 3-hour-rated concrete walls except the floor and has 3-hour-rated fire doors. Penetrations and openings are sealed for fire confinement. HVAC ductwork that passes through barriers is equipped with a fire damper. The floor of this area is Basemat that is not required to be rated, according to NRC RG 1.189.

Combustible materials in this area are listed in Table 9.5A-2. The fire loading of fire area F055-A54B is 3.18×10^5 kJ/m^2 (2.80×10^4 Btu/ft^2), and the expected duration of fire is 21 minutes. Three-hour-rated fire barriers provide adequate separation from adjacent fire areas, and the fire is contained within the fire area.

A fire in this area is detected by a smoke detector and is extinguished manually using a water hose or portable extinguisher in accordance with NFPA 72, 14, and 10. Based on the expected fire hazards in this area, the 3-hour-rated boundaries of this area provide sufficient containment of any unsuppressed fire that can be expected to occur. On this basis, the fire protection that is provided for this fire area is adequate.

This fire area is served by the AB controlled area HVAC system. Any HVAC ductwork that passes into the area is provided with automatically closing fire dampers at the fire area boundaries. Smoke migration into the area is mitigated by sealed penetrations and openings in the fire area boundaries. After the fire, smoke is removed from the fire area by an exhaust ACU.

Fire Protection System Integrity

Because no automatic suppression systems are installed in this area, an evaluation of the inadvertent actuation effect of an automatic suppression system is not applicable.

Safe Shutdown Analysis

The Auxiliary Charging Pump (451-M-PP03) is designed to be powered from both divisions. Therefore, cabling and piping associated with Divisions I and II are routed in this area. However, a fire in this room would result in loss of only the auxiliary charging pump; at least one of the other two charging pumps (assuming one is down for maintenance) would be available to accomplish safe shutdown because two charging pumps and their associated cables are separated from this area by 3-hour-rated fire barriers.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

The charcoal filters in the exhaust ACUs provide reasonable assurance that the potential for the release of radioactive materials is eliminated. Therefore, significant release is not expected; any release is below the 10 CFR Part 20 limits.

9.5A.3.3.15 F055-A55B: Charging Pump Room B

Figure 9.5A-1 shows the location of fire area F055-A55B.

Combustible materials in this area are listed in Table 9.5A-2. The fire loading of fire area F174-A15B is 3.29×10^5 kJ/m^2 (2.90×10^4 Btu/ft^2), and the expected duration of fire is 22 minutes. Three-hour-rated fire barriers provide adequate separation from adjacent fire areas, and the fire is contained within the fire area.

A fire in this area is detected by a smoke detector and is extinguished manually using a water hose or portable extinguisher in accordance with NFPA 72, 14, and 10. Based on the expected fire hazards in this area, the 3-hour-rated boundaries of this area provide sufficient containment of any unsuppressed fire that can be expected to occur. On this basis, the fire protection that is provided for this fire area is adequate.

Fire Protection System Integrity

Because no automatic suppression systems are installed in this area, an evaluation of the inadvertent actuation effect of an automatic suppression system is not applicable.

Safe Shutdown Analysis

The design basis fire would occur if all of the combustibles in this area burned. This fire area is separated from the adjacent fire area with 3-hour-rated fire barriers and equipment located in this area is not needed for safe shutdown.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

The filters in the ACU may contain radioactive materials only if filters have been used for radiological events for the time within the allowable limit. However, the likelihood that the radioactive smoke would be released is low because the fire would be extinguished by the water spray nozzles for the charcoal filters, which are in the filter housing. Thus, no significant release is expected; any release is below the 10 CFR Part ~~100~~ limits.

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Fire Protection System Integrity

Inadvertent actuation of automatic suppression system would not impact safe shutdown of the plant since there is no safe shutdown equipment in this area.

Safe Shutdown Analysis

The design basis fire would occur if all the combustibles in this area burned. An area that has a high fire load, such as an oil tank room, is separated from this area by 3-hour-rated fire barriers. ~~Even if the steel structure of turbine generator building is collapsed, the auxiliary building would not be affected since the AB is separated from the turbine generator building by 3-hour-rated fire barriers.~~ Therefore, the ability to safety shut down the plant would not be affected.

The fire barrier that separates the turbine building from the auxiliary building will maintain its structural integrity even in the event of a complete collapse of the building structure.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~

There is no significant release of radioactive materials by a fire in this area since radioactive materials are in closed metal tanks or containers. Any release is below the 10 CFR Part ~~100~~ 20 limits.

9.5A.3.5.8 F073-T11: Switchgear Area - 73 ft 0 in

Figure 9.5A-12 shows the location of fire area F073-T1.

Fire Protection Adequacy Evaluation

The fire area is enclosed with 3-hour-rated concrete walls except exterior wall. Penetrations and openings are sealed for fire confinement. HVAC ductwork passing into the barrier is equipped with fire damper.

A fire in this area is detected by a smoke detector and is extinguished manually using water hose or portable extinguishers in accordance with NFPA 72, 14, and 10. Based on the

Fire Protection Adequacy Evaluation

The fire area is enclosed with 3-hour-rated concrete walls except for the exterior walls. Penetrations and openings are sealed for fire confinement. HVAC ductwork passing into the barrier is equipped with a fire damper.

A fire in this area is detected by smoke and temperature detectors and is extinguished manually using water hose or portable extinguishers in accordance with NFPA 72, 14, and 10. The fire area has an automatic wet pipe sprinkler system in accordance with NFPA 13 and regulatory guidance. Based on the expected fire hazards in this area, the 3-hour-rated boundaries of this area provide sufficient containment of any unsuppressed fire that can be expected. On this basis, there is adequate fire protection provided for this fire area.

This fire area is served by the CPB HVAC system. Any HVAC ductwork passing into the area is provided with automatically closing fire dampers at the fire area boundaries. Smoke migration into the area is mitigated by sealed penetrations and openings of the fire area boundaries. After the fire, smoke is removed from the fire area by the exhaust ACU.

Fire Protection System Integrity

Inadvertent actuation of the automatic wet pipe sprinklers installed in this area would not affect the capability to safely shut down the plant since there is no safety-related equipment in this area.

Safe Shutdown Analysis

The design basis fire would occur if all combustibles in this fire area burned, but the design basis fire would not affect the ability to safely shut down the plant since this fire area is completely separated from the adjacent fire areas by 3-hour-rated fire barriers and equipment located in this fire area is non-safety related.

Radioactive Release Analysis

~~This fire area is not a radiological area. The piping systems in the fire area do not contain fluids with radiological content. Therefore, a radioactive release due to a fire in this area is not expected.~~