# 9B FIRE PROTECTION ANALYSIS - PLANT SPECIFIC SUPPLEMENT

## 9B.1 INTRODUCTION

The Fire Protection Analysis (FPA) evaluates the potential for occurrence of fires within the plant, documents the capabilities of the fire protection system, and provides reasonable assurance of the capability to safely shut down the plant. The FPA is an integral part of the process of selecting fire prevention, detection, and suppression methods, and provides a design basis for the fire protection system. The design of the fire protection system is described in Section 9.5.1 and U.S. EPR FSAR Section 9.5.1.

This FPA is performed for the remaining power block and balance of plant structures that were not addressed in Appendix 9A. The FPA is performed for each fire area using the methodology addressed in Section 9B.2. The methodology follows the guidance of Regulatory Guide 1.189 (NRC, 2007a). The results of the analysis are provided in Section 9B.3.

Fires are expected to occur over the life of a nuclear power plant and should be treated as anticipated operational occurrences as defined in Appendix A to 10 CFR Part 50. Requirements for protection against radiation during normal operations appear in 10 CFR Part 20. Anticipated operational occurrences of fires should not result in unacceptable radiological consequences applying the exposure criteria of 10 CFR Part 20. Prevention of a radiological release that could result in a radiological hazard to the public, environment, or plant personnel becomes the primary objective during plant shutdown and decommissioning.

### 9B.1.1 REGULATORY BASES

The regulatory bases and requirements applicable to the U.S. EPR design certification and {BBNPP} have been previously established, and are only restated in this FPA for completeness. 10 CFR 52.48 (CFR, 2008a) specifies, in part, that applications filed under this subpart will be reviewed for compliance with the standards set out in 10 CFR Part 50 and its appendices.

GDC 3 of Appendix A to 10 CFR Part 50 states:

"Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and control room. Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety. Firefighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components."

Additionally, 10 CFR 50.34(h) (CFR, 2008b) requires new reactor license applications to include an evaluation of the facility against the current Standard Review Plan (SRP) guidance. The applicable SRP guidance is specified in Section 9.5.1 of NUREG-0800 (NRC, 2007b). NUREG-0800 describes the areas of review, acceptance criteria and review procedure for NRC review of nuclear power plant fire protection programs. NUREG-0800 in turn invokes Regulatory Guide 1.189, for methods acceptable to the NRC to demonstrate compliance with the SRP review criteria. In addition to the guidance specified in Regulatory Guide 1.189, Section 9.5.1 of NUREG-0800 also invokes SECY-90-016 (NRC, 1990) for additional NRC fire protection requirements applicable to evolutionary reactor designs.


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### 9B.1.2 DEFENSE-IN-DEPTH

The objective of the overall Fire Protection Program is to implement a defense-in-depth strategy to achieve and maintain a high degree of plant safety. This strategy is accomplished by achieving and maintaining a balance between the following:

- Prevent fires from occurring.
- The capability to rapidly detect, control, and promptly extinguish those fires that do occur.
- Adequate protection for structures, systems, and components (SSC) important to safety so that a fire that is not promptly extinguished by fire suppression activities will not prevent safe shutdown of the plant or result in release of radioactive materials to the environment.

The programmatic elements used by the FPA to implement the defense-in-depth strategy are:

- Document and assess the impact of in situ and transient fire hazards on a fire area basis throughout the facility, including potential effects on safe shutdown capability, effects of fire suppression activities, and applicable risk insights from the probabilistic fire risk assessment.
- Specify measures for fire prevention, fire detection, fire suppression, and fire confinement.
- Minimize the potential for a fire or fire-related event to place the plant in an unrecoverable condition, cause a release of radioactive materials, or result in radiological exposure to onsite and offsite personnel.
- Specify measures that will provide reasonable assurance that one success path of safe shutdown capability will be available under credible post fire conditions.

### 9B.1.3 SCOPE

The scope of the FPA consists of the comprehensive assessment of the fire or explosion hazards for the plant structures in the following list, including a description of the fire protection defense-in-depth features provided to minimize the consequences of such an event.

- Turbine Building (UMA)
- Switchgear Building (UBA)
- Auxiliary Power Transformer Area (UBE)
- Generator Transformer Area (UBF)
- {Warehouse Building (UST)}
- Security Access Building (UYF)
- Central Gas Supply Building (UTG)
- {Grid Systems Control Building (UAC)}
- Fire Protection Building (USG)
- {Circulating Water System Cooling Tower Structures (URA)}
- {Circulating Water System Pumphouse (UQA)}
- {Essential Service Water Emergency Makeup System Pumphouse (UPF)}
- {Circulating Water System Makeup Water Intake Structure (UPE)}


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## 9B.2 FIRE PROTECTION ANALYSIS METHODOLOGY

### 9B.2.1 GENERAL DESIGN CRITERIA

As described in Section 9B.1, the fire protection performance objectives are:

- Provide reasonable assurance that one success path of SSC will remain free of fire damage so that hot standby and cold shutdown conditions can be achieved without crediting plant or system repair activities.
- Minimize and control the release of radioactivity to the environment.

To meet these performance objectives, SECY-90-016 (NRC, 1990) specifies the following design criteria:

"Therefore, the evolutionary ALWR designers must ensure the safe shutdown can be achieved, assuming all equipment in any one fire area is rendered inoperable by fire and that re-entry into the fire area for repairs and operator actions is not possible. Because of its physical configuration, the control room is excluded from this approach, provided an independent alternative shutdown capability that is physically and electrically independent of the control room is included in the design. Evolutionary ALWR designers must provide fire protection for redundant shutdown systems in the reactor containment building that will ensure, to the extent practicable, that one shutdown division will be free of fire damage. Additionally, the evolutionary ALWR designers must ensure that smoke, hot gases or the fire suppressant will not migrate into other fire areas to the extent that they could adversely affect safe shutdown capabilities, including operator manual actions."

Based on the previously mentioned criteria, for the U.S. EPR, redundant divisions of safe shutdown systems, components, and cables, including associated circuits (e.g., safety-related, non-safety-related, Class 1E and non-Class 1E), whose failure could affect or prevent post fire safe shutdown capability, should not be located within the same fire area. The exceptions are the control room, because of provision of physically and electrically independent alternative shutdown capability, and the Reactor Building, because of provision of fire protection defense-in-depth features that provide reasonable assurance, to the extent practicable, that one success path of SSC necessary to achieve safe shutdown will remain free of fire damage.

### 9B.2.2 SPECIFIC ELEMENTS

To meet this design criterion, the following methodology is employed.

1. In accordance with GDC 3, structures, systems, and components important to safety must be designed and located to minimize the probability and effect of fires and explosions. The requirements of GDC 3 are met, in part, by compartmentation of the plant into separate fire areas. Specifically, based on the hazards present and the need for physical separation of SSC important to safety, the plant is segregated into separate fire areas by passive, fire-rated structural barriers (e.g., walls, floors, and ceilings). In some instances (e.g., Reactor Building), a fire area is sub-divided into fire zones based on physical separation, location of plant equipment, or for FPA purposes. These fire areas and zones serve the primary purpose of confining the effects of fires to a single compartment or area, thereby minimizing the potential for adverse effects from fires on redundant SSC important to safety. Outside of the control room and the Reactor Building, each of the redundant divisions of emergency core cooling are separated by three hour rated structural fire barriers.


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2. Materials used in plant construction are noncombustible or heat resistant to the extent practicable in accordance with GDC 3. Walls, floors, roofs, including structural materials, suspended ceilings, thermal insulation, radiation shielding materials, and soundproofing and interior finish are noncombustible or meet applicable qualification test acceptance criteria unless otherwise justified. Concealed spaces are devoid of combustibles unless otherwise justified.

3. The plant layout also provides reasonable assurance that adequate means of access to all plant areas is provided for manual fire suppression activities and allow safe access and egress for personnel. The layout and travel distances of access and egress routes meet the intent of NFPA 101 (NFPA, 2006) to the extent practicable, unless otherwise justified. Potential delays in plant access or egress due to security locking systems are considered.

4. The in situ plant equipment and components, including electrical cables, housed within each fire area are considered. Any SSC important to safety located within the fire area are considered.

5. In situ fire and explosion hazards associated with plant operations, maintenance, and refueling activities within the fire area are identified (e.g., cables, lube oil, diesel fuel oil, flammable gases, chemicals, building materials, and interior finish). In developing postulated fire scenarios for each fire area, the FPA considers the continuity of combustible materials, susceptibility of the materials to ignition, heat of combustion, heat release rates (HRR), and potential for fire spread.

   In the event that a fire area could be subject to potentially explosive environments from flammable gases or other potentially energetic sources (e.g., chemical treatment systems, ion exchange columns), explosion-prevention features and measures are provided.

   External exposure hazards are identified (e.g., flammable and combustible liquid or gas storage, auxiliary boiler units, natural vegetation) that could potentially expose SSC important to safety to fire effects (i.e., heat, flame, smoke). Wildfire hazards are addressed if the potential for damage to SSC important to safety exists.

6. The credible in situ ignition sources within the fire area are identified. The FPA classifies ignition sources as common or atypical and assign potential fire severity levels on a generic basis using predefined guidance. Most in situ ignition sources are of the common type, which include electrical switchgear cabinets, general electrical and control cabinets, electric motors, pumps (i.e., reactor coolant pumps, feedwater pumps, and other pumps), diesel generators, air compressors, battery banks, boiler heating units, electric dryers, heating, ventilation, air conditioning (HVAC) subsystem components, and others.

   Atypical sources of ignition include arcing electrical faults, hydrogen storage tanks, hydrogen piping, turbine generator exciter hydrogen, outdoor oil-filled transformers, and liquid fuels (i.e., spills). Because of their nature, fires associated with atypical ignition sources are not assigned a generic intensity level.

   Most anticipated fires will involve the common in situ ignition sources as represented by the equipment and components typically found in nuclear power plants. Such fires can be assessed using a fixed fire intensity (i.e., HRR) level for the given fire ignition source. However, consideration of a fixed fire intensity level for a given ignition source may not adequately consider the potential for low-likelihood, high intensity fires. NUREG/CR-6850 (NRC, 2005) addressed this concern by assigning a ranking of two HRR


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values. The first value assigned is the 75th percentile fire intensity. This means that 75 percent of the fires involving a given ignition source would reach an intensity no greater than the cited fire intensity (absent the fire propagating to any secondary combustibles). The second HRR value is the 98th percentile value, which is intended to represent a high-confidence fire intensity value, which based on the industry guidance cited, is expected to bound the vast majority of fires involving a given ignition source. Table 9B-1-Predefined Severities for Common Plant Ignition Source Fires provides the predefined HRR values associated with common plant ignition sources.

Based on the in situ fire or explosion hazards and sources of ignition present within the fire area under consideration, postulated fire scenarios are developed and assessed. The FPA then assigns a hazard classification to each fire area. This classification is used as a broad characterization of the overall hazard assessment of each fire area. The classification system uses the same category and naming hierarchy as the NFPA 13 (NFPA, 2007) for classification of building occupancies. However, as used herein, these classifications are only intended to be a simplified reflection of the positive correlation between fire severity and the quantity of fuel available to support combustion and the thermal properties (e.g., HRR) of the fuel. The HRR values shown for each fire area hazard classification are only intended to represent the level of intensity that would generally be expected for a fire of this type. These HRR values are not used as a basis for determining worst-case fire scenarios. The classifications used are defined as follows:

-Light Hazard - areas where, in combination or separately, the quantity or combustibility of materials are generally low, and fires with relatively low rates of heat release (e.g., 70 kW) are expected.

-Ordinary Hazard (OH) (Group 1) - areas where the combustibility of materials is generally low, the quantity of materials is moderate (without large concentrations), and fires with moderate rates of heat release (e.g., 200 kW) are expected.

-Ordinary Hazard (OH) (Group 2) - areas where the quantity and combustibility of materials are moderate to high (segregated large concentrations may exist), and fires with moderate to high rates of heat release (e.g., 650 kW) are expected.

-Extra Hazard (EH) (Group 1) - areas where the quantity and combustibility of materials are very high, with materials present that have the potential to result in rapidly developing fires with high rates of heat release (e.g., 2 MW), but with little or no combustible or flammable liquids present.

-Extra Hazard (EH) (Group 2) - areas with moderate to substantial amounts of combustible or flammable liquids present, which would result in fires having very high rates of heat release (e.g., 10 MW).

The predefined higher and lower HRR values associated with common ignition source fires and the corresponding FPA hazard classifications are provided in Table 9B-1.

7. Based on the type and nature of the plant equipment located in the area, the plant activities normally performed in the area, and the frequency of those activities, the FPA provides a transient hazard level (THL) assessment of transient fire hazards into the fire area analysis. A THL-1 determination generally reflects no need for detailed assessment of transient fire hazards. Depending on the type and quantity of in situ hazards within the area and its FPA hazard classification, a THL-2 determination may or may not reflect


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the need for detailed assessment of transient fire hazards. A THL-3 determination generally reflects the need for detailed assessment of transient fire hazards within the area analysis. In such cases, the material type, quantity, and associated thermal properties comprising the transient hazard package is evaluated. More than one type of transient hazard source may apply to a given fire area. Section 9B.2.3.3 provides additional information regarding the transient fire hazard determination process.

8. Based on compartmentation of the plant by three hour rated structural fire barriers, additional fire protection features (e.g., fire detection system capability, fixed fire suppression system capability, electrical raceway fire barrier systems) are generally not required in order to provide adequate separation of redundant trains of safe shutdown systems, components, and cables. Therefore, provision of such fire protection features are based on factors such as regulatory requirements, regulatory guidance, the magnitude of the hazards within the fire area, insights from the probabilistic fire risk assessment and plant damage business interruption considerations). Regulatory requirements and regulatory guidance takes precedent over the other considerations.

9. Based on the previously mentioned considerations, suitable fire protection defense-in-depth features are specified for all plant fire areas.

   The fire protection features provided (e.g., fire barriers and closure devices, fire detection systems, fire suppression systems and equipment) are designed and installed in accordance with applicable regulatory guidance, codes and NFPA standards. Deviations from the above requirements are justified. See U.S. EPR FSAR Section 9.5.1 for further information regarding fire protection features.

10. Appropriate manual fire suppression capability (i.e., hydrants, standpipe and hose systems, and portable fire extinguishers) are specified and described for each plant fire area.

11. Pursuant to GDC 3, the potentially disabling effects of fire suppression systems, due to normal or inadvertent operation, on SSC important to safety are described for each fire area.

12. The FPA describes the means provided to ventilate, exhaust, or isolate each fire area. Additionally, in accordance with SECY-90-016 (NRC, 1990), the ventilation system design provides reasonable assurance that smoke, hot gases, and fire suppressants do not migrate into other fire areas to the extent that they could adversely affect safe shutdown capabilities, including operator manual actions. See U.S. EPR FSAR Section 9.5.1 for further information regarding the ventilation system design.

13. For each fire area, the capability to protect SSC important to safety from flooding associated with automatic and manual fire suppression activities, including inadvertent operation or fire suppression system failure, is considered. The effects of floor drains on the ability of total flooding gaseous fire suppression systems to achieve and maintain agent concentration upon discharge is considered for applicable fire areas.

    In fire areas containing flammable or combustible liquids, the measures are provided to minimize the potential for fire propagation via the drainage system.

14. Emergency lighting required to support fire suppression activities and post fire safe shutdown operations, including access and egress routes to such locations, is described.

15. Plant communication systems, including hardwired and radio systems to provide effective communications between plant personnel performing safe shutdown


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operations, fire brigade personnel, and the main control room (MCR) or alternative shutdown location, are described.

## 9B.2.3 ASSUMPTIONS

### 9B.2.3.1 General

1. The loss of function of systems used to mitigate the consequences of design basis accidents under post fire conditions does not necessarily impact public safety. The need to limit fire damage to systems required to achieve and maintain safe shutdown conditions is greater than the need to limit fire damage to those systems required to mitigate the consequences of design basis accidents.
2. The systems used for alternative shutdown do not need to be designed to Seismic Category I criteria, single failure criteria, or other design basis accident criteria, except the portions of these systems that interface with or impact safety systems.
3. Fire damage to safe shutdown equipment or fires with the potential to result in release of radioactive materials to the environment is assessed on the basis of a single fire, including an exposure fire. An exposure fire is a fire in a given area that involves either in situ or transient combustibles and has the potential to affect SSC important to safety or radioactive materials located in or adjacent to that same area. The effects of such fire (e.g., smoke, heat, and ignition) can adversely affect those SSC important to safety. Thus, if safe shutdown equipment associated with multiple success paths were located in the same fire area, a fire involving one success path of safe shutdown equipment could constitute an exposure fire to the remaining success paths. A fire involving combustibles other than a redundant success path may constitute an exposure fire to redundant success paths located in the same area.
4. Redundant systems required for design basis accident consequence mitigation, but not required for fire safe shutdown may be damaged by a single exposure fire. The most stringent limitation for fire damage applies toward those systems that are required for both safe shutdown and design basis accident mitigation.
5. The fire event considered for alternative shutdown is a postulated fire in a specific fire area containing redundant safe shutdown cables or equipment where it has been determined that fire protection systems and features can not be provided to provide reasonable assurance that safe shutdown capability will be preserved. For the U.S. EPR, areas requiring alternative shutdown are limited to the control room.
6. It is assumed that a fire may occur at any time, but is not postulated to occur simultaneously with plant accidents or with severe natural phenomena (e.g., floods or high winds). However, severe natural phenomena (e.g., earthquakes) may initiate a fire event and are considered in evaluating the design capability of fire protection systems and features.
7. In evaluating the capability to accomplish post fire safe shutdown, offsite power may or may not be available and consideration is given to both cases. However, loss of offsite power need not be considered for a fire in non-alternative shutdown areas (i.e., outside of the control room) if it can be shown that offsite power can not be lost because of a fire in that area.
8. Alternative shutdown capability accommodates post fire conditions where offsite power is available and where offsite power is not available for 72 hours. In evaluating safe shutdown circuits, including associated circuits, the availability of uninterrupted power (i.e., offsite power available) may impact the ability to control the safe shutdown


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of the plant by increasing the potential for associated circuit interactions resulting from fire damage to energized power and control circuits.

9. Intentional station blackout (SBO) is not relied upon to mitigate potential fire damage to safe shutdown systems or associated circuits.

#### 9B.2.3.2 Ignition Sources

1. Self-ignition of electrical cables that are qualified in accordance with a nationally recognized standard fire test methodology, such as IEEE Standard 1202 (IEEE, 2006) is not considered credible due to the protective devices (e.g., fuses, circuit breakers) provided and analyzed to be properly sized. On this basis, qualified electrical cables are considered as potential damage targets, but not ignition sources. Accordingly, any type of electrical cabling routed within metal conduit is considered as potential damage targets, but do not contribute to fire growth and spread. Therefore, they are not considered as ignition sources.
2. Hot work is only considered as a transient ignition source where performance of hot work is consistent with the plant equipment and normal activities to be performed within the fire area.

#### 9B.2.3.3 Transient Fire Hazards

1. THL-1 applies to fire areas that are normally closed to any type of traffic, are not visited often (e.g., not more than once per week), are not occupied during normal plant operations, and where maintenance activities would generally be disallowed during at-power modes of plant operation. Such fire areas should also be subject to administrative controls that disallow leaving or storing unattended transient combustible materials. Examples of THL-1 areas include:
   - Areas where the exposed combustibles are limited to qualified cables, access is strictly controlled, and administrative controls prevent unattended transient combustibles.
   - Cable vaults and other areas having controlled access.
   - MCR (Exception: continuous occupancy of the MCR is not taken as indicative of a higher transient fire likelihood because extraordinary vigilance is expected for this area).
   - Reactor Building.
2. THL-2 applies to fire areas that either have occasional to frequent foot traffic (e.g., not more than once per shift and the area is not a regular access transit pathway) or are occasionally, but not continuously occupied during normal plant operations. Modest storage of transient combustible materials may be allowed. THL-2 would also apply to a fire area where maintenance activities are allowed at-power modes of plant operation, but such maintenance activities are subject to administrative controls (e.g., activity-specific permit process or other combustible controls program measures) and are a relatively rare occurrence (e.g., once per operating year). Examples of THL-2 areas or processes include:
   - Areas not normally locked but are not used as a passage to other areas of the plant (e.g., a DC power distribution panel room at the end of a corridor).


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- Normally unlocked areas that only a few plant personnel may enter once or twice per shift.
- Areas that normal plant operations may infrequently involve personnel occupation for up to several hours.
- Areas where the predominate exposed combustibles are qualified cables, but may contain other plant components.
- Areas where materials may be stored on a temporary basis (e.g., to perform a maintenance or repair activity on nearby equipment). However, such storage should be infrequent rather than routine.
- Areas where routine maintenance or repair activities (e.g., pump lube oil change-out or motor bearing maintenance) may result in the introduction of transient combustibles or ignition sources on a relatively common basis (e.g., two or more times per year) while the plant is at-power.
- Most pump rooms and areas within the Nuclear Auxiliary Building.
- Most switchgear areas and battery rooms, depending on the frequency of maintenance activities.

3. THL-3 generally applies to fire areas that have heavy foot traffic, are frequently or continuously occupied, where transient combustibles are typically stored, where plant refuse is routinely gathered in substantive quantities for collection, where ignition sources are frequently brought into the area, and where maintenance activities are common during normal plant operation. Examples of THL-3 areas include:

   - Plant areas where personnel are present for a large fraction of the time. Paper-based items (e.g., letters, reports, computer printouts) are brought in and maintained in the area. Small electrical tools or appliances (e.g., hot plates, portable heaters, microwave ovens, and coffee pots) may frequently be used in the area. Also included are health physics access control areas, break room areas, any area used for food preparation, and security stations. While not applicable to the MCR, portions of the control room complex, such as kitchen or security areas may be THL-3.
   - Areas where smoking is not prohibited, or where there is evidence of smoking.
   - Areas with open trash cans that routinely contain substantive quantities of general trash.
   - Areas where radiation protection gear (e.g., jump suits, gloves, boots) are stored or collected including turn-out and change-out areas.
   - Areas used for storage (permanent or temporary) of flammable or combustible liquids or gases.
   - Staging areas where items are repaired or constructed before they are taken to other parts of the plant for use or installation.


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- Areas where materials are prestaged in anticipation of a planned outage.
- Truck loading and unloading bays.
- Areas where hot work is relatively common during at-power plant operations.
- Areas within the diesel generator areas, intake structures, and the Radiation Waste Building.


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## 9B.3 FIRE AREA-BY-FIRE AREA EVALUATION

The FPA is performed on a fire area by fire area basis for the following plant structures:

- Turbine Building (UMA)
- Switchgear Building (UBA)
- Auxiliary Power Transformer Area (UBE)
- Generator Transformer Area (UBF)
- {Warehouse Building (UST)}
- Security Access Building (UYF)
- Central Gas Supply Building (UTG)
- {Grid Systems Control Building (UAC)}
- Fire Protection Building (USG)
- {Circulating Water System Cooling Tower Structures (URA)}
- {Circulating Water Pumphouse (UQA)}
- {Essential Service Water Emergency Makeup System Pumphouse (UPF)}
- {Circulating Water System Makeup Water Intake Structure (UPE)}

### 9B.3.1 TURBINE BUILDING

#### 9B.3.1.1 Fire Area FA-UMA-01 (Table 9B-2, Column 1)

Fire area FA-UMA-01 is the Turbine Building. It consists of all floor elevations from (-)23 ft to 65 ft, but also includes the condenser pits located at (-)43 ft below grade elevation. Due to its vast size, fire area FA-UMA-01 is divided into the following fire zones:

| Zone Number | Zone Name |
|---|---|
| FZ-UMA-01 | Turbine Building, Floor Elev. (-)23'0", Plant South |
| FZ-UMA-02 | Turbine Building, Floor Elev. (-)23'0", Plant North |
| FZ-UMA-03 | Turbine Building, Floor Elev. 0'0", Plant South |
| FZ-UMA-04 | Turbine Building, Floor Elev. 0'0", Plant North |
| FZ-UMA-05 | Turbine Building, Floor Elev. 38'0", Plant South |
| FZ-UMA-06 | Turbine Building, Floor Elev. 38'0", Plant North |
| FZ-UMA-07 | Turbine Building, Floor Elev. 65'0" |

Note: The condenser pits located at (-)43 ft are each included in FZ-UMA-01 and FZ-UMA-02, respectively.

The following areas contained in FA-UMA-01 are specifically cited for their hazards. Their locations are represented by the following descriptions:

| Hazard Location | Hazard Name |
|---|---|
| UMA03-001 | Hydrogen Seal Oil Unit |


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| Hazard Location | Hazard Name |
|---|---|
| UMA05-001 | Lube Oil Drainage Trench 1 |
| UMA05-002 | Lube Oil Lines 1 |
| UMA05-003 | Turbine-Generator/Exciter Bearings |
| UMA05-004 | Lube Oil Lines 2 |
| UMA05-005 | Lube Oil Drainage Trench 2 |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-01 from affecting adjacent fire areas.

This fire area is frequently occupied during normal plant operations. The egress route from this area in the event of a fire is via grade level exits provided from each room.

#### 9B.3.1.2 Fire Area FA-UMA-02 (Table 9B-2, Column 2)

Fire area FA-UMA-02 is the Stairwell located in the southeast (plant southeast) corner of the Turbine Building that serves those elevations from (-)23 ft to 115 ft.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-02 from affecting adjacent fire areas.

This fire area is one of four egress routes/exits from the Turbine Building. If this exit becomes obstructed due to fire conditions, three other exit stairwells are available.

#### 9B.3.1.3 Fire Area FA-UMA-03 (Table 9B-2, Column 3)

[Security-Related Information - Withheld Under 10 CFR 2.390(d)(1) - See Part 9 of this COL Application]

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-03 from affecting adjacent fire areas.

This fire area is one of four egress routes/exits from the Turbine Building. If this exit becomes obstructed due to fire conditions, three other exit stairwells are available.

#### 9B.3.1.4 Fire Area FA-UMA-04 (Table 9B-2, Column 4)

Fire area FA-UMA-04 is the Stairwell located in the northeast (plant northeast) corner of the Turbine Building that serves those elevations from (-)23 ft to 115 ft.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-04 from affecting adjacent fire areas.

This fire area is one of four egress routes/exits from the Turbine Building. If this exit becomes obstructed due to fire conditions, three other exit stairwells are available.

#### 9B.3.1.5 Fire Area FA-UMA-05 (Table 9B-2, Column 5)

[Security-Related Information - Withheld Under 10 CFR 2.390(d)(1) - See Part 9 of this COL Application]

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-05 from affecting adjacent fire areas.


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This fire area is one of four egress routes/exits from the Turbine Building. If this exit becomes obstructed due to fire conditions, three other exit stairwells are available.

#### 9B.3.1.6 Fire Area FA-UMA-06 (Table 9B-2, Column 6)

Fire area FA-UMA-06 is the Elevator shaft located in the southeast (plant southeast) corner of the Turbine Building from elevation (-)23 ft to 65 ft.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-06 from affecting adjacent fire areas.

This fire area is not used as an egress component and occupants are protected from the effects of fire by rated construction and by elevator control and recall features.

#### 9B.3.1.7 Fire Area FA-UMA-07 (Table 9B-2, Column 7)

Fire area FA-UMA-07 is the Oil Discharge Tank Room located at grade elevation within FZ-UMA-04.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-07 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is through one of multiple doors provided from the room with continuing egress to the exterior of the structure.

#### 9B.3.1.8 Fire Area FA-UMA-08 (Table 9B-2, Column 8)

Fire area FA-UMA-08 is the the Lube Oil Room located 38 ft above grade elevation. It includes the Main Lube Oil Tank, Filter and Cooler and is located within FZ-UMA-06.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-08 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is through one of multiple doors provided from the room with continuing egress to the exterior of the structure.

### 9B.3.2 SWITCHGEAR BUILDING

#### 9B.3.2.1 Fire Area FA-UBA-01 (Table 9B-2, Column 9)

Fire area FA-UBA-01 is the Switchgear Building floor located 13 ft below grade elevation. Fire area FA-UBA-01 is comprised of the following rooms:

| Room Number | Room Name |
|---|---|
| UBA01-001 | Cable Spreading Room 1 |
| UBA01-002 | Cable Spreading Room 2 |
| UBA01-003 | SBO Diesel Tank Room 1 |
| UBA01-004 | SBO Cable Spreading Room 1 |


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| Room Number | Room Name |
|---|---|
| UBA01-005 | SBO Cable Spreading Room 2 |
| UBA01-006 | SBO Diesel Tank Room 2 |
| UBA01-007 | SBO Aux. Equipment Room 1 |
| UBA01-008 | SBO Aux. Equipment Room 2 |
| UBA01-009 | Corridor |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBA-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. [Security-Related Information - Withheld Under 10 CFR 2.390(d)(1) - See Part 9 of this COL Application]

#### 9B.3.2.2 Fire Area FA-UBA-02 (Table 9B-2, Column 10)

Fire area FA-UBA-02 is the Switchgear Building floor located 0 ft (grade) elevation. Fire area FA-UBA-02 is comprised of the following rooms:

| Room Number | Room Name |
|---|---|
| UBA02-001 | MV Distribution Board Room 1 |
| UBA02-002 | 480V LV Main Distribution Room 1 |
| UBA02-003 | 480V LV Main Distribution Room 2 |
| UBA02-004 | MV Distribution Board Room 2 |
| UBA02-005 | Engine Room 1 |
| UBA02-006 | SBO Control Room 1 |
| UBA02-007 | SBO Control Room 2 |
| UBA02-008 | Engine Room 2 |
| UBA02-009 | Auxiliary Boiler Equipment Room |
| UBA02-010 | Corridor |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBA-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations.

[Security-Related Information - Withheld Under 10 CFR 2.390(d)(1) - See Part 9 of this COL Application]

#### 9B.3.2.3 Fire Area FA-UBA-03 (Table 9B-2, Column 11)

Fire area FA-UBA-03 is the Switchgear Building floor located 13 ft above grade elevation. Fire area FA-UBA-03 is comprised of the following rooms:

| Room Number | Room Name |
|---|---|
| UBA03-001 | Cable Distribution Division Room 1 |
| UBA03-002 | Cable Distribution Division Room 2 |
| UBA03-003 | Corridor |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBA-03 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations.

The egress route from this area in the event of a fire is via Turbine Building exit stairwells FA-UMA-03 and FA-UMA-05.


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#### 9B.3.2.4 Fire Area FA-UBA-04 (Table 9B-2, Column 12)

Fire area FA-UBA-04 is the Switchgear Building floor located 24.5 ft above grade elevation. Fire area FA-UBA-04 is comprised of the following rooms:

| Room Number | Room Name |
|---|---|
| UBA04-001 | Battery Room 1 |
| UBA04-002 | Battery Charger Room 1 |
| UBA04-003 | I&C Control & Protection Panel Room 1 |
| UBA04-004 | I&C Control & Protection Panel Room 2 |
| UBA04-005 | Battery Charger Room 2 |
| UBA04-006 | Battery Room 2 |
| UBA04-007 | Air Handling Room 1 |
| UBA04-008 | Air Handling Room 2 |
| UBA04-009 | Corridor |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBA-04 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. [Security-Related Information - Withheld Under 10 CFR 2.390(d)(1) - See Part 9 of this COL Application]

### 9B.3.3 AUXILIARY POWER TRANSFORMER AREA

#### 9B.3.3.1 Fire Area FA-UBE-01 (Table 9B-2, Column 13)

Fire area FA-UBE-01 is the area that houses the Emergency Auxiliary Power Transformer number 1 (EAT 1) and associated equipment in structure 31UBE. Fire area FA-UBE-01 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBE-01 | Cubicle housing the EAT 1 Transformer (30BDT01) |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-01 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

#### 9B.3.3.2 Fire Area FA-UBE-02 (Table 9B-2, Column 14)

Fire area FA-UBE-02 is the area that houses the Normal Auxiliary Power Transformer number 1 (NAT 1) and associated equipment in structure 32UBE. Fire area FA-UBE-02 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBE-02 | Cubicle housing the NAT 1 Transformer (30BBT01) |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-02 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.


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#### 9B.3.3.3 Fire Area FA-UBE-03 (Table 9B-2, Column 15)

Fire area FA-UBE-03 is the area that houses the Normal Auxiliary Power Transformer number 2 (NAT 2) and associated equipment in structure 33UBE. Fire area FA-UBE-03 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBE-03 | Cubicle housing the NAT 2 Transformer (30BBT02) |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-03 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

#### 9B.3.3.4 Fire Area FA-UBE-04 (Table 9B-2, Column 16)

Fire area FA-UBE-04 is the area that houses the Normal Auxiliary Power Transformer number 3 (NAT 3) and associated equipment in structure 34UBE. Fire area FA-UBE-04 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBE-04 | Cubicle housing the NAT 3 Transformer (30BBT03) |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-04 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

#### 9B.3.3.5 Fire Area FA-UBE-05 (Table 9B-2, Column 17)

Fire area FA-UBE-05 is the area that houses the Emergency Auxiliary Power Transformer number 2 (EAT 2) and associated equipment in structure 35UBE. Fire area FA-UBE-05 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBE-05 | Cubicle housing the EAT 2 Transformer (30BDT02) |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-04 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

### 9B.3.4 GENERATOR TRANSFORMER AREA

#### 9B.3.4.1 Fire Area FA-UBF-01 (Table 9B-2, Column 18)

Fire area FA-UBF-01 is the area that houses the Main Step-Up (MSU) Transformer 30BAT01 and associated equipment in structure 31UBF. Fire area FA-UBF-01 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBF-01 | Cubicle housing the MSU Transformer 30BAT01 |


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The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBF-01 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

#### 9B.3.4.2 Fire Area FA-UBF-02 (Table 9B-2, Column 19)

Fire area FA-UBF-02 is the area that houses the Main Step-Up (MSU) Transformer 30BAT02 and associated equipment in structure 33UBF. Fire area FA-UBF-02 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBF-02 | Cubicle housing the MSU Transformer 30BAT02 |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBF-02 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

#### 9B.3.4.3 Fire Area FA-UBF-03 (Table 9B-2, Column 20)

Fire area FA-UBF-03 is the area that houses the Main Step-Up (MSU) Transformer 30BAT03 and associated equipment in structure 33UBF. Fire area FA-UBF-03 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBF-03 | Cubicle housing the MSU Transformer 30BAT03 |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBF-03 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

#### 9B.3.4.4 Fire Area FA-UBF-04 (Table 9B-2, Column 21)

Fire area FA-UBF-04 is the area that houses the spare Main Step-Up (MSU) Transformer 30BAT04 and associated equipment in structure 34UBF. Fire area FA-UBF-04 is comprised of the following zones:

| Zone Number | Fire Zone Description |
|---|---|
| FZ-UBF-04 | Cubicle housing the spare MSU Transformer 30BAT04 |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBF-04 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.


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## 9B.3.5 {WAREHOUSE BUILDING

### 9B.3.5.1 Fire Area FA-UST-01 (Table 9B-2, Column 22)

Fire area FA-UST-01 is the Warehouse Building. It consists of the following rooms:

| Room Number | Room Name |
|---|---|
| UST-01-001 | Office |
| UST-01-002 | Storage Area |

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UST-01 from affecting adjacent fire areas.

This fire area is frequently occupied during normal plant operations. The egress route from this area in the event of a fire is via the stair enclosures located at each corner of the Warehouse Building.}

## 9B.3.6 SECURITY ACCESS FACILITY

### 9B.3.6.1 Fire Area FA-UYF-01 (Table 9B-2, Column 23)

Fire area FA-UYF-01 is the Security Access Facility.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UYF-01 from affecting adjacent fire areas.

This fire area is frequently occupied during normal plant operations. The egress route from this area in the event of a fire is via grade level exits.

## 9B.3.7 CENTRAL GAS SUPPLY BUILDING

### 9B.3.7.1 Fire Area FA-UTG-01 (Table 9B-2, Column 24)

Fire area FA-UTG-01 is the oxygen cylinder storage room.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UTG-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.

### 9B.3.7.2 Fire Area FA-UTG-02 (Table 9B-2, Column 25)

Fire area FA-UTG-02 is the miscellaneous gas cylinder storage room. Gases stored in this area include argon, nitrogen, and argon-methane (flammable – 90% argon, 10% methane).

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UTG-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.


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#### 9B.3.7.3 Fire Area FA-UTG-03 (Table 9B-2, Column 26)

Fire area FA-UTG-03 is the hydrogen cylinder storage room. Only hydrogen gas is stored in this area.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UTG-03 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.

### 9B.3.8 {GRID SYSTEMS CONTROL BUILDING

#### 9B.3.8.1 Fire Area FA-UAC-01 (Table 9B-2, Column 27)

Fire area FA-UAC-01 is one of two switchyard control rooms and is designated as Switchyard Control Room 1.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UAC-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.

#### 9B.3.8.2 Fire Area FA-UAC-02 (Table 9B-2, Column 28)

Fire area FA-UAC-02 is one of two switchyard control rooms and is designated as Switchyard Control Room 2.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UAC-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.}

### 9B.3.9 FIRE PROTECTION BUILDING

#### 9B.3.9.1 Fire Area FA-USG-01 (Table 9B-2, Column 29)

Fire area FA-USG-01 is one of two diesel fire pump rooms and is designated as Diesel Fire Pump Room 1.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-USG-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single exit to the exterior.

#### 9B.3.9.2 Fire Area FA-USG-02 (Table 9B-2, Column 30)

Fire area FA-USG-02 is one of two diesel fire pump rooms and is designated as Diesel Fire Pump Room 2.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-USG-02 from affecting adjacent fire areas.


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This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single exit to the exterior.

#### 9B.3.9.3 Fire Area FA-USG-03 (Table 9B-2, Column 31)

Fire area FA-USG-03 is the electric and jockey fire pump room.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-USG-03 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single exit to the exterior.

### 9B.3.10 {CIRCULATING WATER SYSTEM COOLING TOWER STRUCTURES

#### 9B.3.10.1 Fire Area FA-URA-01 (Table 9B-2, Column 32)

Fire area FA-URA-01 is the west Circulating Water System Cooling Tower Structure.

The adequacy of the fire protection features provided are sufficient to prevent a fire originating within fire area FA-URA-01 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations.

#### 9B.3.10.2 Fire Area FA-URA-02 (Table 9B-2, Column 33)

Fire area FA-URA-02 is the east Circulating Water System Cooling Tower Structure.

The adequacy of the fire protection features provided are sufficient to prevent a fire originating within fire area FA-URA-02 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations.

### 9B.3.11 CIRCULATING WATER SYSTEM PUMPHOUSE

#### 9B.3.11.1 Fire Area FA-UQA-01 (Table 9B-2, Column 34)

Fire area FA-UQA-01 is the upper floor level of the building that houses electrical equipment and the four circulating water system pumps.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within Fire Area FA-UQA-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of fire is via the three exits to the exterior.

### 9B.3.12 ESSENTIAL SERVICE WATER EMERGENCY MAKEUP SYSTEM PUMPHOUSE

#### 9B.3.12.1 Fire Area FA-UPF-01 (Table 9B-2, Column 35)

Fire area FA-UPF-01 is the corridor which serves the ESWEMS pump rooms.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-01 from affecting adjacent fire areas.


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This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of fire is via two exits to the exterior.

#### 9B.3.12.2 Fire Area FA-UPF-02 (Table 9B-2, Column 36)

Fire area FA-UPF-02 is one of the ESWEMS pump rooms and is designated as ESWEMS Pump Room 1.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of fire is via a single grade level exit to fire area FA-UPF-01, a single mezzanine level exit to fire area FA-UPF-03, and via multiple ladders from below grade and the mezzanine.

#### 9B.3.12.3 Fire Area FA-UPF-03 (Table 9B-2, Column 37)

Fire area FA-UPF-03 is one of the four ESWEMS pump rooms and is designated ESWEMS Pump Room 2.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-03 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of fire is via a single grade level exit to the fire area FA-UPF-01, a single mezzanine level exit to fire area FA-UPF-02, and via multiple ladders from below grade and the mezzanine.

#### 9B.3.12.4 Fire Area FA-UPF-04 (Table 9B-2, Column 38)

Fire area FA-UPF-04 is one of the four ESWEMS pump rooms and is designated as ESWEMS Pump Room 3.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-04 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of fire is via a single grade level exit to the fire area FA-UPF-01, a single mezzanine level exit to fire area FA-UPF-05, and via multiple ladders from below grade and the mezzanine.

#### 9B.3.12.5 Fire Area FA-UPF-05 (Table 9B-2, Column 39)

Fire area FA-UPF-05 is one of the four ESWEMS pump rooms and is designated as ESWEMS Pump Room 4.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-05 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of fire is via a single grade level exit to the fire area FA-UPF-01, a single mezzanine level exit to fire area FA-UPF-04, and via multiple ladders from below grade and the mezzanine.


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## 9B.3.13 CIRCULATING WATER SYSTEM MAKEUP WATER INTAKE STRUCTURE

### 9B.3.13.1 Fire Area FA-UPE-01 (Table 9B-2, Column 40)

Fire Area FA-UPE-01 is an open area on the upper level of the building. Electrical control equipment, three circulating water system makeup pumps, three RWS makeup pumps, and three screen-wash pumps are in this area.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within Fire Area FA-UPE-01 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. The egress route from this area is via two exits to the exterior.}


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## 9B.4 REFERENCES

{**CFR, 2008a.** Title 10, Code of Federal Regulations, CFR Part 52.48, Standards for Review of Applications, 2008.

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**NRC, 2007b.** NUREG-0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, Nuclear Regulatory Commission, March 2007.}


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**Table 9B-1 Predefined Severities for Common Plant Ignition Source Fires**

| Fire Size (Hazard Classification) | Small Electrical Fire | Large Electrical Fire | Indoor Oil-Filled Transformers | Very Large Fire Sources | Engines and Heaters | Solid and Transient Combustibles |
|---|---|---|---|---|---|---|
| 70 kW (Light) | 75th Percentile Fire | | | | 75th Percentile Fire | 75th Percentile Fire |
| 200 kW (OH-Group 1) | 98th Percentile Fire | 75th Percentile Fire | | | 98th Percentile Fire | 98th Percentile Fire |
| 650 kW (OH Group 2) | | 98th Percentile Fire | 75th Percentile Fire | 75th Percentile Fire | | |
| 2 MW (EH Group 1) | | | 98th Percentile Fire | | | |
| 10 MW (EH Group 2) | | | | 98th Percentile Fire | | |


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**Table 9B-2 {Fire Area Parameters}**
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| Column | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Fire Area | FA-UMA-01 | FA-UMA-02 | FA-UMA-03 | FA-UMA-04 | FA-UMA-05 |
| Building or Area | UMA | UMA | UMA | UMA | UMA |
| Figures | Figures 9B-1 through 9B-5, 7, 9 | Figures 9B-1 through 9B-4, 6, 8 | Figures 9B-1 through 9B-4, 6 | Figures 9B-1 through 9B-4, 6 | Figures 9B-1 through 9B-4, 6, 8 |
| Fire Barriers (Notes 3,4,5,6) | See Figures | See Figures | See Figures | See Figures | See Figures |
| SSC: important to safety | None | None | None | None | None |
| SCC: post-fire safe shutdown | None | None | None | None | None |
| In situ Loading (Note 1) | a, b, c, d, f, g, j | None | None | None | None |
| Transient Fire Loading | THL-3 | THL-2 | THL-2 | THL-2 | THL-2 |
| Common Ignition Source (Note 2a) | a, b, c, d, e, m | a | a | a | a |
| Atypical Ignition Sources (Note 2b) | cc, dd, ee | None | None | None | None |
| Hazard Classification (Note 13) | OH Group-2 | Light Hazard | Light Hazard | Light Hazard | Light Hazard |
| Automatic Fire Detection | Yes (Hazard specific)<br>05-003 T-G/Exciter Brgs<br>03-001 H2 Seal Oil Unit<br>05-001 LO Drain Trench 1<br>05-005 LO Drain Trench 2 | No | No | No | No |
| Manual Fire Alarms | Yes | Yes | Yes | Yes | Yes |
| Automatic Fixed Fire Suppression | Yes<br>(Hazard & Zone specific)<br>Auto wet-pipe: Turbine underfloor zones & skirt, and Lube Oil lines 1 and 2<br>Auto pre-action: T-G/ Exciter Bearings<br>Auto water spray: H2 Seal Oil Unit, and Lube Oil Drain Trenches | Yes | Yes | Yes | Yes |
| Manual Fixed Fire Suppression | No | No | No | No | No |
| Standpipe and Hose System (Note 7) | Yes | Yes | Yes | Yes | Yes |
| Portable Fire Extinguishers (Note 8) | Yes | Yes | Yes | Yes | Yes |
| Suppression Affects | Note 14 | Note 14 | Note 14 | Note 14 | Note 14 |
| Plant Drains | Note 9 | Note 9 | Note 9 | Note 9 | Note 9 |
| Radiological Affects | None | None | None | None | None |
| HVAC | Note 10<br>Smoke and heat vents | Note 10 | Note 10 | Note 10 | Note 10 |
| Emergency Lighting (Note 11) | aa | aa | aa | aa | aa |
| Communication (Note 12) | Yes | Yes | Yes | Yes | Yes |
| Engineering Evaluations | None | None | None | None | None |


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**Table 9B-2 {Fire Area Parameters}**
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| Column | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|
| Fire Area | FA-UMA-06 | FA-UMA-07 | FA-UMA-08 | FA-UBA-01 | FA-UBA-02 |
| Building or Area | UMA | UMA | UMA | UBA | UBA |
| Figures | Figures 9B-1 through 9B-4, 6 | Figures 9B-2, 9 | Figures 9B-3, 7, 8 | Figures 9B-10,14 | Figures 9B-11, 12, 14 |
| Fire Barriers (Notes 3,4,5,6) | See Figures | See Figures | See Figures | See Figures | See Figures |
| SSC: important to safety | None | None | None | Yes | Yes |
| SCC: post-fire safe shutdown | None | None | None | None | None |
| In situ Loading (Note 1) | a, c, d, e, g, j | d | a, c, d, e, g, j | a, b, c, d, e, g, j, n | a, b, c, d, e, g, j, k, n, s |
| Transient Fire Loading | THL-2 | THL-2 | THL-2 | THL-2 | THL-2 |
| Common Ignition Source (Note 2a) | a, b, m | a | a, b, c, d, m | a, b, c, d, g, m | a, b, c, d, g, i, k, m, p |
| Atypical Ignition Sources (Note 2b) | None | ee | ee | aa, ee | aa, ee |
| Hazard Classification (Note 13) | OH Group-1 | EH Group-2 | EH Group-2 | EH Group-2<br>EH Group-1<br>Light | EH Group-2<br>OH Group-1<br>Light |
| Automatic Fire Detection | No | No | No | Yes (Hazard specific)<br>01-001 Cable Spread Rm 1<br>01-002 Cable Spread Rm 2<br>01-004 SBO Cable Spread Rm 1<br>01-005 SBO Cable Spread Rm 2 | Yes (Hazard specific)<br>02-001 MV Dist Bd Rm 1<br>02-002 LV Main Dist Rm 1<br>02-003 LV Main Dist Rm 2<br>02-004 MV Dist Bd Rm 2<br>02-006 SBO Control Rm 1<br>02-007 SBO Control Rm 2 |
| Manual Fire Alarms | Yes | Yes | Yes | Yes | Yes |
| Automatic Fixed Fire Suppression | Yes | Yes | Yes | Yes (Hazard specific)<br>Auto wet-pipe: SBO Diesel Tank Rooms, SBO Aux. Equip. Rms, and Corridor<br>Auto double interlock pre-action: Cable Spreading Rooms | Yes (Hazard specific)<br>Auto wet-pipe: Engine Rooms, Aux. Boiler Equip. Rm and Corridor<br>Auto double interlock pre-action: MV and LV Distrib Board Rms and SBO Control Rooms |


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**Table 9B-2 {Fire Area Parameters}**
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| | | | | | |
|---|---|---|---|---|---|
| Manual Fixed Fire Suppression | No | No | No | No | No |
| Standpipe and Hose System (Note 7) | Yes | Yes | Yes | Yes | Yes |
| Portable Fire Extinguishers (Note 8) | Yes | Yes | Yes | Yes | Yes |
| Suppression Affects | Note 14 | Note 14 | Note 14 | Note 14 | Note 14 |
| Plant Drains | Note 9 | Note 9 | Note 9 | Note 9 | Note 9 |
| Radiological Affects | None | None | None | None | None |
| HVAC | Note 10 | Note 10 | Note 10 | Note 10 | Note 10 |
| Emergency Lighting (Note 11) | aa | aa | aa | aa | aa |
| Communication (Note 12) | Yes | Yes | Yes | Yes | Yes |
| Engineering Evaluations | None | None | None | None | None |


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**Table 9B-2 {Fire Area Parameters}**
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| Column | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|
| Fire Area | FA-UBA-03 | FA-UBA-04 | FA-UBE-01 | FA-UBE-02 | FA-UBE-03 |
| Building or Area | UBA | UBA | UBE | UBE | UBE |
| Figures | Figures 9B-12, 14 | Figures 9B-13, 14 | Figure 9B-15 | Figure 9B-15 | Figure 9B-15 |
| Fire Barriers (Notes 3,4,5,6) | See Figures | See Figures | See Figure | See Figure | See Figures |
| SSC: important to safety | Yes | Yes | Yes | None | None |
| SCC: post-fire safe shutdown | None | None | None | None | None |
| In situ Loading (Note 1) | a, c, e, g, j | a, b, c, e, f, g, h, j, m | a, e, g, l | a, e, g, l | a, e, g, l |
| Transient Fire Loading | THL-2 | THL-2 | THL-2 | THL-2 | THL-2 |
| Common Ignition Source (Note 2a) | a, b, g, m | a, b, g, j, k, m | a, b, f | a, b, f | a, b, f |
| Atypical Ignition Sources (Note 2b) | aa | aa | aa, ee, ff | aa, ee, ff | aa, ee, ff |
| Hazard Classification (Note 13) | EH Group-1<br>Light | OH Group-2<br>OH Group-1<br>Light | EH Group-2 | EH Group-2 | EH Group-2 |
| Automatic Fire Detection | Yes (Hazard specific)<br>03-001 Cable Dist Div., Rm 1<br>03-002 Cable Dist Div., Rm 2 | Yes (Hazard specific)<br>04-001 Battery Rm 1<br>04-002 Battery Chgr Rm 1<br>04-003 I&C C&P Panel Rm 1<br>04-004 I&C C&P Panel Rm 2<br>04-005 Battery Chgr Rm 2<br>04-006 Battery Rm 2 | Yes | Yes | Yes |
| Manual Fire Alarms | Yes | Yes | No | No | No |
| Automatic Fixed Fire Suppression | Yes (Hazard specific)<br>Auto wet-pipe: Corridor<br>Auto double interlock pre-action: Cable Distribution Division Rooms | Yes (Hazard specific)<br>Auto wet-pipe: Air Handling Rms and Corridor<br>Auto double interlock pre-action: Battery Rms, Battery Charger Rms, and I&C Control / Protection Panel Rms | Yes | Yes | Yes |
| Manual Fixed Fire Suppression | No | No | No | No | No |
| Standpipe and Hose System (Note 7) | Yes | Yes | No | No | No |


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**Table 9B-2 {Fire Area Parameters}**
(Page 5 of 16)

| | | | | | |
|---|---|---|---|---|---|
| Portable Fire Extinguishers (Note 8) | Yes | Yes | No | No | No |
| Suppression Affects | Note 14 | Note 14 | Note 14 | Note 14 | Note 14 |
| Plant Drains | Note 9 | Note 9 | Note 9 | Note 9 | Note 9 |
| Radiological Affects | None | None | None | None | None |
| HVAC | Note 10 | Note 10 | Note 10 | Note 10 | Note 10 |
| Emergency Lighting (Note 11) | aa | aa | None | None | None |
| Communication (Note 12) | Yes | Yes | Yes | Yes | Yes |
| Engineering Evaluations | None | None | None | None | None |


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**Table 9B-2 {Fire Area Parameters}**
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| Column | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|
| Fire Area | FA-UBE-04 | FA-UBE-05 | FA-UBF-01 | FA-UBF-02 | FA-UBF-03 |
| Building or Area | UBE | UBE | UBF | UBF | UBF |
| Figures | Figure 9B-15 | Figure 9B-15 | Figure 9B-15 | Figure 9B-15 | Figure 9B-15 |
| Fire Barriers (Notes 3,4,5,6) | See Figure | See Figure | See Figure | See Figure | See Figure |
| SSC: important to safety | None | Yes | None | None | None |
| SCC: post-fire safe shutdown | None | None | None | None | None |
| In situ Loading (Note 1) | a, e, g, l | a, e, g, l | a, e, g, l | a, e, g, l | a, e, g, l |
| Transient Fire Loading | THL-2 | THL-2 | THL-2 | THL-2 | THL-2 |
| Common Ignition Source (Note 2a) | a, b, f | a, b, f | a, b, f | a, b, f | a, b, f |
| Atypical Ignition Sources (Note 2b) | aa, ee, ff | aa, ee, ff | aa, ee, ff | aa, ee, ff | aa, ee, ff |
| Hazard Classification (Note 13) | EH Group-2 | EH Group-2 | EH Group-2 | EH Group-2 | EH Group-2 |
| Automatic Fire Detection | Yes | Yes | Yes | Yes | Yes |
| Manual Fire Alarms | No | No | No | No | No |
| Automatic Fixed Fire Suppression | Yes | Yes | Yes | Yes | Yes |
| Manual Fixed Fire Suppression | No | No | No | No | No |
| Standpipe and Hose System (Note 7) | No | No | No | No | No |
| Portable Fire Extinguishers (Note 8) | No | No | No | No | No |
| Suppression Affects | Note 14 | Note 14 | Note 14 | Note 14 | Note 14 |
| Plant Drains | Note 9 | Note 9 | Note 9 | Note 9 | Note 9 |
| Radiological Affects | None | None | None | None | None |
| HVAC | Note 10 | Note 10 | Note 10 | Note 10 | Note 10 |
| Emergency Lighting (Note 11) | None | None | None | None | None |
| Communication (Note 12) | Yes | Yes | Yes | Yes | Yes |
| Engineering Evaluations | None | None | None | None | None |


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**Table 9B-2 {Fire Area Parameters}**
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| Column | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|
| Fire Area | FA-UBF-04 | FA-UST-01 | FA-UYF-01 | FA-UTG-01 | FA-UTG-02 |
| Building or Area | UBF | UST | UYF | UTG | UTG |
| Figures | Figure 9B-15 | Figure 9B-16 | Figure 9B-17 | Figure 9B-18 | Figure 9B-18 |
| Fire Barriers (Notes 3,4,5,6) | See Figure | See Figure | See Figure | See Figure | See Figure |
| SSC: important to safety | None | None | None | None | None |
| SCC: post-fire safe shutdown | None | None | None | None | None |
| In situ Loading (Note 1) | a, e, g, l | a, b, c, d, r, s | a, b, c, r, s | a, c, g, j | a, c, g, j, u |
| Transient Fire Loading | THL-2 | THL-3 | THL-3 | THL-1 | THL-1 |
| Common Ignition Source (Note 2a) | a, b, f | a, c | a | a, m | a, m |
| Atypical Ignition Sources (Note 2b) | aa, ee, ff | ee | None | None | None |
| Hazard Classification (Note 13) | EH Group-2 | OH Group-2 | Light Hazard | EH Group-2 | OH Group-2 |
| Automatic Fire Detection | Yes | No | Yes | No | No |
| Manual Fire Alarms | No | Yes | Yes | Yes | Yes |
| Automatic Fixed Fire Suppression | Yes | Yes | No | Yes | Yes |
| Manual Fixed Fire Suppression | No | No | No | No | No |
| Standpipe and Hose System (Note 7) | No | Yes | No | No | No |
| Portable Fire Extinguishers (Note 8) | No | Yes | Yes | Yes | Yes |
| Suppression Affects | Note 14 | Note 14 | Note 14 | Note 14 | Note 14 |
| Plant Drains | Note 9 | Note 9 | Note 9 | Note 9 | Note 9 |
| Radiological Affects | None | None | None | None | None |
| HVAC | Note 10 | Note 10 | Note 10 | Note 10 | Note 10 |
| Emergency Lighting (Note 11) | None | aa | aa | aa | aa |
| Communication (Note 12) | Yes | Yes | Yes | Yes | Yes |
| Engineering Evaluations | None | None | None | None | None |


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**Table 9B-2 {Fire Area Parameters}**
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| Column | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|
| Fire Area | FA-UTG-03 | FA-UAC-01 | FA-UAC-02 | FA-USG-01 | FA-USG-02 |
| Building or Area | UTG | UAC | UAC | USG | USG |
| Figures | Figure 9B-18 | Figure 9B-19 | Figure 9B-19 | Figure 9B-20 | Figure 9B-20 |
| Fire Barriers (Notes 3,4,5,6) | See Figure | See Figure | See Figure | See Figure | See Figure |
| SSC: important to safety | None | None | None | Yes | Yes |
| SCC: post-fire safe shutdown | None | None | None | None | None |
| In situ Loading (Note 1) | a, c, f, g, j | a, b, c, d, e, f, g, j, m, r, s, v | a, b, c, d, e, f, g, j, m, r, s, v | a, c, d, g, j, n | a, c, d, g, j, n |
| Transient Fire Loading | THL-1 | THL-2 | THL-2 | THL-2 | THL-2 |
| Common Ignition Source (Note 2a) | a, m | a, b, j, m | a, b, j, m | a, b, d, m | a, b, d, m |
| Atypical Ignition Sources (Note 2b) | bb | None | None | ee | ee |
| Hazard Classification (Note 13) | EH Group-2 | OH Group-1 | OH Group-1 | EH Group-2 | EH Group-2 |
| Automatic Fire Detection | No (H2 gas detection w/ exhaust auto-start) | Yes | Yes | No | No |
| Manual Fire Alarms | Yes | Yes | Yes | Yes | Yes |
| Automatic Fixed Fire Suppression | Yes | No | No | Yes | Yes |
| Manual Fixed Fire Suppression | No | No | No | No | No |
| Standpipe and Hose System (Note 7) | No | No | No | No | No |
| Portable Fire Extinguishers (Note 8) | Yes | Yes | Yes | Yes | Yes |
| Suppression Affects | Note 14 | Note 14 | Note 14 | Note 14 | Note 14 |
| Plant Drains | Note 9 | Note 9 | Note 9 | Note 9 | Note 9 |
| Radiological Affects | None | None | None | None | None |
| HVAC | Note 10 | Note 10 | Note 10 | Note 10 | Note 10 |
| Emergency Lighting (Note 11) | aa | aa | aa | aa | aa |
| Communication (Note 12) | Yes | Yes | Yes | Yes | Yes |
| Engineering Evaluations | None | None | None | None | None |


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**Table 9B-2 {Fire Area Parameters}**
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| Column | 31 | 32 | 33 | 34 | 35 |
|---|---|---|---|---|---|
| Fire Area | FA-USG-03 | FA-URA-01 | FA-URA-02 | FA-UQA-01 | FA-UPF-01 |
| Building or Area | USG | URA | URA | UQA | UPF |
| Figures | Figure 9B-20 | Figure 9B-21 | Figure 9B-21 | Figure 9B-22 | Figure 9B-23 |
| Fire Barriers (Notes 3,4,5,6) | See Figure | See Figure | See Figure | See Figure | See Figure |
| SSC: important to safety | None | None | None | None | None |
| SCC: post-fire safe shutdown | None | None | None | None | None |
| In situ Loading (Note 1) | a, c, d, g, j | a, b, d, e, g, w | a, b, d, e, g, w | a, b, c, d, e, g, j | a, c, g |
| Transient Fire Loading | THL-2 | THL-1 | THL-1 | THL-2 | THL-2 |
| Common Ignition Source (Note 2a) | a, b, c, d, m | a, b, c | a, b, c | a, b, c, d, m | a |
| Atypical Ignition Sources (Note 2b) | None | ee | ee | None | None |
| Hazard Classification (Note 13) | OH Group-1 | OH Group-2 | OH Group-2 | OH Group-1 | Light |
| Automatic Fire Detection | Yes | Yes | Yes | Yes | Yes |
| Manual Fire Alarms | Yes | Yes | Yes | Yes | Yes |
| Automatic Fixed Fire Suppression | No | No | No | No | No |
| Manual Fixed Fire Suppression | No | No | No | No | No |
| Standpipe and Hose System (Note 7) | No | No | No | No | Yes |
| Portable Fire Extinguishers (Note 8) | Yes | Yes | Yes | Yes | Yes |
| Suppression Affects | Note 14 | Note 14 | Note 14 | Note 14 | Note 14 |
| Plant Drains | Note 9 | Note 9 | Note 9 | Note 9 | Note 9 |
| Radiological Affects | None | None | None | None | None |
| HVAC | Note 10 | Note 10 | Note 10 | Note 10 | Note 10 |
| Emergency Lighting (Note 11) | aa | None | None | aa | aa |
| Communication (Note 12) | Yes | Yes | Yes | Yes | Yes |
| Engineering Evaluations | None | None | None | None | None |


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**Table 9B-2 {Fire Area Parameters}**
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| Column | 36 | 37 | 38 | 39 | 40 |
|---|---|---|---|---|---|
| Fire Area | FA-UPF-02 | FA-UPF-03 | FA-UPF-04 | FA-UPF-05 | FA-UPE-01 |
| Building or Area | UPF | UPF | UPF | UPF | UPE |
| Figures | Figure 9B-23 | Figure 9B-23 | Figure 9B-23 | Figure 9B-23 | Figure 9B-24 |
| Fire Barriers (Notes 3,4,5,6) | See Figure | See Figure | See Figure | See Figure | See Figure |
| SSC: important to safety | Yes | Yes | Yes | Yes | None |
| SCC: post-fire safe shutdown | None | None | None | None | None |
| In situ Loading (Note 1) | a, c, e, g, j, k, t | a, c, e, g, j, k, t | a, c, e, g, j, k, t | a, c, e, g, j, k, t | a, c, d, e, g, j |
| Transient Fire Loading | THL-2 | THL-2 | THL-2 | THL-2 | THL-2 |
| Common Ignition Source (Note 2a) | a, b, c, d, m, o, p | a, b, c, d, m, o, p | a, b, c, d, m, o, p | a, b, c, d, m, o, p | a, b, c, d, m |
| Atypical Ignition Sources (Note 2b) | None | None | None | None | None |
| Hazard Classification (Note 13) | Light | Light | Light | Light | OH Group-1 |
| Automatic Fire Detection | Yes | Yes | Yes | Yes | Yes |
| Manual Fire Alarms | Yes | Yes | Yes | Yes | Yes |
| Automatic Fixed Fire Suppression | No | No | No | No | No |
| Manual Fixed Fire Suppression | No | No | No | No | No |
| Standpipe and Hose System (Note 7) | Yes | Yes | Yes | Yes | No |
| Portable Fire Extinguishers (Note 8) | Yes | Yes | Yes | Yes | Yes |
| Suppression Affects | Note 14 | Note 14 | Note 14 | Note 14 | Note 14 |
| Plant Drains | Note 9 | Note 9 | Note 9 | Note 9 | Note 9 |
| Radiological Affects | None | None | None | None | None |
| HVAC | Note 10 | Note 10 | Note 10 | Note 10 | Note 10 |
| Emergency Lighting (Note 11) | aa | aa | aa | aa | aa |
| Communication (Note 12) | Yes | Yes | Yes | Yes | Yes |
| Engineering Evaluations | None | None | None | None | None |


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**Table 9B-2 {Fire Area Parameters}**
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**Notes**

1. In-situ Loading:

   a. Miscellaneous Cable Insulation
   b. Miscellaneous Plastic and Rubber
   c. Miscellaneous Wire and Plastic Components (Panels)
   d. Lubricants and Hydraulic Fluids
   e. Electrical Cabinets
   f. Flammable Gases (Hydrogen)
   g. Electrical Cable Insulation (Cable Trays)
   h. Charcoal (Filters)
   i. Air Compressors
   j. HVAC Subsystem Components
   k. Transformers (Dry)
   l. Transformers (Oil-filled)
   m. Battery Cases
   n. Diesel Fuel Oil
   o. Paints, Solvents and Cleaning Fluids
   p. Clothing (Cotton and Synthetic Blends)
   q. Clothing (Rubber and Plastic)
   r. Paper Records, Procedures and Files
   s. Furniture and/or Appliances
   t. Air Handling Units
   u. Flammable Gases (Methane)
   v. Battery Chargers


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**Table 9B-2 {Fire Area Parameters}**
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2a. Common Ignition Sources:

j . Low to Medium Voltage Electrical Circuits

k . General Electrical and Control Cabinets

l . Electric Motors

m . Pumps

n . Air Compressors

o . Indoor Oil-filled Transformers

p . Electrical Switchgear Cabinets

q . Reactor Protection System MG sets

r . Diesel Generators

s . Battery Banks

t . Boiler Heating Units

u . Electric Dryers

v . HVAC subsystem components

w . Low Voltage Electrical Circuits

x . Air Handling Units

y . Transformers (Dry)


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**Table 9B-2 {Fire Area Parameters}**
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2b. Atypical Ignition Sources:

aa. Arcing Electrical Faults

bb. Hydrogen Storage Tanks

cc. Hydrogen Piping

dd. T/G Exciter / Hydrogen

ee. Liquid Fuels (spills)

ff. Outdoor Oil-filled Transformers

3. Barrier Ratings: See "Fire Barrier Location" located on the Fire Area Layout Drawings

4. Doors:

- For 1 hour fire rated barriers, minimum 1 hour fire rated door assemblies are provided.
- For 2 hour fire rated barriers, minimum 1.5 hour fire rated door assemblies are provided.
- For 3 hour fire rated barriers, minimum 3 hour fire rated door assemblies are provided.

5. Dampers:

- For 1 hour fire rated barriers, minimum 1 hour fire rated dampers are provided, except where through duct configuration is suitable to satisfy NFPA 90A (NFPA, 2002) requirements to allow for dampers to be omitted.
- For 2-hour fire rated barriers, minimum 1.5-hour fire rated dampers are provided.
- For 3-hour fire rated barriers, minimum 3-hour fire rated dampers are provided.


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**Table 9B-2 {Fire Area Parameters}**
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6. Penetrations:

   Penetrations through fire rated walls, floors, and ceilings of each fire area are sealed or otherwise closed with rated penetration seal assemblies except where seal omission is permitted by NFPA code/standard. Any non-rated penetrations through rated barriers in this fire area will be justified by engineering evaluations.

7. Standpipe and Hose Stations:

   A Class II hose and standpipe system is available.

8. Portable Fire Extinguishers:

   Portable fire extinguishers are available throughout the building to support manual fire fighting activities.

9. Plant Drains:

   Drainage to be determined during detailed design. Drains will be provided except where storage of hazardous materials and/or radiological contamination imposes requirements for confinement and/or secondary containment.


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**Table 9B-2 {Fire Area Parameters}**
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10. HVAC:

Duct smoke detection and fan interlock will be provided when required by NFPA 90A.

11. Emergency Lighting:

aa. self-contained, battery backed fixtures installed throughout the fire area which provide minimum illumination for a 90 minute period to ensure a safe access/egress path in the event of a loss of the normal lighting system.

12. Communication:

One or more of the following methods of communication are available: plant-wide public address/paging system, in-plant telephone system, external communication links to the outside world, and/or portable radio communications.

13. Hazard Classification:

See Section 9B.2.2 for definition of hazard classifications.

- Light Hazard
- Ordinary Hazard (OH Group-1)
- Ordinary Hazard (OH Group-2)
- Extra Hazard (EH Group-1)
- Extra Hazard (EH Group-2)


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**Table 9B-2 {Fire Area Parameters}**
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14. Suppression Affects:

No adverse affects from automatic suppression systems are anticipated based on selected suppression agents and systems, on the absence of important to safety SSCs in the area or room of concern, and/or on the absence of important to safety SSCs susceptible to damage in the area or room of concern. This will require confirmation after final room/area, suppression system and important to safety SSC configuration/layout.


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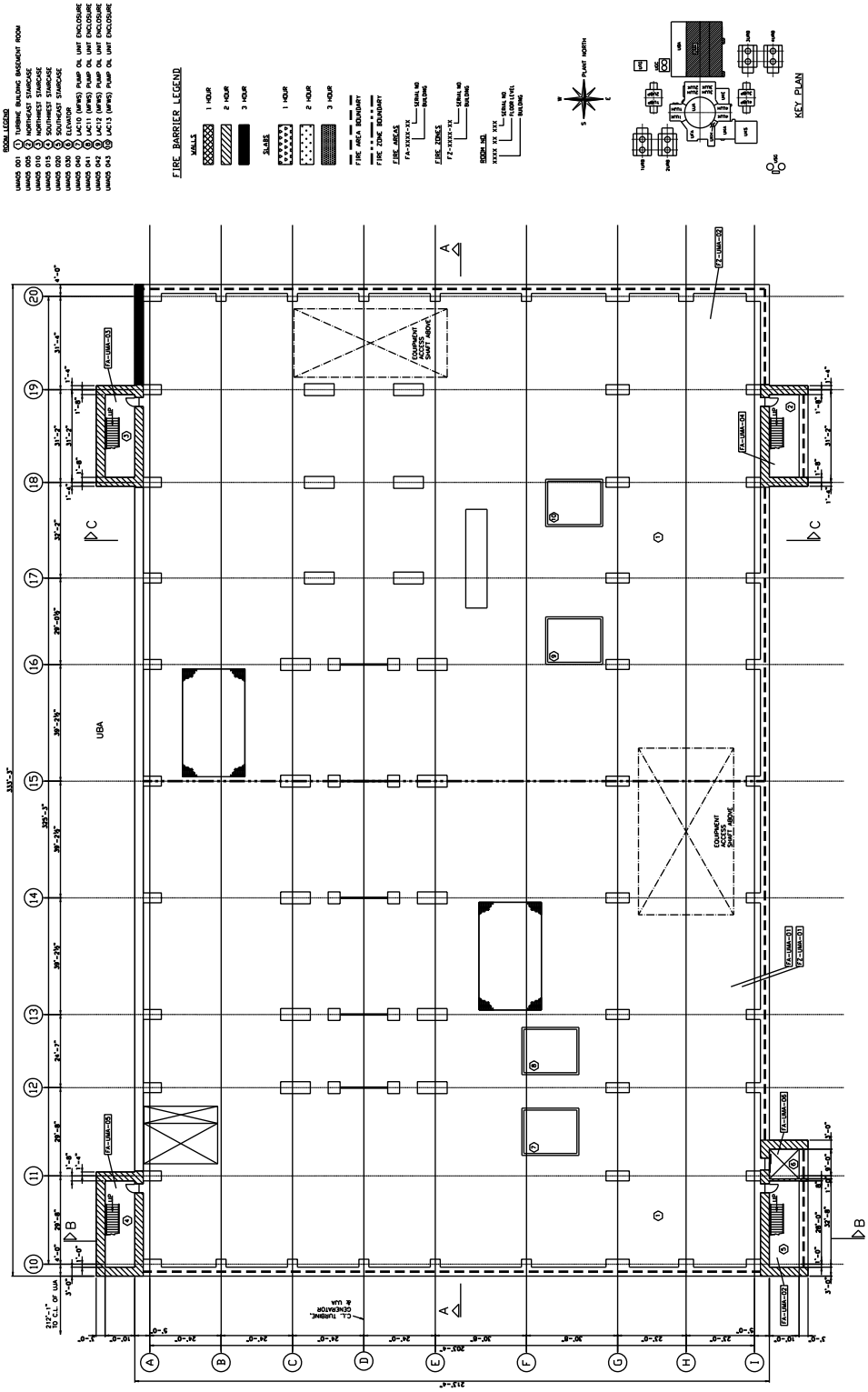
**Figure 9B-1 {Fire Barrier Location, Turbine Building Plan at Elevation (-)23 ft}**





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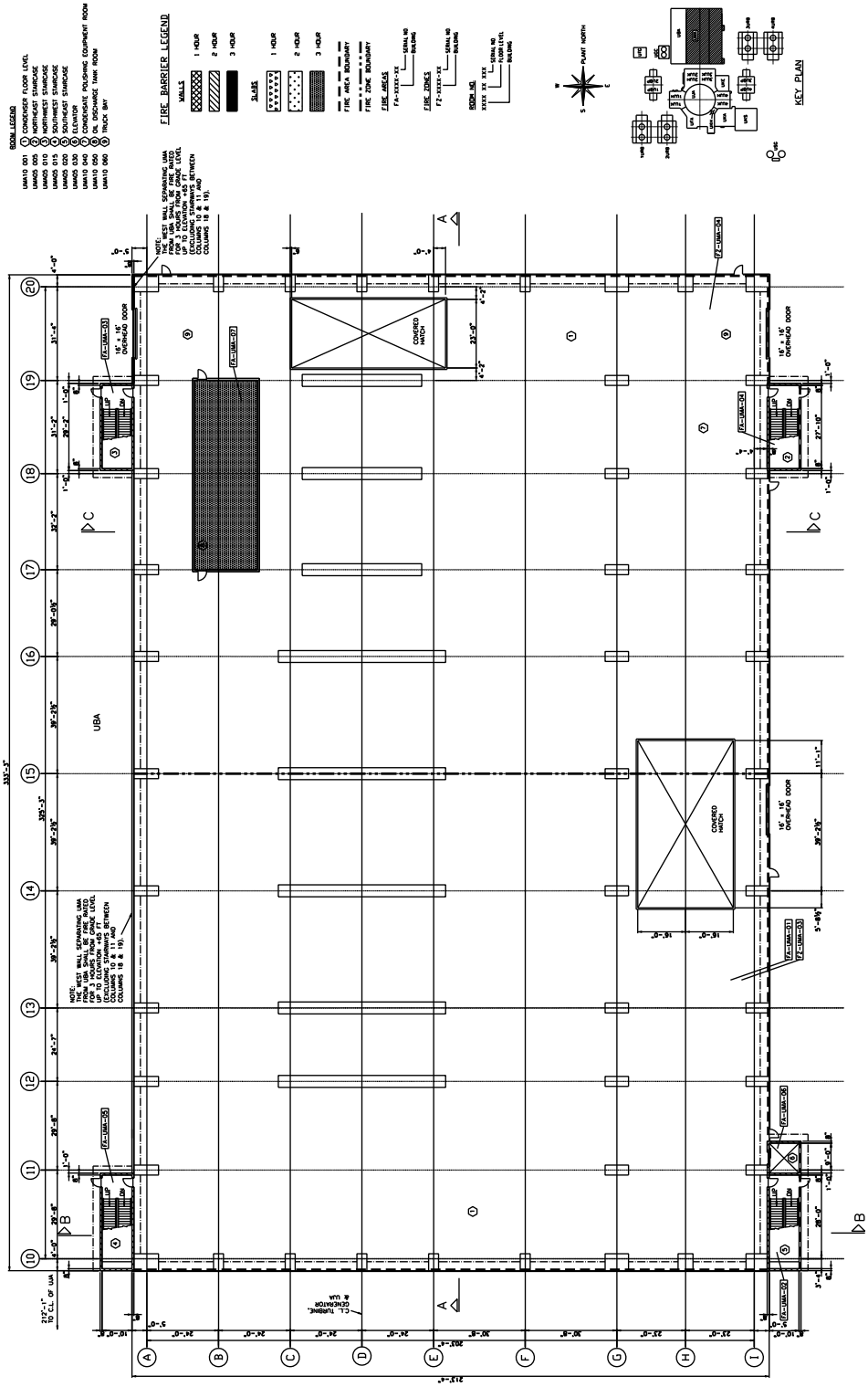


**Figure 9B-2 {Fire Barrier Location, Turbine Building Plan at Elevation 0 ft}**


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**Figure 9B-3 {Fire Barrier Location, Turbine Building Plan at Elevation +38 ft}**

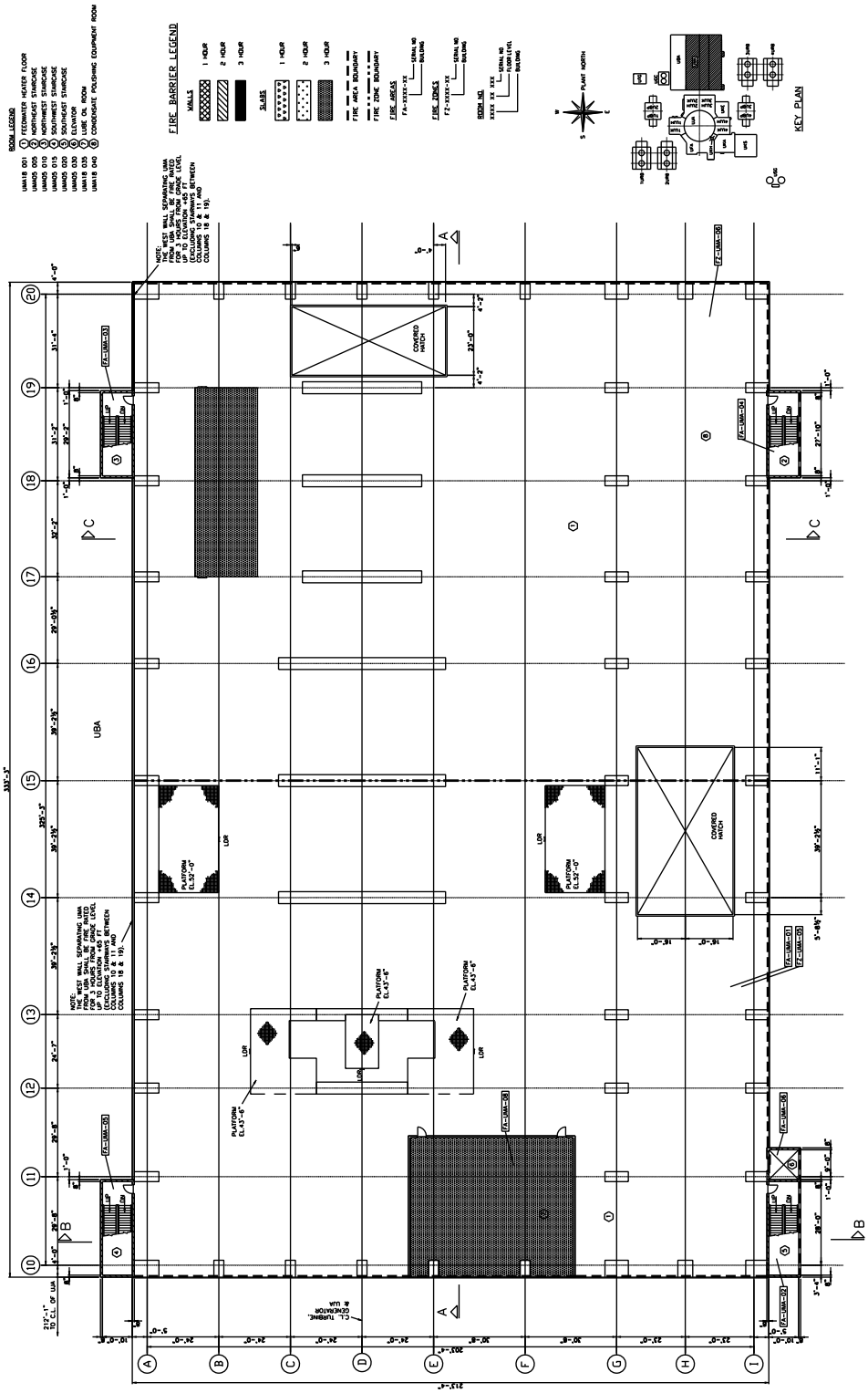



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**Figure 9B-4 {Fire Barrier Location, Turbine Building Plan at Elevation +65 ft}**

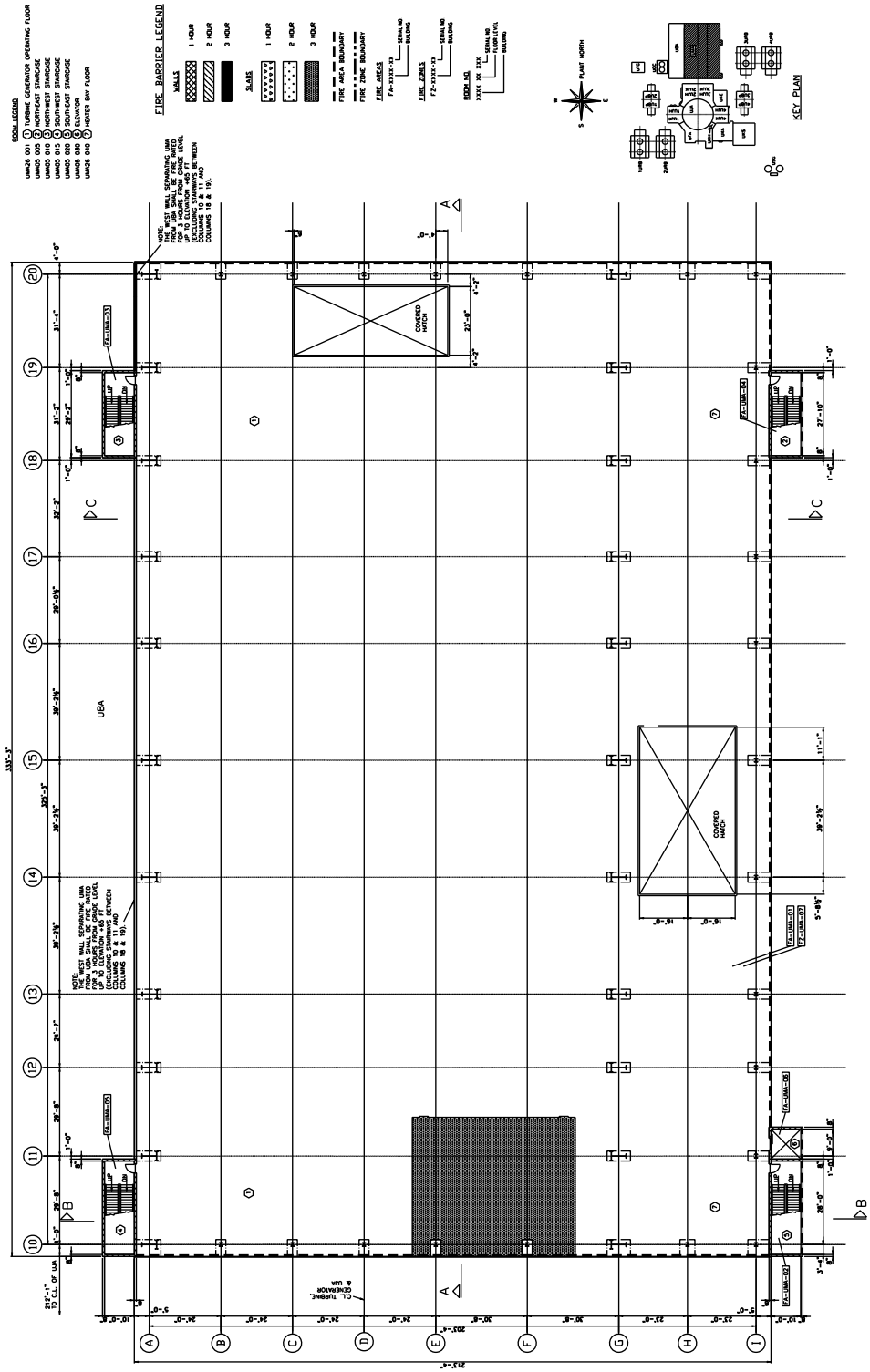



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**Figure 9B-5 {Fire Barrier Location, Turbine Building Plan at Elevation (-)43 ft}**

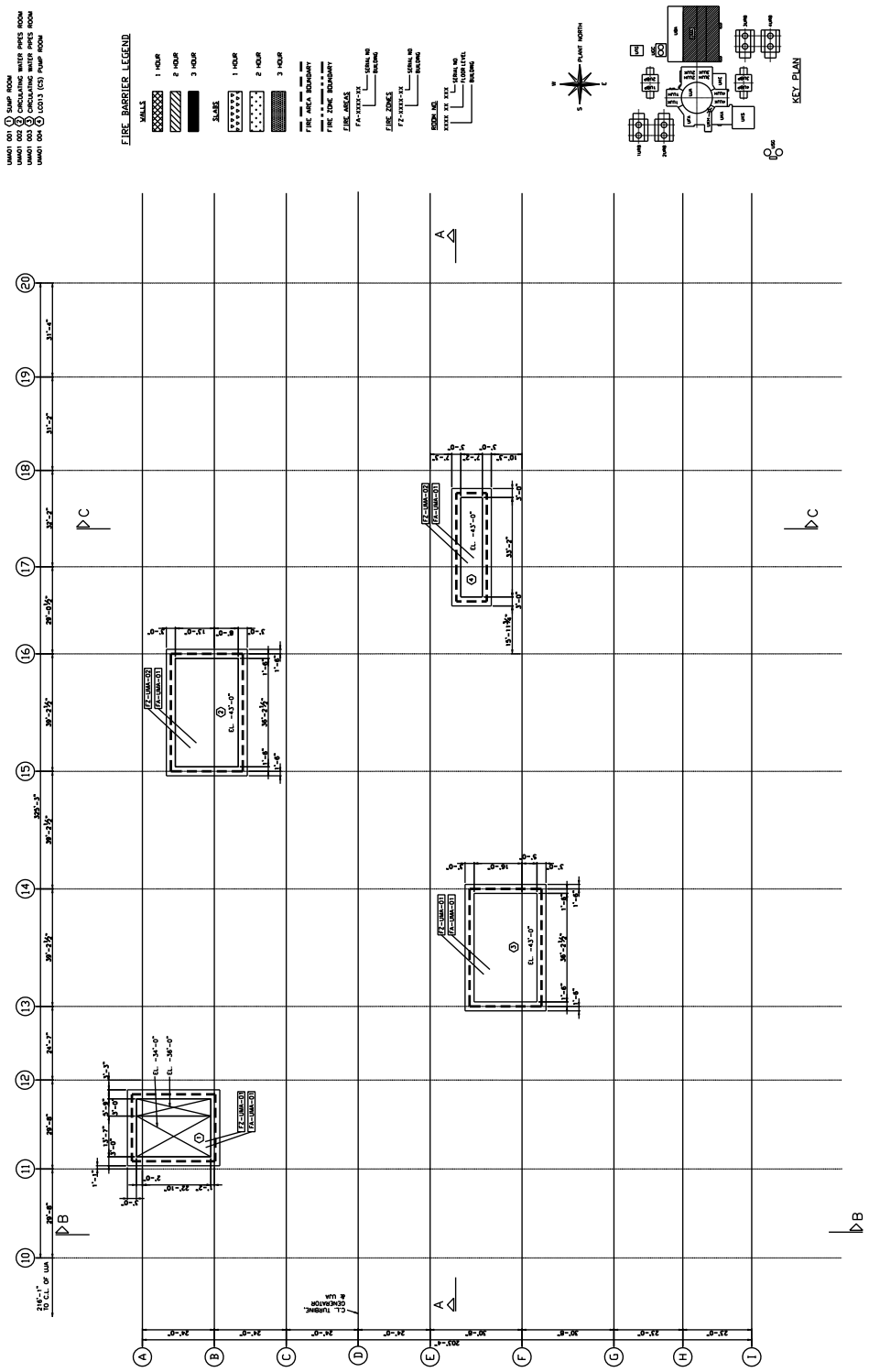



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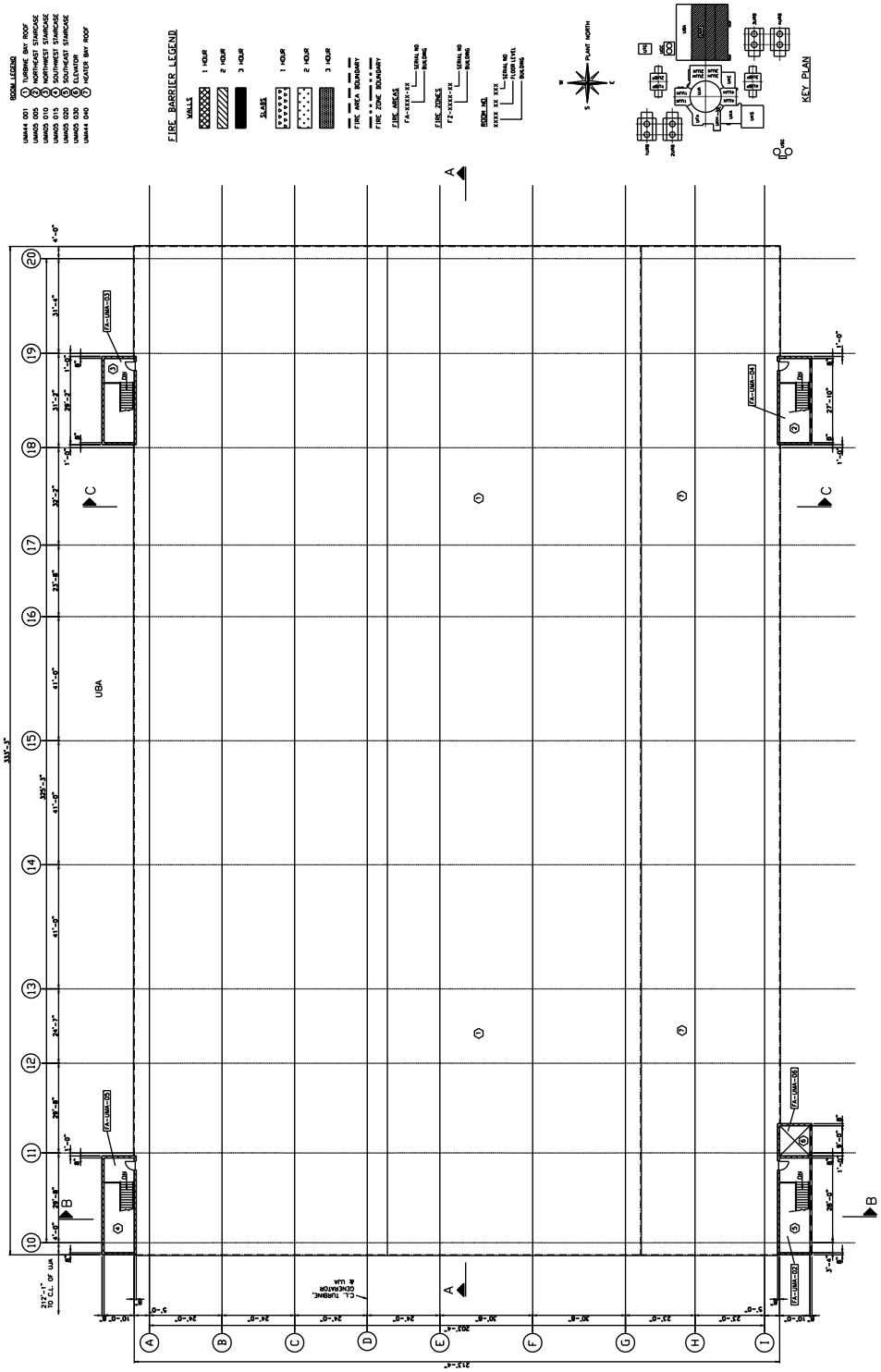
**Figure 9B-6 {Fire Barrier Location, Turbine Building Roof Plan}**





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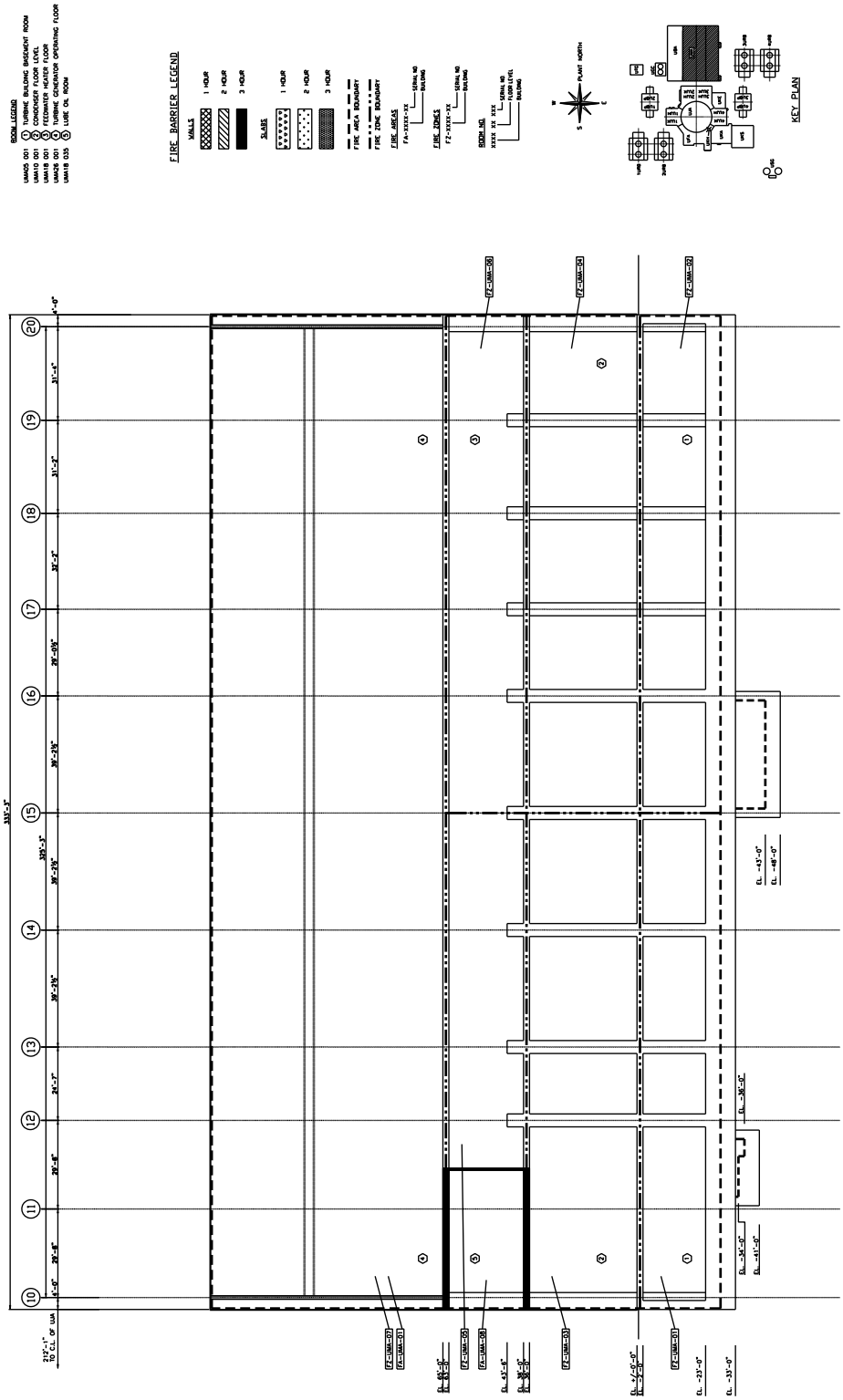


**Figure 9B-7 {Fire Barrier Location, Turbine Building Section A-A}**


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**Figure 9B-8 {Fire Barrier Location, Turbine Building Section B-B}**

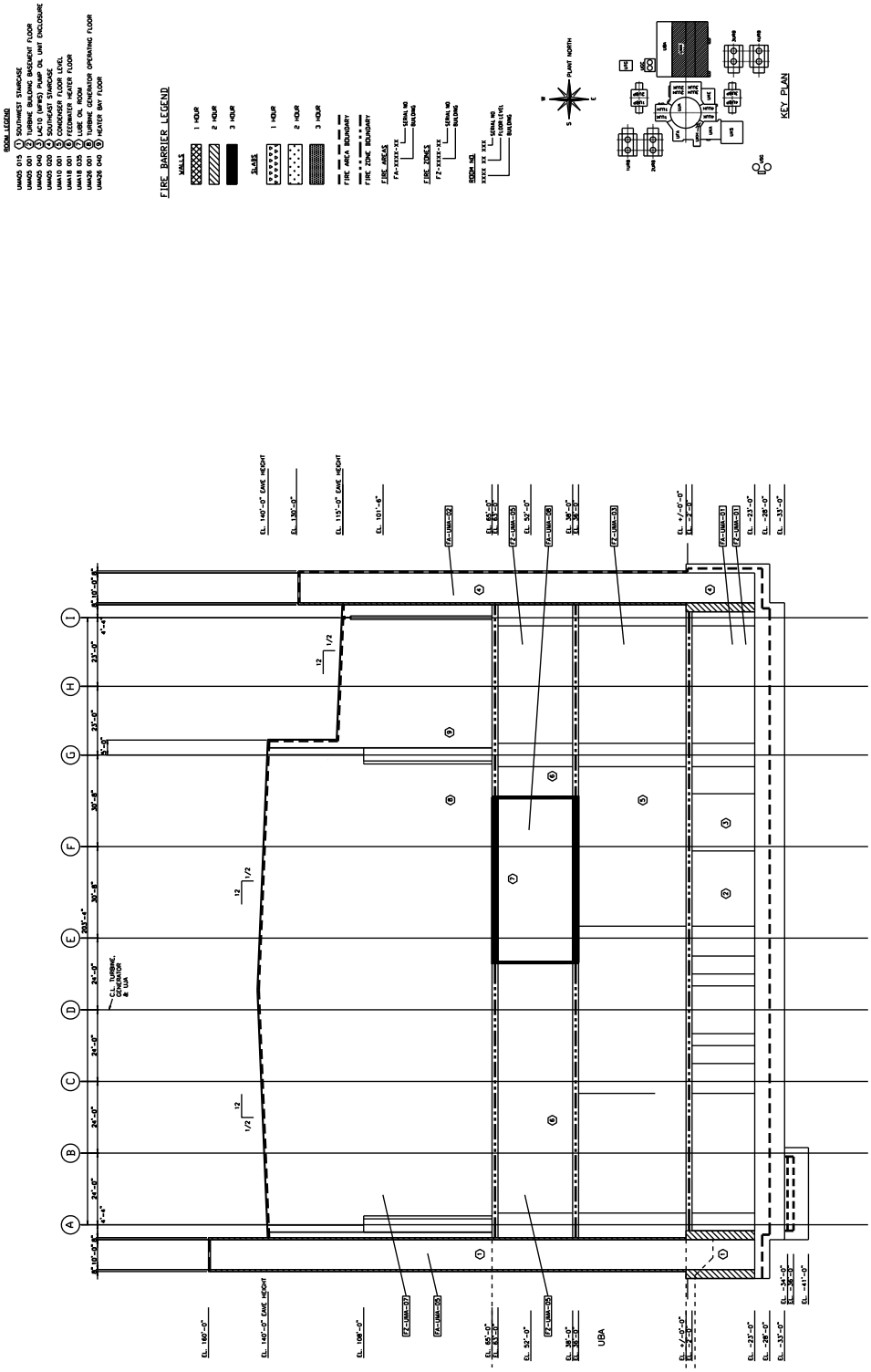



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**Figure 9B-9 {Fire Barrier Location, Turbine Building Section C-C}**

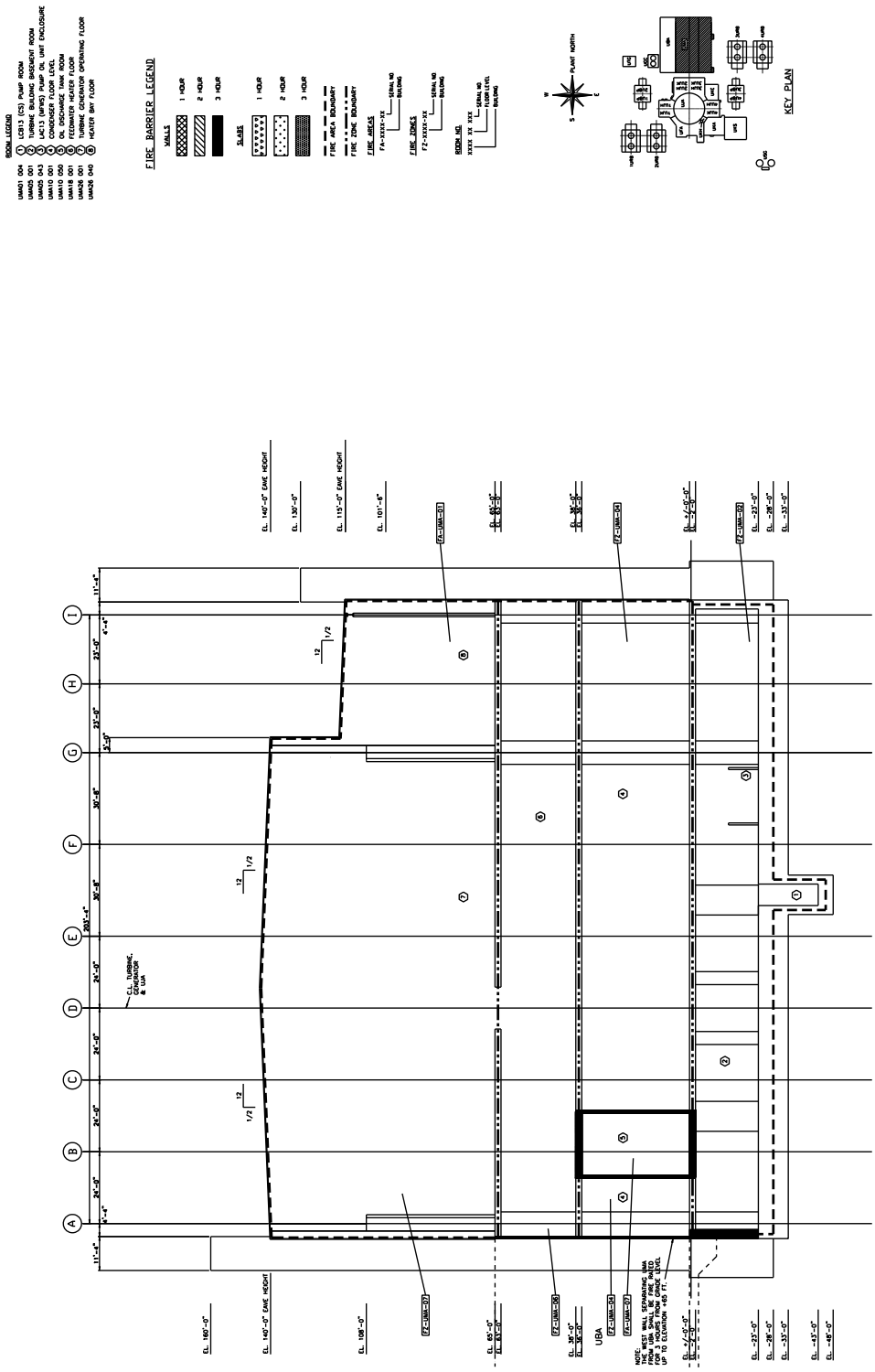



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Figure 9B-10 {Fire Barrier Location, SWGR-SBO Buildings Plan View at Elevation (-)13 ft}

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Figure 9B-11 {Fire Barrier Location, SWGR-SBO-AUX BLR Buildings Plan View at Elevation 0 ft}

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Figure 9B-12 {Fire Barrier Location, SWGR-SBO-AUX BLR Buildings Plan View at Elevation 13 ft}

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Figure 9B-13 {Fire Barrier Location, SWGR-SBO-AUX BLR Buildings Plan View at Elevation 24.5 ft}

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Figure 9B-14 {Fire Barrier Location, SWGR-SBO-AUX BLR Buildings Plan View Section A-A}

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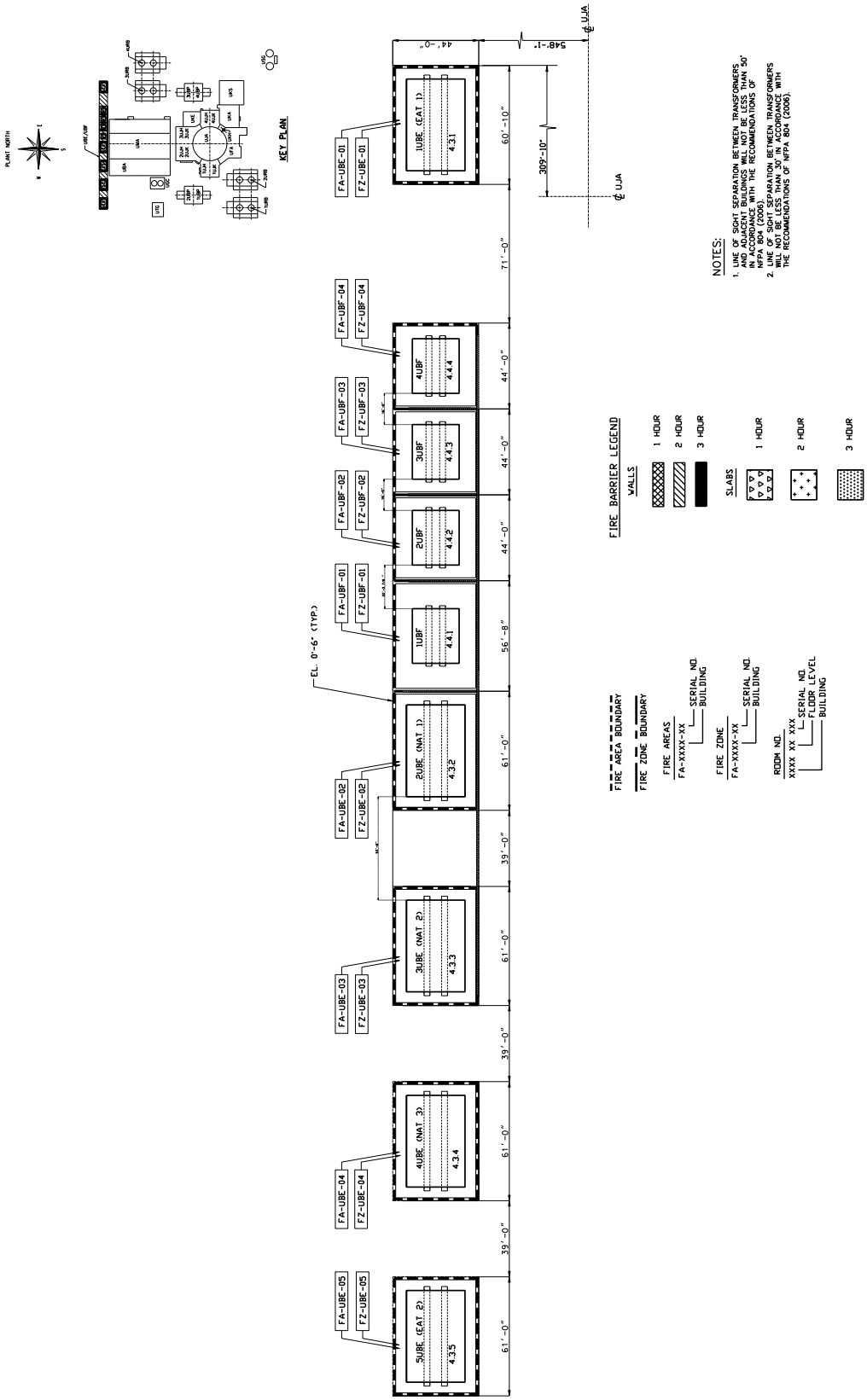
**Figure 9B-15 {Fire Barrier Location, Transformer Area Plan View at Elevation 0 ft}**





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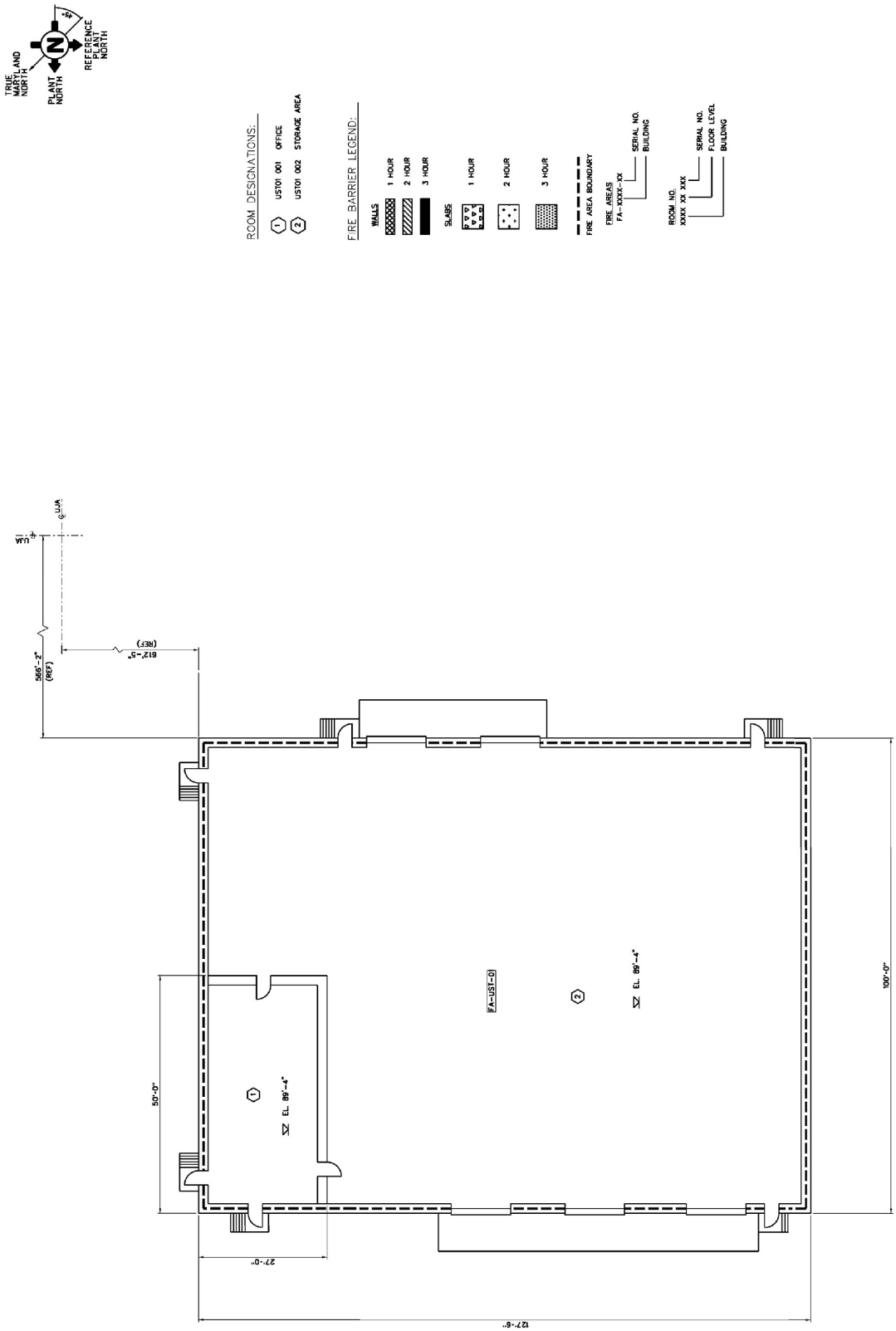


**Figure 9B-16 {Fire Barrier Location, Warehouse Building Plan}**


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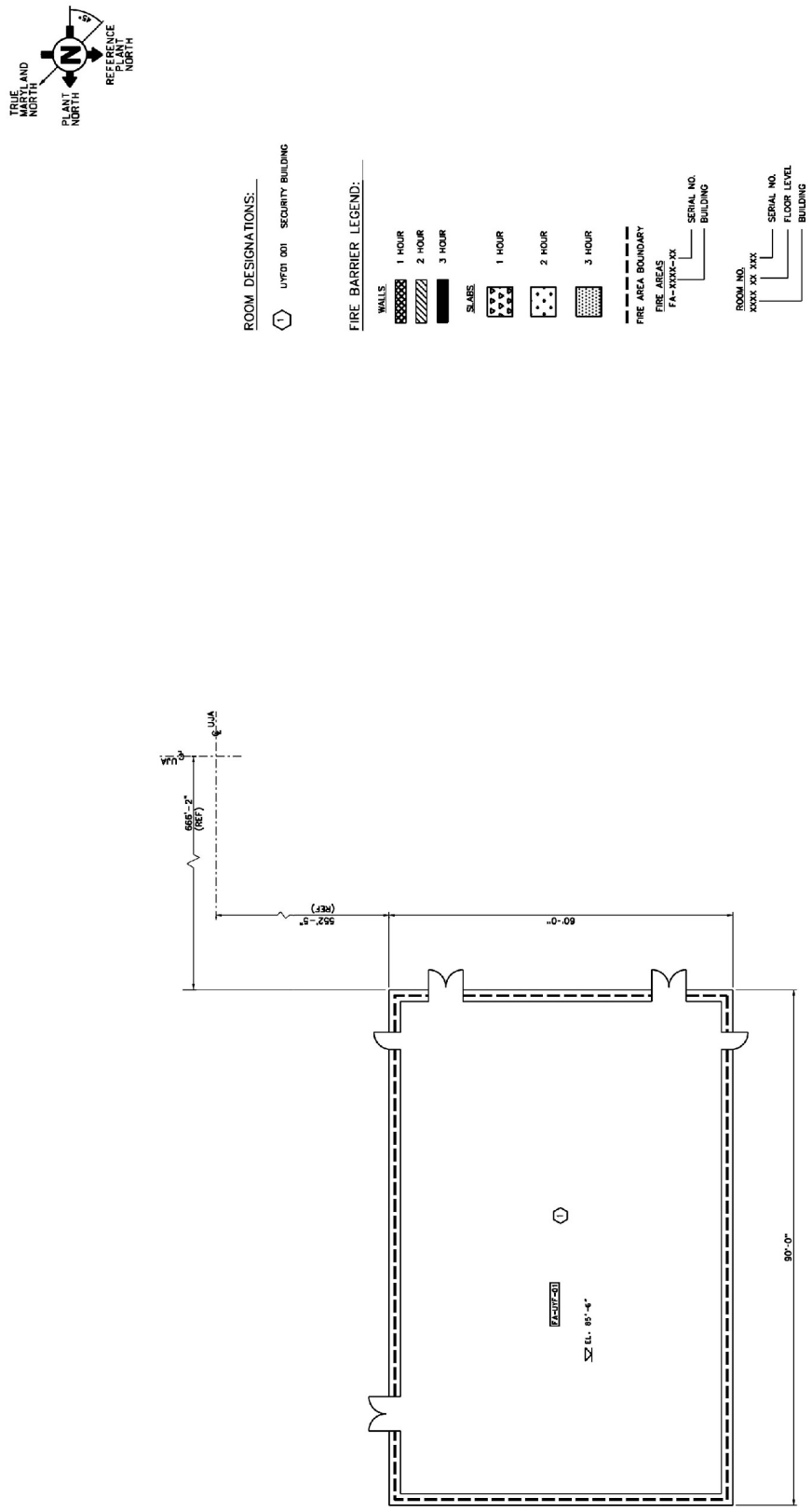


**Figure 9B-17 {Fire Barrier Location, Security Access Facility Plan}**


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Figure 9B-18 {Fire Barrier Location, Central Gas Supply Building Plan View at Elevation 85'0"}}

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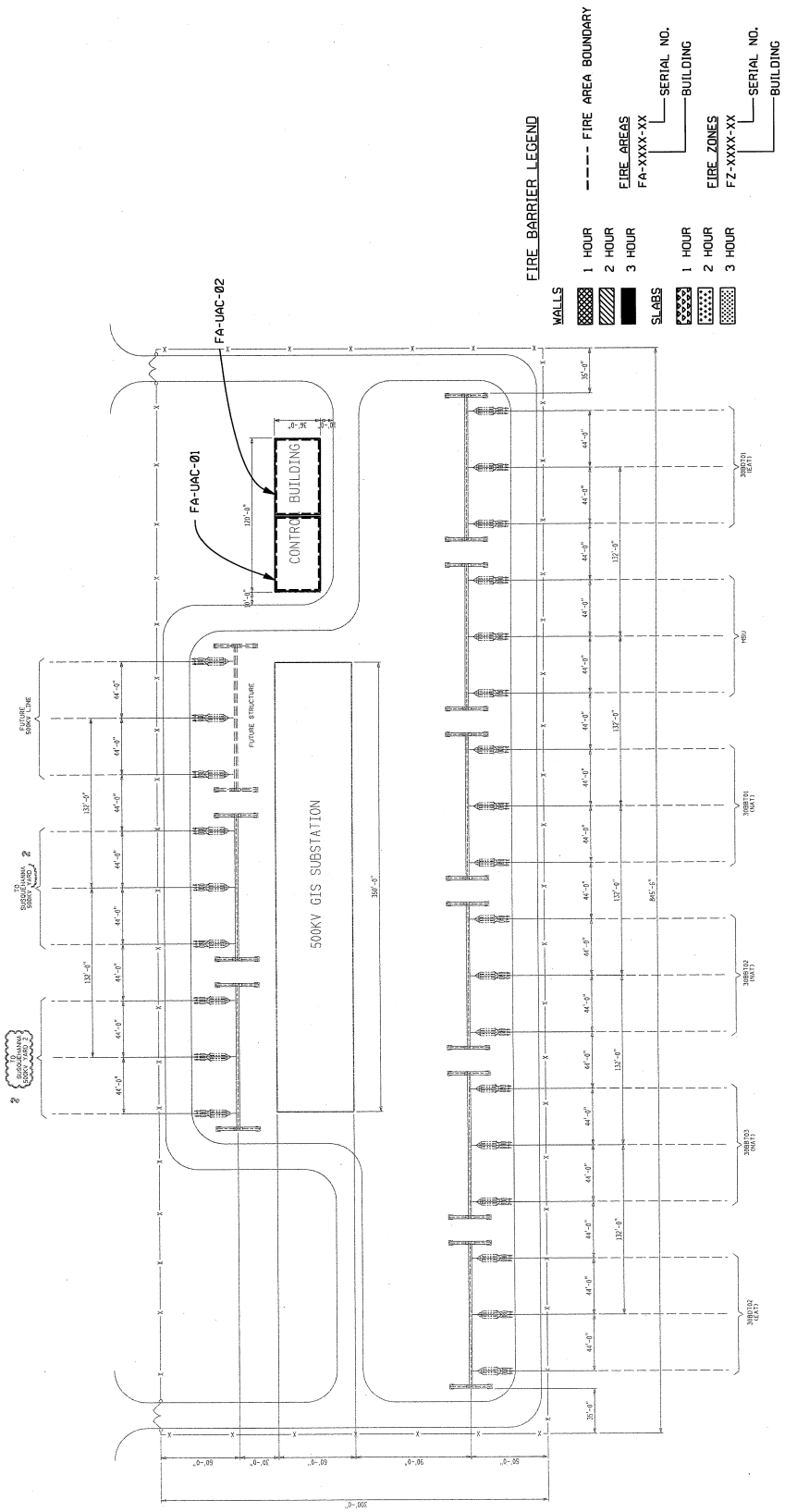
**Figure 9B-19 {Fire Barrier Location, Grid Systems Control Building}**





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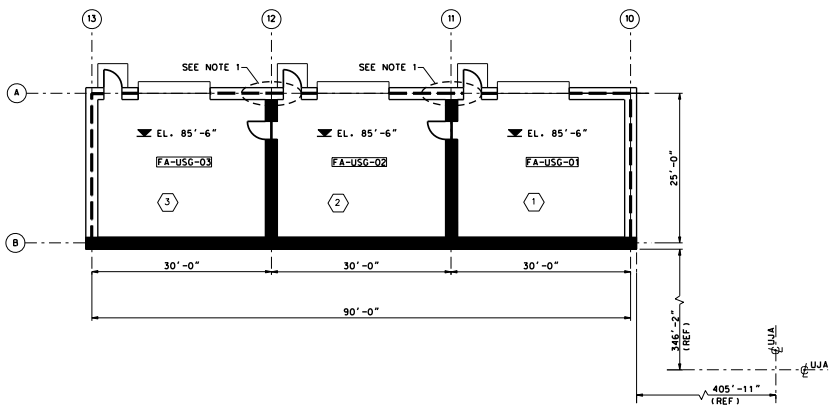
# Figure 9B-20 {Fire Barrier Location, Fire Protection Building Plan View at Elevation 85'0"}




ROOM DESIGNATIONS:

1. USG01 001 FIRE PROTECTION DIESEL ENGINE DRIVEN PUMP HOUSE 1 ENCLOSURE
2. USG01 002 FIRE PROTECTION DIESEL ENGINE DRIVEN PUMP HOUSE 2 ENCLOSURE
3. USG01 003 FIRE PROTECTION PUMP HOUSE ENCLOSURE

FIRE BARRIER LEGEND

WALLS
- 1 HOUR
- 2 HOUR
- 3 HOUR

SLABS
- 1 HOUR
- 2 HOUR
- 3 HOUR

FIRE AREA BOUNDARY

FIRE AREAS
FA-XXXX-XX
- SERIAL NO.
- BUILDING

ROOM NO.
XXXX XX XXX
- SERIAL NO.
- FLOOR LEVEL
- BUILDING

NOTES:

1. THIS SECTION OF THE EXTERIOR WALL SHALL COMPLY WITH SECTION 705.5 OF IBC REQUIREMENTS FOR HORIZONTAL CONTINUITY. SEE SECTION 3.1.6 OF THE FIRE HAZARDS ANALYSIS (FHA) FOR THE BALANCE OF PLANT (BOP) SYSTEMS. DOCUMENT NUMBER 25237-000-30R-PFFH-00001.


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**Figure 9B-21 {Fire Barrier Location, Cooling Tower Structure, Plan View and Section A-A}**

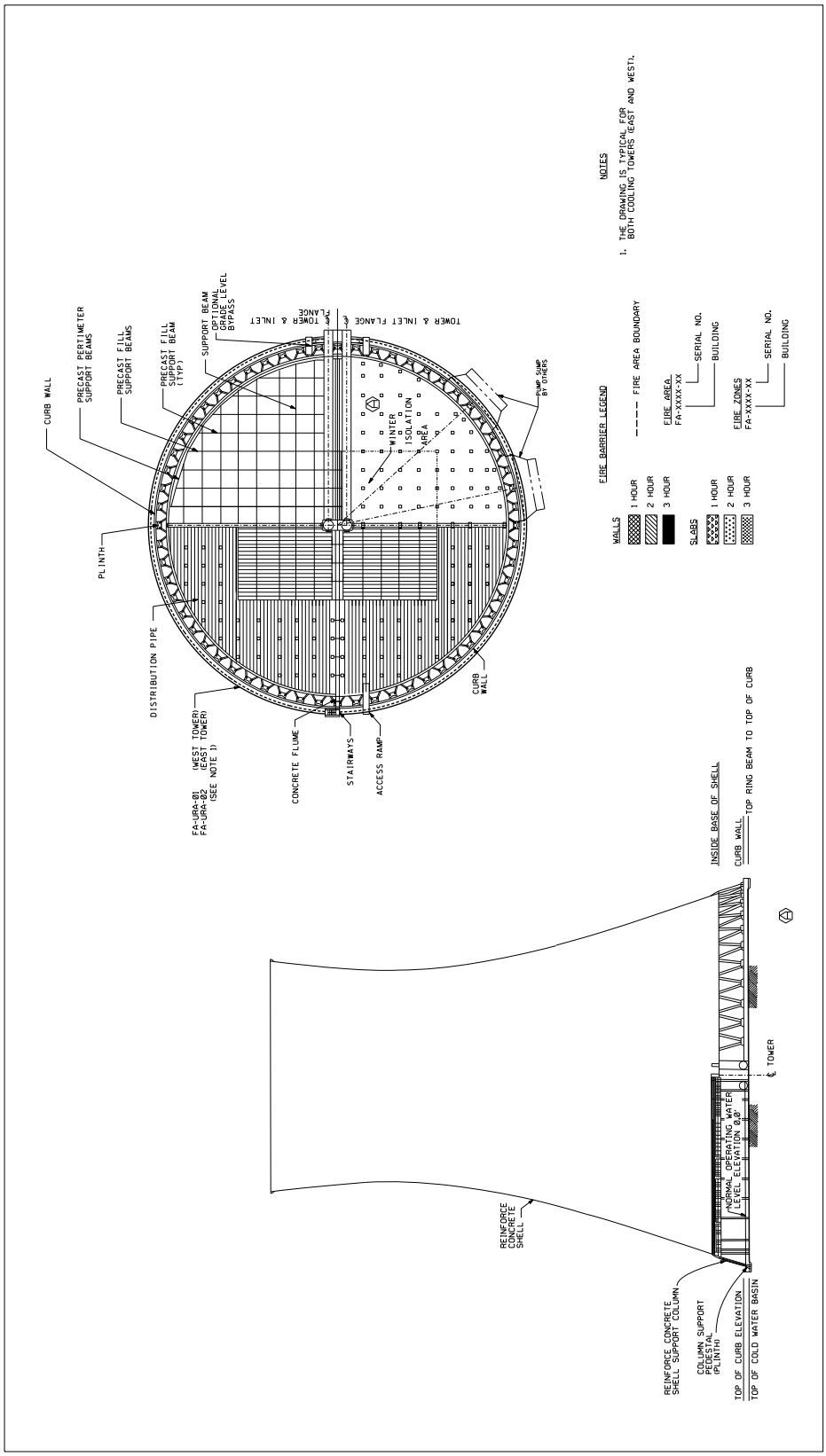



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**Figure 9B-22 {Fire Barrier Location, Circulating Water System Pumphouse}**

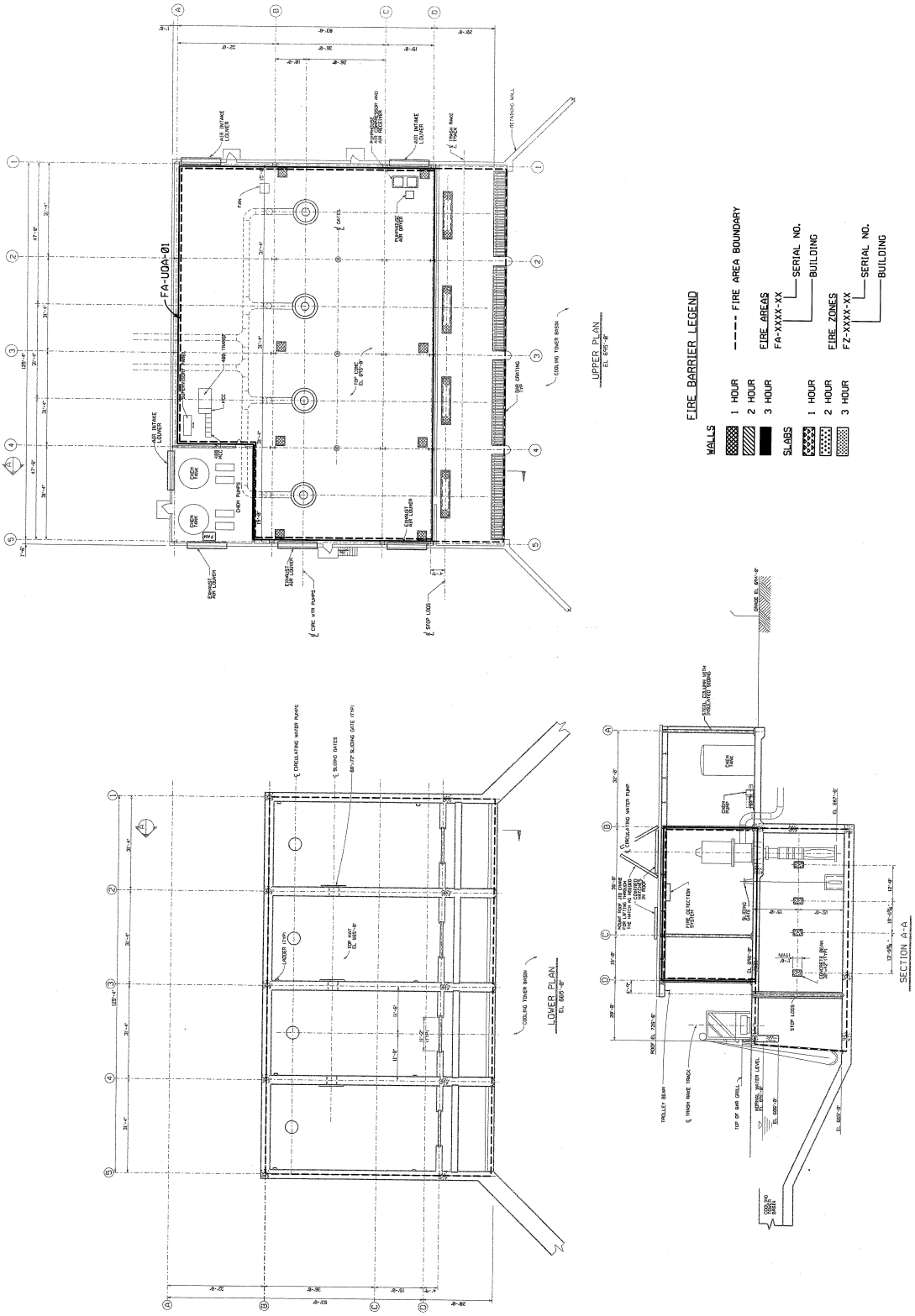



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Figure 9B-23 {Fire Barrier Location, ESWEMS Ground Floor and Mezzanine Plan}

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Figure 9B-24 {Fire Barrier Location, Circulating Water System Makeup Water Intake Structure}

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