Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluations BYR-01, BYR-13, and BYR-16 identify the equipment within this room that is separated from redundant equipment in an adjacent area (fire zones 11.3-0, 11.3G-1 and 11.3-1, respectively) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.90 Centrifugal Charging Pump 2A Room (Fire Zone 11.3D-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone.

Unit 2 Safe Shutdown Functions

Cables from Division 21 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The Division 21 charging pump and support components and associated cables are present in this zone. The Division 21 pump is assumed to be unavailable. The Division 22 charging pump and support components, and instrumentation from both divisions are unaffected by a fire in this zone, and are credited for safe shutdown.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluations BYR-23, BYR-24, BYR-25 identify that the equipment within this room that is separated from redundant equipment in an adjacent area (fire zones 11.3G-2, 11.3-2, 11.3-0) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.91 Residual Heat Removal HX 1B Room (Fire Zone 11.3E-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

Components from Division 12 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The Division 12 RHR heat exchanger and associated valves are present in this zone, and are assumed to be unavailable. The redundant Division 11 RHR train is unaffected by a fire in this zone, and is credited for safe shutdown.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.92 Residual Heat Removal HX 2B Room (Fire Zone 11.3E-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone.

Unit 2 Safe Shutdown Functions

Components from Division 22 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The Division 22 RHR heat exchanger and associated valves are present in this zone, and are assumed to be unavailable. The redundant Division 21 RHR train is unaffected by a fire in this zone, and is credited for safe shutdown.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.93 Safety Injection Pump 1B Room (Fire Zone 11.3F-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

Cables from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are not directly affected by a fire in this zone.

Valves 1RH8702A, 1RH8702B, 1SI8804B and 1SI8812B whose spurious operation could affect the RHR system have control cables routed through this zone. However, the RHR shutdown cooling operating procedure requires verification of valve position for RH and connecting system valves whose position could impact the decay heat removal function of the RH system. Therefore, this procedure ensures that if any of these valves spuriously operated, they would be placed in the proper position, if necessary by local manual operation of their handwheels, prior to placing RH in service.

Cables for RHR Train B pump suction valves 1RH8702A and 1RH8702B are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the low pressure RHR system. This condition is discussed in Section 2.4.3.1.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.94 Safety Injection Pump 2B Room (Fire Zone 11.3F-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone.

Unit 2 Safe Shutdown Functions

Cables from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps, support components, and instrumentation from both divisions are not directly affected by a fire in this zone.

One valve related to the RCS inventory control function is subject to spurious operation as a result of having control circuit cables routed through this fire zone. This is discussed below.

The RHR Hx 2A to charging pump suction valve, 2CV8804A, has a cable routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect

charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are not directly affected by a fire in this zone.

Several valves whose spurious operation could affect the RHR system have control cables routed through this zone. This includes 2CV8804A, 2RH8702A and B, 2SI8804B and 2SI8812B However, the RHR shutdown cooling operating procedure requires verification of valve position for RH and connecting system valves whose position could impact the decay heat removal function of the RH system. Therefore, this procedure ensures that if any of these valves spuriously operated, they would be placed in the proper position, if necessary by local manual operation of their handwheels, prior to placing RH in service.

Cables for RHR Train B pump suction valves 2RH8702A and 2RH8702B are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the low pressure RHR system. This condition is discussed in Section 2.4.3.1.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.95 Centrifugal Charging Pump 1B Room (Fire Zone 11.3G-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

Cables from Division 12 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The Division 12 charging pump and support components and associated cables are present in this zone. The Division 12 pump is assumed to be unavailable. The Division 11 charging pump and support components, and instrumentation from both divisions are unaffected by a fire in this zone, and are credited for safe shutdown.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-13 identifies the equipment within this room that is separated from redundant equipment in an adjacent area (fire zone 11.3D-1) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.96 Centrifugal Charging Pump 2B Room (Fire Zone 11.3G-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone.

Unit 2 Safe Shutdown Functions

Cables from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The Division 22 charging pump and support components and associated cables are present in this zone. The Division 22 pump is assumed to be unavailable. The Division 21 charging pump and support components, and instrumentation from both divisions are unaffected by a fire in this zone, and are credited for safe shutdown.

The RHR Hx 2A to charging pump suction valve, 2CV8804A, has a cable routed through this zone. Postulated fire damage to this cable could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are not directly affected by a fire in this zone.

Two valves 2CV8804A and 2SI8804B, whose spurious operation could affect the RHR system have control cables routed through this zone. However, the RHR shutdown cooling operating procedure requires verification of valve position for RH and connecting system valves whose position could impact the decay heat removal function of the RH system. Therefore, this procedure ensures that if either of these valves spuriously operated, they would be placed in the proper position, if necessary by local manual operation of their handwheels, prior to placing RH in service.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-23 identifies the equipment within this room that is separated from redundant equipment in an adjacent area (fire zone 11.3D-2) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.97 Auxiliary Building General Area, El. 383' (Fire Zone 11.4-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Cables for fans and dampers in both trains of the control room ventilation system are present in this zone. Because both trains of the VC system can be rendered unavailable, all room cooling for the main control room and for both the unit 1 and unit 2 auxiliary electrical equipment rooms (AEERs) can be disabled. Loss of cooling to the AEERs could eventually affect main control room instrumentation, since much of the circuitry for the main control room instrumentation and alarms is dependent on cabinets and equipment in the AEERs. Loss of cooling to the main control room could affect the habitability environment for the control room operator. In the event of the total loss of the VC system, portable fans will be staged and flow paths established to ventilate the AEERs and main control room from the Turbine Building. Station evaluations (reference EC#333738 and Calculation #BRW-97-0339-M/BYR97-210), assuming Turbine Building ambient temperatures associated with peak summer temperatures, have demonstrated that temporary ventilation can maintain the AEER and main control

room temperatures within conditions to assure the control room remains habitable and control room instrumentation would not be adversely affected. Additionally, safe shutdown instrumentation at the unit 1 and unit 2 fire hazards panels would not be affected by the loss of the VC system.
The supply and exhaust fans for the auxiliary building ventilation system are unaffected by a fire in this zone.

Cables for dampers 0VA474Y, 0VA475Y, 0VA476Y and 0VA477Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause these dampers to fail closed. Closure of these dampers would result in blockage of both flowpaths of the auxiliary building supply to the aux building general area at elevation 383' (this fire zone). The effect of this could be that both units AFW system "A" train pumps may not receive adequate room cooling. However, the "A" AFW pumps are assumed to be damaged, since they are present in this zone. The train "B" AFW components are not affected, and will be credited for safe shutdown for both units.

Control cables for both essential service cooling water tower makeup pumps 0SX02PA and 0SX02PB are present in the zone. Locally starting and operating one of the makeup pumps at the river screen house will be credited. Makeup to the tower is not immediately required, only after system and evaporation losses result in low tower basin water levels. Adequate time is available to access the river screen house.

Control cables associated with all four essential service water cooling tower hotwater bypass valves are present in the zone. Local manual action will be credited to manually operate the bypass valves using their handwheels. Re-positioning these valves may be necessary to adjust to extreme changes in ambient temperatures at the ESW cooling towers. At the time of the fire, the cooling tower valves will be set up for ambient conditions and several hours would pass before any manipulation would be required if ambient temperatures drastically changed.

The ESW cooling tower hot water bypass valves are subject to spurious operation as a result of having control cables present in the zone. Spurious operation of these valves could, over time, affect the desired ESW tower operating performance. Proper ESW cooling tower operation will be restored by remote manual operation of the hot water bypass valves (if necessary, manually using its handwheel).

Unit 1 Safe Shutdown Functions

Cables and components from both ESF divisions are present in this fire zone.

Essential Electric Power (AC/DC) Support

Offsite power is assumed to be unavailable for this fire zone. A fire in this zone will affect components from both ESF divisions, but both divisions also remain available. For Division 11, the emergency diesel generator, the 4160Vac ESF switchgear bus and

the 480Vac ESF switchgear bus all are unaffected, and remain available. Division 11 ESF MCCs 131X2, 131X4 and 131X5 also are unaffected and remain available. However, Division 11 ESF MCC 131X3 is located in this zone and MCC 131X1 has power cables routed through this zone, and both are therefore assumed to be unavailable. Power to MCC 131X3 will be isolated by opening its supply breaker at Bus 131X. This action eliminates the need to open individual MCC 131X3 breakers (the fire may prevent access to the MCC) to isolate power to motor operated valves being manually operated outside of this zone. Power and control cables for four Division 11 4160Vac loads are present in this zone. Credit is taken for manually opening the breakers and removing control power fuses from the affected cubicles for the Division 11 AFW, CV, CS and common CC pumps upon the detection of a design basis fire, as a precautionary measure to protect the bus.

Control cables for the Division 11 diesel generator room and ESF switchgear room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit.

For Division 12, the emergency diesel generator, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus all are unaffected, and remain available. Division 12 ESF MCCs 132X2 and 132X4 also are unaffected and remain available. However, Division 12 ESF MCC 132X3 is located in this zone and MCCs 132X1 and 132X5 have power cables routed through this zone, and both are therefore assumed to be unavailable. Power and control cables for four Division 12 4160Vac loads are present in this zone. Credit is taken for manually opening the breakers and removing control power fuses from the affected cubicles for the Division 12 CC, CS, SX, and common CC pumps upon the detection of a design basis fire, as a precautionary measure to protect the bus.

Control cables for the Division 12 diesel generator room, ESF switchgear room, and miscellaneous electrical equipment room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit.

The DC power and diesel oil systems for both divisions remain available.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

A fire in this zone can affect both trains of charging. A power cable for the Division 11 charging pump is present in the zone, this pump is assumed to be unavailable. Control cables for the Division 12 charging pump are present, but the Division 12 charging pump remains available via local manual operation of its breaker at the switchgear bus. The Division 12 pump will be credited for safe shutdown. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

A Cubicle cooler fan for the Division 12 charging pump may be rendered unavailable by a fire in this zone. As long as auxiliary building ventilation system airflow to the charging pump cubicle remains available, cubicle cooling is not required. This has been demonstrated by calculation. However, the VA system supply path to the Division 12 charging pump room has a damper, 0VA274Y, which fails closed on loss of instrument air. Loss of instrument air is conservatively assumed to occur for a fire in this zone. If instrument air is lost, credit is taken for monitoring the charging pump cubicle temperature per the station fire response procedure, and for operator recognition and diagnosis of the condition should a high temperature be observed. Credit is taken for re-establishing auxiliary building ventilation flow to the room by opening the cubicle door. Therefore, the loss of the cubicle cooler fans will not preclude safe shutdown of unit 1.

Control cables associated with charging flow indicators 1FI-0121A (1PM05J) and 1FI-0121B (1PL06J) are present in the zone. A fire in this zone can result in the lost of both 1FI-0121A, 1FI-0121B. Fire damage in this zone cannot spuriously fail charging FCV 1CV121 closed, however verification of charging flow may not be available. A manual action to verify at least one charging pump is operating and all reactor coolant pump seal leakoff temperatures are normal is credited upon loss of charging flow indication. If verifications are not obtained, abnormal operating procedure for loss of RCP seal cooling will be entered to proceed to safe shutdown.

Charging pump suction valves 1CV112B and 1CV112D have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, remote manual closure of 1CV112C, and remote manual opening of 1CV112E from the main control room is credited (these circuits are unaffected).

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in the charging system are such that the spurious operation of a single valve could affect both trains of the charging system. These are discussed below.

The LPSI containment sump supply isolation valve, 1SI8811A, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to

the reactor containment sump. RWST level indication and low level alarms and containment recirculation sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 1SI8812A via local operation of the handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valve 1CV112B has cables present in this zone. The spurious operation of this valve could isolate the VCT from the charging pump suction. To mitigate this postulated event, the RWST to charging pump suction valve CV112E will be opened from the main control room.

RWST to charging pump suction valve 1CV112D has cables present in this zone. The spurious operation of this valve would have no effect other than to align the RWST to the charging pump suction, which is its desired position for most scenarios. If necessary, the valve will be locally manually operated using the handwheel.

The charging pump 1B mini-flow isolation valves, 1CV8110 and 1CV8116, each have cables present in this zone. The spurious closure of either of these valves would block the minimum recirculation flowpath for charging pump 1B. The RCP seal injection flowpath passes sufficient flow (>60gpm) to prevent charging pump damage (spurious operation position, Section 2.4.1.6.4, applied). Operator response to diagnose and identify the condition is credited. If necessary, the 1CV8116 valve will be failed open by opening its electrical supply breaker and the 1CV8110 valve will be locally manually operated using the handwheel.

The charging flow control valve, 1CV121, has cables present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

The RCP seal injection line isolation valves, 1CV8355A through D, have cables routed through this zone. Postulated fire damage to these cables could cause one of these valves to spuriously close, which would isolate seal injection flow to the affected RCP. The Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperature greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling or loss of RCP seal injection.

The RHR Hx 1A to charging pump suction valve, 1CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Charging pump to cold leg injection isolation valves 1SI8801A and 1SI8801B each have cables present in this zone. The impact of spuriously opening of one of these valves would be to create an additional flowpath for charging to the RCS. This could result in excessive charging flow. Operator response to locally manually close the affected valve by using its handwheel is credited per existing station procedures.

Hot Standby Decay Heat Removal

A fire in this zone will affect both division 11 and division 12 components and systems used to accomplish this function. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

The control circuits for both auxiliary feedwater pumps are potentially affected. The Division 11 pump is located in this zone and is assumed to be unavailable. This is the subject of unit 1 deviation 1A.7 from BTP CMEB 9.5-1. Credit is taken for operation of the Division 12 pump via the remote start switch located outside of the fire zone on elevation 364 feet.

The AFW pump diesel engine cooling water valve, 1SX173, has a cable present in this zone. Circuit analysis of the valves' control circuit has demonstrated that postulated faults on the affected cable can fail the valve open (its desired position), but cannot prevent it from opening or cause it to spuriously close. Therefore, no action is required to reposition this valve as a result of fire damage to its control circuit. The flow control valves, 1AF005A through H, are all potentially affected. Circuit analysis of these valves' circuits has demonstrated that postulated faults on these cables can disable the controls at both the main control room and remote shutdown panels, or could cause all four valves to fail open. However, the spurious closure of any valve cannot occur. If necessary, valves E through H can be locally manually throttled using their handwheels to control AFW flow. The AFW containment isolation valves, 1AF013A through H, are also potentially affected. The spurious closure of a single valve would not prevent safe shutdown. When time permits and manpower is available, an affected valve will be manually opened via local operation of its handwheel.

The pump discharge isolation valve, 1AF004B, has a control cable present in this zone, and is susceptible to spurious operation. The spurious closure of this valve would not damage the pump, since the recirculation line would not be affected (spurious operation position, Section 2.4.1.6.4, applied). Credit is taken for operator response to the situation by failing the air operated valve open by opening its DC control power circuit

breaker located outside of the zone (cable damage assumption, Section 2.4.1.5.2c, applied).

The AFW pump 1B recirculation valve, 1AF022B, has cables in this zone, and is subject to spurious operation resulting from postulated control circuit faults on these cables. The spurious closure of this valve would not prevent operation of the 1B AFW pump, since the flowpath from the pump discharge to the steam generators is not simultaneously affected (spurious operation position, Section 2.4.1.6.4, applied). Thus, safe shutdown could not be prevented by this postulated event.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown.

The main steam isolation valves, 1MS001A through 1MS001D, each have a Division 11 and Division 12 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

The main steam isolation bypass valves, 1MS101A through 1MS101D, each have cables from their Division 11 actuation circuit present in this zone. Each of these valves has two independent actuation circuits which will close the valves on a main steam isolation signal. These valves are normally closed, and it is desired to keep them closed for safe shutdown. A failure of the Division 11 circuit could not prevent them from closing in the event that they are open. With the MSIV bypass valve hand position controllers in their normal position of 0%, postulated circuit faults on an actuation circuit for one of these valves are incapable of causing the spurious opening of the affected valve. No response is required.

In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures.

Essential Support

A fire in this zone affects support systems from both divisions. The essential service water pumps, component cooling water pumps, and all four containment ventilation fans can all be affected. Credit is taken for manual operation of the Division 11 essential service water pump and component cooling water pump via local operation of the breakers at the 4160Vac ESF switchgear bus. Credit is taken for manual operation of the Division 11 RCFC fans via local operation of the breaker at the 480Vac ESF switchgear bus.

Three of four Division 11 SX pump cubicle cooler fans have cables in this zone, and may be unavailable. In the event of coincident fire damage to the power and/or control circuits of the cubicle cooler fans, credit is taken for auxiliary building ventilation flow to the pump room. Per an existing calculation, adequate room cooling is provided by VA flow if the cubicle coolers are not operating. However, the VA system return path from the Division 11/21 essential service pump room has two fire dampers, 0VA455Y and 0VA456Y, which are conservatively assumed to fail closed for a fire in this zone. Credit is taken for monitoring the essential service water pump cubicle temperature and for operator recognition and diagnosis of the condition should a high temperature be observed. Credit is taken for re-establishing auxiliary building ventilation flow to the room by opening the door, if required. Auxiliary building ventilation supply air to this room is unaffected by a fire in this zone.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in these systems are such that the spurious operation of a single valve could affect both trains of the affected system. These are discussed below.

The intermediate header crosstie valves, 1CC9473A and 1CC9473B, have control cables routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore the spurious operation of this valve will not affect unit separation of the component cooling system.

Valves 1CC9413A, 1CC9413B, and 1CC685 each have control cables routed through this zone. These are containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperature greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; the operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

The supply header isolation valve, 1CC9415, has a control cable routed through this zone. The spurious closure of this valve would block the discharge flowpath for the units' component cooling system. Operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the

problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

Control cables for both of the RHR heat exchanger outlet valves, 1CC9412A and 1CC9412B, are routed through this zone. The spurious opening of one of these valves would result in excessive flow through the system. If a second pump did not autostart on low discharge pressure, then operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

The essential service water discharge header crosstie valves, 1SX033 and 1SX034, have control cables routed through this zone. The spurious closure of one of these normally open valves would isolate the train A and train B essential service water supply headers. For this fire zone, components from both divisions may be operating. The Division 12 charging pump is credited in this zone. Credit is taken for operator action to diagnose the problem, temporarily shutdown the Division 12 charging pump, and manually open the affected valve locally with its handwheel to restore essential service water flow to both of the essential service water system supply headers.

The essential service water pump suction valves, 1SX001A and 1SX001B, have control cables present in this zone. The spurious closure of one of these valves would disable its associated pump. This valve has power locked out during normal operation and is there fore not susceptible to postulated spurious operation.

The unit 1 component cooling heat exchanger ESW inlet valve, 1SX004, has a control cable routed through this zone. The spurious closure of this normally open valve would block essential service water flow to the component cooling heat exchanger, and would result in loss of heat removal by the component cooling system. Credit is taken for operator action to diagnose the problem and re-establish essential service water flow to the affected component cooling heat exchanger per the loss of component cooling station procedure.

The common component cooling heat exchanger ESW inlet and outlet valves, 0SX146, 0SX147, 1SX005 and 2SX005 each have control cables routed through this zone. The spurious operation of one of these valves would have no impact on normal plant operation, since the common component cooling heat exchanger normally is only aligned to a unit and operated during cooldown to cold shutdown conditions. The operating procedures for aligning the common component cooling heat exchanger to a given unit require verification of proper valve alignment prior to initiating cooldown with this heat exchanger, and are therefore adequate to deal with postulated spurious operations of these valves.

The unit 1 return header crosstie valves, 1SX010, 1SX011 and 1SX136, each have control cables routed through this zone. The spurious closure of one of these normally open valves would have no impact. It would force return flow from some unit 1

components to one of the two main return headers, but no flow paths would be blocked. Thus, no adverse consequences result from the spurious closure of one of these valves.

Cables for the containment chiller condenser bypass valves, 1SX147A and 1SX147B, are located in this zone. This valve normally throttles to divert a portion of the essential service water RCFC return flow through the containment chiller condensers. The spurious closure of one of this valve could block essential service water flow to one train of RCFCs, which would disable containment cooling if the affected train of RCFCs were operating at that time. Credit is taken for operator action to diagnose the problem and if necessary, manually open the affected valve locally by bleeding air from the valve operator when time permits.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Both trains can be affected by a fire in this zone. Both RHR pumps have power cables present in this zone. Credit is taken for repairing the power cable for one of the RHR pumps per existing station procedures. Power and/or control circuits for three of the four RHR pump room cubicle cooler fans are also present. Credit is taken for repairing the circuit for the chosen RHR pump cubicle cooler fans per existing station procedures. Each train of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8701A and 1RH8701B for train A. In the event of fire damage to the control circuit for these valves, credit is taken for locally manually opening the valves in order to establish a flowpath to one of the RHR pumps. These pair of valves also forms a high-low pressure interface between the RCS and the low pressure RHR system. This condition is discussed in Section 2.4.3.1.

Several other valves in the RHR system flowpaths have cables present in this zone. This includes 1CS009A and B, 1CV8804A, 1RH610, 1RH611, 1RH8716A, 1SI8804B, 1SI8809A, 1SI8811A, 1SI8812A and 1SI8840. Except as discussed above, the spurious operation of these valves during normal operation or while the unit is in hot standby would not have any adverse consequences. The RHR operating procedure requires verification of proper valve position prior to placing an RH pump in operation. Therefore, credit is taken for manually verifying and/or repositioning affected valves via local operation with their handwheels prior to initiating cooldown with the RHR system. Additionally, Division 11 valves 1CC9412A and 1CC9415 and Division 12 valve 1CC9412B may need to be repositioned (if not previously addressed) to ensure adequate component cooling water flow to the RH heat exchanger. If required, credit is taken for locally manually operating these valves with their handwheels.

Unit 2 Safe Shutdown Functions

Cables and components from both ESF divisions are present in this fire zone.

Essential Electric Power (AC/DC) Support

Offsite power is assumed to be unavailable for this fire zone. A fire in this zone will affect components from both ESF divisions, but both divisions also remain available. For Division 21, the emergency diesel generator, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus all are unaffected, and remain available. Division 21 ESF MCC 231X1 has power cables routed through this zone, and is therefore assumed to be unavailable. The other four MCCs are unaffected. Power and control cables for four Division 21 4160Vac loads are present in this zone. Credit is taken for manually opening the breakers and removing control power fuses from the affected cubicles for the Division 21 AFW, CS, SX and common CC pumps upon detection of a design basis fire, as a precautionary measure to protect the bus. The Division 21 ventilation support systems are unaffected by a fire in this zone.

For Division 22, the emergency diesel generator, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus are unaffected, and remain available. Division 22 ESF MCCs 232X1 and 232X3 are located in this zone and are assumed to be unavailable. The remaining three Division 22 ESF MCCs are unaffected by a fire in this zone. Power to MCC 232X1 will be isolated by opening its supply breaker at Bus 232X. This action eliminates the need to open individual MCC 232X1 breakers (the fire may prevent access to the MCC) to isolate power to motor operated valves being manually operated outside of this zone. Power and control cables for one Division 22 4160Vac load is present in this zone. Credit is taken for manually opening the breaker and removing control power fuses from the affected cubicle for the common CC pump upon detection of a design basis fire, as a precautionary measure to protect the bus.

Control cables for the Division 22 diesel generator room, ESF switchgear room, and miscellaneous electrical equipment room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit.

The DC power and diesel oil systems for both divisions remain available.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

A fire in this zone can affect both trains of charging. Control cables for the Division 21 charging pump is present in the zone. The Division 22 charging pump is available for safe shutdown of unit 2. The Division 21 charging pump remains available via local manual operation of its breaker at the switchgear bus. Instrumentation in the main

control room remains available. In addition, instrumentation at the fire hazard panel is also available.

Both cubicle cooler fans for the Division 22 charging pump and one fan for the Division 21 charging pump may be rendered unavailable by a fire in this zone. As long as auxiliary building ventilation system airflow to the charging pump cubicle remains available, cubicle cooling is not required. This has been demonstrated by calculation. However, the VA system supply path to the Division 22 charging pump room has a damper, 0VA305Y, which fails closed on loss of instrument air. Loss of air is conservatively assumed to occur for a fire in this zone. Credit is taken for the Division 21 charging pump. Therefore, the loss of the cubicle cooler fans will not preclude safe shutdown of unit 2.

Control cables associated with charging flow indicators 2FI-0121A (2PM05J) and 2FI-0121B (2PL06J) are present in the zone. A fire in this zone can result in the lost of both 2FI-0121A, 2FI-0121B. Fire damage in this zone cannot spuriously fail charging FCV 2CV121 closed, however verification of charging flow may not be available. A manual action to verify at least one charging pump is operating and all reactor coolant pump seal leakoff temperatures are normal is credited upon loss of charging flow indication. If verifications are not obtained, abnormal operating procedure for loss of RCP seal cooling will be entered to proceed to safe shutdown.

Charging pump suction valves 2CV112B and 2CV112D have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, remote manual closure of 2CV112C, and remote manual opening of 2CV112E from the main control room is credited (these circuits are unaffected).

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in the charging system are such that the spurious operation of a single valve could affect both trains of the charging system. These are discussed below.

The LPSI containment sump supply isolation valve, 2SI8811A, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor containment sump. RWST level indication and low level alarms and containment recirculation sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 2SI8812A via local operation of the handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valve 2CV112B has cables present in this zone. The spurious operation of this valve could isolate the VCT from the charging pump suction. To mitigate this postulated event, the RWST to charging pump suction valves 2CV112E will be opened from the main control room.

RWST to charging pump suction valve 2CV112D has cables present in this zone. The spurious operation of this valve would have no effect other than to align the RWST to the charging pump suction, which is its desired position for most scenarios. If necessary, the valve will be locally manually operated using the handwheel.

The charging pump mini-flow isolation valves 2CV8114 and 2CV8116, each have cables present in this zone. The spurious closure of one of these valves would block the minimum recirculation flowpath for the associated charging pump. The RCP seal injection flowpath passes sufficient flow (>60gpm) to prevent charging pump damage (spurious operation position, Section 2.4.1.6.4, applied). Operator response to diagnose and identify the condition is credited. If necessary, the valve associated with the operating charging pump will be failed open by opening its electrical supply breaker. In addition, the redundant charging pump remains available as described above.

The charging flow control valve, 2CV121, has cables present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

The RCP seal injection line isolation valves, 2CV8355A through D, have cables routed through this zone. Postulated fire damage to these cables could cause one of these valves to spuriously close, which would isolate seal injection flow to the affected RCP. The Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection.

The RHR Hx 2A to charging pump suction valve, 2CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Charging pump to cold leg injection isolation valves 2SI8801A and 2SI8801B each have cables present in this zone. The impact of spuriously opening of one of these valves would be to create an additional flowpath for charging to the RCS. This could result in

excessive charging flow. Operator response to close the affected valve locally manually by using its handwheel is credited per existing station procedures.

Hot Standby Decay Heat Removal

A fire in this zone will affect both division 21 and division 22 components and systems used to accomplish this function. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

The control circuits for both auxiliary feedwater pumps are potentially affected. The Division 21 pump is located in this zone and is assumed to be unavailable. This is the subject of unit 2 deviation 2A.6 from BTP CMEB 9.5-1. Credit is taken for operation of the Division 22 pump via the remote start switch located outside of the fire zone on elevation 364 feet.

The AFW pump diesel engine cooling water valve, 2SX173, has a cable present in this zone. Circuit analysis of the valves' control circuit has demonstrated that postulated faults on the affected cable can fail the valve open (its desired position), but cannot prevent it from opening or cause it to spuriously close. Therefore, no action is required to reposition this valve as a result of fire damage to its control circuit. The flow control valves, 2AF005A through H, are all potentially affected. Circuit analysis of the control circuits of these valves has demonstrated that postulated faults on the cables in this zone can disable the controls at both the main control boards and the remote shutdown panels, or can cause all four valves to fail open. The spurious closure of any of these valves cannot occur. If necessary, these valves can be locally manually throttled using their handwheels to control AFW flow. The AFW containment isolation valves, 2AF013A through H, are also potentially affected. The spurious closure of a single valve would not prevent safe shutdown. When time permits and manpower is available, and affected valve will be manually opened via local operation of its handwheel.

The AFW pump 2B recirculation valve, 2AF022B, has a cable in this zone, and is subject to spurious operation resulting from postulated control circuit faults on this cable. The spurious closure of this valve would not prevent operation of the 2B AFW pump, since the flowpath from the pump discharge to the steam generators is not simultaneously affected (spurious operation position, Section 2.4.1.6.4, applied). Thus, safe shutdown could not be prevented by this postulated event.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown.

The main steam isolation valves, 2MS001A through 1MS001D, each have a Division 21 and Division 22 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated.

In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

The main steam isolation bypass valves, 2MS101A through 2MS101D, each have cables from their Division 21 actuation circuit present in this zone. Each of these valves has two independent actuation circuits which will close the valves on a main steam isolation signal. These valves are normally closed, and it is desired to keep them closed for safe shutdown. A failure of the Division 21 circuit could not prevent them from closing in the event that they are open. With the MSIV bypass valve hand position controllers in their normal position of 0%, postulated circuit faults on an actuation circuit for one of these valves are incapable of causing the spurious opening of the affected valve. No response is required.

In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures.

Essential Support

A fire in this zone affects support systems from both divisions. The essential service water pumps, component cooling water pumps, and both Division 21 containment ventilation fans can all be affected. Credit is taken for manual operation of the Division 22 essential service water pump and component cooling water pump via local operation of the breakers at the 4160Vac ESF switchgear bus Credit is taken for manual operation of the Division 22 RCFC fans from the control room. All four Division 22 SX pump cubicle cooler fans have cables in this zone, and may be unavailable. In the event of coincident fire damage to the power and/or control circuits of the cubicle cooler fans, credit is taken for auxiliary building ventilation flow to the pump room. Per an existing calculation, adequate room cooling is provided by VA flow if the cubicle coolers are not operating.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in these systems are such that the spurious operation of a single valve could affect both trains of the affected system. These are discussed below.

The intermediate header crosstie valve, 2CC9473B, has control cables routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore the spurious operation of this valve will not affect unit separation of the component cooling system.

Valves 2CC9413A, 2CC9413B, 2CC685, and 2CC9414 each have control cables routed through this zone. These are containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block

component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; the operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

Control cables for both of the RHR heat exchanger outlet valves, 2CC9412A and 2CC9412B, are routed through this zone. The spurious opening of one of these valves would result in excessive flow through the system. If a second pump did not autostart on low discharge pressure, then operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

The essential service water discharge header crosstie valves, 2SX033 and 2SX034, have control cables routed through this zone. The spurious closure of one of these normally open valves would isolate the train A and train B essential service water supply headers. For this fire zone, components from both divisions may be operating, although initially only Division 22 components will be used. Credit is taken for operator action to diagnose the problem and manually open the affected valve locally with its handwheel to restore essential service water flow to both of the essential service water system supply headers.

The Division 22 essential service water pump suction valve, 2SX001B, has a control cable present in this zone. The spurious closure of this valve would disable its associated pump. This valve has power locked out during normal operation and is therefore not susceptible to postulated spurious operation.

The unit 2 component cooling heat exchanger ESW inlet valve, 2SX004, has a control cable routed through this zone. The spurious closure of this normally open valve would block essential service water flow to the component cooling heat exchanger, and would result in loss of heat removal by the component cooling system. Credit is taken for operator action to diagnose the problem and re-establish essential service water flow to the affected component cooling heat exchanger per the loss of component cooling station procedure.

The common component cooling heat exchanger ESW inlet and outlet valves, 0SX146, 0SX147, 1SX005 and 2SX005 each have control cables routed through this zone. The

spurious operation of one of these valves would have no impact on normal plant operation, since the common component cooling heat exchanger normally is only aligned to a unit and operated during cooldown to cold shutdown conditions. The operating procedures for aligning the common component cooling heat exchanger to a given unit require verification of proper valve alignment prior to initiating cooldown with this heat exchanger, and are therefore adequate to deal with postulated spurious operations of these valves.

The unit 1 return header crosstie valves, 2SX010, 2SX011 and 2SX136, each have control cables routed through this zone. The spurious closure of one of these normally open valves would have no impact. It would force return flow from some unit 1 components to one of the two main return headers, but no flow paths would be blocked. Thus, no adverse consequences result from the spurious closure of one of these valves.

Cables for the containment chiller condenser bypass valves, 2SX147A and 2SX147B, are located in this zone. This valve normally throttles to divert a portion of the essential service water RCFC return flow through the containment chiller condensers. The spurious closure of one of this valve could block essential service water flow to one train of RCFCs, which would disable containment cooling if the affected train of RCFCs were operating at that time. Credit is taken for operator action to diagnose the problem and if necessary, manually open the affected valve locally by bleeding air from the valve operator when time permits.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. A fire in this zone can affect both trains. The train A RHR pump power cable is present in this zone. Cubicle cooler fans for both pumps have power and control cables in this zone. Credit is taken for repairing the circuits for one trains' RHR pump and cubicle coolers per existing station procedures. Note that Division 22 MCC 2AP23E is present in this fire zone. This MCC is the power supply for one of the Division 22 RHR pump cubicle cooler fans. If this MCC is damaged by fire, then repair of the Division 21 RHR train per existing station procedures is mandatory, since it is not considered to be feasible to repair an MCC. Division 21 RHR pump suction valve 2RH8701A has control cables in the zone. In the event of fire damage to this control circuit, credit is taken for locally manually opening this valve in order to establish a flowpath to the Division 21 RHR pump.

Several other valves in the RHR system flowpaths have cables present in this zone. This includes 2CS009A and B, 2CV8804A, 2RH610, 2RH611, 2RH8716A, 2SI8809A, 2SI8811A, 2SI8812A and 2SI8840. Except as discussed above, the spurious operation of these valves during normal operation or while the unit is in hot standby would not have any adverse consequences. The RHR operating procedure requires verification of proper valve position prior to placing an RH pump in operation. Therefore, credit is taken for manually verifying and/or repositioning affected valves via local operation with

their handwheels prior to initiating cooldown with the RHR system. Additionally, Division 21 valve 2CC9412A and Division 22 valve 2CC9412B may need to be repositioned (if not previously addressed) to ensure adequate component cooling water flow to the RH heat exchanger. If required, credit is taken for locally manually operating these valves with their handwheels.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-28 identifies the equipment within this room that is separated from redundant equipment on the next elevation (fire zone 11.3-0) by an unrated floor assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

Also, Generic Letter 86-10 Evaluations BYR-04 and BYR-19 identify the equipment within this room that is separated from redundant equipment in an adjacent area (fire zones 11.3-2 and 11.3-1, respectively) by an unrated wall assembly. These evaluations justify the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.98 Control Room Refrigeration Equipment Room (Fire Zone 11.4A-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The safe shutdown components within the control room ventilation system are not affected by a fire in this zone. The auxiliary building ventilation system is also not affected by a fire in this zone.

Unit 1 Safe Shutdown Functions

Cables from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

Power and control cables for both the Train A and Train B control room refrigeration units are present in this zone. Credit is taken for opening the breaker and removing control power fuses at the Division 11 and 12 switchgear bus cubicles per station procedure upon detection of a design basis fire, as a precautionary measure to protect the bus. With these actions, both ESF buses will remain available, and are credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The systems and components which perform this function are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The systems and components which perform this function are unaffected by a fire in this zone.

Essential Support

The essential support systems are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system and its required support functions are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone. Therefore, a fire in this zone will not have any impact on unit 2 safe shutdown.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.99 Unit 1 Auxiliary Feedwater Pump 1B Room (Fire Zone 11.4A-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are not affected by a fire in this zone.

Unit 1 Safe Shutdown Functions

Cables from Division 12 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The systems and components which perform this function are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The Division 12 auxiliary feedwater pump and its support components, including oil pumps and coolers, essential service water cooling components, room coolers and associated valves are present in this zone. Cables for each of these active components are also present. Therefore, the Division 12 AFW system is assumed to be unavailable.

The Division 11 AFW system is unaffected by a fire in this zone, and is credited for safe shutdown.

Essential Support

The component cooling water and containment ventilation systems are unaffected by a fire in this zone. Two fire dampers 0VA455Y and 0VA456Y in the return ductwork from the Train A essential service water pump room are present in the walls of this zone. A fire in this zone could therefore block the return flowpath for the auxiliary building airflow through this room. The cubicle coolers for the Train A essential service water pump room are not affected, and therefore the operation of the essential service water pumps within this room is also not affected. Thus, both trains of essential service water remain available for safe shutdown.

Cold Shutdown Decay Heat Removal

The residual heat removal system and its required support functions are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone. Therefore, a fire in this zone will not have any impact on unit 2 safe shutdown.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.11.31 of the fire hazards analysis.

2.4.2.100 Unit 2 Auxiliary Feedwater Pump 2B Room (Fire Zone 11.4A-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are not affected by a fire in this zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone. Therefore, a fire in this zone will not have any impact on unit 1 safe shutdown.

Unit 2 Safe Shutdown Functions

Cables from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The systems and components which perform this function are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The Division 22 auxiliary feedwater pump and its support components, including oil pumps and coolers, essential service water cooling components, room coolers and associated valves are present in this zone. Cables for each of these active components are also present. Therefore, the Division 22 AFW system is assumed to be unavailable. The Division 21 AFW system is not directly affected by a fire in this zone, and is credited for safe shutdown.

Essential Support

The essential service water pumps and support components and the containment ventilation system are unaffected by a fire in this zone. A power cable for the Division 21 component cooling water pump is present in the zone. The Division 22 component cooling water pump is unaffected and is credited in this zone.

The intermediate header crosstie valve, 2CC9473A, has control cables routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore fire damage to control cables for this valve will not result in a spurious valve operation that will affect unit separation of the component cooling system.

Cold Shutdown Decay Heat Removal

The residual heat removal system and its required support functions are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.11.32 of the fire hazards analysis.

2.4.2.101 Radwaste / RSP Ventilation Control Room (Fire Zone 11.4B-0)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will not impact on the safe shutdown of either unit.

2.4.2.102 Unit 1 Seal Water HX Room (Fire Zone 11.4B-1)

The Seal Water Heat Exchanger 1CV02A is located in this zone, however it is a passive mechanical component not affected by a fire. No safe shutdown electrical components or cables are located in this fire zone. Therefore, a fire in this zone will no impact on the safe shutdown of either unit.

2.4.2.103 Unit 2 Seal Water HX Room (Fire Zone 11.4B-2)

The Seal Water Heat Exchanger 2CV02A is located in this zone, however it is a passive mechanical component not affected by a fire. No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will not impact the safe shutdown of either unit.

2.4.2.104 Radwaste/Remote Shutdown Control Room (Fire Zone 11.4C-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Cables for fans and dampers for train A of the control room ventilation system are present in this zone. Train B is unaffected in this zone.

The auxiliary building ventilation system is unaffected by a fire in this zone.

Control cables for both essential service cooling water tower makeup pumps 0SX02PA and 0SX02PB are present in the zone. Locally starting and operating one of the makeup pumps at the river screen house will be credited. Makeup to the tower is not immediately required, only after system and evaporation losses result in low tower basin water levels. Adequate time is available to access the river screen house.

Unit 1 Safe Shutdown Functions

Cables and components from both ESF divisions are present in this fire zone. The remote shutdown panels located in this zone, contain controls and indication for a limited subset of the safe shutdown systems for the unit. See Tables 2.4-5 through 2.4-11. For a design basis fire, the controls in both the main control room and at the remote shutdown panels may be rendered unavailable. Safe shutdown instrumentation in the control room will remain available. The safe shutdown instruments in the control room will be credited for safe shutdown. In addition, instrumentation at the fire hazards panel remains available (but is not needed). Local manual control of affected safe shutdown components and systems will be credited for safe shutdown of the unit.

Essential Electric Power (AC/DC) Support

The unit 1 ESF AC and DC power sources, including support systems, are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

Cables for both charging pumps are present in this zone. Both charging pumps remain available via local manual breaker operation at the ESF switchgear buses. Credit is taken for initial operation of the Division 11 charging pump.

Support systems for the charging pumps are unaffected by a fire in this zone.

Control cables associated with charging flow indicators 1FI-0121A (1PM05J) and 1FI-0121B (1PL06J) are present in the zone. A fire in this zone can result in the lost of both 1FI-0121A, 1FI-0121B. Fire damage in this zone cannot spuriously fail charging FCV 1CV121 closed, however verification of charging flow may not be available. A manual action to verify at least one charging pump is operating and all reactor coolant pump

seal leakoff temperatures are normal is credited upon loss of charging flow indication. If verifications are not obtained, abnormal operating procedure for loss of RCP seal cooling will be entered to proceed to safe shutdown.

The charging flow control valve, 1CV121, has cables present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

Hot Standby Decay Heat Removal

A fire in this zone can affect both division 11 and division 12 components and systems used to accomplish this function. Instrumentation in the control room will be credited for safe shutdown.

The control circuits for both auxiliary feedwater pumps are potentially affected. Credit is taken for manual operation of the Division 11 pump via local operation of the breaker at the ESF switchgear bus. Credit is also taken for manual operation of the flow control valves, 1AF005A through D, locally with their handwheels. The AFW containment isolation valves, 1AF013A through D, are also potentially affected. The spurious closure of a single valve would not prevent safe shutdown. When time permits and manpower is available, an affected valve will be manually opened via local operation of its handwheel.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown.

The main steam isolation valves, 1MS001A through 1MS001D, each have a Division 11 and a Division 12 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

In the event of the spurious opening of one of the steam generator PORVs, manual action will be credited to open the breakers for the affected steam generator PORV. These valves fail closed on loss of electrical power.

Essential Support

A fire in this zone affects support systems from both divisions. The essential service water pumps, component cooling water pumps, and all four containment ventilation fans can all be affected. Each of these components remain available via local operation of their breakers at the switchgear buses. Credit is taken for manual

operation of Division 11 essential service water pump, component cooling water pump, and both RCFC fans via local operation of the breakers at the switchgear bus.

Cold Shutdown Decay Heat Removal

The RHR system is unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

Cables and components from both ESF divisions are present in this fire zone. The remote shutdown panels, located in this zone, contain controls and indication for a limited subset of the safe shutdown systems for the unit. See Tables 2.4-5 through 2.4-11. For a design basis fire, the controls in both the main control room and at the remote shutdown panels may be rendered unavailable. Safe shutdown instrumentation in the control room will remain available. In this case, the safe shutdown instruments in the control room will be credited for safe shutdown. In addition, instrumentation at the fire hazards panel remains available (but is not needed). Local manual control of affected safe shutdown components and systems will be credited for safe shutdown of the unit.

Essential Electric Power (AC/DC) Support

The unit 2 ESF AC and DC power sources are unaffected by a fire in this zone. Except as noted in the following discussion, support systems are also unaffected by a fire in this zone. Cables for one Division 21 diesel oil transfer pump are routed through this zone. The redundant pump is unaffected; therefore operation of the Division 21 emergency diesel generator will not be adversely affected by fire damage to this component.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

Cables for both charging pumps are present in this zone. Both charging pumps remain available via local manual breaker operation at the ESF switchgear buses. Credit is taken for initial operation of the Division 21 charging pump.

Support systems for the charging pumps are unaffected by a fire in this zone.

Control cables associated with charging flow indicators 2FI-0121A (2PM05J) and 2FI-0121B (2PL06J) are present in the zone. A fire in this zone can result in the lost of both 2FI-0121A, 2FI-0121B. Fire damage in this zone cannot spuriously fail charging FCV 2CV121 closed, however verification of charging flow may not be available. A manual action to verify at least one charging pump is operating and all reactor coolant pump seal leakoff temperatures are normal is credited upon loss of charging flow indication.

If verifications are not obtained, abnormal operating procedure for loss of RCP seal cooling will be entered to proceed to safe shutdown.

The charging flow control valve, 2CV121, has cables present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

Hot Standby Decay Heat Removal

A fire in this zone can affect both division 21 and division 22 components and systems used to accomplish this function. Instrumentation in the control room will be credited for safe shutdown.

The control circuits for both auxiliary feedwater pumps are potentially affected. Credit is taken for manual operation of the Division 21 pump via local operation of the breaker at the ESF switchgear bus. Credit is also taken for manual operation of the flow control valves, 2AF005A through D, locally with their handwheels. The AFW containment isolation valves, 2AF013A through D, are also potentially affected. The spurious closure of a single valve would not prevent safe shutdown. When time permits and manpower is available, and affected valve will be manually opened via local operation of its handwheel.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown.

The main steam isolation valves, 2MS001A through 2MS001D, each have a Division 21 and a Division 22 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

In the event of the spurious opening of one of the steam generator PORVs, manual action will be credited to open the breakers for the affected steam generator PORV. These valves fail closed on loss of electrical power.

Essential Support

A fire in this zone affects support systems from both divisions. The essential service water pumps, component cooling water pumps, and all four containment ventilation fans can all be affected. Each of these components remain available via local operation of their breakers at the switchgear buses. Credit is taken for manual operation of Division 21 essential service water pump, component cooling water pump, and both RCFC fans via local operation of the breakers at the switchgear bus.

Cold Shutdown Decay Heat Removal

The RHR system is unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.11.36 of the fire hazards analysis.

2.4.2.105 Letdown HX 1A Room (Fire Zone 11.4C-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

Cables from Division 11 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The power cable for the Division 11 charging pump and power and control cables for its cubicle cooler fan are routed through this zone. The Division 11 pump is assumed to be unavailable. The Division 12 charging pump and support components, and instrumentation from both divisions are unaffected by a fire in this zone, and are credited for safe shutdown.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-20 identifies the equipment within this room that is separated from redundant equipment in an adjacent area (fire zone 11.3-1) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.106 Letdown HX 2A Room (Fire Zone 11.4C-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone.

Unit 2 Safe Shutdown Functions

Cables from Division 21 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The power cable for the Division 21 charging pump and power and control cables for its cubicle cooler fan are routed through this zone. The Division 21 pump is assumed to be unavailable. The Division 22 charging pump and support components, and instrumentation from both divisions are unaffected by a fire in this zone, and are credited for safe shutdown.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.107 Letdown HX 1B Room (Fire Zone 11.4D-1)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will no impact on the safe shutdown of either unit.

2.4.2.108 Letdown HX 2B Room (Fire Zone 11.4D-2)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will no impact on the safe shutdown of either unit.

2.4.2.109 Auxiliary Building General Area, El. 401' (Fire Zone 11.5-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Cables for fans and dampers in both trains of the control room ventilation system are present in this zone. Because both trains of the VC system can be rendered unavailable, all room cooling for the main control room and for both the unit 1 and unit 2 auxiliary electrical equipment rooms (AEERs) can be disabled. Loss of cooling to the AEERs could eventually affect main control room instrumentation, since much of the circuitry for the main control room instrumentation and alarms is dependent on cabinets and equipment in the AEERs. Loss of cooling to the main control room could affect the habitability environment for the control room operator. In the event of the total loss of the VC system, portable fans will be staged and flow paths established to ventilate the AEERs and main control room from the Turbine Building. Station evaluations (reference EC#333738 and Calculation #BRW-97-0339-M/BYR97-210), assuming Turbine Building ambient temperatures associated with peak summer temperatures, have demonstrated that temporary ventilation can maintain the AEER and main control room temperatures within conditions to assure the control room remains habitable and control room instrumentation would not be adversely affected. Additionally, safe shutdown instrumentation at the unit 1 and unit 2 fire hazards panels would not be affected by the loss of the VC system.

The "A" and "C" supply and exhaust fans for the auxiliary building ventilation system have power cables routed through this zone. The remaining two sets of supply and exhaust fans are unaffected by a fire in this zone, and are credited for safe shutdown.

Cables for dampers 0VA474Y, 0VA475Y, 0VA476Y and 0VA477Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause these dampers to fail closed. Closure of these dampers would result in blockage of both flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. The effect of this could be that both units AFW system "A" train pumps may not receive adequate room cooling. The train "B" AFW components are not affected, and will be credited for safe shutdown for both units.

Control cables for both essential service cooling water tower makeup pumps 0SX02PA and 0SX02PB are present in the zone. Locally starting and operating one of the makeup pumps at the river screen house will be credited. Makeup to the tower is not immediately required, only after system and evaporation losses result in low tower basin water levels. Adequate time is available to access the river screen house.

Control cables associated with all four essential service water cooling tower hotwater bypass valves are present in the zone. Local manual action will be credited to manually operate the bypass valves using their handwheels. Re-positioning these valves may be necessary to adjust to extreme changes in ambient temperatures at the ESW cooling towers. At the time of the fire, the cooling tower valves will be set up for ambient conditions and several hours would pass before any manipulation would be required if ambient temperatures drastically changed.

The ESW cooling tower hot water bypass valves are subject to spurious operation as a result of having control cables present in the zone. Spurious operation of these valves could, over time, affect the desired ESW tower operating performance. Proper ESW cooling tower operation will be restored by remote manual operation of the hot water bypass valves (if necessary, manually using its handwheel).

Unit 1 Safe Shutdown Functions

Cables and components from both ESF divisions are present in this fire zone.

Essential Electric Power (AC/DC) Support

Offsite power is assumed to be unavailable for this fire zone. A fire in this zone will affect components from both ESF divisions, but both divisions also remain available. For Division 11, the emergency diesel generator, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus all are unaffected, and remain available. Division 11 ESF MCC 131X5 also is unaffected and remains available. However, the other four Division 11 ESF MCCs all have power cables routed through this zone, and are therefore assumed to be unavailable. Power and control cables for four Division 11 4160Vac loads are present in this zone. Credit is taken for manually opening the breakers and removing control power fuses from the affected cubicles for the Division 11 AFW, CV, CS and common CC pumps upon detection of a design basis fire, as a precautionary measure to protect the bus.

Control cables for the Division 11 diesel generator room and ESF switchgear room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit.

For Division 12, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus are unaffected, and remain available. Division 12 ESF MCCs 132X2 and 132X4 also are unaffected and remain available. However, the other three Division 12 ESF MCCs all have power cables routed through this zone, and are therefore assumed to be unavailable. The Division 12 emergency diesel generator has control cables present in this zone. Credit is taken for manually starting and controlling the EDG from its local panel. Additionally, control cables associated with the Division 12 emergency diesel generator output breaker are present in the zone. Credit is taken for manually closing the Division 12 EDG output breaker at the Division 12 ESF switchgear bus. Power and control cables for four Division 12 4160Vac loads are present in this zone. Credit is taken for manually opening the breakers and removing control power fuses from the affected cubicles for the Division 12 CC, CS, SX, and common CC pumps upon detection of a design basis fire as a precautionary measure to protect the bus. In

addition, a cable for the Division 12 SAT feed breaker is present in this zone. Postulated faults on this cable could result in its spurious closure, possibly resulting in simultaneously feeding the bus from two energized sources. Therefore, credit is taken for removing the control power fuses and manually placing the Division 12 SAT feed breaker in its desired position.

Control cables for the Division 12 diesel generator room, ESF switchgear room, and miscellaneous electrical equipment room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit. The diesel generator cooling water valve, 1SX169B, has a cable present in this zone. Circuit analysis of the valves' control circuit has demonstrated that postulated faults on the affected cable can fail the valve open (its desired position), but cannot prevent it from opening or cause it to spuriously close. Therefore, no action is required to reposition this valve as a result of fire damage to its control circuit.

The DC power and diesel oil systems for both divisions remain available.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

A fire in this zone can affect both trains of charging. The Division 11 pump is assumed to be unavailable, since its power cable is present. Control cables for the Division 12 charging pump are present, but the charging pump remains available via local manual operation of its breaker at the switchgear bus. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

Both cubicle cooler fans for the Division 12 charging pump may be rendered unavailable by a fire in this zone. As long as auxiliary building ventilation system airflow to the charging pump cubicle remains available, cubicle cooling is not required. This has been demonstrated by calculation. However, the VA system supply path to the Division 12 charging pump room has a damper, 0VA274Y, which fails closed on loss of instrument air. Loss of instrument air is conservatively assumed to occur for a fire in this zone. If instrument air is lost, credit is taken for monitoring the charging pump cubicle temperature per the station fire response procedure, and for operator recognition and diagnosis of the condition should a high temperature be observed. Credit is taken for re-establishing auxiliary building ventilation flow to the room by opening the cubicle door. Therefore, the loss of the cubicle cooler fans will not preclude safe shutdown of unit 1.

Control cables associated with charging flow indicators 1FI-0121A (1PM05J) and 1FI-0121B (1PL06J) are present in the zone. A fire in this zone can result in the lost of both 1FI-0121A, 1FI-0121B. Fire damage in this zone cannot spuriously fail charging FCV 1CV121 closed, however verification of charging flow may not be available. A manual action to verify at least one charging pump is operating and all reactor coolant pump seal leakoff temperatures are normal is credited upon loss of charging flow indication. If verifications are not obtained, abnormal operating procedure for loss of RCP seal cooling will be entered to proceed to safe shutdown.

Charging pump suction valves 1CV112B, 1CV112C, 1CV112D and 1CV112E have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, manual closure of either 1CV112B or 1CV112C, and manual opening of either 1CV112D or 1CV112E is credited (if necessary, via local operation of the handwheel).

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in the charging system are such that the spurious operation of a single valve could affect both trains of the charging system. These are discussed below.

Cables for reactor vessel head vent valves 1RC014A and 1RC014C are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the containment atmosphere. This condition is discussed in Section 2.4.3.3.

The LPSI containment sump supply isolation valves, 1SI8811A and 1SI8811B, both have cables in this zone. The effect of the spurious opening of one of these valves is that RWST inventory would drain to the reactor containment sump. RWST level indication and low level alarms have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 1SI8812A or 1SI8812B (depending upon which 1SI8811A/B valve has spuriously opened) via local operation of the handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valves 1CV112B and 1CV112C have cables present in this zone. The spurious closure of these valves could isolate the VCT from the charging pump suction. To mitigate this postulated event, the operating charging pump will be stopped and one of the two RWST to charging pump suction valves 1CV112D or 1CV112E will be opened from the main control room, immediately upon determination of a design basis fire. If this cannot be accomplished from the main control room because of fire damage to their control cables, the operating charging pump will be stopped at its

switchgear and either valve 1CV112D or 1CV112E manually opened using its handwheel. The charging pump will be re-started after its suction flowpath is aligned to the RWST and control power fuses removed from valves 1CV112D and/or 1CV112E.

RWST to charging pump suction valves 1CV112D and 1CV112E have cables present in this zone. The spurious operation of one of these valves would have no effect other than to align the RWST to the charging pump suction, which is its desired position for most scenarios. If necessary, the valves will be locally manually operated using the handwheel.

The charging pump mini-flow isolation valves, 1CV8110, 1CV8111 and 1CV8116, each have cables present in this zone. The spurious closure of one of these valves would block the minimum recirculation flowpath for the associated charging pump. The RCP seal injection flowpath, which remains available, passes sufficient flow (>60gpm) to prevent charging pump damage (spurious operation position, Section 2.4.1.6.4, applied). Operator response to diagnose and identify the condition is credited. If necessary, the 1CV8116 solenoid valve will be failed open by opening its electrical supply breaker and the 1CV8110 motor operated valve will be locally manually operated using its handwheel to restore a recirculation flowpath for the Division 12 charging pump.

The charging flow control valve, 1CV121, has cables present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

The RCP seal injection line isolation valves, 1CV8355A through D, have cables routed through this zone. Postulated fire damage to these cables could cause one of these valves to spuriously close, which would isolate seal injection flow to the affected RCP. The Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperature greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling or loss of RCP seal injection.

The RHR Hx 1A to charging pump suction valve, 1CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Charging pump to cold leg injection isolation valves 1SI8801A and 1SI8801B each have cables present in this zone. The impact of spuriously opening of one of these valves

would be to create an additional flowpath for charging to the RCS. This could result in excessive charging flow. Operator response to locally manually close the affected valve by using its handwheel is credited per existing station procedures. Since an operator must travel through this fire zone, access to valves 1SI8801A and 1SI8801B may not be available until after the fire is extinguished. If necessary, charging can be stopped or delayed during this time.

Hot Standby Decay Heat Removal

A fire in this zone will affect both division 11 and division 12 components and systems used to accomplish this function. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

The control circuits for both auxiliary feedwater pumps are potentially affected. The Division 11 pump is assumed to be unavailable, since both its power and control circuits are present in this zone. Credit is taken for operation of the Division 12 pump via the remote start switch. The AFW pump diesel engine cooling water valve, 1SX173, has a cable present in this zone. Circuit analysis of the valves' control circuit has demonstrated that postulated faults on the affected cable can fail the valve open (its desired position), but cannot prevent it from opening or cause it to spuriously close. Therefore, no action is required to reposition this valve as a result of fire damage to its control circuit. The flow control valves, 1AF005A through H, are all potentially affected. Circuit analysis of these valves control circuits has demonstrated that faults on the cables in this zone can disable the controls at both the main control board and the remote shutdown panels, or cause all four valves to fail open. However, the spurious closure of any valve cannot occur. If necessary, these valves can be locally manually throttled using their handwheels to control AFW flow. The AFW containment isolation valves, 1AF013A through H, are also potentially affected. The spurious closure of a single valve would not prevent safe shutdown. When time permits and manpower is available, an affected valve will be manually opened via local operation of its handwheel.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown.

The main steam isolation valves, 1MS001A through 1MS001D, each have a Division 11 and a Division 12 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

The main steam isolation bypass valves, 1MS101A through 1MS101D, each have cables from their Division 11 and Division 12 actuation circuit present in this zone. These valves are normally closed, and it is desired to keep them closed for safe

shutdown. With the MSIV bypass valve hand position controllers in their normal position of 0%, postulated circuit faults on an actuation circuit for one of these valves are incapable of causing the spurious opening of the affected valve. No response is required.

In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV isolation valve will be locally manually closed using handwheel per existing station procedures.

Essential Support

A fire in this zone affects support systems from both divisions. The essential service water pumps, component cooling water pumps, and all four containment ventilation fans can all be affected. Credit is taken for manual operation of the Division 11 essential service water pump and component cooling water pump via local operation of their breakers at the 4160Vac ESF switchgear bus. Credit is taken for manual operation of the Division 12 RCFC fans via local operation of their breakers at the 480Vac ESF switchgear bus. Two of four Division 11 SX pump cubicle cooler fans have cables in this zone, and may be unavailable. In the event of coincident fire damage to the power and/or control circuits of the cubicle cooler fans, credit is taken for auxiliary building ventilation flow to the pump room. Per an existing calculation, adequate room cooling is provided by VA flow if the cubicle coolers are not operating.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in these systems are such that the spurious operation of a single valve could affect both trains of the affected system. These are discussed below.

The intermediate header crosstie valves, 1CC9473A and 1CC9473B, have control cables routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore fire damage to control cables for these valves will not result in a spurious valve operation that will affect unit separation of the component cooling system.

Valves 1CC9413A, 1CC9413B, 1CC685, 1CC9416 and 1CC9438, all have control cables routed through this zone. These are all containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperature greater

than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; the operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

The supply header isolation valve, 1CC9415, has a control cable routed through this zone. The spurious closure of this valve would block the discharge flowpath for the units' component cooling system. Operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

Control cables for both of the RHR heat exchanger outlet valves, 1CC9412A and 1CC9412B, are routed through this zone. The spurious opening of one of these valves would result in excessive flow through the system. If a second pump did not autostart on low discharge pressure, then operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

The essential service water discharge header crosstie valves, 1SX033 and 1SX034, have control cables routed through this zone. The spurious closure of one of these normally open valves would isolate the train A and train B essential service water supply headers. For this fire zone, components from both divisions may be operating. If the train B AFW pump must be operated as described above for the hot standby decay heat removal function, the train B AFW pump is capable of supplying its own essential service water flow using its engine driven cooling pump. The Division 12 charging pump is credited in this zone. Credit is taken for operator action to diagnose the problem, temporarily shutdown the Division 12 charging pump, and manually open the affected valve locally with its handwheel to restore essential service water flow to both of the essential service water system supply headers.

The essential service water pump suction valves, 1SX001A and 1SX001B, have control cables present in this zone. The spurious closure of one of these valves would disable its associated pump. This valve has power locked out during normal operation and is therefore not susceptible to postulated spurious operation.

The unit 1 component cooling heat exchanger ESW inlet valve, 1SX004, has control cables routed through this zone. The spurious closure of this normally open valve would block essential service water flow to the component cooling heat exchanger, and would result in loss of heat removal by the component cooling system. Credit is taken for operator action to diagnose the problem and re-establish essential service water flow to the affected component cooling heat exchanger per the loss of component cooling station procedure.

The common component cooling heat exchanger ESW inlet and outlet valves, 0SX146, 0SX147, 1SX005 and 2SX005 each have control cables routed through this zone. The spurious operation of one of these valves would have no impact on normal plant operation, since the common component cooling heat exchanger normally is only aligned to a unit and operated during cooldown to cold shutdown conditions. The operating procedures for aligning the common component cooling heat exchanger to a given unit require verification of proper valve alignment prior to initiating cooldown with this heat exchanger, and are therefore adequate to deal with postulated spurious operations of these valves.

The unit 1 return header crosstie valves, 1SX010, 1SX011 and 1SX136, each have control cables routed through this zone. The spurious closure of one of these normally open valves would have no impact. It would force return flow from some unit 1 components to one of the two main return headers, but no flow paths would be blocked. Thus, no adverse consequences result from the spurious closure of one of these valves.

Cables for the Division 12 essential service water RCFC inlet and outlet containment isolation valves 1SX016Band 1SX027B, are present in this zone. The spurious closure of one of these valves could block essential service water flow to the Division 12 RCFCs, which would disable containment cooling. Credit is taken for operator action to diagnose the problem and manually open the affected valve locally with its handwheel to restore containment cooling.

Cables for the containment chiller condenser bypass valves, 1SX147A and 1SX147B, are located in this zone. These valves normally throttle to divert a portion of the essential service water RCFC return flow through the containment chiller condensers. The spurious closure of one of these valves could block essential service water flow to one train of RCFCs, which would disable containment cooling if the affected train of RCFCs were operating at that time. Credit is taken for operator action to diagnose the problem and if necessary, manually open the affected valve locally by bleeding air from the valve operator when time permits.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Both trains can be affected by a fire in this zone. Both RHR pumps have power cables present in this zone. Credit is taken for repairing the power cable for one of the RHR pumps per existing station procedures. Power and/or control circuits for three of the four RHR pump room cubicle cooler fans are also present. Credit is taken for repairing the circuit for the chosen RHR pump cubicle cooler fans per existing station procedures. Each train of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8701A and 1RH8701B for train A and 1RH8702A and 1RH8702B for train B. In the event of fire damage to the control circuit for these valves, credit is taken for locally manually opening the valves in order to establish a flowpath to

one of the RHR pumps. These pairs of valves each also form a high-low pressure interface between the RCS and the low pressure RHR system. This condition is discussed in Section 2.4.3.1.

Cables for both reactor coolant wide range pressure indicators are present in this zone. Credit is taken for repairing the circuit for one of the indicators per station repair procedures.

Several other valves in the RHR system flowpaths have cables present in this zone. This includes 1CS009A and B, 1CV8804A, 1RH610, 1RH611, 1RH8716A and B, 1SI8804B, 1SI8809A and B, 1SI8811A and B, 1SI8812A and B, and 1SI8840. Except as noted above, the spurious operation of these valves during normal operation or while the unit is in hot standby would not have any adverse consequences. The RHR operating procedure requires verification of proper valve position prior to placing an RH pump in operation. Therefore, credit is taken for manually verifying and/or repositioning affected valves via local operation with their handwheels prior to initiating cooldown with the RHR system. Additionally, Division 11 valves 1CC9412A and 1CC9415 and Division 12 valve 1CC9412B may need to be repositioned (if not previously addressed) to ensure adequate component cooling water flow to the RH heat exchanger. If required, credit is taken for locally manually operating these valves with their handwheels.

Unit 2 Safe Shutdown Functions

Cables and components from both ESF divisions are present in this fire zone.

Essential Electric Power (AC/DC) Support

Offsite power is assumed to be unavailable for this fire zone. A fire in this zone will affect components from both ESF divisions, but both divisions also remain available. For Division 21, the emergency diesel generator, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus all are unaffected, and remain available. Four Division 21 ESF MCCs have power cables routed through this zone, and are therefore assumed to be unavailable. Division 21 MCC 231X5 is unaffected in this zone. Power to MCC 231X3 will be isolated by opening its supply breaker at Bus 231X. This action eliminates the need to open individual MCC 231X3 breakers (the fire may prevent access to the MCC) to isolate power to motor operated valves being manually operated outside of this zone. Power and control cables for six Division 21 4160Vac loads are present in this zone. Credit is taken for manually opening the breakers and removing control power fuses from the affected cubicles for the Division 21 AFW, CC, CS, CV, SX and common CC pumps upon detection of a design basis fire, as a precautionary measure to protect the bus.

Control cables for the Division 21 diesel generator room and ESF switchgear room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these

postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit.

For Division 22, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus are unaffected, and remain available. Division 22 ESF MCCs 232X2 and 232X4 also are unaffected and remain available. However, the other three Division 22 ESF MCCs all have power cables routed through this zone, and are therefore assumed to be unavailable. The Division 22 emergency diesel generator has control cables present in this zone. Credit is taken for manually starting and controlling the EDG from its local panel. Additionally, control cables associated with the Division 22 emergency diesel generator output breaker are present in the zone. Credit is taken for manually closing the Division 22 EDG output breaker at the Division 22 ESF switchgear bus. Power and control cables for one Division 22 4160Vac load is present in this zone. Credit is taken for manually opening the breaker and removing control power fuses from the affected cubicle for the common CC pump upon detection of a design basis fire, as a precautionary measure to protect the bus. In addition, a cable for the Division 22 SAT feed breaker is present in this zone. Postulated faults on this cable could result in its spurious closure, possibly resulting in simultaneously feeding the bus from two energized sources. Therefore, credit is taken for removing the control power fuses and manually placing the Division 22 SAT feed breaker in its desired position.

A control cable for the Division 22 diesel generator room ventilation fan is present in this zone. Credit is taken for manually operating the fan by local operation of its breaker at the 480Vac ESF switchgear bus. Control cables for the Division 22 diesel generator room, ESF switchgear room, and miscellaneous electrical equipment room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit. The diesel generator cooling water valve, 2SX169B, has a cable present in this zone. Circuit analysis of the valves' control circuit has demonstrated that postulated faults on the affected cable can fail the valve open (its desired position), but cannot prevent it from opening or cause it to spuriously close. Therefore, no action is required to reposition this valve as a result of fire damage to its control circuit.

The DC power and diesel oil systems for both divisions remain available.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

A fire in this zone can affect both trains of charging. The Division 21 pump is assumed to be unavailable, since its power cable is present. Control cables for the Division 22 charging pump are present, but the charging pump remains available via local manual operation of its breaker at the switchgear bus. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

Both cubicle cooler fans for the Division 22 charging pump may be rendered unavailable by a fire in this zone. As long as auxiliary building ventilation system airflow to the charging pump cubicle remains available, cubicle cooling is not required. This has been demonstrated by calculation. However, the VA system supply path to the Division 22 charging pump room has a damper, 0VA305Y, which fails closed on loss of instrument air. Loss of instrument air is conservatively assumed to occur for a fire in this zone. If instrument air is lost credit is taken for monitoring the charging pump cubicle temperature per station fire response procedure, and for operator recognition and diagnosis of the condition should a high temperature be observed. Credit is taken for re-establishing auxiliary building ventilation flow to the room by opening the cubicle door. Therefore, the loss of the cubicle cooler fans will not preclude safe shutdown of unit 2.

Control cables associated with charging flow indicators 2FI-0121A (2PM05J) and 2FI-0121B (2PL06J) are present in the zone. A fire in this zone can result in the lost of both 2FI-0121A, 2FI-0121B. Fire damage in this zone cannot spuriously fail charging FCV 2CV121 closed, however verification of charging flow may not be available. A manual action to verify at least one charging pump is operating and all reactor coolant pump seal leakoff temperatures are normal is credited upon loss of charging flow indication. If verifications are not obtained, abnormal operating procedure for loss of RCP seal cooling will be entered to proceed to safe shutdown.

Charging pump suction valves 2CV112B, 2CV112C, and 2CV112D have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, manual closure of 2CV112B or 2CV112C using its handwheel and remote manual opening of 2CV112E from the main control room is credited.

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in the charging system are such that the spurious operation of a single valve could affect both trains of the charging system. These are discussed below.

Cables for reactor vessel head vent valves 2RC014A and 2RC014C are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the containment atmosphere. This condition is discussed in Section 2.4.3.3.

The LPSI containment sump supply isolation valves, 2SI8811A and 2SI8811B, both have cables in this zone. The effect of the spurious opening of one of these valves is

that RWST inventory would drain to the reactor containment sump. RWST level indication and low level alarms have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 2SI8812A or 2SI8812B (depending upon which 2SI8811A/B valve has spuriously opened) via local operation of the handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valves 2CV112B and 2CV112C have cables present in this zone. The spurious closure of these valves could isolate the VCT from the charging pump suction. To mitigate this postulated event, the RWST to charging pump suction valve 2CV112E will be opened from the main control room.

RWST to charging pump suction valve 2CV112D has cables present in this zone. The spurious operation of this valve would have no effect other than to align the RWST to the charging pump suction, which is its desired position for most scenarios. If necessary, the valve will be locally manually operated using the handwheel.

The charging pump miniflow isolation valves, 2CV8110, 2CV8114 and 2CV8116, each have cables present in this zone. The spurious closure of one of these valves would block the minimum recirculation flowpath for the associated charging pump. The RCP seal injection flowpath passes sufficient flow (>60gpm) to prevent charging pump damage (spurious operation position, Section 2.4.1.6.4, applied). Operator response to diagnose and identify the condition is credited. If necessary, the 2CV8116 solenoid valve will be failed open by opening its electrical supply breaker and the 2CV8110 motor operated valve will be locally manually operated using the handwheel to restore a recirculation flowpath for the Division 22 charging pump.

The charging flow control valve, 2CV121, has cables present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

The RCP seal injection line isolation valves, 2CV8355A through D, have cables routed through this zone. Postulated fire damage to these cables could cause one of these valves to spuriously close, which would isolate seal injection flow to the affected RCP. The Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff

temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection

The RHR Hx 2A to charging pump suction valve, 2CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Charging pump to cold leg injection isolation valves 2SI8801A and 2SI8801B each have cables present in this zone. The impact of spuriously opening of one of these valves would be to create an additional flowpath for charging to the RCS. This could result in excessive charging flow. Operator response to locally manually close the affected valve by using its handwheel is credited per existing station procedures. Since an operator must travel through this fire zone, access to valves 2SI8801A and 2SI8801B may not be available until after the fire is extinguished. If necessary, charging can be stopped or delayed during this time.

Hot Standby Decay Heat Removal

A fire in this zone will affect both division 21 and division 22 components and systems used to accomplish this function. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

The control circuits for both auxiliary feedwater pumps are potentially affected. The Division 21 pump is assumed to be unavailable, since both its power and control circuits are present in this zone. Credit is taken for operation of the Division 22 pump via the remote start switch. The AFW pump diesel engine cooling water valve, 2SX173, has a cable present in this zone. Circuit analysis of the valves' control circuit has demonstrated that postulated faults on the affected cable can fail the valve open (its desired position), but cannot prevent it from opening or cause it to spuriously close. Therefore, no action is required to reposition this valve as a result of fire damage to its control circuit. The flow control valves, 2AF005A through H, are all potentially affected. Circuit analysis of the control circuits for these valves has demonstrated that postulated faults on the cables in this zone can disable the controls at both the main control board and the remote shutdown panels, or cause all four valves to fail open. However, the spurious closure of any valve cannot occur. If necessary, these valves can be locally manually throttled using their handwheels to control AFW flow. The AFW containment isolation valves, 2AF013A through H, are also potentially affected. The spurious closure of a single valve would not prevent safe shutdown. When time permits and manpower is available, an affected valve will be manually opened via local operation of its handwheel.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown.

The main steam isolation valves, 2MS001A through 2MS001D, each have a Division 21 and a Division 22 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

The main steam isolation bypass valves, 2MS101A through 2MS101D, each have cables from their Division 21 and Division 22 actuation circuit present in this zone. These valves are normally closed, and it is desired to keep them closed for safe shutdown. With the MSIV bypass valve hand position controllers in their normal position of 0%, postulated circuit faults on an actuation circuit for one of these valves are incapable of causing the spurious opening of the affected valve. No response is required.

In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures.

Essential Support

A fire in this zone affects support systems from both divisions. The essential service water pumps, component cooling water pumps, and all four containment ventilation fans can all be affected. Credit is taken for manual operation of the Division 22 essential service water pump and component cooling water pump via local operation of the breakers at the 4160Vac ESF switchgear bus. Credit is taken for manual operation of the Division 22 RCFC fans via local operation of the breaker at the 480Vac ESF switchgear bus. Two of four Division 22 SX pump cubicle cooler fans have cables in this zone, and may be unavailable. In the event of coincident fire damage to the power and/or control circuits of the cubicle cooler fans, credit is taken for auxiliary building ventilation flow to the pump room. Per an existing calculation, adequate room cooling is provided by VA flow if the cubicle coolers are not operating.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in these systems are such that the spurious operation of a single valve could affect both trains of the affected system. These are discussed below.

The intermediate header crosstie valves, 2CC9473A and 2CC9473B, have control cables routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves

have their power locked out during normal operation, therefore fire damage to control cables for these valves will not result in a spurious valve operation that will affect unit separation of the component cooling system.

Valves 2CC9413A, 2CC9413B, 2CC685, 2CC9414, 2CC9416 and 2CC9438, all have control cables routed through this zone. These are all containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; the operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

The supply header isolation valve, 2CC9415, has control cables routed through this zone. The spurious closure of this valve would block the discharge flowpath for the units' component cooling system. Operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

Control cables for both of the RHR heat exchanger outlet valves, 2CC9412A and 2CC9412B, are routed through this zone. The spurious opening of one of these valves would result in excessive flow through the system. If a second pump did not autostart on low discharge pressure, then operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

The essential service water discharge header crosstie valves, 2SX033 and 2SX034, have control cables routed through this zone. The spurious closure of one of these normally open valves would isolate the train A and train B essential service water supply headers. For this fire zone, components from both divisions may be operating, although initially only Division 22 components will be used. Credit is taken for operator action to diagnose the problem and manually open the affected valve locally with its handwheel to restore essential service water flow to both of the essential service water system supply headers.

The essential service water pump suction valves, 2SX001A and 2SX001B, have control cables present in this zone. The spurious closure of one of these valves would disable its associated pump. This valve has power locked out during normal operation and is therefore not susceptible to postulated spurious operation.

The unit 2 component cooling heat exchanger ESW inlet valve, 2SX004, has a control cable routed through this zone. The spurious closure of this normally open valve would block essential service water flow to the component cooling heat exchanger, and would result in loss of heat removal by the component cooling system. Credit is taken for operator action to diagnose the problem and re-establish essential service water flow to the affected component cooling heat exchanger per the loss of component cooling station procedure.

The common component cooling heat exchanger ESW inlet and outlet valves, 0SX146, 0SX147, 1SX005 and 2SX005 each have control cables routed through this zone. The spurious operation of one of these valves would have no impact on normal plant operation, since the common component cooling heat exchanger normally is only aligned to a unit and operated during cooldown to cold shutdown conditions. The operating procedures for aligning the common component cooling heat exchanger to a given unit require verification of proper valve alignment prior to initiating cooldown with this heat exchanger, and are therefore adequate to deal with postulated spurious operations of these valves.

The unit 2 return header crosstie valves, 2SX010, 2SX011 and 2SX136, each have control cables routed through this zone. The spurious closure of one of these normally open valves would have no impact. It would force return flow from some unit 2 components to one of the two main return headers, but no flow paths would be blocked. Thus, no adverse consequences result from the spurious closure of one of these valves.

Cables for the containment chiller condenser bypass valves, 2SX147A and 2SX147B, are located in this zone. These valves normally throttle to divert a portion of the essential service water RCFC return flow through the containment chiller condensers. The spurious closure of one of this valve could block essential service water flow to one train of RCFCs, which would disable containment cooling if the affected train of RCFCs were operating at that time. Credit is taken for operator action to diagnose the problem and if necessary, manually open the affected valve locally by bleeding air from the valve operator when time permits.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. A fire in this zone can affect both trains. The train A RHR pumps' power cable is present in this zone. Both cubicle cooler fans for this pump also have circuits present in this zone. The train B RHR pump is unaffected, however one of the cubicle cooler fans for this pump has control cables in this zone. Credit is taken for repairing the circuits for one

train of the RHR system per existing station procedures. Each train of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8701A and 2RH8701B for train A and 2RH8702A and 2RH8702B for train B. In the event of fire damage to the control circuit for valves 2RH8701A and 2RH8702A, credit is taken for locally manually opening the valves in order to establish a flowpath to one of the RHR pumps.

Several other valves in the RHR system flowpaths have cables present in this zone. This includes 2CS009A and B, 2CV8804A, 2RH610, 2RH611, 2RH8716A, 2SI8809A and B, 2SI8811A and B, 2SI8812A and B, and 2SI8840. Except as noted above, the spurious operation of these valves during normal operation or while the unit is in hot standby would not have any adverse consequences. The RHR operating procedure requires verification of proper valve position prior to placing an RH pump in operation. Therefore, credit is taken for manually verifying and/or repositioning affected valves via local operation with their handwheels prior to initiating cooldown with the RHR system. Additionally, Division 21 valves 2CC9412A and 2CC9415 and Division 22 valve 2CC9412B may need to be repositioned (if not previously addressed) to ensure adequate component cooling water flow to the RH heat exchanger. If required, credit is taken for locally manually operating these valves with their handwheels.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluations BYR-05 and BYR-29 identify the equipment within this room that is separated from redundant equipment on the next elevation (fire zones 11.6A-0 and 11.6-0) by an unrated floor assembly. These evaluations justify the existing separation, so that a credible fire will not adversely affect the redundant components.

Also, Generic Letter 86-10 Evaluations BYR-07, BYR-08, BYR-18, and BYR-26 identify the equipment within this room that is separated from redundant equipment in an adjacent area (fire zones 11.3-2 , 11.3-1, 11.5A-1, and 11.5A-2) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.110 Unit 1 Containment Refrigeration Equipment Room (Fire Zone 11.5-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

Cables from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

However, two essential service water valves 1SX147A, and 1SX147B are located in this zone, along with their cables. These are the containment chiller condenser bypass valves. These valves normally throttle to divert a portion of the essential service water RCFC return flow through the containment chiller condensers. The spurious closure of one of this valve could block essential service water flow to one train of RCFCs, which would disable containment cooling if the affected train of RCFCs were operating at that time. Credit is taken for operator action to diagnose the problem and if necessary, manually open the affected valve locally by bleeding air from the valve operator when time permits.

Cold Shutdown Decay Heat Removal

The residual heat removal system and support components from both divisions are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.111 Unit 2 Containment Refrigeration Equipment Room (Fire Zone 11.5-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone.

Unit 2 Safe Shutdown Functions

Cables from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps and instrumentation from both divisions are unaffected by a fire in this zone. Power and control cables for a Division 21 charging pump cubicle cooler fan is present in the zone. Therefore the Division 22 charging pump will be credited in this zone.

Hot Standby Decay Heat Removal

The AFW pumps and support components from both divisions are unaffected by a fire in this zone. Cables for both Division 22 steam generator PORVs and cables for two Division 21 steam generator pressure indicators are present in this zone. Therefore, the Division 21 steam generator PORVs will be relied upon for safe shutdown. Primary side instrumentation is unaffected by a fire in this zone, and redundant secondary side instrumentation remains available for all four steam generators.

In the event of the spurious opening of one of the Division 22 steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV will be locally manually closed by opening the breaker at its MCC cubicle.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

However, two essential service water valves 2SX147A, and 2SX147B are located in this zone, along with their cables. These are the containment chiller condenser bypass valves. These valves normally throttle to divert a portion of the essential service water RCFC return flow through the containment chiller condensers. The spurious closure of one of this valve could block essential service water flow to one train of RCFCs, which would disable containment cooling if the affected train of RCFCs were operating at that time. Credit is taken for operator action to diagnose the problem and if necessary, manually open the affected valve locally by bleeding air from the valve operator when time permits.

Cold Shutdown Decay Heat Removal

The residual heat removal system and support components from both divisions are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.112 Radiological Equipment Calibration Room (Fire Zone 11.5A-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this fire zone.

Unit 1 Safe Shutdown Functions

Cables from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The AFW pumps and support components, and associated primary side instrumentation from both divisions are unaffected by a fire in this zone. Two Division 11 steam generator pressure indicators have cables routed through this zone. However, redundant indication remains available.

All four steam generator PORVs have cables routed through this zone. Therefore, one or more steam generator PORVs will be manually operated via local operation with the hydraulic hand pumps per an existing station procedure.

In the event of the spurious opening of one of the steam generator PORVs, manual action will be credited to open the breakers for the affected steam generator PORV. These valves fail closed on loss of electrical power.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.113 Division 11 Containment Electrical Penetration Area, El. 414' (Fire Zone 11.5A-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is not directly affected by a fire in this zone. Train B will be credited in this zone.

The "A" supply and exhaust fans for the auxiliary building ventilation system have control cables routed through this zone, and are assumed to be unavailable. The remaining three sets of supply and exhaust fans are unaffected, and are credited for safe shutdown. Cables for damper 0VA474Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause this damper to fail closed. Closure of this damper would result in blockage of one of two flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. A second flowpath is unaffected by a fire in this zone, therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 11. In general, Division 12 systems and components are credited for safe shutdown. However, Division 11 systems and components may be credited when they are shown to remain available.

Essential Electric Power (AC/DC) Support

The Division 12 ESF bus and its support systems are unaffected, and will be credited for safe shutdown. A control cable for the Division 11 diesel generator room ventilation system and a control cable for the Division 11 ESF switchgear room ventilation system are present in this zone. Fire damage to these cables will cause the modulating supply damper to fail open, and the return damper to fail closed. This will result in full airflow through both the diesel generator room and the ESF switchgear room, with no recirculation. This mode of operation will not prevent operation of the affected components. Additionally, power and control cables for Division 11 essential service water pump 1A are present in this zone. This non-credited component could adversely affect the operation of the Division 11 bus. Credit is taken for manually opening its breaker and removing the control power fuse upon detection of a design basis fire, as a precautionary measure to protect the Division 11 bus. With this action, the Division 11 ESF bus is assumed to remain available, in addition to the credited Division 12 bus. Division 11 MCCs 131X2 and 131X4 are located in the zone and are not available and not credited.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 11 valves, they could potentially impact the operation of Division 12 components. These are discussed below.

Cables for Division 11 pressurizer PORV 1RY455A and block valve 1RY8000A are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the PRT. This condition is discussed in Section 2.4.3.2.

Cables for reactor vessel head vent valves 1RC014A and 1RC014C are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the containment atmosphere. This condition is discussed in Section 2.4.3.3.

The LPSI containment sump supply isolation valve, 1SI8811A, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor containment sump. RWST level indication, RSWT level alarms, and containment recirc sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by closing valve 1SI8812A to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

The RHR Hx 1A to charging pump suction valve, 1CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Hot Standby Decay Heat Removal

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 AFW and main steam system components and

associated primary and secondary side instrumentation are credited with accomplishing this safe shutdown function.

The Division 11 steam generator PORVs, 1MS018A and D, have cables routed through this zone. Credit is taken for the Division 12 steam generator PORVs. In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited. An affected Division 11 steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures.

Essential Support

Division 11 support systems are assumed to be unavailable. The Division 12 essential service water pump and its support components, the Division 12 component cooling water pump, and the Division 12 containment ventilation system are unaffected by a fire in this zone.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 11 valves, they could potentially impact the operation of Division 12 components. These are discussed below.

Valves 1CC9416 and 1CC9438, each have control cables routed through this zone. These are each containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperature greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; The operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train A is assumed to be unavailable. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8702A and 1RH8702B. Valve 1RH8702A has cables present in this zone. In the event of fire damage to the

control circuit for this valve, credit is taken for locally manually opening this valve using its handwheel in order to establish a flowpath to the train B RHR pump.

Cables for both reactor coolant wide range pressure indicators are present in this zone. Credit is taken for repairing the circuit for the Division 12 indicator per station repair procedures.

Cables for both RHR heat exchanger outlet temperature indicators are present in this zone. Credit is taken for repairing the circuit for the Division 12 indicator per station repair procedures.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-12 identifies the equipment within this room that is separated from redundant equipment on the next elevation (fire zone 11.6-1) by an unrated floor assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

Also, Generic Letter 86-10 Evaluation BYR-18 identifies the equipment within this room that is separated from redundant equipment in an adjacent area (fire zone 11.5-0) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.114 Division 21 Containment Electrical Penetration Area, El. 414' (Fire Zone 11.5A-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

The "C" supply and exhaust fans for the auxiliary building ventilation system have control cables routed through this zone, and are assumed to be unavailable. The remaining three sets of supply and exhaust fans are unaffected, and are credited for safe shutdown. Cables for damper 0VA476Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause this damper to fail closed. Closure of this damper would result in blockage of one of two flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. A second

flowpath is unaffected by a fire in this zone, therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components are present in this fire zone.

Unit 2 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 21. In general, Division 22 systems and components are credited for safe shutdown. However, Division 21 systems and components may be credited when they are shown to remain available.

Essential Electric Power (AC/DC) Support

The Division 21 and 22 ESF buses and their support systems are unaffected, and will be credited for safe shutdown. Control cables for the Division 21 diesel generator room ventilation system (VD) and Division 21 ESF switchgear room ventilation system (VX) dampers are present in the zone. Fire damage to these cables will only cause the modulating supply damper to fail open and the return damper to fail closed, both positions will not prevent the safe shutdown function of the systems from being accomplished. Division 21 MCCs 231X2 and 231X4 are located in the zone and are not available and not credited.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 21 valves, they could potentially impact the operation of Division 22 components. These are discussed below.

Cables for Division 21 pressurizer PORV 2RY455A and block valve 2RY8000A are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the PRT. This condition is discussed in Section 2.4.3.2.

Cables for reactor vessel head vent valves 2RC014A and 2RC014C are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the containment atmosphere. This condition is discussed in Section 2.4.3.3.

The LPSI containment sump supply isolation valve, 2SI8811A, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor containment sump. RWST level indication, RSWT level alarms, and containment recirc sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by closing valve 2SI8812A to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

The RHR Hx 2A to charging pump suction valve, 2CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Hot Standby Decay Heat Removal

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 AFW and main steam system components and associated primary and secondary side instrumentation are credited with accomplishing this safe shutdown function.

All four steam generator PORVs, 2MS018A through D, have cables routed through this zone. Credit is taken for local manual operation of either 2MS018B or 2MS018C using the hydraulic hand pump per existing station procedures to accomplish decay heat removal via steam release to the atmosphere. In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited. An affected Division 21 steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures.

Essential Support

Power cables for the Division 22 component cooling water and essential service water pumps are present in the zone and their associated pumps are unavailable. The Division 21 essential service water pump and its support components, the Division 21 component cooling water pump, and the Division 22 containment ventilation system are unaffected by a fire in this zone.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. These are discussed below.

Valves 2CC9416 and 2CC9438, each have control cables routed through this zone. These are each containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection Component cooling flow through this flowpath is a small fraction of total component cooling flow; the operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result. Credit is taken for operator diagnosis of the problem, and for locally manually re-opening the valve using its handwheel when time permits.

Cold Shutdown Decay Heat Removal

The train B RHR system is credited with decay heat removal for cold shutdown. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8702A and 2RH8702B. Valve 2RH8702A has cables present in this zone. In the event of fire damage to the control circuit for this valve, credit is taken for locally manually opening this valve using its handwheel in order to establish a flowpath to the train B RHR pump.

Cables for both reactor coolant wide range pressure indicators are present in this zone. Credit is taken for repairing the circuit for the Division 22 indicator per station repair procedures.

Cables for both RHR heat exchanger outlet temperature indicators are present in this zone. Credit is taken for repairing the circuit for the Division 22 indicator per station repair procedures.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-22 identifies the equipment within this room that is separated from redundant equipment on the next elevation (fire zone 11.6-2) by an unrated floor assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

Also, Generic Letter 86-10 Evaluations BYR-03 and BYR-26 identify the equipment within this room that is separated from redundant equipment in an adjacent areas (fire zone 11.3-2 and 11.5-0, respectively) by an unrated wall assembly. These evaluations justify the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.115 Division 12 Cable Riser Area (Fire Zone 11.5B-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Both the control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 12. In general, Division 11 systems and components are credited for safe shutdown. However, Division 12 systems and components may be credited when they are shown to remain available.

Essential Electric Power (AC/DC) Support

The Division 11 and 12 ESF buses and their support systems are unaffected, and will be credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

Division 12 components and systems used to accomplish this function are assumed to be unavailable. The Division 11 charging pump, sufficient instrumentation, and support components are unaffected by a fire in this zone.

Charging pump suction valves 1CV112C and 1CV112E have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, remote manual closure of 1CV112B, and remote manual opening of 1CV112D from the main control room is credited (these circuits are unaffected).

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone.

Although these valves are Division 12 valves, they could potentially impact the operation of Division 11 components. These are discussed below.

The LPSI containment sump supply isolation valve, 1SI8811B, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor containment sump. RWST level indication, RSWT level alarms, and containment recirc sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 1SI8812B via local operation of its handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valve 1CV112C has cables present in this zone. The spurious operation of this valve could isolate the VCT from the charging pump suction. To mitigate this postulated event, the RWST to charging pump suction valve 1CV112D will be opened from the main control room.

RWST to charging pump suction valve 1CV112E has cables present in this zone. The spurious opening of this valve would have no effect other than to align the RWST to the charging pump suction, which is its desired position for most scenarios. If necessary, this valve will be locally manually operated using its handwheel.

Charging pump 1A mini-flow isolation valve, 1CV8111, has cables present in this zone. The spurious closure of this valve would block the minimum recirculation flowpath for charging pump 1A. The RCP seal injection flowpath, which is unaffected, passes sufficient flow (>60gpm) to prevent charging pump damage. Operator response to diagnose and identify the condition is credited. If necessary, the valve will be locally manually opened using its handwheel.

Hot Standby Decay Heat Removal

Division 12 components and systems used to accomplish this function are assumed to be unavailable. The Division 11 AFW and main steam system components are unaffected by a fire in this zone, and are credited with accomplishing this safe shutdown function. Division 11 instrumentation associated with RCS loop A and the Fire Hazards panel are present in the zone. Instrumentation on the other three loops are not affected and are credited in the main control room.

Essential Support

Division 12 support systems are assumed to be unavailable. The Division 11 essential service water pump and its support components, the Division 11 component cooling

water pump, and the Division 11 containment ventilation system are unaffected by a fire in this zone.

One valve related to these functions is subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although this valve is a Division 12 valve, it could potentially impact the operation of Division 11 components. It is discussed below.

Valve 1CC685 has control cables routed through this zone. It is a containment isolation valve for component cooling service to the RCPs. The spurious closure of this valve would block component cooling flow to the RCP thermal barriers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; the operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train B is assumed to be unavailable. Train A of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8701A and 1RH8701B. Valve 1RH8701B has cables present in this zone. In the event of fire damage to the control circuit for this valve, credit is taken for locally manually opening this valve using its handwheel in order to establish a flowpath to the train A RHR pump.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-06 identifies the equipment within this room that is separated from redundant equipment on the next elevation (fire zone 11.3-1) by an unrated floor assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.116 Division 22 Cable Riser Area (Fire Zone 11.5B-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Both the control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components are present in this fire zone.

Unit 2 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 22. In general, Division 21 systems and components are credited for safe shutdown. However, Division 22 systems and components may be credited when they are shown to remain available.

Essential Electric Power (AC/DC) Support

The Division 21 and 22 ESF buses and their support systems are unaffected, and will be credited for safe shutdown. Power and control cables for the Division 22 feed to the containment spray pump are present in this zone. Therefore, credit is taken for manually opening the breaker and removing control power fuses per station procedure upon detection of a design basis fire, as a precautionary measure to protect the Division 22 4 Kv bus.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

Division 22 components and systems used to accomplish this function are assumed to be unavailable. The Division 21 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Charging pump suction valves 2CV112C and 2CV112E have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, remote manual closure of 2CV112B, and remote manual opening of 2CV112D from the main control room is credited (these circuits are unaffected).

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone.

Although these valves are Division 22 valves, they could potentially impact the operation of Division 21 components. These are discussed below.

The LPSI containment sump supply isolation valve, 2SI8811B, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor building. RWST level indication, RSWT level alarms, and containment recirc sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 2SI8812B via local operation of its handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valve 2CV112C has a cable present in this zone. The spurious operation of this valve could isolate the VCT from the charging pump suction. To mitigate this postulated event, the RWST to charging pump suction valves 2CV112D will be opened from the main control room.

RWST to charging pump suction valve 2CV112E has cables present in this zone. The spurious opening of this valve would have no effect other than to align the RWST to the charging pump suction, which is its desired position for most scenarios. If necessary, this valve will be locally manually operated using its handwheel.

Charging pump 2A mini-flow isolation valve, 2CV8111, has a cable present in this zone. The spurious closure of this valve would block the minimum recirculation flowpath for charging pump 2A. The RCP seal injection flowpath, which is unaffected, passes sufficient flow (>60gpm) to prevent charging pump damage. Operator response to diagnose and identify the condition is credited. If necessary, the valve will be locally manually opened using its handwheel.

Hot Standby Decay Heat Removal

Division 22 components and systems used to accomplish this function are assumed to be unavailable. The Division 21 AFW and main steam system components and associated primary and secondary side instrumentation are unaffected by a fire in this zone, and are credited with accomplishing this safe shutdown function.

Essential Support

Division 22 support systems are assumed to be unavailable. The Division 21 essential service water pump and its support components, the Division 21 component cooling water pump, and the Division 21 containment ventilation system are unaffected by a fire in this zone.

One valve related to these functions is subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although this valve is a Division 22 valve, it could potentially impact the operation of Division 21 components. It is discussed below.

Valve 2CC685 has a control cable routed through this zone. It is a containment isolation valve for component cooling service to the RCPs. The spurious closure of this valve would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; The operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train B is assumed to be unavailable. Train A of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8701A and 2RH8701B. Valve 2RH8701B has cables present in this zone. In the event of fire damage to the control circuit for this valve, credit is taken for locally manually opening this valve using its handwheel in order to establish a flowpath to the train A RHR pump.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.11.48 of the fire hazards analysis.

2.4.2.117 Auxiliary Building General Area, El. 426' (Fire Zone 11.6-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Cables for fans and dampers in both trains of the control room ventilation system are present in this zone. Because both trains of the VC system can be rendered unavailable, all room cooling for the main control room and for both the unit 1 and unit 2 auxiliary electrical equipment rooms (AEERs) can be disabled. Loss of cooling to the AEERs could eventually affect main control room instrumentation, since much of the circuitry for the main control room instrumentation and alarms is dependent on cabinets and equipment in the AEERs. Loss of cooling to the main control room could affect the habitability environment for the control room operator. In the event of the total loss of the VC system, portable fans will be staged and flow paths established to ventilate the AEERs and main control room from the Turbine Building. Station evaluations (reference EC#333738 and Calculation #BRW-97-0339-M/BYR97-210), assuming Turbine Building ambient temperatures associated with peak summer temperatures, have demonstrated that temporary ventilation can maintain the AEER and main control room temperatures within conditions to assure the control room remains habitable and control room instrumentation would not be adversely affected. Additionally, safe shutdown instrumentation at the unit 1 and unit 2 fire hazards panels would not be affected by the loss of the VC system.

The "A" and "C" supply and exhaust fans for the auxiliary building ventilation system have control cables routed through this zone. The remaining two sets of supply and exhaust fans are unaffected by a fire in this zone, and are credited for safe shutdown.

Cables for dampers 0VA474Y, 0VA475Y, 0VA476Y and 0VA477Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause these dampers to fail closed. Closure of these dampers would result in blockage of both flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. The effect of this could be that both units AFW system "A" train pumps may not receive adequate room cooling. However, since Division 11 and 21 power is not available anyway, there is no impact due to this effect. The train "B" AFW components remain available, and will be credited for safe shutdown for both units.

Fire dampers 0VA490Y, 0VA492Y, 0VA495Y, 0VA496Y, and 0VA497Y are present in walls separating this zone from the Division 12 and 22 electrical penetration areas. In addition, flow control damper 0VA430Y is present in this zone. A fire in this zone could cause the fire dampers to close and block auxiliary building ventilation to the electrical penetration areas. The postulated closure of these flowpaths have no impact upon VA system operation. Safe shutdown equipment located in the electrical penetration area include Division 12 and 22 motor control centers and the Fire Hazard panel with associated instrumentation. Credit is taken for the operator to monitor area temperatures and open doors to the Division 11/21 electrical penetration area and fuel handling building to restore cooling, if the normal VA supply ducts are isolated.

Control cables for both essential service cooling water tower makeup pumps 0SX02PA and 0SX02PB are present in the zone. Locally starting and operating one of the makeup pumps at the river screen house will be credited. Makeup to the tower is not

immediately required, only after system and evaporation losses result in low tower basin water levels. Adequate time is available to access the river screen house.

Control cables associated with all four essential service water cooling tower hotwater bypass valves are present in the zone. Local manual action will be credited to manually operate the bypass valves using their handwheels. Re-positioning these valves may be necessary to adjust to extreme changes in ambient temperatures at the ESW cooling towers. At the time of the fire, the cooling tower valves will be set up for ambient conditions and several hours would pass before any manipulation would be required if ambient temperatures drastically changed.

The ESW cooling tower hot water bypass valves are subject to spurious operation as a result of having control cables present in the zone. Spurious operation of these valves could, over time, affect the desired ESW tower operating performance. Proper ESW cooling tower operation will be restored by remote manual operation of the hot water bypass valves (if necessary, manually using its handwheel).

Unit 1 Safe Shutdown Functions

Cables and components from both ESF divisions are present in this fire zone.

Essential Electric Power (AC/DC) Support

Offsite power is assumed to be unavailable for this fire zone. A fire in this zone will affect components from both ESF divisions. Division 11 ESF power sources will be unavailable due to the loss of critical support functions.

For Division 12, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus are unaffected, and remain available. Division 12 ESF MCC 132X5 is located in this fire zone, and is therefore assumed to be unavailable. MCC 132X3 and all components powered from MCC 132X3 will also be assumed to be unavailable because it is fed from the same 480Vac breaker as MCC 132X5. However, the other three Division 12 ESF MCCs all are unaffected and remain available. Power to MCCs 132X3, 132X5 will be isolated by opening its supply breaker at Bus 132X. This action eliminates the need to open individual MCC 132X5 breakers (the fire may prevent access to the MCC) to isolate power to motor operated valves being manually operated outside of this zone. The Division 12 emergency diesel generator has control cables present in this zone. Credit is taken for manually starting and controlling the EDG from its local panel. Additionally, control cables associated with the Division 12 emergency diesel generator output breaker are present in the zone. Credit is taken for manually closing the Division 12 EDG output breaker at the Division 12 ESF switchgear bus. In addition, a cable for the Division 12 SAT feed breaker is present in this zone. Postulated faults on this cable could result in its spurious closure, possibly resulting in simultaneously feeding the bus from two energized sources. Therefore, credit is taken for removing the control power fuses and manually placing the Division 12 SAT feed breaker in its desired position.

Control cables for the Division 12 diesel generator room and miscellaneous electrical equipment room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit. The diesel generator cooling water valve, 1SX169B, has a cable present in this zone. Circuit analysis of the valves' control circuit has demonstrated that postulated faults on the affected cable can fail the valve open (its desired position), but cannot prevent it from opening or cause it to spuriously close. Therefore, no action is required to reposition this valve as a result of fire damage to its control circuit.

The DC power and diesel oil systems for Division 12 remain available.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 11 IP buses 1IP01J and 1IP03J should be relied upon only in the short term. The assumed loss of Division 11 power means that Division 11 battery 1DC01E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 11 components and systems used to accomplish this function are assumed to be unavailable. Control cables for the Division 12 charging pump are present, but the charging pump remains available via local manual operation of its breaker at the switchgear bus. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

Control cables associated with charging flow indicators 1FI-0121A (1PM05J) and 1FI-0121B (1PL06J) are present in the zone. A fire in this zone can result in the lost of both 1FI-0121A, 1FI-0121B. Fire damage in this zone cannot spuriously fail charging FCV 1CV121 closed, however verification of charging flow may not be available. A manual action to verify at least one charging pump is operating and all reactor coolant pump seal leakoff temperatures are normal is credited upon loss of charging flow indication. If verifications are not obtained, abnormal operating procedure for loss of RCP seal cooling will be entered to proceed to safe shutdown.

Charging pump suction valves 1CV112B, 1CV112C, 1CV112D and 1CV112E have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, manual closure of either 1CV112B or 1CV112C, and manual opening of either 1CV112D or 1CV112E is credited (if necessary, via local operation of the handwheel).

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in the charging system are such that the spurious operation of a single valve could affect both trains of the charging system. These are discussed below.

Cables for reactor vessel head vent valves 1RC014A and 1RC014C, and 1RC014B and 1RC014D are present in this zone. These pairs of valves each form a high-low pressure interface between the RCS and the containment atmosphere. This condition is discussed in Section 2.4.3.3.

The LPSI containment sump supply isolation valves, 1SI8811A and 1SI8811B, both have cables in this zone. The effect of the spurious opening of one of these valves is that RWST inventory would drain to the reactor containment sump. RWST level indication and low level alarms have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 1SI8812A or 1SI8812B (depending upon which 1SI8811A/B valve has spuriously opened) via local operation of the handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valves 1CV112B and 1CV112C have cables present in this zone. The spurious closure of these valves could isolate the VCT from the charging pump suction. To mitigate this postulated event, the operating charging pump will be stopped and one of the two RWST to charging pump suction valves 1CV112D or 1CV112E will be opened from the main control room, immediately upon determination of a design basis fire. If this cannot be accomplished from the main control room because of fire damage to their control cables, the operating charging pump will be stopped at its switchgear and either valve 1CV112D or 1CV112E manually opened using its handwheel. The charging pump will be re-started after its suction flowpath is aligned to the RWST and control power fuses removed from valves 1CV112D and/or 1CV112E.

RWST to charging pump suction valves 1CV112D and 1CV112E have cables present in this zone. The spurious operation of one of these valves would have no effect other than to align the RWST to the charging pump suction, which is its desired position for most scenarios. If necessary, the valves will be locally manually operated using the handwheel.

The charging pump 1B mini-flow isolation valves, 1CV8110 and 1CV8116, each have cables present in this zone. The spurious closure of one of these valves would block the minimum recirculation flowpath for its charging pump. However, the RCP seal injection flowpath, which remains available, passes sufficient flow (>60gpm) to prevent

charging pump damage (spurious operation position, Section 2.4.1.6.4, applied). Operator response to diagnose and identify the condition is credited. If necessary, the 1CV8116 solenoid valve will be failed open by opening its electrical supply breaker and the 1CV8110 motor operated valve will be locally manually operated using the handwheel to restore a recirculation flowpath for the Division 12 charging pump.

The charging flow control valve, 1CV121, has cables present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

The RCP seal injection line isolation valves, 1CV8355A through D, have cables routed through this zone. Postulated fire damage to these cables could cause one of these valves to spuriously close, which would isolate seal injection flow to the affected RCP. The Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that seal cooling or injection flow should not be restored with seal leakoff temperature greater than 235°F after the pumps are tripped. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling or loss of RCP seal injection..

The RHR Hx 1A to charging pump suction valve, 1CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Charging pump to cold leg injection isolation valves 1SI8801A and 1SI8801B each have cables present in this zone. The impact of spuriously opening of one of these valves would be to create an additional flowpath for charging to the RCS. This could result in excessive charging flow. Operator response to locally manually close the affected valve by using the handwheel is credited per existing station procedures.

Hot Standby Decay Heat Removal

Division 11 components and systems used to accomplish this function are assumed to be unavailable. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

The control circuits for the Division 12 auxiliary feedwater pump and its lube oil pumps are present in this zone. Credit is taken for operation of the Division 12 pump via the remote start switch. The flow control valves, 1AF005A through H, are all potentially affected. If necessary, the Division 12 valves can be locally manually throttled using their handwheels to control AFW flow. The AFW containment isolation valves,

1AF013A through H, are also potentially affected. The spurious closure of a single valve would not prevent safe shutdown. When time permits and manpower is available, an affected valve will be manually opened via local operation of its handwheel.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown.

The main steam isolation valves, 1MS001A through 1MS001D, each have a Division 11 and a Division 12 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

The main steam isolation bypass valves, 1MS101A through 1MS101D, each have cables from their Division 11 and Division 12 actuation circuit present in this zone. These valves are normally closed, and it is desired to keep them closed for safe shutdown. With the MSIV bypass valve hand position controllers in their normal position of 0%, postulated circuit faults on an actuation circuit for one of these valves are incapable of causing the spurious opening of the affected valve. No response is required.

In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited. An affected Division 11 steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures. An affected Division 12 steam generator PORV will be locally manually closed by opening the breaker at its MCC cubicle.

Essential Support

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 essential service water pump, component cooling water pump, and containment ventilation fans can each be affected. Credit is taken for manual operation of the Division 12 essential service water pump and component cooling water pump via local operation of the breakers at the 4160Vac ESF switchgear bus. Credit is taken for manual operation of the Division 12 RCFC fans via local operation of the breaker at the 480Vac ESF switchgear bus.

The unit 1 component cooling water system surge tank is located in this zone. This mechanical component, along with piping, is not susceptible to fire damage.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in these systems are such that the spurious

operation of a single valve could affect both trains of the affected system. These are discussed below.

The intermediate header crosstie valve, 1CC9473B, has a control cable routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore fire damage to control cables for this valve will not result in a spurious valve operation that will affect unit separation of the component cooling system.

Valves 1CC9413A, 1CC9413B, 1CC685, 1CC9414, 1CC9416 and 1CC9438, all have control cables routed through this zone. These are all containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperature greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; the operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

Control cables for both of the RHR heat exchanger outlet valves, 1CC9412A and 1CC9412B, are routed through this zone. The spurious opening of one of these valves would result in excessive flow through the system. If a second pump did not autostart on low discharge pressure, then operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

The essential service water discharge header crosstie valves, 1SX033 and 1SX034, have control cables routed through this zone. The spurious closure of one of these normally open valves would isolate the train A and train B essential service water supply headers. For this fire zone, components from Division 12 only are expected to be operating. Credit is taken for operator action to diagnose the problem and manually open the affected valve locally with its handwheel to restore essential service water flow to both of the essential service water system supply headers.

The essential service water pump suction valve, 1SX001B, has control cables present in this zone. The spurious closure of this valve would disable its associated pump. This valve has power locked out during normal operation and is therefore not susceptible to postulated spurious operation.

The unit 1 component cooling heat exchanger ESW inlet valve, 1SX004, has a control cable routed through this zone. The spurious closure of this normally open valve would block essential service water flow to the component cooling heat exchanger, and would result in loss of heat removal by the component cooling system. Credit is taken for operator action to diagnose the problem and re-establish essential service water flow to the affected component cooling heat exchanger per the loss of component cooling station procedure.

The common component cooling heat exchanger ESW inlet and outlet valves, 0SX146, 0SX147, 1SX005 and 2SX005 each have control cables routed through this zone. The spurious operation of one of these valves would have no impact on normal plant operation, since the common component cooling heat exchanger normally is only aligned to a unit and operated during cooldown to cold shutdown conditions. The operating procedures for aligning the common component cooling heat exchanger to a given unit require verification of proper valve alignment prior to initiating cooldown with this heat exchanger, and are therefore adequate to deal with postulated spurious operations of these valves.

The unit 1 return header crosstie valves, 1SX010, 1SX011 and 1SX136, each have control cables routed through this zone. The spurious closure of one of these normally open valves would have no impact. It would force return flow from some unit 1 components to one of the two main return headers, but no flow paths would be blocked. Thus, no adverse consequences result from the spurious closure of one of these valves.

Cables for the Division 12 containment chiller condenser bypass valve, 1SX147B, are located in this zone. This valve normally throttles to divert a portion of the essential service water RCFC return flow through the containment chiller condensers. The spurious closure of this valve could block essential service water flow to one train of RCFCs, which would disable containment cooling if the affected train of RCFCs were operating at that time. Credit is taken for operator action to diagnose the problem and if necessary, manually open the affected valve locally by bleeding air from the valve operator when time permits.

Cables for the Division 12 essential service water RCFC inlet and outlet containment isolation valves 1SX016B and 1SX027B, are present in this zone. The spurious closure of one of these valves could block essential service water flow to the Division 12 RCFCs, which would disable containment cooling. Credit is taken for operator action to diagnose the problem and manually open the affected valve locally with its handwheel to restore containment cooling.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Both trains can be affected by a fire in this zone. The Train "A" RHR pumps' power cable is

present in this zone. Credit is taken for operation of the "B" RHR pump, which is not affected. Each train of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8702A and 1RH8702B for train B. In the event of fire damage to the control circuit for these valves, credit is taken for locally manually opening the valves using their handwheels in order to establish a flowpath to the RHR pump. Cables for RHR Train A pump suction valves 1RH8701A and 1RH8701B, and RHR Train B pump suction valves 1RH8702A and 1RH8702B are present in this zone. These pairs of valves each form a high-low pressure interface between the RCS and the low pressure RHR system. This condition is discussed in Section 2.4.3.1.

Several other valves in the RHR system flowpaths have cables present in this zone. This includes valves 1CS009B, 1RH611, 1RH8716B, 1SI8804B, 1SI8809B, 1SI8811B and 1SI8812B in the Train B flowpath. Except as noted above, the spurious operation of these valves during normal operation or while the unit is in hot standby would not have any adverse consequences. The RHR operating procedure requires verification of proper valve position prior to placing an RH pump in operation. Therefore, credit is taken for manually verifying and/or repositioning affected valves via local operation with their handwheels prior to initiating cooldown with the RHR system. Additionally, Division 11 valve 1CC9412A and Division 12 valve 1CC9412B may need to be repositioned (if not previously addressed) to ensure adequate component cooling water flow to the Train B RH heat exchanger. If required, credit is taken for locally manually operating these valves with their handwheels.

Unit 2 Safe Shutdown Functions

Cables and components from both ESF divisions are present in this fire zone.

Essential Electric Power (AC/DC) Support

Offsite power is assumed to be unavailable for this fire zone. A fire in this zone will affect components from both ESF divisions. Division 21 ESF power sources will be unavailable due to the loss of critical support functions.

For Division 22, the 4160Vac ESF switchgear bus and the 480Vac ESF switchgear bus are unaffected, and remain available. Division 22 ESF MCC 232X5 is located in this fire zone, and is therefore assumed to be unavailable. However, the other four Division 22 ESF MCCs all are unaffected and remain available. Power to MCC 232X5 will be isolated by opening its supply breaker at Bus 232X. This action eliminates the need to open individual MCC 232X5 breakers (the fire may prevent access to the MCC) to isolate power to motor operated valves being manually operated outside of this zone. The Division 22 emergency diesel generator has control cables present in this zone. Credit is taken for manually starting and controlling the EDG from its local panel. Additionally, control cables associated with the Division 22 emergency diesel generator output breaker are present in the zone. Credit is taken for manually closing the Division 22 EDG output breaker at the Division 22 ESF switchgear bus. In addition, a cable for

the Division 22 SAT feed breaker is present in this zone. Postulated faults on this cable could result in its spurious closure, possibly resulting in simultaneously feeding the bus from two energized sources. Therefore, credit is taken for removing the control power fuses and manually placing the Division 22 SAT feed breaker in its desired position.

A control cable for the Division 22 diesel generator room ventilation fan is present in this zone. Credit is taken for manually operating the fan by local operation of its breaker at the 480Vac ESF switchgear bus. Control cables for the Division 22 diesel generator room and miscellaneous electrical equipment room ventilation system dampers are present in this zone. Circuit analysis of the damper control circuits for each affected damper has demonstrated that fire induced faults on the affected cables can prevent the dampers from modulating. However, these postulated faults will only fail the dampers in the safe (once-through cooling) position, and therefore cannot prevent operation of the safe shutdown equipment in each of these rooms. Therefore, no action is required to position the dampers as a result of fire damage to their control circuit. The diesel generator cooling water valve, 2SX169B, has a cable present in this zone. Circuit analysis of the valves' control circuit has demonstrated that postulated faults on the affected cable can fail the valve open (its desired position), but cannot prevent it from opening or cause it to spuriously close. Therefore, no action is required to reposition this valve as a result of fire damage to its control circuit.

The DC power and diesel oil systems for Division 22 remain available.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 21 IP buses 2IP01J and 2IP03J should be relied upon only in the short term. The assumed loss of Division 21 power means that Division 21 battery 2DC01E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

The Division 21 power feed to the unit 2 Fire Hazards panel is present in this zone. The redundant Division 22 power feed is unaffected in this zone and is credited for safe shutdown.

RCS Inventory Control (Including Boration)

Division 21 components and systems used to accomplish this function are assumed to be unavailable. A control cable for the Division 22 charging pump is present, but the charging pump remains available via local manual operation of its breaker at the switchgear bus. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

Control cables associated with charging flow indicators 2FI-0121A (2PM05J) and 2FI-0121B (2PL06J) are present in the zone. A fire in this zone can result in the lost of both 2FI-0121A, 2FI-0121B. Fire damage in this zone cannot spuriously fail charging FCV 2CV121 closed, however verification of charging flow may not be available. A manual action to verify at least one charging pump is operating and all reactor coolant pump

seal leakoff temperatures are normal is credited upon loss of charging flow indication. If verifications are not obtained, abnormal operating procedure for loss of RCP seal cooling will be entered to proceed to safe shutdown.

Charging pump suction valves 2CV112B, 2CV112C and 2CV112D have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, manual closure of either 2CV112B or 2CV112C, and remote manual opening of 2CV112E from the main control room is credited.

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in the charging system are such that the spurious operation of a single valve could affect both trains of the charging system. These are discussed below.

Cables for reactor vessel head vent valves 2RC014A and 2RC014C are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the containment atmosphere. This condition is discussed in Section 2.4.3.3.

The LPSI containment sump supply isolation valves, 2SI8811A and 2SI8811B, both have cables in this zone. The effect of the spurious opening of one of these valves is that RWST inventory would drain to the reactor containment sump. RWST level indication and low level alarms have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 2SI8812A or 2SI8812B (depending upon which 2SI8811A/B valve has spuriously opened) via local operation of the handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valves 2CV112B and 2CV112C have cables present in this zone. The spurious operation of these valves could isolate the VCT from the charging pump suction. To mitigate this postulated event, the RWST to charging pump suction valves CV112E will be opened from the main control room.

RWST to charging pump suction valve 2CV112D has cables present in this zone. The spurious operation of this valve would have no effect other than to align the RWST to the charging pump suction, which is its desired position for most scenarios. If necessary, the valve will be locally manually operated using the handwheel.

The charging pump 2B mini-flow isolation valves, 2CV8110 and 2CV8116, each have cables present in this zone. The spurious closure of one of these valves would block the minimum recirculation flowpath for the associated charging pump. However, the

RCP seal injection flowpath, which remains available, passes sufficient flow (>60gpm) to prevent charging pump damage (spurious operation position, Section 2.4.1.6.4, applied). Operator response to diagnose and identify the condition is credited. If necessary, the 2CV8116 solenoid valve will be failed open by opening its electrical supply breaker and the 2CV8110 motor operated valve will be locally manually operated using the handwheel to restore a recirculation flowpath for the Division 22 charging pump.

The charging flow control valve, 2CV121, has cables present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

The RCP seal injection line isolation valves, 2CV8355A through D, have cables routed through this zone. Postulated fire damage to these cables could cause one of these valves to spuriously close, which would isolate seal injection flow to the affected RCP. The Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection.

The RHR Hx 2A to charging pump suction valve, 2CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Charging pump to cold leg injection isolation valves 2SI8801A and 2SI8801B each have cables present in this zone. The impact of spuriously opening of one of these valves would be to create an additional flowpath for charging to the RCS. This could result in excessive charging flow. Operator response to locally manually close the affected valve by using the handwheel is credited per existing station procedures.

Hot Standby Decay Heat Removal

Division 21 components and systems used to accomplish this function are assumed to be unavailable. Instrumentation in the main control room remains available. In addition, instrumentation at the fire hazard panel is also available.

The control circuits for the Division 22 auxiliary feedwater pump and its lube oil pumps are present in this zone. Credit is taken for operation of the Division 22 pump via the remote start switch. The flow control valves, 2AF005A through H, are all potentially

affected. If necessary, the Division 22 valves can be locally manually throttled using their handwheels to control AFW flow. The AFW containment isolation valves, 2AF013A through H, are also potentially affected. The spurious closure of a single valve would not prevent safe shutdown. When time permits and manpower is available, an affected valve will be manually opened via local operation of its handwheel.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown.

The main steam isolation valves, 2MS001A through 2MS001D, each have a Division 21 and a Division 22 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually {or remotely as the case may be} operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

The main steam isolation bypass valves, 2MS101A through 2MS101D, each have cables from their Division 21 and Division 22 actuation circuit present in this zone. These valves are normally closed, and it is desired to keep them closed for safe shutdown. With the MSIV bypass valve hand position controllers in their normal position of 0%, postulated circuit faults on an actuation circuit for one of these valves are incapable of causing the spurious opening of the affected valve. No response is required.

In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited. An affected Division 21 steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures. An affected Division 22 steam generator PORV will be locally manually closed by opening the breaker at its MCC cubicle.

Essential Support

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 essential service water pump, component cooling water pump, and containment ventilation fans have control cables present in this fire zone. Credit is taken for manual operation of the Division 22 essential service water pump and component cooling water pump via local operation of the breakers at the 4160Vac ESF switchgear bus. Credit is taken for manual operation of the Division 22 RCFC fans via local operation of the breaker at the 480Vac ESF switchgear bus.

The unit 2 component cooling water system surge tank is located in this zone. This mechanical component, along with piping, is not susceptible to fire damage.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Valves from both divisions are affected. The valve arrangements in these systems are such that the spurious operation of a single valve could affect both trains of the affected system. These are discussed below.

The intermediate header crosstie valves, 2CC9473A and 2CC9473B, have control cables routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore fire damage to control cables for these valves will not result in a spurious valve operation that will affect unit separation of the component cooling system.

Valves 2CC9413A, 2CC9413B, 2CC685, 2CC9414, 2CC9416 and 2CC9438, all have control cables routed through this zone. These are all containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; the operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.
The supply header isolation valve, 2CC9415, has control cables routed through this zone. The spurious closure of this valve would block the discharge flowpath for the units' component cooling system. Operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

Control cables for both of the RHR heat exchanger outlet valves, 2CC9412A and 2CC9412B, are routed through this zone. The spurious opening of one of these valves would result in excessive flow through the system. If a second pump did not autostart on low discharge pressure, then operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

The essential service water discharge header crosstie valves, 2SX033 and 2SX034, have control cables routed through this zone. The spurious closure of one of these

normally open valves would isolate the train A and train B essential service water supply headers. For this fire zone, only Division 22 components are expected to be used. Credit is taken for operator action to diagnose the problem and manually open the affected valve locally with its handwheel to restore essential service water flow to both of the essential service water system supply headers.

The essential service water pump suction valve, 2SX001B, has control cables present in this zone. The spurious closure of this valve would disable its associated pump. This valve has power locked out during normal operation and is therefore not susceptible to postulated spurious operation.

The unit 2 component cooling heat exchanger ESW inlet valve, 2SX004, has control cables routed through this zone. The spurious closure of this normally open valve would block essential service water flow to the component cooling heat exchanger, and would result in loss of heat removal by the component cooling system. Credit is taken for operator action to diagnose the problem and re-establish essential service water flow to the affected component cooling heat exchanger per the loss of component cooling station procedure.

The common component cooling heat exchanger ESW inlet and outlet valves, 0SX146, 0SX147, 1SX005 and 2SX005 each have control cables routed through this zone. The spurious operation of one of these valves would have no impact on normal plant operation, since the common component cooling heat exchanger normally is only aligned to a unit and operated during cooldown to cold shutdown conditions. The operating procedures for aligning the common component cooling heat exchanger to a given unit require verification of proper valve alignment prior to initiating cooldown with this heat exchanger, and are therefore adequate to deal with postulated spurious operations of these valves.

The unit 1 return header crosstie valves, 2SX010, 2SX011 and 2SX136, each have control cables routed through this zone. The spurious closure of one of these normally open valves would have no impact. It would force return flow from some unit 1 components to one of the two main return headers, but no flow paths would be blocked. Thus, no adverse consequences result from the spurious closure of one of these valves.

Cables for the containment chiller condenser bypass valve, 2SX147B, are located in this zone. This valve normally throttles to divert a portion of the essential service water RCFC return flow through the containment chiller condensers. The spurious closure of this valve could block essential service water flow to one train of RCFCs, which would disable containment cooling if the affected train of RCFCs were operating at that time. Credit is taken for operator action to diagnose the problem and if necessary, manually open the affected valve locally by bleeding air from the valve operator when time permits.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. A fire in this zone can affect both trains. The train A RHR pumps' power cable is present in this zone. Control and/or power circuits for both cubicle cooler fans are also affected. This pump is therefore assumed to be unavailable. The train B RHR pump is unaffected, and is credited for safe shutdown. Each train of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8702A and 2RH8702B for train B. In the event of fire damage to the control circuit for valve 2RH8702A, credit is taken for locally manually opening valve 2RH8702A using its handwheel in order to establish a flowpath to the RHR pumps.

Several other valves in the RHR system flowpaths have cables present in this zone. This includes valves 2CS009B, 2RH611, 2SI8809B, 2SI8811B and 2SI8812B in the Train B flowpath. The spurious operation of these valves during normal operation or while the unit is in hot standby would not have any adverse consequences. The RHR operating procedure requires verification of proper valve position prior to placing an RH pump in operation. Therefore, credit is taken for manually verifying and/or repositioning affected valves via local operation with their handwheels prior to initiating cooldown with the RHR system. Additionally, Division 21 valves 2CC9412A and 2CC9415 and Division 22 valve 2CC9412B may need to be repositioned (if not previously addressed) to ensure adequate component cooling water flow to the Train B RH heat exchanger. If required, credit is taken for locally manually operating these valves with their handwheels.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-29 identifies the equipment within this room that is separated from redundant equipment on the next elevation (fire zone 11.5-0) by an unrated floor assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

Also, Generic Letter 86-10 Evaluations BYR-02 and BYR-14 identify the equipment within this room that is separated from redundant equipment in an adjacent area (fire zones 11.6-2 and 11.6C-0, respectively) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.118 Division 12 Containment Electrical Penetration Area, El. 426' (Fire Zone 11.6-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is not directly affected by a fire in this zone. Train A is credited in this zone because Division 12 electrical power may not be available.

The "A" and "B" supply and exhaust fans for the auxiliary building ventilation system have power cables routed through this zone, and are assumed to be unavailable. The remaining two sets of supply and exhaust fans are unaffected, and one of the two trains will be credited for safe shutdown. Although two trains (one on unit 1 and one on unit 2) are normally operating, safe shutdown can be achieved with only one operating train for a fire in this zone. Cables for dampers 0VA474Y and 0VA475Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause these dampers to fail closed. Closure of these dampers would result in blockage of one of two flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. A second flowpath is unaffected by a fire in this zone, therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 12. Division 12 is assumed to be unavailable for this zone; Division 11 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 12 ESF bus is assumed to be unavailable. The Division 11 ESF bus and its support systems are unaffected, and will be credited for safe shutdown. Power to MCC 132X4 will be isolated by opening its supply breaker at Bus 132X. This action eliminates the need to open individual MCC 132X4 breakers (the fire may prevent access to the MCC) to isolate power to motor operated valves being manually operated outside of this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 12 IP buses 1IP02J and 1IP04J should be relied upon only in the short term. The assumed loss of Division 12 power means that Division 12 battery 1DC02E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 12 components and systems used to accomplish this function are assumed to be unavailable. The Division 11 charging pump and support components are unaffected by a fire in this zone. Division 11 instrumentation at the Fire Hazards panel and the main control room are affected, but redundant safe shutdown instrumentation remains available. Cables associated with both channels of unit 1 nuclear source range instrumentation are present in this zone. Channel A of the post accident neutron monitor system is not affected and is credited for safe shutdown in this zone.

Charging pump suction valves 1CV112C and 1CV112E have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, remote manual closure of 1CV112B, and remote manual opening of 1CV112D from the main control room is credited (these circuits are unaffected).

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 12 valves, they could potentially impact the operation of Division 11 components. These are discussed below.

Cables for Division 12 pressurizer PORV 1RY456 and block valve 1RY8000B are present in this zone. These valves form a high-low pressure interface between the RCS and low pressure systems. A high-low pressure interface evaluation of these valves is provided in subsection 2.4.3.2. The post-fire safe shutdown function of these valves is to depressurize the RCS as required to RHR system entry conditions to allow for cold shutdown decay heat removal. The Division 11 valves are available to perform this function.

Cables for reactor vessel head vent valves 1RC014B and 1RC014D are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the containment atmosphere. This condition is discussed in Section 2.4.3.3.

The LPSI containment sump supply isolation valve, 1SI8811B, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor containment sump. RWST level indication, RSWT level alarms, and containment recirc sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 1SI8812B via local operation of its handwheel to prevent completely emptying the RWST. Note that MCC 132X4, the power source for 1SI8812B, is located in this zone and is assumed to be inaccessible. Credit is taken for de-energizing the valve circuit by opening the MCC supply breaker at bus 1AP12E in the ESF switchgear room. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valve 1CV112C has cables present in this zone. The spurious operation of this valve could isolate the VCT from the charging pump suction. To mitigate this postulated event, the RWST to charging pump suction valve 1CV112D will be opened from the main control room.

RWST to charging pump suction valve 1CV112E has cables present in this zone. The spurious opening of this valve would have no effect other than to align the RWST to the

charging pump suction, which is its desired position for most scenarios. If necessary, this valve will be locally manually operated using its handwheel.

Charging pump 1A mini-flow isolation valve 1CV8111 has cables present in this zone. The spurious closure of this valve would block the minimum recirculation flowpath for charging pump 1A. The RCP seal injection flowpath, which is unaffected, passes sufficient flow (>60gpm) to prevent charging pump damage. Operator response to diagnose and identify the condition is credited. If necessary, the valve will be locally manually opened using its handwheel.

Hot Standby Decay Heat Removal

Division 12 components and systems used to accomplish this function are assumed to be unavailable. The Division 11 AFW and main steam system components and associated primary and secondary side instrumentation are credited with accomplishing this safe shutdown function.

Cables for all reactor coolant wide range cold leg temperature indication are present, and therefore, this parameter will be lost. Credit is taken for utilizing the core exit thermocouples and steam generator pressure indication to infer RCS cold leg temperature in accordance with station procedures.

Essential Support

Division 12 support systems are assumed to be unavailable. The Division 11 essential service water pump and its support components, the Division 11 component cooling water pump, and the Division 11 containment ventilation system are unaffected by a fire in this zone.

One valve related to these functions is subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although this valve is a Division 12 valve, it could potentially impact the operation of Division 11 components. It is discussed below.

Valve 1CC685 has control cables routed through this zone. It is a containment isolation valve for component cooling service to the RCPs. The spurious closure of this valve would block component cooling flow to the RCP thermal barriers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection. Component

cooling flow through this flowpath is a small fraction of total component cooling flow. The operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train B is assumed to be unavailable. Train A of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8701A and 1RH8701B. Valve 1RH8701B has cables present in this zone. In the event of fire damage to the control circuit for this valve, credit is taken for locally manually opening this valve in order to establish a flowpath to the train A RHR pump.

Control cables for the Division 11 pressurizer PORV, 1RY455A, is present in this zone. If required to depressurize the RCS, credit is taken for the repair of the affected control cable for the Division 11 PORV per station repair procedures.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-12 identifies the equipment within this room that is separated from redundant equipment on the next elevation (fire zone 11.5A-1) by an unrated floor assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

Also, Generic Letter 86-10 Evaluation BYR-14 identifies the equipment within this room that is separated from redundant equipment in an adjacent area (fire zones 11.6-0 and 11.6C-0, respectively) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.119 Division 22 Containment Electrical Penetration Area, El. 426' (Fire Zone 11.6-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

The "C" and "D" supply and exhaust fans for the auxiliary building ventilation system have power cables routed through this zone, and are assumed to be unavailable. The remaining two sets of supply and exhaust fans are unaffected, and one of the trains is credited for safe shutdown. Although two trains (one on unit 1 and one on unit 2) are normally operating, safe shutdown can be achieved with only one operating train for a fire in this zone. Cables for damper 0VA477Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause this damper to fail closed. Closure of this damper would result in blockage of one of two flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. A second flowpath is unaffected by a fire in this zone, therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components are present in this fire zone.

Unit 2 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 22. Division 22 is assumed to be unavailable for this zone; Division 21 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 22 ESF bus is assumed to be unavailable. The Division 21 ESF bus and its support systems are unaffected, and will be credited for safe shutdown. Power to MCC 232X4 will be isolated by opening its supply breaker at Bus 232X. This action eliminates the need to open individual MCC 232X4 breakers (the fire may prevent access to the MCC) to isolate power to motor operated valves being manually operated outside of this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 22 IP buses 2IP02J and 2IP04J should be relied upon only in the short term. The assumed loss of Division 22 power means that Division 22 battery 2DC02E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 22 components and systems used to accomplish this function are assumed to be unavailable. The Division 21 charging pump is unaffected by a fire in this zone. A control cable for Division 21 cubicle cooler fan 2VA06CB is present in the zone. The second fan 2VA06CA and normal auxiliary building ventilation is unaffected. The charging pump has been demonstrated by calculation to be capable to operate for 72 hours with the loss of this fan. Division 21 instrumentation at the Fire Hazards panel

and the main control room are affected, but redundant safe shutdown instrumentation remains available. Cables associated with both channels of unit 2 nuclear source range instrumentation are present in this zone. Channel A of the post accident neutron monitor system is not affected and is credited for safe shutdown in this zone.

Charging pump suction valves 2CV112C and 2CV112E have cables present in this zone. In order to establish a charging pump suction flowpath to the refueling water storage tank, remote manual closure of 2CV112B, and remote manual opening of 2CV112D from the main control room is credited (these circuits are unaffected).

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 22 valves, they could potentially impact the operation of Division 21 components. These are discussed below.

Cables for Division 22 pressurizer PORV 2RY456 and block valve 2RY8000B are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the PRT. This condition is discussed in Section 2.4.3.2.

Cables for reactor vessel head vent valves 2RC014B and 2RC014D are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the containment atmosphere. This condition is discussed in Section 2.4.3.3.

The LPSI containment sump supply isolation valve, 2SI8811B, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor containment sump. RWST level indication, RSWT level alarms, and containment recirc sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 2SI8812B via local operation of its handwheel to prevent completely emptying the RWST. Note that MCC 232X4, the power source for 2SI8812B, is located in this zone and is assumed to be inaccessible. Credit is taken for de-energizing the valve circuit by opening the MCC supply breaker at bus 2AP12E in the ESF switchgear room. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

VCT outlet isolation valve 2CV112C has cables present in this zone. . The spurious operation of this valve could isolate the VCT from the charging pump suction. To mitigate this postulated event, the RWST to charging pump suction valve 2CV112D will be opened from the main control room.

RWST to charging pump suction valve 2CV112E has cables present in this zone. The spurious opening of this valve would have no effect other than to align the RWST to the

charging pump suction, which is its desired position for most scenarios. If necessary, this valve will be locally manually operated using its handwheel.

Charging pump 2A mini-flow isolation valve 2CV8111 has cables present in this zone. The spurious closure of this valve would block the minimum recirculation flowpath for charging pump 2A. The RCP seal injection flowpath, which is unaffected, passes sufficient flow (>60gpm) to prevent charging pump damage. Operator response to diagnose and identify the condition is credited. If necessary, the valve will be locally manually opened using its handwheel.

Hot Standby Decay Heat Removal

Division 22 components and systems used to accomplish this function are assumed to be unavailable. The Division 21 AFW and main steam system components and associated primary and secondary side instrumentation are credited with accomplishing this safe shutdown function.

Cables for all reactor coolant wide range cold leg temperature indication are present, and therefore, this parameter will be lost. Credit is taken for utilizing the core exit thermocouples and steam generator pressure indication to infer RCS cold leg temperature in accordance with station procedures.

Cables for both Division 22 steam generator PORVs are present in this zone. In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures.

Essential Support

Division 22 support systems are assumed to be unavailable. The Division 21 essential service water pump and its support components, the Division 21 component cooling water pump, and the Division 21 containment ventilation system are unaffected by a fire in this zone.

One valve related to these functions is subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although this valve is a Division 22 valve, it could potentially impact the operation of Division 21 components. It is discussed below.

Valve 2CC685 has control cables routed through this zone. It is a containment isolation valve for component cooling service to the RCPs. The spurious closure of this valve would block component cooling flow to the RCP thermal barriers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal

cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperatures greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation of RCP seal cooling flow or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; The operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train B is assumed to be unavailable. Train A of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8701A and 2RH8701B. Valve 2RH8701B has cables present in this zone. In the event of fire damage to the control circuit for this valve, credit is taken for locally manually opening this valve in order to establish a flowpath to the train A RHR pump.

Control cables for Division 21and 22 pressurizer PORVs 2RY455A and 2RY456 are present in the zone. Credit is taken for the repair of control cable 2RY486 for Division 21 pressurizer PORV 2RY455A per station repair procedures.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-22 identifies the equipment within this room that is separated from redundant equipment on the next elevation (fire zone 11.5A-2) by an unrated floor assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

Also, Generic Letter 86-10 Evaluation BYR-02 identifies the equipment within this room that is separated from redundant equipment in an adjacent area (fire zone 11.6-0) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.120 Laboratory HVAC Equipment Room (Fire Zone 11.6A-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Train A of the control room ventilation system can be affected by a fire in this zone, since numerous dampers have control cables present in this zone. This train is assumed to be unavailable. Train B is unaffected and remains available.

The auxiliary building ventilation system supply and exhaust fans are not directly affected by a fire in this zone. However, the resulting unavailability of the Division 11 electrical power sources will render the A supply and exhaust fans unavailable.

Unit 1 Safe Shutdown Functions

The cables in this zone are associated with ESF Division 11. Division 11 systems and components are assumed to be unavailable for this zone. Division 12 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 11 ESF bus is assumed to be unavailable for this zone. The Division 12 ESF bus and its support systems are unaffected, and will be credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 11 IP buses 1IP01J and 1IP03J should be relied upon only in the short term. The assumed loss of Division 11 power means that Division 11 battery 1DC01E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 AFW and main steam system components and associated primary and secondary side instrumentation are credited with accomplishing this safe shutdown function.

Essential Support

Division 11 support systems are assumed to be unavailable due to postulated damage to the ESF bus (but they are otherwise unaffected by the fire). The Division 12 essential service water pump and its support components, the Division 12 component cooling water pump, and the Division 12 containment ventilation system are unaffected by a fire in this zone.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are

Division 11 valves, they could potentially impact the operation of Division 12 components. These are discussed below.

The intermediate header crosstie valve, 1CC9473A, has a control cable routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore fire damage to control cables for this valve will not result in a spurious valve operation that will affect unit separation of the component cooling system.

The supply header isolation valve, 1CC9415, has a control cable routed through this zone. The spurious closure of this valve would block the discharge flowpath for the units' component cooling system. Operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train A is assumed to be unavailable. Train B of the RHR system is unaffected by a fire in this zone. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8702A and 1RH8702B for train B. In the event of the loss of power to valve 1RH8702A, credit is taken for locally manually opening the valve using its handwheel in order to establish a flowpath to the RHR pump. Additionally, Division 11 valve 1CC9415 may need to be re-positioned to assure adequate component cooling water flow to the Train B RH heat exchanger. For these events, credit is taken for locally operating the valves with their handwheels.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown cables or components are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-05 identifies the equipment within this room that is separated from redundant equipment on the next elevation (fire zone 11.5-0) by an unrated floor assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.121 Unit 1 Volume Control Tank Room (Fire Zone 11.6A-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

The "B" supply and exhaust fans for the auxiliary building ventilation system have control cables routed through this zone, and are assumed to be unavailable. The remaining three sets of supply and exhaust fans are unaffected, and are credited for safe shutdown. Cables for damper 0VA475Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause this damper to fail closed. Closure of this damper would result in blockage of one of two flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. A second flowpath is unaffected by a fire in this zone, therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 12.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps and their support components from both divisions are unaffected by a fire in this zone. The volume control tank is located in this room. Because of the tank construction and the low combustible loading in this zone, the VCT is assumed to be unaffected by a fire in this zone. The two VCT isolation valves, 1CV112B and 1CV112C, are both present in this zone, along with associated cables. Following a fire in this zone, the valves will be unavailable for remote operation, and access for local manual action will not be available until the fire is extinguished and temperatures return to near ambient. In order to establish a charging pump suction flowpath to the refueling water storage tank, remote manual opening of either 1CV112D or 1CV112E from the main control room is credited. This will ensure adequate flow and NPSH to the charging pumps, ensuring the capability to provide makeup to the RCS. Credit is also taken for manually closing either 1CV112B or 1CV112C when time permits (after access is established and manpower is available).

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components are present in this fire zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.122 Unit 2 Volume Control Tank Room (Fire Zone 11.6A-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

Cables for damper 0VA477Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause this damper to fail closed. Closure of this damper would result in blockage of one of two flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. A second flowpath is unaffected by a fire in this zone, therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components are present in this fire zone.

Unit 2 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 22.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The charging pumps and their support components from both divisions are unaffected by a fire in this zone. The volume control tank is located in this room. Because of the tank construction and the low combustible loading in this zone, the VCT is assumed to be unaffected by a fire in this zone. The two VCT isolation valves, 2CV112B and 2CV112C, are both present in this zone, along with associated cables. Following a fire in this zone, the valves will be unavailable for remote operation, and access for local manual action will not be available until the fire is extinguished and temperatures return to near ambient. In order to establish a charging pump suction flowpath to the refueling water storage tank, remote manual opening of either 2CV112D or 2CV112E from the main control room is credited. This will ensure adequate flow and NPSH to the charging pumps, ensuring the capability to provide makeup to the RCS. Credit is also taken for manually closing either 2CV112B or 2CV112C when time permits (after access is established and manpower is available).

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The essential service water pumps and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.123 Auxiliary Building Offices, El. 426' (Fire Zone 11.6B-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

The "C" supply and exhaust fans for the auxiliary building ventilation system have control cables routed through this zone, and are assumed to be unavailable. The remaining three sets of supply and exhaust fans are unaffected, and are credited for safe shutdown.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone.

Unit 2 Safe Shutdown Functions

Most of the cables in this zone are associated with ESF Division 21. Division 21 systems and components are assumed to be unavailable for this zone. Division 22 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 21 ESF bus is assumed to be unavailable for this zone. The Division 22 ESF bus and its support systems are unaffected, and will be credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 21 IP buses 2IP01J and 2IP03J should be relied upon only in the short term. The assumed loss of Division 21 power means that Division 21 battery 2DC01E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 21 valves, they could potentially impact the operation of Division 22 components. These are discussed below.

The LPSI containment sump supply isolation valve, 2SI8811A, has a cable in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor containment sump. RWST level indication and RSWT level alarms have been verified to remain available in the control room to provide indication of this

postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 2SI8812A to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

Hot Standby Decay Heat Removal

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 AFW and main steam system components and associated primary and secondary side instrumentation are credited with accomplishing this safe shutdown function.

The main steam isolation valves 2MS001A through 2MS001C have a Division 21 actuation circuit cable present in the zone. Valve 2MS001D has a Division 22 actuation circuit cable present in this zone. Each of these valves has two independent actuation circuits, either one of which can actuate the valves. Thus these valves remain available since one Division 11 or 12 actuation circuit is unaffected by a fire in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves and the steam generator PORVs will remove decay heat. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

Essential Support

Division 21 support systems are assumed to be unavailable. The Division 22 essential service water pump and its support components, the Division 22 component cooling water pump, and the Division 22 containment ventilation system are unaffected by a fire in this zone.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 21 valves, they could potentially impact the operation of Division 22 components. These are discussed below.

The intermediate header crosstie valve, 2CC9473A, has a control cable routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore fire damage to control cables for this valve will not result in a spurious valve operation that will affect unit separation of the component cooling system.

The supply header isolation valve, 2CC9415, has a control cable routed through this zone. The spurious closure of this valve would block the discharge flowpath for the

units' component cooling system. Operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train A is assumed to be unavailable. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8702A and 2RH8702B. Although valve 2RH8702A has no cables present in this zone, its power supply may not be available. In the event of fire damage to the power supply for this valve, credit is taken for locally manually opening this valve in order to establish a flowpath to the train B RHR pump. Additionally, Division 21 valve 2CC9415 may need to be re-positioned to assure adequate component cooling water flow to the Train B RH heat exchanger. For these events, credit is taken for locally operating the valves with their handwheels.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to this fire zone.

2.4.2.124 Auxiliary Building Laundry Room, El. 426' (Fire Zone 11.6C-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Train A of the control room ventilation system has cables for the supply and return fans and dampers present in this zone. Train B of the control room ventilation system is unaffected by a fire in this zone.

The "A" supply and exhaust fans for the auxiliary building ventilation system have control cables routed through this zone, and are assumed to be unavailable. The remaining three sets of supply and exhaust fans are unaffected, and are credited for safe shutdown. Cables for damper 0VA474Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause this damper to fail closed. Closure of this damper would result in blockage of one of two flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. A second flowpath is unaffected by a fire in this zone, therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

The cables in this zone are mostly associated with ESF Division 11. Division 11 systems and components are assumed to be unavailable for this zone. Division 12 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 11 ESF bus is assumed to be unavailable for this zone. The Division 12 ESF bus and its support systems are unaffected, and will be credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 11 IP buses 1IP01J and 1IP03J should be relied upon only in the short term. The assumed loss of Division 11 power means that Division 11 battery 1DC01E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Several valves related to the RCS inventory control function are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 11 valves, they could potentially impact the operation of Division 12 components. These are discussed below.

The LPSI containment sump supply isolation valve, 1SI8811A, has cables in this zone. The effect of the spurious opening of this valve is that RWST inventory would drain to the reactor containment sump. RWST level indication, RSWT level alarms, and containment recirc sump level indication have been verified to remain available in the control room to provide indication of this postulated event. With the RWST at the Tech Spec low level setpoint, the estimated drawdown time to a minimum credited inventory is approximately 36 minutes. For this event, credit is taken for operator identification and diagnosis of this condition, and for mitigating the event by manually closing valve 1SI8812A via local operation of its handwheel to prevent completely emptying the RWST. This action will occur quickly enough to preserve sufficient inventory in the RWST to borate the primary system to cold shutdown conditions. Thus, the RCS inventory control function would not be prevented by this postulated spurious operation.

The RHR Hx 1A to charging pump suction valve, 1CV8804A, has cables routed through this zone. Postulated fire damage to these cables could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Hot Standby Decay Heat Removal

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 AFW and main steam system components and associated primary and secondary side instrumentation are credited with accomplishing this safe shutdown function.

The main steam isolation valves, 1MS001A through 1MS001D, each have a Division 11 actuation circuit present in this zone. Each of these valves has two independent actuation circuits, either one of which can actuate the valves. Thus these valves remain available since the Division 12 actuation circuits are unaffected by a fire in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

In the event of the spurious opening of one of the Division 11 steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures.

Essential Support

Division 11 support systems are assumed to be unavailable. The Division 12 essential service water pump and its support components, the Division 12 component cooling water pump, and the Division 12 containment ventilation system are unaffected by a fire in this zone.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 11 valves, they could potentially impact the operation of Division 12 components. These are discussed below.

Valves 1CC9416 and 1CC9438, each have control cables routed through this zone. These are each containment isolation valves for component cooling service to the RCPs. The spurious closure of one of these valves would block component cooling flow to the RCP thermal barriers and/or oil coolers. For spurious valve closure that causes loss of CC flow to the thermal barrier with the RCPs running, the seal leakoff temperature would not be expected to exceed 235°F. Additionally, the Byron reactor coolant pump seals are designed to withstand a complete loss of seal cooling at RCS pressure and temperature with the limitation that the RCPs are tripped if the RCP seal leakoff temperature exceeds 235°F and that seal cooling or injection flow should not be restored with seal leakoff temperature greater than 235°F. Procedures for restoring seal injection or seal cooling account for seal leakoff temperatures. Credit is taken for operators to diagnose and mitigate the consequences of fire induced spurious isolation

of RCP seal cooling or loss of RCP seal injection. Component cooling flow through this flowpath is a small fraction of total component cooling flow; The operating component cooling pump will not be significantly affected by this postulated event. Therefore, no adverse consequences result.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train A is assumed to be unavailable. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8702A and 1RH8702B. Valve 1RH8702A has cables present in this zone. In the event of fire damage to the control circuit for this valve, credit is taken for locally manually opening this valve in order to establish a flowpath to the train B RHR pump.

Unit 2 Safe Shutdown Functions

A cable for the Division 21 SAT feed breaker is present in this zone. Postulated faults on this cable could result in a spurious breaker closure signal. This breaker is normally closed and not otherwise affected by the fire. Therefore, fire damage to this cable will not impact operation of the Division 21 buses..

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations are applicable to the boundary of this fire zone. However, Generic Letter 86-10 Evaluation BYR-14 identifies the equipment within this room that is separated from redundant equipment in an adjacent area (fire zone 11.6-1) by an unrated wall assembly. This evaluation justifies the existing separation, so that a credible fire will not adversely affect the redundant components.

2.4.2.125 Auxiliary Building Showers/Decon/Change Area, El. 426' (Fire Zone 11.6D-0)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.126 Auxiliary Building Decon/Storage Area, El. 426' (Fire Zone 11.6E-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

Fire Damper 0VA489Y is located in the zone. Fire actuation of this fire damper would isolate one of two auxiliary building ventilation paths to the electrical penetration area. Closure of this fire damper has no impact on the operation of the VA system.

Unit 1 Safe Shutdown Functions

No unit 1 systems are affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

Cables from Division 21 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The Division 22 charging pump, support components and instrumentation are unaffected by a fire in this zone, and are credited for safe shutdown. The Division 21 charging pump cubicle cooler fan has a control cable present in the zone, therefore Division 21 is not credited.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The Division 22 essential service water pump and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone. The Division 21 essential service water pump has control cables present in the zone, therefore Division 21 is not credited.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to this fire zone.

2.4.2.127 Auxiliary Building HVAC Exhaust Complex (Fire Zone 11.7-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Cables for several dampers in train B of the control room ventilation system are present in this zone. Train A of the VC is unaffected by a fire in this zone, and will be credited for safe shutdown.

All four auxiliary building ventilation system supply fans and all four exhaust fans are present in this zone. Power and control cables for each of these auxiliary building supply and exhaust fans are also present in this zone. Upon determination of a design basis fire in this zone, credit is taken for opening the breakers and removing control power fuses for each of these fans as a precautionary measure to protect their respective ESF power buses. The presence of each of these fans and their associated cables in the same fire zone is the subject of BTP CMEB 9.5-1 Deviation 0A.2 This BTP CMEB 9.5-1 deviation concludes that adequate protection is provided for these fans and cables by the existing physical configuration in this fire zone. Therefore, at least one supply and exhaust fan will remain available following a fire in this zone.

Safe shutdown of both units can be accomplished following a fire in this zone with no auxiliary building ventilation available. However, after the fire is extinguished and fire damage is assessed, the undamaged supply and exhaust fans of the VA system could be restored to service.

Cables for dampers 0VA474Y, 0VA475Y, 0VA476Y and 0VA477Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause these dampers to fail closed. Closure of these dampers would result in blockage of both flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. The effect of this could be that both units AFW system "A" train pumps may not receive adequate room cooling. The train "B" AFW components are not affected, and will be credited for safe shutdown for both units.

Unit 1 Safe Shutdown Functions

No unit 1 systems are directly affected by a fire in this zone. As described above, ventilation for the train A auxiliary feedwater pump may be affected. Therefore, the Division 12 AFW system will be credited for safe shutdown.

The Division 11 ESF essential power buses are credited to supply power to the Train A control room ventilation system.

Unit 2 Safe Shutdown Functions

No unit 2 systems are directly affected by a fire in this zone. As described above, ventilation for the train A auxiliary feedwater pump may be affected. Therefore, the Division 22 AFW system will be credited for safe shutdown.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.128 Unit 1 Purge Room (Fire Zone 11.7-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

Cables for the "A" and "B" supply and exhaust fans for the auxiliary building ventilation system are present in this zone. The other two sets of supply and exhaust fans of the VA system are unaffected by a fire in this zone, and one of the sets is credited for safe shutdown. Although two sets of supply and exhaust fans (one on unit 1 and one on unit 2) are normally operating, safe shutdown can be achieved with only one operating set for a fire in this zone.

Cables for dampers 0VA474Y and 0VA475Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause these dampers to fail closed. Closure of these dampers would result in blockage of one of the flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. The redundant flowpath is unaffected by a fire in this zone, and therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are directly affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are directly affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.129 Unit 2 Purge Room (Fire Zone 11.7-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

Cables for the "C" and "D" supply and exhaust fans for the auxiliary building ventilation system are present in this zone. The other two sets of supply and exhaust fans of the VA system are unaffected by a fire in this zone, and one of the sets is credited for safe shutdown. Although two sets of supply and exhaust fans (one on unit 1 and one on unit 2) are normally operating, safe shutdown can be achieved with only one operating set for a fire in this zone.

Cables for damper 0VA477Y of the auxiliary building ventilation system are present in this fire zone. Fire damage to these cables may cause this damper to fail closed. Closure of this damper would result in blockage of one of the flowpaths of the auxiliary building supply to the aux building general area at elevation 383'. The redundant flowpath is unaffected by a fire in this zone, and therefore, the VA system supply flow to this aux building general area is adequate to support safe shutdown of both units.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are directly affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are directly affected by a fire in this zone.

Power and control cables for the Division 21 and 22 feeds to the "C" and "D" supply and exhaust fans for the auxiliary building ventilation system are present in this zone. Therefore, credit is taken for manually opening the breakers and removing control power fuses per station procedure upon detection of a design basis fire, as a precautionary measure to protect the Division 21 and 22 4 Kv buses.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.130 Fuel Handling Building (Fire Zone 12.1-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

Cables from Division 21 are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The Division 21 and 22 charging pumps, support components and instrumentation are unaffected by a fire in this zone. Division 21 pressurizer PORV block valve 2RY8000A has a control cable present in the zone. Division 22 is credited for safe shutdown.

One valve related to the RCS inventory control function is subject to spurious operation as a result of having control circuit cables routed through this fire zone. The valve arrangements in the charging system are such that the spurious operation of a single valve could affect both trains of the charging system. This is discussed below.

The RHR Hx 2A to charging pump suction valve, 2CV8804A, has a cable routed through this zone. Postulated fire damage to this cable could cause this valve to spuriously open. The effect would be to open a path from the RWST to the charging pump suction via the RHR pump and heat exchanger. This would not adversely affect charging in any way, since establishment of such a flowpath is a desired safe shutdown function. Therefore, there is no adverse impact due to this postulated event.

Hot Standby Decay Heat Removal

The AFW and main steam system components and associated primary and secondary side instrumentation from both divisions are unaffected by a fire in this zone.

Essential Support

The Division 22 essential service water pump and support components, the component cooling water pumps, and the containment ventilation system are all unaffected by a fire in this zone. The Division 21 essential service water pump has control cables present in the zone, therefore Division 21 is not credited.

Cold Shutdown Decay Heat Removal

The residual heat removal system, support components, and instrumentation from both divisions are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.131 QA Vault (Fire Zone 13)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.132 Radwaste Drumming Station and Tunnel (Fire Zone 14.1-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are both unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

Division 21 instrument cables are routed through this zone. These are instrument cables for steam generator level and pressure indicators located at the remote shutdown panel. Indication in the main control room for all four steam generators is unaffected and remains available to support safe shutdown.

One Division 22 instrument cable is routed through this zone.

RCS Inventory Control (Including Boration)

The Division 21 and 22 charging pumps, support components and instrumentation are unaffected by a fire in this zone.

The charging flow control valve, 2CV121, has a cable present in this zone. Postulated fire-induced faults on these cables can cause this valve to fail open. If failed open, credit is taken for manual actions to manually throttle charging flow by implementing use of the flow control valve bypass line.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.133 Radwaste Evaporator Tank/Spent Resin Pump Room (Fire Zone 14.2-0)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.134 Surface Condenser Room (Fire Zone 14.3-0)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.135 Spent Resin Tank/Waste Gas Compressor Room (Fire Zone 14.4-0)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.136 Radwaste Evaporator Room (Fire Zone 14.5-0)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.137 Radwaste Building Ground Floor (Fire Zone 14.6-0)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.138 Unit 1 Refueling Water Storage Tank (Fire Zone 16.1-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

One unit 1 safe shutdown component is present in this zone. The refueling water storage tank (RWST) is a steel lined concrete tank which is not susceptible to fire damage. Therefore, a fire in this zone will not have any effect on safe shutdown of unit 1.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are directly affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.139 Unit 2 Refueling Water Storage Tank (Fire Zone 16.1-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are directly affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

One unit 2 safe shutdown component is present in this zone. The refueling water storage tank (RWST) is a steel lined concrete tank which is not susceptible to fire damage. Therefore, a fire in this zone will not have any effect on safe shutdown of unit 2.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.140 Cooling Tower Unit 1 (Fire Zone 17.1-1)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.141 Cooling Tower Unit 2 (Fire Zone 17.1-2)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.142 Unit 1 Essential Service Water Cooling Tower (Fire Zone 17.2-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

The auxiliary building ventilation system is unaffected by a fire in this zone.

All essential service water (SX) cooling "B" tower makeup inlet valves, hot water bypass valves, and riser valves are present in the zone. Additionally, control cables associated with the "B" SX makeup pump are present in the zone. The train "A" tower valves and "A" SX makeup pump are unaffected and credited for safe shutdown.

Unit 1 Safe Shutdown Functions

No unit 1 systems are directly affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 systems are directly affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.143 Unit 2 Essential Service Water Cooling Tower (Fire Zone 17.2-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone.

The auxiliary building ventilation system is unaffected by a fire in this zone.

All essential service water (SX) cooling "A" tower makeup inlet valves, hot water bypass valves, and riser valves are present in the zone. The train "B" tower valves are unaffected and credited for safe shutdown. Additionally, control cables associated with both SX makeup pumps are present in the zone. Locally starting and operating one of the makeup pumps at the river screen house will be credited. Makeup to the tower is not immediately required, only after system and evaporation losses result in low tower basin water levels. Adequate time is available to access the river screen house.

Unit 1 Safe Shutdown Functions

No unit 1 systems are directly affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 systems are directly affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.144 Diesel Generator 1B/Switchgear Room Air Shaft (Fire Zone 18.1-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are not directly affected by a fire in this fire zone. However, the resulting unavailability of Division 12 electrical power sources will render Train B of the control room ventilation system unavailable and 0B supply and exhaust fans of the auxiliary building ventilation system unavailable.

Unit 1 Safe Shutdown Functions

The components and cables in this zone are associated with ESF Division 12. Division 12 is assumed to be unavailable for this zone; Division 11 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

All of the components and cables in this zone are associated with the Division 12 emergency diesel generator room ventilation system, the ESF switchgear room ventilation system, and the miscellaneous electrical equipment room ventilation system. Therefore, the Division 12 ESF AC power sources are assumed to be unavailable. The Division 11 ESF bus is unaffected by a fire in this zone, and is credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 12 IP buses 1IP02J and 1IP04J should be relied upon only in the short term. The assumed loss of Division 12 power means that Division 12 battery 1DC02E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 12 components and systems used to accomplish this function are assumed to be unavailable. The Division 11 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

Division 12 components and systems used to accomplish this function are assumed to be unavailable. The Division 11 AFW and main steam system components and associated primary and secondary side instrumentation are unaffected by a fire in this zone, and are credited with accomplishing this safe shutdown function.

Essential Support

Division 12 support systems are assumed to be unavailable. The Division 11 essential service water pump and its support components, the Division 11 component cooling water pump, and the Division 11 containment ventilation system are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train B is assumed to be unavailable. Train A of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8701A and 1RH8701B. Although valve 1RH8701B has no cables present in this zone, its power source may be unavailable. In the event the power supply is not available, credit is taken for locally manually opening this valve in order to establish a flowpath to the train A RHR pump.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components are present in this fire zone. Therefore, safe shutdown of unit 2 will be unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.18.1 of the fire hazards analysis.

2.4.2.145 Diesel Generator 2B/Switchgear Room Air Shaft (Fire Zone 18.1-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone. The auxiliary building ventilation system is not directly affected by a fire in this fire zone. However, the resulting unavailability of Division 22 electrical power sources will render the 0D supply and exhaust fans of the auxiliary building ventilation system unavailable.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components are present in this fire zone. Therefore, safe shutdown of unit 1 will be unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

The components and cables in this zone are associated with ESF Division 22. Division 22 is assumed to be unavailable for this zone; Division 21 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

All of the components and cables in this zone are associated with the Division 22 emergency diesel generator room ventilation system, the ESF switchgear room ventilation system, and the miscellaneous electrical equipment room ventilation system. Therefore, the Division 22 ESF AC power sources are assumed to be unavailable. The Division 21 ESF bus is unaffected by a fire in this zone, and is credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 22 IP buses 2IP02J and 2IP04J should be relied upon only in the short term. The assumed loss of Division 22 power means that Division 22 battery 2DC02E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 22 components and systems used to accomplish this function are assumed to be unavailable. The Division 21 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

Division 22 components and systems used to accomplish this function are assumed to be unavailable. The Division 21 AFW and main steam system components and associated primary and secondary side instrumentation are unaffected by a fire in this zone, and are credited with accomplishing this safe shutdown function.

Essential Support

Division 22 support systems are assumed to be unavailable. The Division 21 essential service water pump and its support components, the Division 21 component cooling water pump, and the Division 21 containment ventilation system are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train B is assumed to be unavailable. Train A of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8701A and 2RH8701B. Although valve 2RH8701B has no cables present in this zone, its power source may be unavailable. In the event the power supply is not available, credit is taken for locally manually opening this valve in order to establish a flowpath to the train A RHR pump.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.18.2 of the fire hazards analysis.

2.4.2.146 Diesel Generator 1A/Switchgear Room Air Shaft (Fire Zone 18.2-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are not directly affected by a fire in this fire zone. However, the resulting unavailability of Division 11 electrical power sources will render Train A of the control room ventilation system unavailable and the 0A supply and exhaust fans of the auxiliary building ventilation system unavailable.

Unit 1 Safe Shutdown Functions

The cables in this zone are associated with ESF Division 11. Division 11 is assumed to be unavailable for this zone; Division 12 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

The components and cables in this zone are associated with the Division 11 emergency diesel generator room ventilation system, the ESF switchgear room ventilation system, and the miscellaneous electrical equipment room ventilation system. Therefore, the Division 11 ESF AC power sources are assumed to be unavailable. The Division 12 ESF bus is unaffected by a fire in this zone, and is credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 11 IP buses 1IP01J and 1IP03J should be relied upon only in the short term. The assumed loss of Division 11 power means that Division 11 battery 1DC01E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 AFW and main steam system components and associated primary and secondary side instrumentation are unaffected by a fire in this zone, and are credited with accomplishing this safe shutdown function.

Essential Support

Division 11 support systems are assumed to be unavailable. The Division 12 essential service water pump and its support components, the Division 12 component cooling water pump, and the Division 12 containment ventilation system are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train A is assumed to be unavailable. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8702A and 1RH8702B.

Although valve 1RH8702A has no cables present in this zone, its power source may be unavailable. In the event the power supply is not available, credit is taken for locally manually opening this valve in order to establish a flowpath to the train B RHR pump.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components are present in this fire zone. Therefore, safe shutdown of unit 2 will be unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.18.3 of the fire hazards analysis.

2.4.2.147 Diesel Generator 2A/Switchgear Room Air Shaft (Fire Zone 18.2-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system is unaffected by a fire in this zone. The auxiliary building ventilation system is not directly affected by a fire in this fire zone. However, the resulting unavailability of Division 21 electrical power sources will render the 0C supply and exhaust fans of the auxiliary building ventilation system unavailable.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components are present in this fire zone. Therefore, safe shutdown of unit 1 will be unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

The cables in this zone are associated with ESF Division 21. Division 21 is assumed to be unavailable for this zone; Division 22 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

All of the components and cables in this zone are associated with the Division 21 emergency diesel generator room ventilation system, the ESF switchgear room ventilation system, and the miscellaneous electrical equipment room ventilation system. Therefore, the Division 21 ESF AC power sources are assumed to be unavailable. The Division 22 ESF bus is unaffected by a fire in this zone, and is credited for safe shutdown.

The four instrument power buses are unaffected by a fire in this zone, and remain available. However, Division 21 IP buses 2IP01J and 2IP03J should be relied upon only in the short term. The assumed loss of Division 21 power means that Division 21 battery 2DC01E is the only power source for these buses. When the battery becomes depleted, these buses and their instruments will also fail.

RCS Inventory Control (Including Boration)

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 AFW and main steam system components and associated primary and secondary side instrumentation are unaffected by a fire in this zone, and are credited with accomplishing this safe shutdown function.

Essential Support

Division 21 support systems are assumed to be unavailable. The Division 22 essential service water pump and its support components, the Division 22 component cooling water pump, and the Division 22 containment ventilation system are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train A is assumed to be unavailable. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8702A and 2RH8702B. Although valve 2RH8702A has no cables present in this zone, its power source may be unavailable. In the event the power supply is not available, credit is taken for locally manually opening this valve in order to establish a flowpath to the train B RHR pump.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.18.4 of the fire hazards analysis.

2.4.2.148 Unit 1 Main Steam/AFW Pipe Tunnel (Fire Zone 18.3-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4. Several cables present in this zone are also routed in conduit through the unit 1

tendon tunnel area and through the buttress #2 area of unit 1 and enter the auxiliary building near grade level. The tendon tunnel and buttress areas have not been assigned fire zone designations as these areas have very little in them except for lights, sump pumps, and cables in conduit. . The cables are all associated with the steam generator PORVs. The consequence of damage to these cables are bounded by the analysis for this fire zone.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are not affected by a fire in this zone.

Unit 1 Safe Shutdown Functions

Cables and components from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are not directly affected by a fire in this zone.

Power and control cables for one Division 12 4160Vac load is present in this zone. Credit is taken for manually opening the breaker and removing the control power fuse from the affected cubicle for the Division 12 control room chiller as a precautionary measure to protect the Division 12 bus.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The systems and components which perform this function are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

This fire zone includes the main steam and feedwater pipe tunnels and the two valve houses located approximately 120 degrees apart at the containment wall. Components present in this fire zone include the auxiliary feedwater containment isolation valves, the steam generator safety valves, the steam generator PORVs, the main steam isolation valves, and the main steam isolation bypass valves. Cables for these components are also present, as are cables for all of the steam generator pressure instruments. Byron BTP CMEB 9.5-1 Deviation 1A.1 identifies that these components are located in the same fire zone, and concludes that adequate protection is provided for these components and cables by the existing physical configuration in this fire zone. Therefore, at least one train of components and instruments will remain available to safely shut down unit 1 following a fire in this fire zone.

The main steam isolation valves, 1MS001A through 1MS001D, each have a Division 11 and a Division 12 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

The main steam isolation bypass valves, 1MS101A through 1MS101D, each have cables from their Division 11 and Division 12 actuation circuit present in this zone. These valves are normally closed, and it is desired to keep them closed for safe shutdown. With the MSIV bypass valve hand position controllers in their normal position of 0%, postulated circuit faults on an actuation circuit for one of these valves are incapable of causing the spurious opening of the affected valve. No response is required.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown. If necessary, credit is taken for operation of the safety valves to remove decay heat until the fire is extinguished and access to the area is re-established.

In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures. If necessary, this action will be delayed until the fire is extinguished and access to the area is re-established.

Essential Support

The essential service water, component cooling water and containment ventilation systems are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system and its required support functions are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components or cables are present in this fire zone. Therefore, a fire in this zone will not have any impact on unit 2 safe shutdown.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.149 Unit 2 Main Steam/AFW Pipe Tunnel (Fire Zone 18.3-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4. Several cables present in this zone are also routed in conduit through the unit 2 tendon tunnel area and through the buttress #4 area of unit 2 and enter the auxiliary building at various elevations. The tendon tunnel and buttress areas have not been assigned fire zone designations as these areas have very little in them except for lights, sump pumps, and cables in conduit. . The cables are all associated with the steam generator PORVs. The consequence of damage to these cables are bounded by the analysis for this fire zone.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are not affected by a fire in this zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components or cables are present in this fire zone. Therefore, a fire in this zone will not have any impact on unit 1 safe shutdown.

Unit 2 Safe Shutdown Functions

Cables and components from both divisions are present in this zone.

Essential Electric Power (AC/DC) Support

The essential power systems are unaffected by a fire in this zone.

The four instrument power buses are unaffected by a fire in this zone, and remain available.

RCS Inventory Control (Including Boration)

The systems and components which perform this function are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

This fire zone includes the main steam and feedwater pipe tunnels and the two valve houses located approximately 120 degrees apart at the containment wall. Components present in this fire zone include the auxiliary feedwater containment isolation valves, the steam generator safety valves, the steam generator PORVs, the main steam isolation

valves, and the main steam isolation bypass valves. Cables for these components are also present, as are cables for all of the steam generator pressure instruments. Byron BTP CMEB 9.5-1 Deviation 2A.1 identifies that these components are located in the same fire zone, and concludes that adequate protection is provided for these components and cables by the existing physical configuration in this fire zone. Therefore, at least one train of components and instruments will remain available to safely shut down unit 2 following a fire in this fire zone.

The main steam isolation valves, 2MS001A through 2MS001D, each have a Division 21 and a Division 22 actuation circuit present in this zone. In the event of the spurious closure of one or all MSIVs due to actuator circuit damage, the main steam safety valves will remove decay heat until the steam generator PORVs are manually operated. In the event of the spurious opening of any MSIV, actions will be taken per station procedures to prevent overcooling of the RCS.

The main steam isolation bypass valves, 2MS101A through 2MS101D, each have cables from their Division 21 and Division 22 actuation circuit present in this zone. These valves are normally closed, and it is desired to keep them closed for safe shutdown. With the MSIV bypass valve hand position controllers in their normal position of 0%, postulated circuit faults on an actuation circuit for one of these valves are incapable of causing the spurious opening of the affected valve. No response is required.

All four steam generator PORVs have control cables present in this zone. Local manual operation of one or more SG PORVs using the hydraulic hand pumps is credited for safe shutdown. If necessary, credit is taken for operation of the safety valves to remove decay heat until the fire is extinguished and access to the area is re-established.

In the event of the spurious opening of one of the steam generator PORVs, operator diagnosis and response per the faulted steam generator procedure is credited, and the affected steam generator PORV isolation valve will be locally manually closed using its handwheel per existing station procedures. If necessary, this action will be delayed until the fire is extinguished and access to the area is re-established.

Essential Support

The essential service water, component cooling water and containment ventilation systems are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The residual heat removal system and its required support functions are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone.

2.4.2.150 Train A Control Room HVAC Equipment Room (Fire Zone 18.4-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Components and cables for train A of the control room ventilation system are present in this zone. Train A of the VC system is assumed to be unavailable. Train B of the VC system is unaffected by a fire in this zone and is credited for safe shutdown. Outlet control dampers to the unit 1 side of the main control room and inlet and outlet control dampers to the unit 1 auxiliary electrical equipment room (AEER) have cables routed through this zone. These are two position dampers which are used to balance flows for the train of VC which is in operation. Fire-induced faults on these cables could cause the dampers to move to the opposite train position. The effect would be to reduce flow to the main control room. The main control room has two supply and return flowpaths, and only one of these is potentially affected. No adverse consequences are expected. The single supply and return flowpath (dampers 0VC094Y and 0VC095Y) to the unit 1 AEER is potentially affected. However, the flow reduction would not reduce room cooling enough to cause equipment high temperature limits to be reached or exceeded. No adverse consequences are expected.

The auxiliary building ventilation system is not directly affected by a fire in this fire zone. The 0A supply and exhaust fans are not credited in this zone because Division 11 electrical power may not be available.

Unit 1 Safe Shutdown Functions

The cables in this zone are associated with ESF Division 11. Division 11 is assumed to be unavailable for this zone; Division 12 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

Cables in this zone are associated with the Division 11 emergency diesel generator and ESF switchgear bus. Therefore, the Division 11 ESF AC power sources are assumed to be unavailable. The Division 12 ESF bus is unaffected by a fire in this zone, and is credited for safe shutdown.

The Division 12 instrument power buses are unaffected by a fire in this zone, and remain available. Division 11 buses 1IP01J and 1IP03J could be disabled by faults on cables in this zone.

RCS Inventory Control (Including Boration)

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Cables for Division 11 pressurizer PORV 1RY455A and block valve 1RY8000A are present in this zone. This pair of valves forms a high-low pressure interface between the RCS and the PRT. This condition is discussed in Section 2.4.3.2. The post-fire safe shutdown function of these valves is to depressurize the RCS as required to RHR system entry conditions to allow for cold shutdown decay heat removal. The Division 12 valves are available to perform this function.

Hot Standby Decay Heat Removal

Division 11 components and systems used to accomplish this function are assumed to be unavailable. The Division 12 AFW and main steam system components and associated primary and secondary side instrumentation are unaffected by a fire in this zone, and are credited with accomplishing this safe shutdown function.

Essential Support

Division 11 support systems are assumed to be unavailable. The Division 12 essential service water pump and its support components, the Division 12 component cooling water pump, and the Division 12 containment ventilation system are unaffected by a fire in this zone.

Several valves related to these functions are subject to spurious operation as a result of having control circuit cables routed through this fire zone. Although these valves are Division 11 valves, they could potentially impact the operation of Division 12 components. These are discussed below.

The intermediate header crosstie valve, 1CC9473A, has a control cable routed through this zone. Either the unit 1 or unit 2 intermediate crosstie valves have their power locked out during normal operation, therefore fire damage to control cables for this valve will not result in a spurious valve operation that will affect unit separation of the component cooling system.

The supply header isolation valve, 1CC9415, has a control cable routed through this zone. The spurious closure of this valve would block the discharge flowpath for the units' component cooling system. Operator action to stop the running pump is required. Loss of component cooling is assumed to result. Credit is taken for diagnosis of the problem and for re-establishing component cooling system flow per the loss of component cooling station procedure.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train A is assumed to be unavailable. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 1RH8702A and 1RH8702B. Valve 1RH8702A has cables present in this zone, and is therefore assumed to be unavailable for remote operation. In this event, credit is taken for locally manually opening this valve in order to establish a flowpath to the train B RHR pump. Additionally, Division 11 valve 1CC9415 may need to be re-positioned to assure adequate component cooling water flow to the Train B RH heat exchanger. For these events, credit is taken for locally operating the valves with their handwheels.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown components are present in this fire zone. However, power and control cables associated with the Division 11 to Division 21 ESF bus crosstie are routed through this zone. Postulated faults on these cables could adversely affect the operation of the Division 21 ESF bus. Therefore, credit is taken for manually opening the crosstie feed breaker per station procedures after determination of a design basis fire, as a precautionary measure. Additionally, power and control cables associated with the Division 21 essential service water cooling tower unit substation 231Z are routed through the zone. Postulated faults on these cables could adversely affect the operation of the Division 21 ESF bus. Therefore, credit is taken for manually opening the unit substation feed breaker per station procedures after determination of a design basis fire, as a precautionary measure.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.18.7 of the fire hazards analysis.

2.4.2.151 Train B Control Room HVAC Equipment Room (Fire Zone 18.4-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Components and cables for train B of the control room ventilation system are present in this zone. Train B of the VC system is assumed to be unavailable. Train A of the VC system is unaffected by a fire in this zone and is credited for safe shutdown. Outlet control dampers to the unit 2 side of the main control room and inlet and outlet control dampers to the unit 2 auxiliary electrical equipment room (AEER) have cables routed through this zone. These are two position dampers which are used to balance flows for the train of VC which is in operation. Fire-induced faults on these cables could cause

the dampers to move to the opposite train position. The effect would be to reduce flow to the main control room. The main control room has two supply and return flowpaths, and only one of these is potentially affected. No adverse consequences are expected. The single supply and return flowpath (dampers 0VC175Y and 0VC182Y) to the unit 2 AEER is potentially affected. However, the flow reduction would not reduce room cooling enough to cause equipment high temperature limits to be reached or exceeded. No adverse consequences are expected.

The auxiliary building ventilation system is not directly affected by a fire in this fire zone. The 0C supply and exhaust fans are not credited in this zone because Division 21 electrical power may not be available.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown components are present in this fire zone. However, train B of the VC system is powered from unit 1 power sources. The impact of a fire in this zone on the VC system is discussed above. Safe shutdown of unit 1 will not be affected by a fire in this zone. Power and control cables associated with the Division 11 to Division 21 4 Kv ESF bus crosstie are routed through this zone. Postulated faults on these cables could adversely affect the operation of the Division 11 ESF bus. Therefore, credit is taken for manually opening this breaker per station procedure after determination of a design basis fire, as a precautionary measure to protect the bus.

Unit 2 Safe Shutdown Functions

With the exception of cables for train B of the VC system, the cables in this zone are associated with ESF Division 21. Division 21 is assumed to be unavailable for this zone; Division 22 systems and components are credited for safe shutdown.

Essential Electric Power (AC/DC) Support

Cables in this zone are associated with the Division 21 emergency diesel generator and ESF switchgear bus. Therefore, the Division 21 ESF AC power sources are assumed to be unavailable. The Division 22 ESF bus is unaffected by a fire in this zone, and is credited for safe shutdown.

The two Division 22 instrument power buses are unaffected by a fire in this zone, and remain available. Both Division 21 IP buses 2IP01J and 2IP03J could be disabled by faults on load cables in this zone, and are assumed to be unavailable.

RCS Inventory Control (Including Boration)

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 charging pump, support components, and instrumentation are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

Division 21 components and systems used to accomplish this function are assumed to be unavailable. The Division 22 AFW and main steam system components and associated primary and secondary side instrumentation are unaffected by a fire in this zone, and are credited with accomplishing this safe shutdown function.

Essential Support

Division 21 support systems are assumed to be unavailable. The Division 22 essential service water pump and its support components, the Division 22 component cooling water pump, and the Division 22 containment ventilation system are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The RHR system is credited with decay heat removal for cold shutdown. Train A is assumed to be unavailable. Train B of the RHR system has two reactor coolant system to RHR pump suction isolation valves in series. These are 2RH8702A and 2RH8702B. Although valve 2RH8702A has no cables present in this zone, its power source may not be available. In this event, credit is taken for locally manually opening this valve in order to establish a flowpath to the train B RHR pump.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundary of this fire zone, since the walls, floor and ceiling have a 3-hour fire rating as described in section 2.3.18.8 of the fire hazards analysis.

2.4.2.152 Kitchen/Locker Area El. 451' (Fire Zone 18.5-1)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.153 Security Control Center El. 451' (Fire Zone 18.5-2)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.154 Main Power Transformer 1E (Fire Zone 18.10A-1)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.155 Main Power Transformer 2E (Fire Zone 18.10A-2)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.156 Main Power Transformer 1W (Fire Zone 18.10B-1)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.157 Main Power Transformer 2W (Fire Zone 18.10B-2)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.158 Unit Auxiliary Transformer 141-1 (Fire Zone 18.10C-1)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.159 Unit Auxiliary Transformer 241-1 (Fire Zone 18.10C-2)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.160 Unit Auxiliary Transformer 141-2 (Fire Zone 18.10D-1)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.161 Unit Auxiliary Transformer 241-2 (Fire Zone 18.10D-2)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.162 System Auxiliary Transformers 142-1/142-2 (Fire Zone 18.10E-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are both unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

The offsite power feeds to both ESF buses are present in this fire zone. Therefore, offsite power will be lost. However, the ESF buses and their support systems are unaffected. Therefore, safe shutdown components and systems from both ESF divisions remain available for safe shutdown of unit 1.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are directly affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.163 System Auxiliary Transformers 242-1/242-2 (Fire Zone 18.10E-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are both unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are directly affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

The offsite power feeds to both ESF buses are present in this fire zone. Therefore, offsite power will be lost. However, the ESF buses and their support systems are unaffected. Therefore, safe shutdown components and systems from both ESF divisions remain available for safe shutdown of unit 2.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.164 Byron River Screen House (Fire Zone 18.11-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Both of the essential service water cooling tower makeup pumps, their diesel engines, and their various coolers are present in the zone. The makeup pumps are separated horizontally by approximately 40 feet, each pump is surrounded by a 48 inch high 12 inch thick concrete barrier, and there are automatic CO2 suppression systems in place for each pump. As a result a single fire is not likely to affect both components.

Two deep well pumps located near the SX cooling tower are capable of making up to the tower using station operating procedures when the safe shutdown makeup pumps at the river screen house are not available. Although the deep well pumps are not listed as safe shutdown components, they are powered off the ESF buses and are not impacted by any fire damage effects at the river screen house.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.165 Byron River Screen House DO Tank Room 1 (Fire Zone 18.11-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The 0B essential service water cooling tower makeup pump diesel oil storage tank is present in the zone. The redundant 0A essential service water cooling tower makeup pump is unaffected by a fire in this zone and is credited for safe shutdown.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.166 Byron River Screen House DO Tank Room 2 (Fire Zone 18.11-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The 0A essential service water cooling tower makeup pump diesel oil storage tank is present in the zone. The redundant 0B essential service water cooling tower makeup pump is unaffected by a fire in this zone and is credited for safe shutdown.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.167 ESW Cooling Tower Electrical Substation, Division 12 (Fire Zone 18.14A-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Control cables for the 0B essential service water cooling tower makeup pump 0SX02PB are present in the zone. The redundant 0A essential service water cooling tower makeup pump is unaffected by a fire in this zone and is credited for safe shutdown. Division 12 0B essential service water cooling tower makeup inlet, tower riser, and hot water bypass valves have cables present in the zone. The redundant Division 11 0A essential service water cooling tower valves are unaffected and credited for safe shutdown.

Unit 1 Safe Shutdown Functions

Cables and components from Division 12 are present in this fire zone. Therefore Division 11 equipment will be relied upon for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 11 and 12 4KV ESF buses are available for safe shutdown. Power and control cables for Unit 1 ESW Cooling Tower unit substation 132Z is located in this zone. Postulated faults on these cables could adversely affect the operation of the Division 12 4KV ESF bus. Therefore, after determination of a design basis fire, credit is taken for manually opening and pulling the control power fuses for the Division 12 unit substation feed breaker per station procedure as a precautionary measure to protect the Division 12 4KV ESF bus. Additionally, components and cables associated with the Division 12 essential service water cooling tower ESF unit substation 132Z, MCC 132Z1, and room ventilation fans are present in this zone. Therefore, the Division 12 ESW AC power sources at the cooling tower are assumed to be unavailable. The Division 11 ESW AC power sources at the cooling tower are unaffected by a fire in this zone, and are credited for safe shutdown.

RCS Inventory Control (Including Boration)

The RCS inventory control systems are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The hot standby decay heat removal systems are unaffected by a fire in this zone.

Essential Support

Division 12 essential service water cooling tower support systems are assumed to be unavailable. The Division 11 essential service water cooling tower support system is unaffected by a fire in this zone.

The remaining essential support systems are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The cold shutdown decay heat removal systems are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.168 ESW Cooling Tower Electrical Substation, Division 22 (Fire Zone 18.14A-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Division 22 0B essential service water cooling tower makeup inlet, tower riser, and hot water bypass valves have cables present in the zone. The redundant Division 21 0A essential service water cooling tower valves are unaffected and credited for safe shutdown.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

Cables and components from Division 22 are present in this fire zone. Therefore Division 21 equipment will be relied upon for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 21 and 22 4KV ESF buses are available for safe shutdown. Power and control cables for Unit 2 ESW Cooling Tower unit substation 232Z is located in this zone. Postulated faults on these cables could adversely affect the operation of the Division 22 4KV ESF bus. Therefore, after determination of a design basis fire, credit is taken for manually opening and pulling the control power fuses for the Division 22 unit substation feed breaker per station procedure as a precautionary measure to protect the Division 22 4KV ESF bus. Additionally, components and cables associated with the Division 22 essential service water cooling tower ESF unit substation 232Z, MCC 232Z1, and room ventilation fans are present in this zone. Therefore, the Division 22 ESW AC power sources at the cooling tower are assumed to be unavailable. The Division 21 ESW AC power sources at the cooling tower are unaffected by a fire in this zone, and are credited for safe shutdown.

RCS Inventory Control (Including Boration)

The RCS inventory control systems are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The hot standby decay heat removal systems are unaffected by a fire in this zone.

Essential Support

Division 22 essential service water cooling tower support systems are assumed to be unavailable. The Division 21 essential service water cooling tower support system is unaffected by a fire in this zone.

The remaining essential support systems are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The cold shutdown decay heat removal systems are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.169 ESW Cooling Tower Electrical Substation, Division 11 (Fire Zone 18.14B-1)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Control cables for the 0A essential service water cooling tower makeup pump 0SX02PA are present in the zone. The redundant 0B essential service water cooling tower makeup pump is unaffected by a fire in this zone and is credited for safe shutdown. Division 11 0A essential service water cooling tower makeup inlet, tower riser, and hot water bypass valves have cables present in the zone. The redundant Division 12 0B essential service water cooling tower valves are unaffected and credited for safe shutdown.

Unit 1 Safe Shutdown Functions

Cables and components from Division 11 are present in this fire zone. Therefore Division 12 equipment will be relied upon for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 11 and 12 4KV ESF buses are available for safe shutdown. Power and control cables for Unit 1 ESW Cooling Tower unit substation 131Z is located in this zone. Postulated faults on these cables could adversely affect the operation of the Division 11 4KV ESF bus. Therefore, after determination of a design basis fire, credit is taken for manually opening and pulling the control power fuses for the Division 11 unit substation feed breaker per station procedure as a precautionary measure to protect the Division 11 4KV ESF bus. Additionally, components and cables associated with the Division 11 essential service water cooling tower ESF unit substation 131Z, MCC

131Z1, and room ventilation fans are present in this zone. Therefore, the Division 11 ESW AC power sources at the cooling tower are assumed to be unavailable. The Division 12 ESW AC power sources at the cooling tower are unaffected by a fire in this zone, and are credited for safe shutdown.

RCS Inventory Control (Including Boration)

The RCS inventory control systems are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The hot standby decay heat removal systems are unaffected by a fire in this zone.

Essential Support

Division 11 essential service water cooling tower support systems are assumed to be unavailable. The Division 12 essential service water cooling tower support system is unaffected by a fire in this zone.

The remaining essential support systems are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The cold shutdown decay heat removal systems are unaffected by a fire in this zone.

Unit 2 Safe Shutdown Functions

No unit 2 safe shutdown systems are affected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.170 ESW Cooling Tower Electrical Substation, Division 21 (Fire Zone 18.14B-2)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

Division 21 0A essential service water cooling tower makeup inlet, tower riser, and hot water bypass valves have cables present in the zone. The redundant Division 22 0B essential service water cooling tower valves are unaffected and credited for safe shutdown.

Unit 1 Safe Shutdown Functions

No unit 1 safe shutdown systems are affected by a fire in this zone.

Unit 2 Safe Shutdown Functions

Cables and components from Division 21 are present in this fire zone. Therefore Division 22 equipment will be relied upon for safe shutdown.

Essential Electric Power (AC/DC) Support

The Division 21 and 22 4KV ESF buses are available for safe shutdown. Power and control cables for Unit 2 ESW Cooling Tower unit substation 231Z is located in this zone. Postulated faults on these cables could adversely affect the operation of the Division 21 4KV ESF bus. Therefore, after determination of a design basis fire, credit is taken for manually opening and pulling the control power fuses for the Division 21 unit substation feed breaker per station procedure as a precautionary measure to protect the Division 21 4KV ESF bus. Additionally, components and cables associated with the Division 21 essential service water cooling tower ESF unit substation 231Z, MCC 231Z1, and room ventilation fans are present in this zone. Therefore, the Division 21 ESW AC power sources at the cooling tower are assumed to be unavailable. The Division 22 ESW AC power sources at the cooling tower are unaffected by a fire in this zone, and are credited for safe shutdown.

RCS Inventory Control (Including Boration)

The RCS inventory control systems are unaffected by a fire in this zone.

Hot Standby Decay Heat Removal

The hot standby decay heat removal systems are unaffected by a fire in this zone.

Essential Support

Division 21 essential service water cooling tower support systems are assumed to be unavailable. The Division 22 essential service water cooling tower support system is unaffected by a fire in this zone.

The remaining essential support systems are unaffected by a fire in this zone.

Cold Shutdown Decay Heat Removal

The cold shutdown decay heat removal systems are unaffected by a fire in this zone.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.171 Condensate Storage Tank Area (Fire Zone 18.23-0)

Safe shutdown components and cables located in this fire zone are listed in Table 2.4-4.

Common Systems

The control room ventilation system and the auxiliary building ventilation system are unaffected by a fire in this zone.

Unit 1 Safe Shutdown Functions

One unit 1 safe shutdown component is present in this zone. The condensate storage tank (CST) is an aluminum tank which is not susceptible to fire damage. Therefore, a fire in this zone will not have any effect on safe shutdown of unit 1.

Unit 2 Safe Shutdown Functions

One unit 2 safe shutdown component is present in this zone. The condensate storage tank (CST) is an aluminum tank which is not susceptible to fire damage. Therefore, a fire in this zone will not have any effect on safe shutdown of unit 2.

Fire Zone Boundary BTP CMEB 9.5-1 Deviations and Generic Letter 86-10 Evaluations

No BTP CMEB 9.5-1 deviations or Generic Letter 86-10 evaluations are applicable to the boundaries of this fire zone.

2.4.2.172 Security Diesel Motor Control Center Elev. 426'-0" (Fire Zone 18.35- 0)

No safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.173 Relay House (Fire Zone 18.36-0)

Offsite power is assumed to be lost for a fire in this zone, however, no safe shutdown components or cables are located in this fire zone. Therefore, a fire in this zone will have no impact on the safe shutdown of either unit.

2.4.2.174 ESW Return Valve Pit @ Braidwood Cooling Lake (Fire Zone 18.39-0)

This is a Braidwood only fire zone which does not exist at the Byron station.

2.4.3 Identification and Analysis of High-Low Pressure Interfaces

A number of interfaces between the RCS and lower pressure systems were reviewed as potential high-low pressure interfaces. The following interfaces were so evaluated:

RCS to RHR pump suction lines
Pressurizer PORVs/Block valves
Reactor vessel head vent valves
Normal letdown line
Excess letdown line

Each of these potential high-low pressure interfaces is discussed below.

2.4.3.1 RHR Pump Suction Lines

The power and control cables for each of the RHR pump suction valves are listed in Table 2.4-4. The routings of each cable can be determined from this table.

Each of the four RHR pump suction lines is isolated from the RCS by two motor-operated valves in series. The valves are located as near to the RCS hot leg nozzle as practicable. Each valve and the intermediate piping is rated for full RCS pressure, but the downstream piping is designed for a lower pressure. The RHR pump suction valves are manually controlled valves which can be opened only by manual operation of their control switches in the main control room or locally using their handwheels.

Each pump suction line has an isolation valve powered from both ESF divisions. For unit 1(2) train A, the two isolation valves are 1(2)RH8701A and 1(2)RH8701B. For unit 1(2) train B, the two isolation valves are 1(2)RH8702A and 1(2)RH8702B. Valves 1(2)RH8701A and 1(2)RH8702A are powered from ESF division 11(21). Valves 1(2)RH8701B and 1(2)RH8702B are powered from ESF division 12(22).

During normal operation, plant procedures require that power be locked out to at least one of the two valves in each RHR pump suction line. The result is that postulated faults on control circuit cables could cause one of the valves to open, but not the valve with power locked out. Therefore, it is not necessary to evaluate the control circuits of these valves for potential spurious operation. Postulated faults on the power cables are assumed to be capable of causing a valve to spuriously open.

For each suction line, a review of the power cable routing for each of the isolation valves reveals that the power cable for both valves in the line are present only in one fire zone. That is the containment itself. Outside of containment, the power cables for both valves in a suction line are never together in the same fire zone. Also, a combination of one power cable and a control cable for the other valve are not found in the same fire zone. Therefore, fires outside of the containment are not capable of causing both valves in a line to spuriously open.

For these valves, the licensing basis of the plant, as documented in the original Fire Protection Report/SSA and subsequently issued SERs, is that simultaneous three phase hot shorts of the proper polarity on the power cables of both of these valves is not credible. Therefore, the spurious operation of these valves is not postulated to occur inside the containments. This position supercedes the cable damage criteria as stated in introductory subsection 2.4.1.5.2 (which is therefore not applied to these valves). Therefore, the spurious opening of these valves due to a fire in the containment is not postulated to occur.

2.4.3.2 Pressurizer PORVs and Block Valves

The power and control cables for each of the pressurizer PORVs and their associated block valves are listed in Table 2.4-4. The routings of each cable can be determined from this table.

The pressurizer PORVs are DC solenoid controlled air operated valves. These valves provide the primary overpressure protection of the RCS during most modes of operation. Each PORV discharge line has a normally open motor operated block valve immediately upstream of the PORV itself. Both PORV discharge lines are routed to the pressurizer relief tank (PRT). The PRT is sized to accept and quench the PORV discharge only for a limited time. Certain post-fire scenarios may require or result in discharge for a longer time. If a PORV were to discharge to the PRT for a sufficiently long time, the PRT pressure would rise to the rupture disc relief pressure, and the PRT contents would be released to the containment atmosphere. The postulated release of reactor coolant to the containment atmosphere would not adversely affect any safe shutdown components located inside containment, since these components are qualified for a post-LOCA environment. However, containment habitability would be affected. Local manual operation of safe shutdown motor operated valves inside containment is credited for some postulated fires.

Postulated hot shorts on any PORV control cables except 1(2)DC100 for PORV 1(2)RY455A and 1(2)DC102 for PORV 1(2)RY456 are assumed to be capable of causing the spurious opening of the valve. Cables 1(2)DC100 and 1(2)DC102 are the cables which provide 125Vdc power to the circuit. Postulated faults on these cables can de-energize (or re-energize) the circuit, but cannot cause a spurious operation of the affected PORV.

The Division 11(21) PORV and block valve both have control cables in the main control room and in two of the upper cable spreading rooms. Should a fire in any of these zones cause the spurious opening of the PORV, coincident with control circuit damage to the block valve, the block valve could still be closed. A "remote/local" isolation switch and control switch are provided for the block valve at its motor control center, located in the Division 11(21) electrical penetration area. The block valve can be closed by placing the "remote/local" isolation switch in "Local" and then closing the valve with the control switch provided. A control cable for the PORV is also present in the Division 11(21) electrical penetration area, along with control and power cables for the block

valve. The PORV control cable is located in conduit without any other cables. Therefore, a fire in this zone may disable both the PORV and its block valve, but fire-induced faults cannot cause the PORV to spuriously open.

The Division 12(22) PORV and block valve both have control cables in the main control room and in two of the lower cable spreading rooms. Should a fire in any of these zones cause the spurious opening of the PORV, coincident with control circuit damage to the block valve, the block valve could still be closed. A "remote/local" isolation switch and control switch are provided for the block valve at its motor control center, located in the Division 12(22) electrical penetration area. The block valve can be closed by placing the "remote/local" isolation switch in "Local" and then closing the valve with the control switch provided. A control cable for the PORV is also present in the Division 12(22) electrical penetration area, along with control and power cables for the block valve. The PORV control cable is located in conduit without any other cables. Therefore, a fire in this zone may disable both the PORV and its block valve, but fire-induced faults cannot cause the PORV to spuriously open.

In fire zones where one of the PORVs has a control cable present in the zone that can spuriously open the PORV and its associated block valve does not have AC power available, the PORV will be failed closed by pulling its control power fuse at its DC distribution panel.

The Division 11 and Division 12 PORVs and block valves both have cables present inside containment. In some locations, these cables are close together. This is the subject of Appendix R Deviation 2C.1. Inside the pressurizer cubicle, all cables are routed in conduit. Outside the pressurizer cubicle, Division 11 cable 1RY246 and Division 12 cable 1RY252 are routed wholly in conduit from the penetration over to the junction box in the pressurizer cubicle. Since the cables are routed in conduit, spurious operation of the PORV due to fire-induced faults on the cable is not possible. Therefore, a fire in this zone may disable both the PORV and its block valve, but fire-induced faults cannot cause the PORV to spuriously open.

The Division 21 and Division 22 PORVs and block valves both have cables present inside containment. In some locations, these cables are close together. This is the subject of Appendix R Deviation 2C.1. Inside the pressurizer cubicle, all cables are routed in conduit. Outside the pressurizer cubicle, Division 21 cable 2RY246 and Division 22 cable 2RY252 are routed wholly in conduit from the penetration over to the junction box in the pressurizer cubicle. Since the cables are routed in conduit, spurious operation of the PORV due to fire-induced faults on the cable is not possible. Therefore, a fire in this zone may disable both the PORV and its block valve, but fire-induced faults cannot cause the PORV to spuriously open.

2.4.3.3 Reactor Vessel Head Vent Valves

The cables for each of the reactor vessel head vent valves are listed in Table 2.4-4. The routings of each cable can be determined from this table.

Each reactor vessel head vent has two parallel flowpaths, each of which has two valves in series. These are 1(2)RC014A and 1(2)RC014C in one path and 1(2)RC014B and 1(2)RC014D in the other path. The arrangement of these valves is shown in UFSAR figure 5.1-1, sheet 1.

All four valves are dc solenoid operated valves. They are normally closed during power operation, and they fail closed. Each valve is controlled through a separate circuit from a two position (OPEN and CLOSE) control switch at main control room panel 1(2)PM11J. Power is supplied to each solenoid directly through the control cabling.

Division 11 valves 1RC014A and 1RC014C have control cables present together in the following fire zones: 2.1-0, 3.3C-1, 3.3D-1, 3.4A-1, 3.2E-1, 11.6-0, 11.5-0, 11.5A-1, and the containment (1-1).

Division 12 valves 1RC014B and 1RC014D have control cables present together in the following fire zones: 2.1-0, 3.2B-1, 3.2C-1, 11.6-0, 11.6-1 and the containment (1-1).

Division 21 valves 2RC014A and 2RC014C have control cables present together in the following fire zones: 2.1-0, 3.3C-2, 3.3D-2, 3.4A-2, 3.2E-2, 11.6-0, 11.5-0, 11.5B-2, and the containment (1-2).

Division 22 valves 2RC014B and 2RC014D have control cables present together in the following fire zones: 2.1-0, 3.2A-2, 3.2B-2, 3.2C-2, 11.6-2 and the containment (1-2).

In order to preclude a control room fire from causing the spurious opening of any of these valves, the control room evacuation procedure requires the circuits for these valves be de-energized upon leaving the control room.

For these valves, the licensing basis of the plant, as documented in the original Fire Protection Report/SSA and subsequently issued SERs, is that simultaneous two wire hot shorts on the DC control cables of both valves in series is not credible, and therefore is not postulated to occur. This position supercedes the cable damage criteria as stated in introductory subsection 2.4.1.5.2 (which is therefore not applied to these valves). Therefore, the spurious opening of these valves due to a fire in any of the zones where control cables from both valves in a flowpath are present is not postulated to occur.

2.4.3.4 Normal Letdown Line

Normal letdown is taken from the reactor coolant system loop 3 cold leg. Two flow control valves are provided in this line, one inside and one outside the missile barrier. These are valves 1(2)CVLCV459 and 1(2)CVLCV460. Both of these valves are air operated valves which fail closed on loss of air or loss of electric power. Downstream of these valves, the letdown line splits into two lines prior to entering the regenerative heat exchangers. Isolation valves 1(2)CV8389A and B are provided in the lines

upstream of each regenerative heat exchanger. Each of these valves are air operated valves which fail closed on loss of air or loss of electric power. Downstream of the regenerative heat exchangers, the letdown lines join together prior to passing through one or more of three parallel letdown orifices and the letdown orifice isolation valves, 1(2)CV8149A, B and C. Each of the letdown orifice isolation valves is an air operated valve which fails closed on either loss of air or loss of electric power. Piping downstream of the letdown orifice isolation valves has a lower design pressure than upstream piping, which is designed for the RCS normal operating pressure. Therefore, these valves form the high-low pressure boundary on the letdown line. The letdown line therefore has at least four valves in series, each of which fails to the closed position. The simultaneous hot shorts on the control circuits of four valves, which is required to cause all four valves to spuriously open, is not considered to be credible. Therefore, this flowpath does not need to be evaluated as a high-low pressure interface. The valves in this flowpath are not listed on the safe shutdown equipment list and are not evaluated further.

2.4.3.5 Excess Letdown Line

Excess letdown can be taken from each of the four reactor coolant system cold leg loop drain headers. These lines are each isolated by normally closed air operated isolation valves, 1(2)RC8037A through D. These valves fail closed on loss of air or loss of electric power. Flowpaths from the reactor coolant system hot leg loop drain headers are also provided, but these are isolated by manual valves which are not susceptible to spurious operation. All eight of these lines combine into a single line prior to splitting into two lines, one for each excess letdown heat exchanger. An isolation valve, 1(2)CV8153A and B, is provided upstream of each excess letdown heat exchanger. These are normally closed air operated valves, which fail closed on loss of air or loss of electric power. The excess letdown lines then rejoin prior to passing through a flow control valve, 1CVHCV123. This normally closed valve also fails closed on loss of air or loss of electric power. The excess letdown line has three normally closed, fail closed valves in series. The simultaneous hot shorts on the control circuits of three valves, which is required to cause all three valves to spuriously open, is not considered to be credible. Therefore, this flowpath does not need to be evaluated as a high-low pressure interface. The valves in this flowpath are not listed on the safe shutdown equipment list and are not evaluated further.

TABLE 2.4-1

SYSTEMS REQUIRED TO PERFORM SAFE SHUTDOWN FUNCTIONS

SAFE SHUTDOWN FUNCTION	SYSTEMS FOR HOT STANDBY	SYSTEMS FOR COLD SHUTDOWN
Reactivity control	Reactor Trip	CVCS & SI (Borated water from RWST)
Reactor Coolant System inventory and pressure control	CVCS (charging pumps) & SI (RWST & flowpaths)	Same as for hot standby
	Pressurizer PORVs	Same as for hot standby
	Boric Acid (BATs and transfer pumps)	N/A
Decay heat removal	Auxiliary Feedwater & Condensate (CST)	Residual Heat Removal (includes SI flowpaths)
	Main Steam (S/G atmospheric relief valves; safety valves)	N/A
Process monitoring	Neutron Monitoring (NR)	Same as for hot standby
	Pressurizer Level (RY) & Pressure (RY)	RCS WR Pressure (RC)
	RCS Hot & Cold Leg Temperature (RC)	RHR HX Outlet Temperature (RH)
	Incore Thermocouples (IT)	N/A
	S/G Pressure (MS)	N/A
	S/G Level (FW)	N/A
	RWST Level (SI)	Same as for hot standby
	Containment sump Level (SI) and Flow (RF) (Diagnostic)	N/A

TABLE 2.4-1

SYSTEMS REQUIRED TO PERFORM SAFE SHUTDOWN FUNCTIONS

SAFE SHUTDOWN FUNCTION	SYSTEMS FOR HOT STANDBY	SYSTEMS FOR COLD SHUTDOWN
Essential mechanical support	Essential Service Water	Same as for hot standby
	Component Cooling Water	Same as for hot standby
Essential HVAC support	Auxiliary Building HVAC	Same as for hot standby
	Control Room HVAC	Same as for hot standby
	Diesel Generator HVAC	Same as for hot standby
	Switchgear Room and MEER HVAC	Same as for hot standby
	Containment Cooling (RCFCs)	Same as for hot standby
Essential electrical support	Essential & Limited Non-Essential AC Power	Essential AC Power
	Diesel Generator and Auxiliaries	Same as for hot standby
	Essential DC Power	Same as for hot standby
	Instrument Power	Same as for hot standby

TABLE 2.4-2

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
0AB03P(1)	Boric Acid Transfer Pump	11.5-0
0AB03P(2)	Boric Acid Transfer Pump	11.5-0
0CC01A	0 Component Cooling Heat Exchanger	11.3-0
0CC01E-A	Switchgear Bus for "0" CC Pump Powered from 4160Vac Bus 141	11.4-0
0CC01E-B	Switchgear Bus for "0" CC Pump Powered from 4160Vac Bus 241	11.4-0
0CC01E-C	Switchgear Bus for "0" CC Pump Powered from 4160Vac Bus 142	11.4-0
0CC01E-D	Switchgear Bus for "0" CC Pump Powered from 4160Vac Bus 242	11.4-0
0CC01P	0 Component Cooling Pump	11.3-0
0DO08TA	SX Makeup Pump Diesel Oil Storage Tank 0A	18.11-2
0DO08TB	SX Makeup Pump Diesel Oil Storage Tank 0A	18.11-1
0FI-SX044	Component Cooling HX "0" Flow Indicator (0FT-SX044)	11.2-0
0SX007	Component Cooling HX "0" ESW Outlet Valve (MO)	11.2-0
0SX02AA	Essential Service Water Cooling Tower 0A	17.2-2
0SX02AB	Essential Service Water Cooling Tower 0B	17.2-1
0SX02PA	Essential Service Water Makeup Pump 0A	18.11-0
0SX02PA-K	Diesel Engine for Essential Service Water Makeup Pump 0A	18.11-0
0SX02PB	Essential Service Water Makeup Pump 0B	18.11-0
0SX02PB-K	Diesel Engine for Essential Service Water Makeup Pump 0B	18.11-0
0SX03AA	ESW Makeup Pump 0A Diesel Jacket Water Heat Exchanger	18.11-0
0SX03AB	ESW Makeup Pump 0B Diesel Jacket Water Heat Exchanger	18.11-0
0SX04AA	ESW Makeup Pump 0A Diesel Gear Oil Cooler	18.11-0
0SX04AB	ESW Makeup Pump 0B Diesel Gear Oil Cooler	18.11-0
0SX146	Component Cooling HX "0" ESW Outlet Isolation Valve (MO)	11.2-0
0SX147	Component Cooling HX "0" ESW Outlet Isolation Valve (MO)	11.2-0
0SX157A	ESW Cooling Tower 0A Makeup Inlet Valve (MO)	17.2-2
0SX157B	ESW Cooling Tower 0B Makeup Inlet Valve (MO)	17.2-1
0SX158A	ESW Cooling Tower 0A Makeup Inlet Valve (MO)	17.2-2
0SX158B	ESW Cooling Tower 0B Makeup Inlet Valve (MO)	17.2-1
0SX162A	ESW Cooling Tower 0A Hot Water Bypass to Basin Valve (MO)	17.2-2
0SX162B	ESW Cooling Tower 0B Hot Water Bypass to Basin Valve (MO)	17.2-1
0SX162C	ESW Cooling Tower 0A Hot Water Bypass to Basin Valve (MO)	17.2-2
0SX162D	ESW Cooling Tower 0B Hot Water Bypass to Basin Valve (MO)	17.2-1
0SX163A	ESW Cooling Tower 0A Riser Valve (MO)	17.2-2
0SX163B	ESW Cooling Tower 0A Riser Valve (MO)	17.2-2
0SX163C	ESW Cooling Tower 0A Riser Valve (MO)	17.2-2
0SX163D	ESW Cooling Tower 0A Riser Valve (MO)	17.2-2
0SX163E	ESW Cooling Tower 0B Riser Valve (MO)	17.2-1
0SX163F	ESW Cooling Tower 0B Riser Valve (MO)	17.2-1
0SX163G	ESW Cooling Tower 0B Riser Valve (MO)	17.2-1
0SX163H	ESW Cooling Tower 0B Riser Valve (MO)	17.2-1
0VA005Y	Aux Bldg HVAC Fan 0A & 0B Supply Air Control Damper (AO)	3.2-0
0VA010Y	Aux Bldg HVAC Fan 0C & 0D Supply Air Control Damper (AO)	3.2-0
0VA011Y	Aux Bldg HVAC Supply Crosstie Isolation Damper (AO)	3.2-0
0VA01CA	Auxiliary Building HVAC Supply Fan 0A	11.7-0
0VA01CB	Auxiliary Building HVAC Supply Fan 0B	11.7-0
0VA01CC	Auxiliary Building HVAC Supply Fan 0C	11.7-0
0VA01CD	Auxiliary Building HVAC Supply Fan 0D	11.7-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
0VA02CA	Auxiliary Building HVAC Exhaust Fan 0A	11.7-0
0VA02CB	Auxiliary Building HVAC Exhaust Fan 0B	11.7-0
0VA02CC	Auxiliary Building HVAC Exhaust Fan 0C	11.7-0
0VA02CD	Auxiliary Building HVAC Exhaust Fan 0D	11.7-0
0VA274Y	Charging Pump 1B Room Inlet Isolation Damper (AO)	11.3G-1
0VA305Y	Charging Pump 2B Room Inlet Isolation Damper (AO)	11.3G-2
0VA430Y	Aux Bldg HVAC Fan 0C & 0D Supply Air Control Damper (AO)	11.6-0
0VA448Y	Aux Bldg HVAC Supply Crosstie Isolation Damper (AO)	3.2-0
0VA455Y	Train A SX Pump Room Return Duct Fire Damper	11.4-0
0VA455Y	Train A SX Pump Room Return Duct Fire Damper	11.4A-1
0VA456Y	Train A SX Pump Room Return Duct Fire Damper	11.4-0
0VA456Y	Train A SX Pump Room Return Duct Fire Damper	11.4A-1
0VA474Y	Aux Bldg HVAC El. 383' Supply Isolation Damper (MO)	11.4-0
0VA475Y	Aux Bldg HVAC El. 383' Supply Isolation Damper (MO)	11.4-0
0VA476Y	Aux Bldg HVAC El. 383' Supply Isolation Damper (MO)	11.4-0
0VA477Y	Aux Bldg HVAC El. 383' Supply Isolation Damper (MO)	11.4-0
0VA489Y	Unit 2 Division 22 Electrical Penetration Area Fire Damper	11.6-2
0VA489Y	Unit 2 Division 22 Electrical Penetration Area Fire Damper	11.6E-0
0VA490Y	Unit 2 Division 22 Electrical Penetration Area Fire Damper	11.6-0
0VA490Y	Unit 2 Division 22 Electrical Penetration Area Fire Damper	11.6-2
0VA492Y	Unit 2 Division 22 Electrical Penetration Area Fire Damper	11.6-0
0VA492Y	Unit 2 Division 22 Electrical Penetration Area Fire Damper	11.6-2
0VA495Y	Unit 1 Division 12 Electrical Penetration Area Fire Damper	11.6-0
0VA495Y	Unit 1 Division 12 Electrical Penetration Area Fire Damper	11.6-1
0VA496Y	Unit 1 Division 12 Electrical Penetration Area Fire Damper	11.6-0
0VA496Y	Unit 1 Division 12 Electrical Penetration Area Fire Damper	11.6-1
0VA497Y	Unit 1 Division 12 Electrical Penetration Area Fire Damper	11.6-0
0VA497Y	Unit 1 Division 12 Electrical Penetration Area Fire Damper	11.6-1
0VA514Y	Unit 1 Division 12 Elect. Penet. Area Flow Control Damper (AO)	11.6-0
0VA515Y	Unit 1 RHR Pump 1B Room Exhaust Fire Damper	11.2B-1
0VA515Y	Unit 1 RHR Pump 1B Room Exhaust Fire Damper	11.2C-1
0VA516Y	Unit 2 RHR Pump 2B Room Exhaust Fire Damper	11.2B-2
0VA516Y	Unit 2 RHR Pump 2B Room Exhaust Fire Damper	11.2C-2
0VC01CA	Control Room HVAC Supply Fan 0A	18.4-1
0VC01CB	Control Room HVAC Supply Fan 0B	18.4-2
0VC01Y	Train B Return Air Fan 0B Inlet Damper	18.4-2
0VC02CA	Control Room HVAC Return Fan 0A	18.4-1
0VC02CB	Control Room HVAC Return Fan 0B	18.4-2
0VC02Y	Train B Purge Exaust Damper to Turbine Bldg	18.4-2
0VC032Y	Train A Outside Air Damper	18.4-1
0VC033Y	Train A Supply Fan 0A Outlet Damper	18.4-1
0VC034Y	MCR HVAC Main Supply Duct Fire Damper	18.4-1
0VC034Y	MCR HVAC Main Supply Duct Fire Damper	3.3A-1
0VC03Y	Train B Return Air Fan 0B Outlet Damper	18.4-2
0VC043Y	Train A Recirculation Charcoal Absorber Bypass Damper	18.4-1
0VC044Y	Train B Recirculation Charcoal Absorber Bypass Damper	18.4-2
0VC04Y	Train B Maximum Outside Air (Purge Line) Inlet Damper	18.4-2

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
0VC060Y	Unit 1 AEER Exhaust Duct Fire Damper	3.3B-1
0VC060Y	Unit 1 AEER Exhaust Duct Fire Damper	5.5-1
0VC094Y	Unit 1 AEER Return Flow Control Damper	3.3B-1
0VC095Y	Unit 1 AEER Supply Flow Control Damper	3.3B-1
0VC096Y	Unit 1 AEER Supply Duct Fire Damper	3.3B-1
0VC096Y	Unit 1 AEER Supply Duct Fire Damper	5.5-1
0VC097Y	Unit 1 AEER Supply Duct Fire Damper	3.3B-1
0VC097Y	Unit 1 AEER Supply Duct Fire Damper	5.5-1
0VC099Y	Unit 1 AEER Exhaust Duct Fire Damper	3.3B-1
0VC099Y	Unit 1 AEER Exhaust Duct Fire Damper	5.5-1
0VC100Y	Unit 1 AEER Exhaust Duct Fire Damper	3.3B-1
0VC100Y	Unit 1 AEER Exhaust Duct Fire Damper	5.5-1
0VC102Y	MCR HVAC Main Return Duct Fire Damper	18.4-1
0VC102Y	MCR HVAC Main Return Duct Fire Damper	3.3B-1
0VC103Y	MCR HVAC Main Supply Duct Fire Damper	3.3A-1
0VC103Y	MCR HVAC Main Supply Duct Fire Damper	3.3C-1
0VC104Y	Unit 1 Main Control Room Supply Flow Control Damper	3.3C-1
0VC105Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC105Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC106Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC106Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC107Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC107Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC108Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC108Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC109Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC109Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC110Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC110Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC111Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC111Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC112Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC112Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC113Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC113Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC114Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC114Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC115Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC115Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC116Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC116Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC117Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC117Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC118Y	Unit 1 Main Control Room Supply Duct Fire Damper	2.1-0
0VC118Y	Unit 1 Main Control Room Supply Duct Fire Damper	3.3C-1
0VC119Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC119Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
0VC120Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC120Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC121Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC121Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC122Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC122Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC123Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC123Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC124Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC124Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC125Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC125Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC126Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC126Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC127Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC127Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC128Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC128Y	Unit 1 Main Control Room Exhaust Duct Fire Damper	3.3C-1
0VC133Y	Unit 1 Main Control Room Return Flow Control Damper	3.3C-1
0VC140Y	Unit 2 Main Control Room Supply Flow Control Damper	3.3C-2
0VC141Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC141Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC142Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC142Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC143Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC143Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC144Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC144Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC145Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC145Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC146Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC146Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC147Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC147Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC148Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC148Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC149Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC149Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC150Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC150Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC151Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC151Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC152Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC152Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC153Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0
0VC153Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC154Y	Unit 2 Main Control Room Supply Duct Fire Damper	2.1-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
0VC154Y	Unit 2 Main Control Room Supply Duct Fire Damper	3.3C-2
0VC155Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC155Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC161Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC161Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC162Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC162Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC163Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC163Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC164Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC164Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC165Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC165Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC166Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC166Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC167Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC167Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC168Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC168Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC169Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	2.1-0
0VC169Y	Unit 2 Main Control Room Exhaust Duct Fire Damper	3.3C-2
0VC16Y	Train B Outside Air Damper	18.4-2
0VC170Y	MCR HVAC Main Supply Duct Fire Damper	3.3C-1
0VC170Y	MCR HVAC Main Supply Duct Fire Damper	3.3C-2
0VC171Y	MCR HVAC Main Return Duct Fire Damper	3.3C-1
0VC171Y	MCR HVAC Main Return Duct Fire Damper	3.3C-2
0VC172Y	Train B Supply Fan 0B Outlet Damper	18.4-2
0VC173Y	MCR HVAC Main Supply Duct Fire Damper	18.4-2
0VC173Y	MCR HVAC Main Supply Duct Fire Damper	3.3A-2
0VC174Y	MCR HVAC Main Return Duct Fire Damper	18.4-2
0VC174Y	MCR HVAC Main Return Duct Fire Damper	3.3B-2
0VC175Y	Unit 2 AEER Supply Flow Control Damper	3.3B-2
0VC176Y	Unit 2 AEER Supply Duct Fire Damper	3.3B-2
0VC176Y	Unit 2 AEER Supply Duct Fire Damper	5.5-2
0VC177Y	Unit 2 AEER Supply Duct Fire Damper	3.3B-2
0VC177Y	Unit 2 AEER Supply Duct Fire Damper	5.5-2
0VC178Y	Unit 2 AEER Exhaust Duct Fire Damper	3.3B-2
0VC178Y	Unit 2 AEER Exhaust Duct Fire Damper	5.5-2
0VC179Y	Unit 2 AEER Exhaust Duct Fire Damper	3.3B-2
0VC179Y	Unit 2 AEER Exhaust Duct Fire Damper	5.5-2
0VC17Y	Train A Return Air Fan 0A Inlet Damper	18.4-1
0VC180Y	Unit 2 AEER Exhaust Duct Fire Damper	3.3B-2
0VC180Y	Unit 2 AEER Exhaust Duct Fire Damper	5.5-2
0VC181Y	Unit 2 AEER Exhaust Duct Fire Damper	3.3B-2
0VC181Y	Unit 2 AEER Exhaust Duct Fire Damper	5.5-2
0VC182Y	Unit 2 AEER Return Flow Control Damper	3.3B-2
0VC18Y	Train A Purge Exaust Damper to Turbine Bldg	18.4-1

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
0VC19Y	Train A Return Air Fan 0A Outlet Damper	18.4-1
0VC20Y	Train A Maximum Outside Air (Purge Line) Inlet Damper	18.4-1
0VC217Y	Unit 2 Main Control Room Return Flow Control Damper	3.3C-2
0VC240Y	MCR HVAC Main Supply Duct Fire Damper	3.3A-2
0VC240Y	MCR HVAC Main Supply Duct Fire Damper	3.3C-2
0VC241Y	MCR HVAC Main Return Duct Fire Damper	3.3B-1
0VC242Y	MCR HVAC Main Return Duct Fire Damper	3.3B-2
0VC242Y	MCR HVAC Main Return Duct Fire Damper	3.3C-2
0VC248Y	Unit 1 AEER Exhaust Duct Fire Damper	3.3B-1
0VC248Y	Unit 1 AEER Exhaust Duct Fire Damper	5.5-1
0VC249Y	Unit 1 AEER Exhaust Duct Fire Damper	3.3B-1
0VC249Y	Unit 1 AEER Exhaust Duct Fire Damper	5.5-1
0VC252Y	Unit 1 AEER and Misc Area Supply Duct Fire Damper	3.3A-1
0VC252Y	Unit 1 AEER and Misc Area Supply Duct Fire Damper	3.3B-1
0VC268Y	Unit 2 AEER and Misc Area Supply Duct Fire Damper	3.3A-2
0VC268Y	Unit 2 AEER and Misc Area Supply Duct Fire Damper	3.3B-2
0VC281Y	Train A Outside Air Damper	18.4-1
0VC282Y	Train B Outside Air Damper	18.4-2
1AB03P	Boric Acid Transfer Pump	11.5-0
1AB03T	Boric Acid Tank	11.5-0
1AB8465	BA Pump Suction Crosstie Isolation Valve (MV)	11.5-0
1AB8468	BA Pump Discharge Crosstie Isolation Valve (MV)	11.5-0
1AF004A	AFW Pump 1A Discharge Isolation Valve (AO)	11.4-0
1AF004B	AFW Pump 1B Discharge Isolation Valve (AO)	11.4A-1
1AF005A	AFW Pump 1A to SG 1A Flow Control Valve (AO)	11.3-0
1AF005B	AFW Pump 1A to SG 1B Flow Control Valve(AO)	11.3-0
1AF005C	AFW Pump 1A to SG 1C Flow Control Valve (AO)	11.3-0
1AF005D	AFW Pump 1A to SG 1D Flow Control Valve(AO)	11.3-0
1AF005E	AFW Pump 1B to SG 1A Flow Control Valve (AO)	11.3-0
1AF005F	AFW Pump 1B to SG 1B Flow Control Valve (AO)	11.3-0
1AF005G	AFW Pump 1B to SG 1C Flow Control Valve (AO)	11.3-0
1AF005H	AFW Pump 1B to SG 1D Flow Control Valve (AO)	11.3-0
1AF006A	Ess'l Service Water to AFW Pump 1A Suction Valve (MO)	11.4-0
1AF006B	Ess'l Service Water to AFW Pump 1B Suction Valve (MO)	11.4A-1
1AF013A	AFW Pump 1A to SG 1A Stop Valve (MO)	18.3-1
1AF013B	AFW Pump 1A to SG 1B Stop Valve (MO)	18.3-1
1AF013C	AFW Pump 1A to SG 1C Stop Valve (MO)	18.3-1
1AF013D	AFW Pump 1A to SG 1D Stop Valve (MO)	18.3-1
1AF013E	AFW Pump 1B to SG 1A Stop Valve (MO)	18.3-1
1AF013F	AFW Pump 1B to SG 1B Stop Valve (MO)	18.3-1
1AF013G	AFW Pump 1B to SG 1C Stop Valve (MO)	18.3-1
1AF013H	AFW Pump 1B to SG 1D Stop Valve (MO)	18.3-1
1AF017A	Ess'l Service Water to AFW Pump 1A Suction Valve (MO)	11.4-0
1AF017B	Ess'l Service Water to AFW Pump 1B Suction Valve (MO)	11.4A-1
1AF01AA	Oil Cooler for AFW Pump 1A	11.4-0
1AF01AB	Oil Cooler for AFW Pump 1B	11.4A-1
1AF01EA-A	Battery 1 for AFW Pump 1B Diesel Engine	11.4A-1

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1AF01EA-B	Battery 1A for AFW Pump 1B Diesel Engine	11.4A-1
1AF01EB-A	Battery 2 for AFW Pump 1B Diesel Engine	11.4A-1
1AF01EB-B	Battery 2A for AFW Pump 1B Diesel Engine	11.4A-1
1AF01PA	Auxiliary Feedwater Pump 1A (Motor Driven)	11.4-0
1AF01PA-A	Lube Oil Pump for AFW Pump 1A	11.4-0
1AF01PB	Auxiliary Feedwater Pump 1B (Diesel Driven)	11.4A-1
1AF01PB-A	Lube Oil Pump for AFW Pump 1B	11.4A-1
1AF01PB-C	Gear Box Lube Oil Pump for AFW Pump 1B	11.4A-1
1AF01PB-K	Diesel Engine for AFW Pump 1B	11.4A-1
1AF022A	AFW Pump 1A Recirculation Valve (AO)	11.4-0
1AF022B	AFW Pump 1B Recirculation Valve (AO)	11.4-0
1AF02A	Gear Oil Cooler for AFW Pump 1B	11.4A-1
1AP05EA	Division 11 ACB 1415Z (4160-480V ESW Clg Twr Transformer 131Z)	5.2-1
1AP05EC	Division 11 ACB (for Safety Injection Pump 1SI01PA)	5.2-1
1AP05EE	Division 11 4160V ESF Switchgear Bus 141 Undervoltage Cubicle	5.2-1
1AP05EF	Division 11 ACB 1413 (Feed from Diesel Generator 1A)	5.2-1
1AP05EG	Division 11 ACB 1411 (Bus Tie to 4160V Swgr Bus 143)	5.2-1
1AP05EJ	Division 11 ACB (for Containment Spray Pump 1CS01PA)	5.2-1
1AP05EK	Division 11 ACB (for Control Room Refrig'n Unit 0WO01CA)	5.2-1
1AP05EP	Division 11 ACB 1414 (Reserve Feed from 4160V Swgr Bus 241)	5.2-1
1AP05ER	Division 11 ACB 1412 (SAT Feed from Transformer 142-1)	5.2-1
1AP05EU	Division 11 ACB 1415X (4160-480V ESF Transformer 1AP11E)	5.1-1
1AP06EC	Division 12 ACB (for Safety Injection Pump 1SI01PB)	5.1-1
1AP06EE	Division 12 4160V ESF Switchgear Bus 142 Undervoltage Cubicle	5.1-1
1AP06EF	Division 12 ACB 1423 (Feed from Diesel Generator 1B)	5.1-1
1AP06EG	Division 12 ACB 1421 (Bus Tie to 4160V Swgr Bus 144)	5.1-1
1AP06EH	Division 12 ACB (for Containment Spray Pump 1CS01PB)	5.1-1
1AP06EL	Division 12 ACB (for Control Room Refrig'n Unit 0WO01CB)	5.1-1
1AP06EN	Division 12 ACB 1425Z (4160-480V ESW Clg Twr Transformer 132Z)	5.1-1
1AP06EP	Division 12 ACB 1425X (4160-480V ESF Transformer 1AP13E)	5.1-1
1AP06EQ	Division 12 ACB 1424 (Reserve Feed from 4160V Swgr Bus 242)	5.1-1
1AP06ES	Division 12 ACB1422 (SAT Feed from Transformer 142-2)	5.1-1
1AP07E	Division 11 4160 Non-ESF Switchgear Bus 143	5.2-1
1AP07EK	4160V Bus 143 Feed From Bus 141	5.2-1
1AP07EL	Transformers 133X and 133Y Feed	5.2-1
1AP10E	Division 11 480V ESF Switchgear Bus 131X	5.2-1
1AP12E	Division 12 480V ESF Switchgear Bus 132X	5.1-1
1AP14E	Division 11 480V Non-ESF Aux Bldg Unit Substation 133X	11.5-0
1AP21E	Division 11 480V ESF MCC 131X1	11.3-1
1AP21EA	Division 11 480V ESF MCC 131X1A	11.3-1
1AP22E	Division 11 480V ESF MCC 131X3	11.4-0
1AP23E	Division 12 480V ESF MCC 132X1	11.3-0
1AP24E	Division 12 480V ESF MCC 132X3	11.4-0
1AP25E	Division 11 480V ESF MCC 131X2	11.5A-1
1AP26E	Division 11 480V ESF MCC 131X4	11.5A-1
1AP27E	Division 12 480V ESF MCC 132X2	11.6-1
1AP28E	Division 12 480V ESF MCC 132X4	11.6-1

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1AP30E	Division 11 480V ESF MCC 131X5	11.6-0
1AP32E	Division 12 480V ESF MCC 132X5	11.6-0
1AP36E	Division 11 480V Non-ESF MCC 133X1B	11.2-0
1AP38E	Division 11 480V Non-ESF MCC 133X1A	11.2-0
1AP42E	Division 11 480V Non-ESF MCC 133X3	11.5-0
1AP92E	Division 12 480V ESW Cooling Tower MCC 132Z1	18.14A-1
1AP93E	Division 11 480V ESW Cooling Tower MCC 131Z1	18.14B-1
1AP98E	Division 12 480V ESF Unit Substation 132Z	18.14A-1
1AP99E	Division 11 480V ESF Unit Substation 131Z	18.14B-1
1CC01A	Unit 1 Component Cooling Heat Exchanger	11.3-0
1CC01PA	1A Component Cooling Pump	11.3-0
1CC01PB	1B Component Cooling Pump	11.3-0
1CC01T	Component Cooling Surge Tank	11.6-0
1CC685	CCW Return Containment Isolation Valve (MO)	11.3-1
1CC9412A	1A RHR Hx Outlet Valve (MO)	11.3-0
1CC9412B	1B RHR Hx Outlet Valve (MO)	11.3-0
1CC9413A	CCW Supply Containment Isolation Valve (MO)	11.3-1
1CC9413B	CCW Supply Containment Isolation Valve (MO)	11.3-1
1CC9414	CCW Return Containment Isolation Valve (MO)	11.3-1
1CC9415	Supply Header Isolation Valve (MO)	11.3-0
1CC9416	CCW Return Containment Isolation Valve (MO)	1-1
1CC9438	CCW Return Containment Isolation Valve (MO)	1-1
1CC9459B	Manual Header Crosstie Valve (Manual)	11.3-0
1CC9467B	Manual Header Crosstie Valve (Manual)	11.3-0
1CC9473A	Intermediate Header Crosstie Valve (MO)	11.3-0
1CC9473B	Intermediate Header Crosstie Valve (MO)	11.3-0
1CD01T	Unit 1 Condensate Storage Tank	18.23-0
1CS009A	Containment Spray Pump 1A Sump Suction Valve (MO)	11.2B-1
1CS009B	Containment Spray Pump 1B Sump Suction Valve (MO)	11.2C-1
1CV01PA	Charging Pump 1A	11.3D-1
1CV01PB	Charging Pump 1B	11.3G-1
1CV02A	CV Seal Water Heat Exchanger	11.4B-1
1CV02SA	Charging Pump 1A Gear Cooler	11.3D-1
1CV02SB	Charging Pump 1B Gear Cooler	11.3G-1
1CV03SA	Charging Pump 1A Lube Oil Cooler	11.3D-1
1CV03SB	Charging Pump 1B Lube Oil Cooler	11.3G-1
1CV112B	VCT Outlet Isolation Valve (MO)	11.6A-1
1CV112C	VCT Outlet Isolation Valve (MO)	11.6A-1
1CV112D	RWST to Charging Pumps Suction Valve (MO)	11.3-1
1CV112E	RWST to Charging Pumps Suction Valve (MO)	11.3-1
1CV121	Centrifugal Charging Pumps Flow Control Valve (AO)	11.3-1
1CV8104	Emergency Boration Valve (MO)	11.6A-1
1CV8110	Charging Pump 1B Miniflow Isolation Valve (MO)	11.3-1
1CV8111	Charging Pump 1A Miniflow Isolation Valve (MO)	11.3-1
1CV8114	Charging Pump 1A Miniflow Isolation Valve (SO)	11.3-1
1CV8116	Charging Pump 1B Miniflow Isolation Valve (SO)	11.3-1
1CV8355A	RCP 1A Seal Injection Isolation Valve (MO)	11.3-1

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1CV8355B	RCP 1B Seal Injection Isolation Valve (MO)	11.3-1
1CV8355C	RCP 1C Seal Injection Isolation Valve (MO)	11.3-1
1CV8355D	RCP 1D Seal Injection Isolation Valve (MO)	11.3-1
1CV8387A	Charging Pump 1A Discharge Header FCV Bypass Valve	11.3D-1
1CV8387B	Charging Pump 1B Discharge Header FCV Bypass Valve (MV)	11.3G-1
1CV8483A	Charging Header FCV Upsteam Isolation Valve (MV)	11.3-1
1CV8483B	Charging Header FCV Downsteam Isolation Valve (MV)	11.3-1
1CV8804A	RHR HX 1A to Charging Pump Suction Isolation Valve (MO)	11.3-1
1DC01E	Division 11 125V Battery 111	5.6-1
1DC02E	Division 12 125V Battery 112	5.4-1
1DC03E	Division 11 Battery Charger 111	5.6-1
1DC04E	Division 12 Battery Charger 112	5.4-1
1DC05E	Division 11 125Vdc Distribution Center 111	5.6-1
1DC06E	Division 12 125Vdc Distribution Center 112	5.4-1
1DC10J	Division 11 125Vdc Fuse Panel	5.6-1
1DC11J	Division 12 125Vdc Fuse Panel	5.4-1
1DG01KA	Diesel Generator 1A	9.2-1
1DG01KB	Diesel Generator 1B	9.1-1
1DO01PA	1A Fuel Oil Transfer Pump	10.2-1
1DO01PB	1B Fuel Oil Transfer Pump	10.1-1
1DO01PC	1C Fuel Oil Transfer Pump	10.2-1
1DO01PD	1D Fuel Oil Transfer Pump	10.1-1
1DO01TA	Diesel Oil Storage Tank 1A	10.2-1
1DO01TB	Diesel Oil Storage Tank 1B	10.1-1
1DO01TC	Diesel Oil Storage Tank 1C	10.2-1
1DO01TD	Diesel Oil Storage Tank 1D	10.1-1
1DO02TA	Diesel Generator Day Tank 1A	9.3-1
1DO02TB	Diesel Generator Day Tank 1B	9.4-1
1DO10T	AFW Diesel Day Tank	11.4A-1
1ESFComp11	Ficticous placeholder for all components receiving manual ESF signal	N/A
1ESFComp12	Ficticous placeholder for all components receiving manual ESF signal	N/A
1FI-0121A	Charging Header Flow Indicator @ 1PM05J (1FT-0121)	2.1-0
1FI-0121B	Charging Header Flow Indicator @ 1PL06J (1FT-0121)	11.4C-0
1FI-SX031	Component Cooling HX "1" Flow Indicator (1FT-SX031)	11.2-0
1IP01E	Division 11 Instrument Bus 111 Transformer	5.6-1
1IP01J	Division 11 120Vac Instrument Bus Distribution Panel 111	5.5-1
1IP02E	Division 12 Instrument Bus 112 Transformer	5.4-1
1IP02J	Division 12 120Vac Instrument Bus Distribution Panel 112	5.5-1
1IP03E	Division 11 Instrument Bus 113 Transformer	5.6-1
1IP03J	Division 11 120Vac Instrument Bus Distribution Panel 113	5.5-1
1IP04E	Division 12 Instrument Bus 114 Transformer	5.4-1
1IP04J	Division 12 120Vac Instrument Bus Distribution Panel 114	5.5-1
1IP05E	Division 11 Instrument Bus 111 Inverter	5.6-1
1IP06E	Division 12 Instrument Bus 112 Inverter	5.4-1
1IP07E	Division 11 Instrument Bus 113 Inverter	5.6-1
1IP08E	Division 12 Instrument Bus 114 Inverter	5.4-1
1LI-0459A	Pressurizer Level Indicator @ 1PM05J (1LT-459)	2.1-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1LI-0459B	Pressurizer Level Indicator @ 1PL06J (1LT-459)	11.4C-0
1LI-0460A	Pressurizer Level Indicator @ 1PM05J (1LT-460)	2.1-0
1LI-0460B	Pressurizer Level Indicator @ 1PL06J (1LT-460)	11.4C-0
1LI-0461	Pressurizer Level Indicator @ 1PM05J (1LT-461)	2.1-0
1LI-0501	Loop 1A SG Wide Range Level Indicator @ 1PL04J (1LT-501)	11.4C-0
1LI-0501A	Loop 1A SG Wide Range Level Indicator @ 1PM06J (1LT-501)	2.1-0
1LI-0502	Loop 1B SG Wide Range Level Indicator @ 1PL04J (1LT-502)	11.4C-0
1LI-0502A	Loop 1B SG Wide Range Level Indicator @ 1PM06J (1LT-502)	2.1-0
1LI-0503	Loop 1C SG Wide Range Level Indicator @ 1PL04J (1LT-503)	11.4C-0
1LI-0503A	Loop 1C SG Wide Range Level Indicator @ 1PM06J (1LT-503)	2.1-0
1LI-0504	Loop 1D SG Wide Range Level Indicator @ 1PL04J (1LT-504)	11.4C-0
1LI-0504A	Loop 1D SG Wide Range Level Indicator @ 1PM06J (1LT-504)	2.1-0
1LI-0930	RWST Level Indicator @ 1PM06J (1LT-0930)	2.1-0
1LI-0931	RWST Level Indicator @ 1PM06J (1LT-0931)	2.1-0
1LI-0932	RWST Level Indicator @ 1PM06J (1LT-0932)	2.1-0
1LI-0933	RWST Level Indicator @ 1PM06J (1LT-0933)	2.1-0
1LI-FW309	Loop 1A SG Wide Range Level Indicator @ 1PL10J (1LT-501)	11.6-1
1LI-FW310	Loop 1B SG Wide Range Level Indicator @ 1PL10J (1LT-502)	11.6-1
1LI-RY034	Pressurizer Level Indicator @ 1PL10J (1LT-459)	11.6-1
1LL-SI075A	Containment Recirc Sump Level Indicating Lights @1PM06J (1LS-0940A)	2.1-0
1LL-SI075B	Containment Recirc Sump Level Indicating Lights @1PM06J (1LS-0941A)	2.1-0
1MS001A	Loop 1A Main Steam Isolation Valve (HO)	18.3-1
1MS001A-DIV11	Loop 1A Main Steam Isolation Valve (HO); Division 11 Actuation Circuit	18.3-1
1MS001A-DIV12	Loop 1A Main Steam Isolation Valve (HO); Division 12 Actuation Circuit	18.3-1
1MS001B	Loop 1B Main Steam Isolation Valve (HO)	18.3-1
1MS001B-DIV11	Loop 1B Main Steam Isolation Valve (HO); Division 11 Actuation Circuit	18.3-1
1MS001B-DIV12	Loop 1B Main Steam Isolation Valve (HO); Division 12 Actuation Circuit	18.3-1
1MS001C	Loop 1C Main Steam Isolation Valve (HO)	18.3-1
1MS001C-DIV11	Loop 1C Main Steam Isolation Valve (HO); Division 11 Actuation Circuit	18.3-1
1MS001C-DIV12	Loop 1C Main Steam Isolation Valve (HO); Division 12 Actuation Circuit	18.3-1
1MS001D	Loop 1D Main Steam Isolation Valve (HO)	18.3-1
1MS001D-DIV11	Loop 1D Main Steam Isolation Valve (HO); Division 11 Actuation Circuit	18.3-1
1MS001D-DIV12	Loop 1D Main Steam Isolation Valve (HO); Division 12 Actuation Circuit	18.3-1
1MS013A	Main Steam Relief Valve	18.3-1
1MS013B	Main Steam Relief Valve	18.3-1
1MS013C	Main Steam Relief Valve	18.3-1
1MS013D	Main Steam Relief Valve	18.3-1
1MS014A	Main Steam Relief Valve	18.3-1
1MS014B	Main Steam Relief Valve	18.3-1
1MS014C	Main Steam Relief Valve	18.3-1
1MS014D	Main Steam Relief Valve	18.3-1
1MS015A	Main Steam Relief Valve	18.3-1
1MS015B	Main Steam Relief Valve	18.3-1
1MS015C	Main Steam Relief Valve	18.3-1
1MS015D	Main Steam Relief Valve	18.3-1
1MS016A	Main Steam Relief Valve	18.3-1
1MS016B	Main Steam Relief Valve	18.3-1

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1MS016C	Main Steam Relief Valve	18.3-1
1MS016D	Main Steam Relief Valve	18.3-1
1MS017A	Main Steam Relief Valve	18.3-1
1MS017B	Main Steam Relief Valve	18.3-1
1MS017C	Main Steam Relief Valve	18.3-1
1MS017D	Main Steam Relief Valve	18.3-1
1MS018A	Steam Generator 1A Power Operated Relief Valve (HO)	18.3-1
1MS018B	Steam Generator 1B Power Operated Relief Valve (HO)	18.3-1
1MS018C	Steam Generator 1C Power Operated Relief Valve (HO)	18.3-1
1MS018D	Steam Generator 1D Power Operated Relief Valve (HO)	18.3-1
1MS019A	Steam Generator 1A Atmospheric Relief Isolation Valve (MV)	18.3-1
1MS019B	Steam Generator 1B Atmospheric Relief Isolation Valve (MV)	18.3-1
1MS019C	Steam Generator 1C Atmospheric Relief Isolation Valve (MV)	18.3-1
1MS019D	Steam Generator 1D Atmospheric Relief Isolation Valve (MV)	18.3-1
1MS101A	Loop 1A MSIV Bypass Valve (AO)	18.3-1
1MS101B	Loop 1B MSIV Bypass Valve (AO)	18.3-1
1MS101C	Loop 1C MSIV Bypass Valve (AO)	18.3-1
1MS101D	Loop 1D MSIV Bypass Valve (AO)	18.3-1
1MS185A	SG 1A PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS185B	SG 1B PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS185C	SG 1C PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS185D	SG 1D PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS186A	SG 1A PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS186B	SG 1B PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS186C	SG 1C PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS186D	SG 1D PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS187A	SG 1A PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS187B	SG 1B PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS187C	SG 1C PORV Hand Pump Isolation Valve (MV)	18.3-1
1MS187D	SG 1D PORV Hand Pump Isolation Valve (MV)	18.3-1
1NI-0031B	Ch A Source Range Neutron Flux Indicator @ 1PM05J (NE-31)	2.1-0
1NI-0032B	Ch B Source Range Neutron Flux Indicator @ 1PM05J (NE-32)	2.1-0
1NI-NR005B	Ch A Post Accident Neutron Flux Indicator @ 0PM02J (1NR11E)	2.1-0
1NI-NR005D	Ch A Post Accident Neutron Flux Indicator @ 1PL10J (1NR11E)	11.6-1
1NI-NR006B	Ch B Post Accident Neutron Flux Indicator @ 0PM02J (1NR13E)	2.1-0
1NI-NR006D	Ch B Post Accident Neutron Flux Indicator @ 1PL10J (1NR13E)	11.6-1
1PI-0402	Hot Leg local Pressure Indicator - Loop C	1-1
1PI-0403A	RCS Wide Range Pressure Indicator @ 1PM06J (1PT-403)	2.1-0
1PI-0404	Hot Leg local Pressure Indicator - Loop A	1-1
1PI-0405	RCS Wide Range Pressure Indicator @ 1PM06J (1PT-405)	2.1-0
1PI-0455A	Pressurizer Pressure Indicator @ 1PM05J (1PT-455)	2.1-0
1PI-0455B	Pressurizer Pressure Indicator @ 1PL06J (1PT-455)	11.4C-0
1PI-0456	Pressurizer Pressure Indicator @ 1PM05J (1PT-456)	2.1-0
1PI-0457	Pressurizer Pressure Indicator @ 1PM05J (1PT-457)	2.1-0
1PI-0458	Pressurizer Pressure Indicator @ 1PM05J (1PT-458)	2.1-0
1PI-0514A	Loop 1A SG Pressure Indicator @ 1PM04J (1PT-0514)	2.1-0
1PI-0514B	Loop 1A SG Pressure Indicator @ 1PL04J (1PT-0514)	11.4C-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1PI-0515A	Loop 1A SG Pressure Indicator @ 1PM04J (1PT-0515)	2.1-0
1PI-0516A	Loop 1A SG Pressure Indicator @ 1PM04J (1PT-0516)	2.1-0
1PI-0524A	Loop 1B SG Pressure Indicator @ 1PM04J (1PT-0524)	2.1-0
1PI-0524B	Loop 1B SG Pressure Indicator @ 1PL05J (1PT-0524)	11.4C-0
1PI-0525A	Loop 1B SG Pressure Indicator @ 1PM04J (1PT-0525)	2.1-0
1PI-0526A	Loop 1B SG Pressure Indicator @ 1PM04J (1PT-0526)	2.1-0
1PI-0534A	Loop 1C SG Pressure Indicator @ 1PM04J (1PT-0534)	2.1-0
1PI-0534B	Loop 1C SG Pressure Indicator @ 1PL05J (1PT-0534)	11.4C-0
1PI-0535A	Loop 1C SG Pressure Indicator @ 1PM04J (1PT-0535)	2.1-0
1PI-0536A	Loop 1C SG Pressure Indicator @ 1PM04J (1PT-0536)	2.1-0
1PI-0544A	Loop 1D SG Pressure Indicator @ 1PM04J (1PT-0544)	2.1-0
1PI-0544B	Loop 1D SG Pressure Indicator @ 1PL04J (1PT-0544)	11.4C-0
1PI-0545A	Loop 1D SG Pressure Indicator @ 1PM04J (1PT-0545)	2.1-0
1PI-0546A	Loop 1D SG Pressure Indicator @ 1PM04J (1PT-0546)	2.1-0
1PI-CC107	Component Cooling Pump Common Discharge Header Pressure Indicator @ 1PM06J (1P	2.1-0
1PI-MS193	Loop 1A SG Pressure Indicator @ 1PL10J (1PT-0514)	11.6-1
1PI-MS194	Loop 1B SG Pressure Indicator @ 1PL10J (1PT-0525)	11.6-1
1PI-RY033	Pressurizer Pressure Indicator @ 1PL10J (1PT-455)	11.6-1
1RC014A	Reactor Vessel Head Vent Valve - Train A (SO) (High-Low Pressure, HLP, interface	1-1
1RC014B	Reactor Vessel Head Vent Valve - Train B (SO) (HLP)	1-1
1RC014C	Reactor Vessel Head Vent Valve - Train A (SO) (HLP)	1-1
1RC014D	Reactor Vessel Head Vent Valve - Train B (SO) (HLP)	1-1
1RC01BA	Steam Generator 1A	1-1
1RC01BB	Steam Generator 1B	1-1
1RC01BC	Steam Generator 1C	1-1
1RC01BD	Steam Generator 1D	1-1
1RC01R	Reactor Vessel	1-1
1RH01PA	Residual Heat Removal Pump 1A	11.2A-1
1RH01PB	Residual Heat Removal Pump 1B	11.2D-1
1RH02AA	Residual Heat Removal Heat Exchanger 1A	11.3B-1
1RH02AB	Residual Heat Removal Heat Exchanger 1B	11.3E-1
1RH606	RHR HX 1A Discharge Valve (AO)	11.3B-1
1RH607	RHR HX 1B Discharge Valve (AO)	11.3E-1
1RH610	RHR Pump 1A Miniflow Valve (MO)	11.3B-1
1RH611	RHR Pump 1B Miniflow Valve (MO)	11.2-0
1RH618	RHR HX 1A Bypass Valve (AO)	11.3B-1
1RH619	RHR HX 1B Bypass Valve (AO)	11.3E-1
1RH8701A	RHR Pump 1A Isolation Valve (MO) (High-Low Pressure, HLP, interface)	1-1
1RH8701B	RHR Pump 1A Isolation Valve (MO) (HLP)	1-1
1RH8702A	RHR Pump 1B Isolation Valve (MO) (HLP)	1-1
1RH8702B	RHR Pump 1B Isolation Valve (MO) (HLP)	1-1
1RH8716A	RHR HX 1A Discharge Crosstie Valve (MO)	11.3-1
1RH8716B	RHR HX 1B Discharge Crosstie Valve (MO)	11.3-1
1RY01S	Pressurizer	1-1
1RY32MA	PORV Accumulator Tank 1A	1-1
1RY32MB	PORV Accumulator Tank 1B	1-1
1RY455A	Pressurizer PORV (AO) (High-Low Pressure, HLP, interface)	1-1

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1RY456	Pressurizer PORV (AO) (HLP)	1-1
1RY8000A	PORV Block Valve (MO) (HLP)	1-1
1RY8000B	PORV Block Valve (MO) (HLP)	1-1
1SI01T	Refueling Water Storage Tank	16.1-1
1SI8801A	Charging Pump to Cold Leg Injection Isol'n Valve (MO)	11.3-1
1SI8801B	Charging Pump to Cold Leg Injection Isol'n Valve (MO)	11.3-1
1SI8804B	RHR HX 1B to SI Pump Isolation Valve (MO)	11.3F-1
1SI8806	SI Pump Suction RWST Isolation Valve (MO)	11.3F-1
1SI8807A	SI/CV Pump Suction Header Crosstie Valve (MO)	11.3A-1
1SI8807B	SI/CV Pump Suction Header Crosstie Valve (MO)	11.3A-1
1SI8808A	SI Accumulator 1A Discharge Isolation Valve	1-1
1SI8808B	SI Accumulator 1B Discharge Isolation Valve	1-1
1SI8808C	SI Accumulator 1C Discharge Isolation Valve	1-1
1SI8808D	SI Accumulator 1D Discharge Isolation Valve	1-1
1SI8809A	RHR HX 1A to RC Cold Leg Isolation Valve (MO)	11.3-1
1SI8809B	RHR HX 1B to RC Cold Leg Isolation Valve (MO)	11.3-1
1SI8811A	LPSI Containment Sump Supply Isolation Valve (MO)	11.3-1
1SI8811B	LPSI Containment Sump Supply Isolation Valve (MO)	11.3-1
1SI8812A	LPSI RWST Supply Isolation Valve (MO)	11.2B-1
1SI8812B	LPSI RWST Supply Isolation Valve (MO)	11.2D-1
1SI8840	RHR HX to RC Hot Leg Isolation Valve (MO)	11.3-1
1SI8923A	SI Pump 1A Suction Valve (MO)	11.3A-1
1SI8924	SI/CV Pump Suction Header Crosstie Isolation Valve (MO)	11.3A-1
1SX001A	Essential Service Water Pump 1A Suction Valve (MO)	11.1A-0
1SX001B	Essential Service Water Pump 1B Suction Valve (MO)	11.1B-0
1SX004	Unit 1 Component Cooling HX ESW Inlet Valve (MO)	11.1A-0
1SX005	Component Cooling HX "0" ESW Inlet Valve (MO)	11.1B-0
1SX007	Unit 1 Component Cooling HX ESW Outlet Valve (MO)	11.2-0
1SX010	Unit 1 Return Header Crosstie Valve (MO)	11.2-0
1SX011	Unit 1 Return Header Crosstie Valve (MO)	11.2-0
1SX016A	RCFC 1A/1C Inlet Containment Isolation Valve (MO)	11.3-1
1SX016B	RCFC 1B/1D Inlet Containment Isolation Valve (MO)	11.3-1
1SX01AA	Essential Service Water Pump 1A Oil Cooler	11.1A-0
1SX01AB	Essential Service Water Pump 1B Oil Cooler	11.1B-0
1SX01K	AFW Pump 1B Engine Closed Cycle Heat Exchanger	11.4A-1
1SX01PA	Essential Service Water Pump 1A	11.1A-0
1SX01PA-C	Essential Service Water Pump 1A Lube Oil Pump	11.1A-0
1SX01PB	Essential Service Water Pump 1B	11.1B-0
1SX01PB-C	Essential Service Water Pump 1B Lube Oil Pump	11.1B-0
1SX027A	RCFC 1A/1C Outlet Containment Isolation Valve (MO)	11.3-1
1SX027B	RCFC 1B/1D Outlet Containment Isolation Valve (MO)	11.3-1
1SX02K	AFW Pump 1B Right Angle Gear Oil Cooler	11.4A-1
1SX033	ESW Pump 1A Discharge Crosstie Isolation Valve (MO)	11.1A-0
1SX034	ESW Pump 1B Discharge Crosstie Isolation Valve (MO)	11.1B-0
1SX04P	AFW Pump 1B Cooling Water Pump (Engine Driven)	11.4A-1
1SX101A	AFW Pump 1A Oil Cooler Outlet Valve (SO)	11.4-0
1SX136	Unit 1 Return Header Crosstie Valve (MO)	11.2-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1SX147A	Containment Chiller Condenser Bypass Valve (AO)	11.5-1
1SX147B	Containment Chiller Condenser Bypass Valve (AO)	11.5-1
1SX169A	Diesel Generator 1A Service Water Isolation Valve (AO)	9.2-1
1SX169B	Diesel Generator 1B Service Water Isolation Valve (AO)	9.1-1
1SX173	AFW Pump 1B SX Supply Isolation Valve (AO)	11.4A-1
1SX178	AFW Pump 1B SX Return Isolation Valve (AO)	11.4A-1
1TI-0413A	Loop 1A Wide Range Hot Leg Temperature Indicator @ 1PM05J (1TE-RC022A)	2.1-0
1TI-0413B	Loop 1A Wide Range Cold Leg Temperature Indicator @ 1PM05J (1TE-RC022B)	2.1-0
1TI-0423A	Loop 1B Wide Range Hot Leg Temperature Indicator @ 1PM05J (1TE-RC023A)	2.1-0
1TI-0423B	Loop 1B Wide Range Cold Leg Temperature Indicator @ 1PM05J (1TE-RC023B)	2.1-0
1TI-0433A	Loop 1C Wide Range Hot Leg Temperature Indicator @ 1PM05J (1TE-RC024A)	2.1-0
1TI-0433B	Loop 1C Wide Range Cold Leg Temperature Indicator @ 1PM05J (1TE-RC024B)	2.1-0
1TI-0443A	Loop 1D Wide Range Hot Leg Temperature Indicator @ 1PM05J (1TE-RC025A)	2.1-0
1TI-0443B	Loop 1D Wide Range Cold Leg Temperature Indicator @ 1PM05J (1TE-RC025B)	2.1-0
1TI-0604	RHR Hx 1A Outlet Temperature Indicator @ 1PM06J (1TE-604)	2.1-0
1TI-0605	RHR Hx 1B Outlet Temperature Indicator @ 1PM06J (1TE-605)	2.1-0
1TI-0608	RHR Hx 1RH02AA Outlet Temperature Indicator	11.3B-1
1TI-0609	RHR Hx 1RH02AB Outlet Temperature Indicator	11.3E-1
1TI-IT001	Division 11 Incore Thermocouple Display Insert @ 1PM05J	2.1-0
1TI-IT002	Division 12 Incore Thermocouple Display Insert @ 1PM05J	2.1-0
1TI-RC005A	Loop 1A Wide Range Hot Leg Temperature Indicator @ 1PL05J (1TE-RC022A)	11.4C-0
1TI-RC005B	Loop 1A Wide Range Cold Leg Temperature Indicator @ 1PL05J (1TE-RC022B)	11.4C-0
1TI-RC006A	Loop 1B Wide Range Hot Leg Temperature Indicator @ 1PL05J (1TE-RC023A)	11.4C-0
1TI-RC006B	Loop 1B Wide Range Cold Leg Temperature Indicator @ 1PL05J (1TE-RC023B)	11.4C-0
1TI-RC007A	Loop 1C Wide Range Hot Leg Temperature Indicator @ 1PL05J (1TE-RC024A)	11.4C-0
1TI-RC007B	Loop 1C Wide Range Cold Leg Temperature Indicator @ 1PL05J (1TE-RC024B)	11.4C-0
1TI-RC008A	Loop 1D Wide Range Hot Leg Temperature Indicator @ 1PL05J (1TE-RC025A)	11.4C-0
1TI-RC008B	Loop 1D Wide Range Cold Leg Temperature Indicator @ 1PL05J (1TE-RC025B)	11.4C-0
1TI-RC022A	Loop 1A Wide Range Hot Leg Temperature Indicator @ 1PL10J (1TE-RC022A)	11.6-1
1TI-RC022B	Loop 1A Wide Range Cold Leg Temperature Indicator @ 1PL10J (1TE-RC022B)	11.6-1
1TI-RC023A	Loop 1B Wide Range Hot Leg Temperature Indicator @ 1PL10J (1TE-RC023A)	11.6-1
1TI-RC023B	Loop 1B Wide Range Cold Leg Temperature Indicator @ 1PL10J (1TE-RC023B)	11.6-1
1TI-RC024A	Loop 1C Wide Range Hot Leg Temperature Indicator @ 1PL10J (1TE-RC024A)	11.6-1
1TI-RC024B	Loop 1C Wide Range Cold Leg Temperature Indicator @ 1PL10J (1TE-RC024B)	11.6-1
1TI-RC025A	Loop 1D Wide Range Hot Leg Temperature Indicator @ 1PL10J (1TE-RC025A)	11.6-1
1TI-RC025B	Loop 1D Wide Range Cold Leg Temperature Indicator @ 1PL10J (1TE-RC025B)	11.6-1
1UL-AN012-A7	RWST LEVEL LO-3 Annunciator Alarm	2.1-0
1UL-AN012-B7	RWST LEVEL LO-2 Annunciator Alarm	2.1-0
1UL-AN012-C7	RWST LEVEL LOW Annunciator Alarm	2.1-0
1VA01CA	SX Pump 1A Cubicle Cooler Fan	11.1A-0
1VA01CB	SX Pump 1A Cubicle Cooler Fan	11.1A-0
1VA01CC	SX Pump 1A Cubicle Cooler Fan	11.1A-0
1VA01CD	SX Pump 1A Cubicle Cooler Fan	11.1A-0
1VA01CE	SX Pump 1B Cubicle Cooler Fan	11.1B-0
1VA01CF	SX Pump 1B Cubicle Cooler Fan	11.1B-0
1VA01CG	SX Pump 1B Cubicle Cooler Fan	11.1B-0
1VA01CH	SX Pump 1B Cubicle Cooler Fan	11.1B-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1VA01SA	SX Pump 1A Cubicle Cooler	11.1A-0
1VA01SB	SX Pump 1B Cubicle Cooler	11.1B-0
1VA02CA	RHR Pump 1A Cubicle Cooler Fan	11.2A-1
1VA02CB	RHR Pump 1A Cubicle Cooler Fan	11.2A-1
1VA02CC	RHR Pump 1B Cubicle Cooler Fan	11.2D-1
1VA02CD	RHR Pump 1B Cubicle Cooler Fan	11.2D-1
1VA02SA	RHR Pump 1A Cubicle Cooler	11.2A-1
1VA02SB	RHR Pump 1B Cubicle Cooler	11.2D-1
1VA06CA	Charging Pump 1A Cubicle Cooler Fan	11.3D-1
1VA06CB	Charging Pump 1A Cubicle Cooler Fan	11.3D-1
1VA06CC	Charging Pump 1B Cubicle Cooler Fan	11.3G-1
1VA06CD	Charging Pump 1B Cubicle Cooler Fan	11.3G-1
1VA06SA	Charging Pump 1A Cubicle Cooler	11.3D-1
1VA06SB	Charging Pump 1B Cubicle Cooler	11.3G-1
1VA08CB	Auxiliary Feedwater Pump Cubicle Cooler Fan (Engine-driven)	11.4A-1
1VA08S	Auxiliary Feedwater Pump Cubicle Cooler	11.4A-1
1VD01CA	Diesel Generator Room 1A Supply Fan	18.2-1
1VD01CB	Diesel Generator Room 1B Supply Fan	18.1-1
1VD01YA	Diesel Generator Room 1B Outside Air Intake Damper	18.1-1
1VD01YB	Diesel Generator Room 1B Outside Air Intake Damper	18.1-1
1VD02YA	Diesel Generator Room 1B Return Air Damper	9.1-1
1VD02YB	Diesel Generator Room 1B Return Air Damper	9.1-1
1VD09YA	Diesel Generator Room 1A Outside Air Intake Damper	18.2-1
1VD09YB	Diesel Generator Room 1A Outside Air Intake Damper	18.2-1
1VD10YA	Diesel Generator Room 1A Return Air Damper	9.2-1
1VD10YB	Diesel Generator Room 1A Return Air Damper	9.2-1
1VD16YA	Diesel Generator Room 1B Fire Damper	18.1-1
1VD16YA	Diesel Generator Room 1B Fire Damper	9.1-1
1VD16YB	Diesel Generator Room 1B Fire Damper	18.1-1
1VD16YB	Diesel Generator Room 1B Fire Damper	9.1-1
1VD17YA	Diesel Generator Room 1B Fire Damper	8.3-1
1VD17YA	Diesel Generator Room 1B Fire Damper	9.1-1
1VD17YB	Diesel Generator Room 1B Fire Damper	8.3-1
1VD17YB	Diesel Generator Room 1B Fire Damper	9.1-1
1VD23YA	Diesel Generator Room 1A Fire Damper	18.2-1
1VD23YA	Diesel Generator Room 1A Fire Damper	9.2-1
1VD23YB	Diesel Generator Room 1A Fire Damper	18.2-1
1VD23YB	Diesel Generator Room 1A Fire Damper	9.2-1
1VD24YA	Diesel Generator Room 1A Fire Damper	8.3-1
1VD24YA	Diesel Generator Room 1A Fire Damper	9.2-1
1VD24YB	Diesel Generator Room 1A Fire Damper	8.3-1
1VD24YB	Diesel Generator Room 1A Fire Damper	9.2-1
1VE01C	Division 12 MEER Supply Fan	5.4-1
1VE01Y	Division 12 MEER Outside Air Intake Damper	18.1-1
1VE02Y	Division 12 MEER Return Air Damper	5.4-1
1VE04Y	Division 12 MEER Fire Damper	18.1-1
1VE04Y	Division 12 MEER Fire Damper	5.3-1

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
1VE05Y	Division 12 MEER Fire Damper	5.6-1
1VE05Y	Division 12 MEER Fire Damper	8.6-0
1VE06Y	Division 11 MEER Fire Damper	18.2-1
1VE06Y	Division 11 MEER Fire Damper	5.4-1
1VE07Y	Division 11 MEER Fire Damper	5.6-1
1VE07Y	Division 11 MEER Fire Damper	8.6-0
1VE12Y	Division 11 MEER Fire Damper	5.4-1
1VE12Y	Division 11 MEER Fire Damper	5.6-1
1VE17Y	Division 12 MEER Fire Damper	5.3-1
1VE17Y	Division 12 MEER Fire Damper	5.4-1
1VP01AA	Essential Service Water Coil	1-1
1VP01AB	Essential Service Water Coil	1-1
1VP01AC	Essential Service Water Coil	1-1
1VP01AD	Essential Service Water Coil	1-1
1VP01CA	RCFC Fan A	1-1
1VP01CB	RCFC Fan B	1-1
1VP01CC	RCFC Fan C	1-1
1VP01CD	RCFC Fan D	1-1
1VX01C	Division 12 ESF Switchhear Room Supply Fan	18.1-1
1VX01Y	Division 12 ESF Swgr Room Outside Air Intake Damper	18.1-1
1VX02Y	Division 12 ESF Swgr Room Return Air Damper	5.1-1
1VX04C	Division 11 ESF Switchgear Room/MEER Supply Fan	18.2-1
1VX04Y	Division 11 ESF Swgr Room Outside Air Intake Damper	18.2-1
1VX05C	ESW Cooling Tower 0A Division 11 Electric Substation Bus 131Z Supply Fan	18.14B-1
1VX05Y	D1vision 11 ESF Swgr Room Return Air Damper	5.2-1
1VX06C	ESW Cooling Tower 0B Division 12 Electric Substation Bus 132Z Supply Fan	18.14A-1
1VX16Y	Division 12 ESF Swgr Room Fire Damper	18.1-1
1VX16Y	Division 12 ESF Swgr Room Fire Damper	5.1-1
1VX17Y	Division 12 ESF Swgr Room Fire Damper	5.1-1
1VX17Y	Division 12 ESF Swgr Room Fire Damper	8.5-1
1VX20Y	Division 11 ESF Swgr Room Fire Damper	5.2-1
1VX20Y	Division 11 ESF Swgr Room Fire Damper	8.5-1
1VX22Y	Division 11 ESF Swgr Room Fire Damper	18.2-1
1VX22Y	Division 11 ESF Swgr Room Fire Damper	5.2-1
1VX30Y	ESW Cooling Tower 0A Division 11 Electric Substation Bus 131Z Outside Air Intake	18.14B-1
1VX32Y	ESW Cooling Tower 0A Division 11 Electric Substation Bus 131Z Return Air Damper	18.14B-1
1VX33Y	ESW Cooling Tower 0B Division 12 Electric Substation Bus 132Z Outside Air Intake	18.14A-1
1VX35Y	ESW Cooling Tower 0B Division 12 Electric Substation Bus 132Z Return Air Damper	18.14A-1
2AB03P	Boric Acid Transfer Pump	11.5-0
2AB03T	Boric Acid Tank	11.5-0
2AB8465	BA Pump Suction Crosstie Isolation Valve (MV)	11.5-0
2AB8468	BA Pump Discharge Crosstie Isolation Valve (MV)	11.5-0
2AF004A	AFW Pump 2A Discharge Isolation Valve (AO)	11.4-0
2AF004B	AFW Pump 2B Discharge Isolation Valve (AO)	11.4A-2
2AF005A	AFW Pump 2A to SG 2A Flow Control Valve (AO)	11.3-0
2AF005B	AFW Pump 2A to SG 2B Flow Control Valve (AO)	11.3-0
2AF005C	AFW Pump 2A to SG 2C Flow Control Valve (AO)	11.3-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2AF005D	AFW Pump 2A to SG 2D Flow Control Valve (AO)	11.3-0
2AF005E	AFW Pump 2B to SG 2A Flow Control Valve (AO)	11.3-0
2AF005F	AFW Pump 2B to SG 2B Flow Control Valve (AO)	11.3-0
2AF005G	AFW Pump 2B to SG 2C Flow Control Valve (AO)	11.3-0
2AF005H	AFW Pump 2B to SG 2D Flow Control Valve (AO)	11.4-0
2AF006A	Ess'l Service Water to AFW Pump 2A Suction Valve (MO)	11.4A-2
2AF006B	Ess'l Service Water to AFW Pump 2B Suction Valve (MO)	18.3-2
2AF013A	AFW Pump 2A to SG 2A Stop Valve (MO)	18.3-2
2AF013B	AFW Pump 2A to SG 2B Stop Valve (MO)	18.3-2
2AF013C	AFW Pump 2A to SG 2C Stop Valve (MO)	18.3-2
2AF013D	AFW Pump 2A to SG 2D Stop Valve (MO)	18.3-2
2AF013E	AFW Pump 2B to SG 2A Stop Valve (MO)	18.3-2
2AF013F	AFW Pump 2B to SG 2B Stop Valve (MO)	18.3-2
2AF013G	AFW Pump 2B to SG 2C Stop Valve (MO)	18.3-2
2AF013H	AFW Pump 2B to SG 2D Stop Valve (MO)	11.4-0
2AF017A	Ess'l Service Water to AFW Pump 2A Suction Valve (MO)	11.4A-2
2AF017B	Ess'l Service Water to AFW Pump 2B Suction Valve (MO)	11.4-0
2AF01AA	Oil Cooler for AFW Pump 2A	11.4A-2
2AF01AB	Oil Cooler for AFW Pump 2B	11.4A-2
2AF01EA-A	Battery 1 for AFW Pump 2B Diesel Engine	11.4A-2
2AF01EA-B	Battery 1A for AFW Pump 2B Diesel Engine	11.4A-2
2AF01EB-A	Battery 2 for AFW Pump 2B Diesel Engine	11.4A-2
2AF01EB-B	Battery 2A for AFW Pump 2B Diesel Engine	11.4-0
2AF01PA	Auxiliary Feedwater Pump 2A (Motor Driven)	11.4-0
2AF01PA-A	Lube Oil Pump for AFW Pump 2A	11.4A-2
2AF01PB	Auxiliary Feedwater Pump 2B (Diesel Driven)	11.4A-2
2AF01PB-A	Lube Oil Pump for AFW Pump 2B	11.4A-2
2AF01PB-C	Gear Box Lube Oil Pump for AFW Pump 2B	11.4A-2
2AF01PB-K	Diesel Engine for AFW Pump 2B	11.4-0
2AF022A	AFW Pump 2A Recirculation Valve (AO)	11.4A-2
2AF022B	AFW Pump 2B Recirculation Valve (AO)	11.4A-2
2AF02A	Gear Oil Cooler for AFW Pump 2B	5.2-2
2AP05ED	Division 21 ACB 2415X (4160-480V ESF Transformer 2AP11E)	5.2-2
2AP05EE	Division 21 ACB 2415Z (4160-480V ESW Clg Twr Transformer 231Z)	5.2-2
2AP05EG	Division 21 ACB 2412 (SAT Feed from Transformer 242-1)	5.2-2
2AP05EJ	Division 21 ACB 2414 (Reserve Feed from 4160V Swgr Bus 141)	5.2-2
2AP05EP	Division 21 ACB (for Containment Spray Pump 2CS01PA)	5.2-2
2AP05ER	Division 21 ACB 2411 (Bus Tie to 4160V Swgr Bus 243)	5.2-2
2AP05ES	Division 21 ACB 2413 (Feed from Diesel Generator 2A)	5.2-2
2AP05ET	Division 21 4160V ESF Switchgear Bus 241 Undervoltage Cubicle	5.2-2
2AP05EV	Division 21 ACB (for Safety Injection Pump 2SI01PA)	5.1-2
2AP06ED	Division 22 ACB 2424 (Reserve Feed from 4160V Swgr Bus 142)	5.1-2
2AP06EF	Division 22 ACB 2422 (SAT Feed from Transformer 242-2)	5.1-2
2AP06EH	Division 22 ACB 2425X (4160-480V ESF Transformer 2AP13E)	5.1-2
2AP06EP	Division 22 ACB (for Containment Spray Pump 2CS01PB)	5.1-2
2AP06EQ	Division 22 ACB 2421 (Bus Tie to 4160V Swgr Bus 244)	5.1-2
2AP06ER	Division 22 ACB 2423 (Feed from Diesel Generator 2B)	

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2AP06ES	Division 22 4160V ESF Switchgear Bus 242 Undervoltage Cubicle	5.1-2
2AP06EU	Division 22 ACB (for Safety Injection Pump 2SI01PB)	5.1-2
2AP06EV	Division 22 ACB 2425Z (4160-480V ESW Clg Twr Transformer 232Z)	5.1-2
2AP07E	Division 21 4160 Non-ESF Switchgear Bus 243	5.2-2
2AP07EE	Transformers 233X and 233Y Feed	5.2-2
2AP07EF	4160V Bus 243 Feed From Bus 241	5.2-2
2AP10E	Division 21 480V ESF Switchgear Bus 231X	5.1-2
2AP12E	Division 22 480V ESF Switchgear Bus 232X	11.5-0
2AP14E	Division 21 480V Non-ESF Aux Bldg Unit Substation 233X	11.3-2
2AP21E	Division 21 480V ESF MCC 231X1	11.3-2
2AP21EA	Division 21 480V ESF MCC 231X1A	11.5-0
2AP22E	Division 21 480V ESF MCC 231X3	11.4-0
2AP23E	Division 22 480V ESF MCC 232X1	11.4-0
2AP24E	Division 22 480V ESF MCC 232X3	11.5A-2
2AP25E	Division 21 480V ESF MCC 231X2	11.5A-2
2AP26E	Division 21 480V ESF MCC 231X4	11.6-2
2AP27E	Division 22 480V ESF MCC 232X2	11.6-2
2AP28E	Division 22 480V ESF MCC 232X4	11.6-0
2AP30E	Division 21 480V ESF MCC 231X5	11.6-0
2AP32E	Division 22 480V ESF MCC 232X5	11.2-0
2AP38E	Division 21 480V Non-ESF MCC 233X1	11.5-0
2AP42E	Division 21 480V Non-ESF MCC 233X3	18.14A-2
2AP92E	Division 22 480V ESW Cooling Tower MCC 232Z1	18.14B-2
2AP93E	Division 11 480V ESW Cooling Tower MCC 231Z1	18.14A-2
2AP98E	Division 22 480V ESF Unit Substation 232Z	18.14B-2
2AP99E	Division 21 480V ESF Unit Substation 231Z	11.3-0
2CC01A	Unit 2 Component Cooling Heat Exchanger	11.3-0
2CC01PA	2A Component Cooling Pump	11.3-0
2CC01PB	2B Component Cooling Pump	11.6-0
2CC01T	Component Cooling Surge Tank	11.3-2
2CC685	CCW Return Containment Isolation Valve (MO)	11.3-0
2CC9412A	2A RHR Hx Outlet Valve (MO)	11.3-0
2CC9412B	2B RHR Hx Outlet Valve (MO)	11.3-2
2CC9413A	CCW Supply Containment Isolation Valve (MO)	11.3-2
2CC9413B	CCW Supply Containment Isolation Valve (MO)	11.3-2
2CC9414	CCW Return Containment Isolation Valve (MO)	11.3-0
2CC9415	Supply Header Isolation Valve (MO)	1-2
2CC9416	CCW Return Containment Isolation Valve (MO)	1-2
2CC9438	CCW Return Containment Isolation Valve (MO)	11.3-0
2CC9459B	Manual Header Crosstie Valve (Manual)	11.3-0
2CC9467B	Manual Header Crosstie Valve (Manual)	11.3-0
2CC9473A	Intermediate Header Crosstie Valve (MO)	11.3-0
2CC9473B	Intermediate Header Crosstie Valve (MO)	18.23-0
2CD01T	Unit 2 Condensate Storage Tank	11.2B-2
2CS009A	Containment Spray Pump 2A Sump Suction Valve (MO)	11.2C-2
2CS009B	Containment Spray Pump 2B Sump Suction Valve (MO)	11.3D-2
2CV01PA	Charging Pump 2A	

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2CV01PB	Charging Pump 2B	11.3G-2
2CV02A	CV Seal Water Heat Exchanger	11.4B-2
2CV02SA	Charging Pump 2A Gear Cooler	11.3D-2
2CV02SB	Charging Pump 2B Gear Cooler	11.3G-2
2CV03SA	Charging Pump 2A Lube Oil Cooler	11.3D-2
2CV03SB	Charging Pump 2B Lube Oil Cooler	11.3G-2
2CV112B	VCT Outlet Isolation Valve (MO)	11.6A-2
2CV112C	VCT Outlet Isolation Valve (MO)	11.6A-2
2CV112D	RWST to Charging Pumps Suction Valve (MO)	11.3-2
2CV112E	RWST to Charging Pumps Suction Valve (MO)	11.3-2
2CV121	Centrifugal Charging Pumps Flow Control Valve (AO)	11.3-2
2CV8104	Emergency Boration Valve (MO)	11.6A-2
2CV8110	Charging Pump 2B Miniflow Isolation Valve (MO)	11.3-2
2CV8111	Charging Pump 2A Miniflow Isolation Valve (MO)	11.3-2
2CV8114	Charging Pump 2A Miniflow Isolation Valve (SO)	11.3-2
2CV8116	Charging Pump 2B Miniflow Isolation Valve (SO)	11.3-2
2CV8355A	RCP 2A Seal Injection Isolation Valve (MO)	11.3-2
2CV8355B	RCP 2B Seal Injection Isolation Valve (MO)	11.3-2
2CV8355C	RCP 2C Seal Injection Isolation Valve (MO)	11.3-2
2CV8355D	RCP 2D Seal Injection Isolation Valve (MO)	11.3-2
2CV8387A	Charging Pump 2A Discharge Header FCV Bypass Valve	11.3D-2
2CV8387B	Charging Pump 2B Discharge Header FCV Bypass Valve	11.3G-2
2CV8483A	Charging Header FCV Upsteam Isolation Valve (MV)	11.3-2
2CV8483B	Charging Header FCV Downsteam Isolation Valve (MV)	11.3-2
2CV8804A	RHR HX 2A to Charging Pump Suction Isolation Valve (MO)	11.3-2
2DC01E	Division 21 125V Battery 211	5.6-2
2DC02E	Division 22 125V Battery 212	5.4-2
2DC03E	Division 21 Battery Charger 211	5.6-2
2DC04E	Division 22 Battery Charger 212	5.4-2
2DC05E	Division 21 125Vdc Distribution Center 211	5.6-2
2DC06E	Division 22 125Vdc Distribution Center 212	5.4-2
2DC10J	Division 21 125Vdc Fuse Panel	5.6-2
2DC11J	Division 22 125Vdc Fuse Panel	5.4-2
2DG01KA	Diesel Generator 2A	9.2-2
2DG01KB	Diesel Generator 2B	9.1-2
2DO01PA	2A Fuel Oil Transfer Pump	10.2-2
2DO01PB	2B Fuel Oil Transfer Pump	10.1-2
2DO01PC	2C Fuel Oil Transfer Pump	10.2-2
2DO01PD	2D Fuel Oil Transfer Pump	10.1-2
2DO01TA	Diesel Oil Storage Tank 2A	10.2-2
2DO01TB	Diesel Oil Storage Tank 2B	10.1-2
2DO02TA	Diesel Generator Day Tank 2A	9.3-2
2DO02TB	Diesel Generator Day Tank 2B	9.4-2
2DO10T	AFW Diesel Day Tank	11.4A-2
2ESFComp21	Ficticous placeholder for all components receiving manual ESF signal	N/A
2ESFComp22	Ficticous placeholder for all components receiving manual ESF signal	N/A
2FI-0121A	Charging Header Flow Indicator @ 2PM05J (2FT-0121)	2.1-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2FI-0121B	Charging Header Flow Indicator @ 2PL06J (2FT-0121)	11.4C-0
2FI-SX031	Component Cooling HX "2" Flow Indicator (2FT-SX031)	11.2-0
2IP01E	Division 21 Instrument Bus 211 Transformer	5.6-2
2IP01J	Division 21 120Vac Instrument Bus Distribution Panel 211	5.5-2
2IP02E	Division 22 Instrument Bus 212 Transformer	5.4-2
2IP02J	Division 22 120Vac Instrument Bus Distribution Panel 212	5.5-2
2IP03E	Division 21 Instrument Bus 213 Transformer	5.6-2
2IP03J	Division 21 120Vac Instrument Bus Distribution Panel 213	5.5-2
2IP04E	Division 22 Instrument Bus 214 Transformer	5.4-2
2IP04J	Division 22 120Vac Instrument Bus Distribution Panel 214	5.5-2
2IP05E	Division 21 Instrument Bus 211 Inverter	5.6-2
2IP06E	Division 22 Instrument Bus 212 Inverter	5.4-2
2IP07E	Division 21 Instrument Bus 213 Inverter	5.6-2
2IP08E	Division 22 Instrument Bus 214 Inverter	5.4-2
2LI-0459A	Pressurizer Level Indicator @ 2PM05J (2LT-459)	2.1-0
2LI-0459B	Pressurizer Level Indicator @ 2PL06J (2LT-459)	11.4C-0
2LI-0460A	Pressurizer Level Indicator @ 2PM05J (2LT-460)	2.1-0
2LI-0460B	Pressurizer Level Indicator @ 2PL06J (2LT-460)	11.4C-0
2LI-0461	Pressurizer Level Indicator @ 2PM05J (2LT-461)	2.1-0
2LI-0501	Loop 2A SG Wide Range Level Indicator @ 2PL04J (2LT-501)	11.4C-0
2LI-0501A	Loop 2A SG Wide Range Level Indicator @ 2PM06J (2LT-501)	2.1-0
2LI-0502	Loop 2B SG Wide Range Level Indicator @ 2PL04J (2LT-502)	11.4C-0
2LI-0502A	Loop 2B SG Wide Range Level Indicator @ 2PM06J (2LT-502)	2.1-0
2LI-0503	Loop 2C SG Wide Range Level Indicator @ 2PL04J (2LT-503)	11.4C-0
2LI-0503A	Loop 2C SG Wide Range Level Indicator @ 2PM06J (2LT-503)	2.1-0
2LI-0504	Loop 2D SG Wide Range Level Indicator @ 2PL04J (2LT-504)	11.4C-0
2LI-0504A	Loop 2D SG Wide Range Level Indicator @ 2PM06J (2LT-504)	2.1-0
2LI-0930	RWST Level Indicator @ 2PM06J (2LT-0930)	2.1-0
2LI-0931	RWST Level Indicator @ 2PM06J (2LT-0931)	2.1-0
2LI-0932	RWST Level Indicator @ 2PM06J (2LT-0932)	2.1-0
2LI-0933	RWST Level Indicator @ 2PM06J (2LT-0933)	2.1-0
2LI-FW309	Loop 2A SG Wide Range Level Indicator @ 2PL10J (2LT-501)	11.6-2
2LI-FW310	Loop 2B SG Wide Range Level Indicator @ 2PL10J (2LT-502)	11.6-2
2LI-RY034	Pressurizer Level Indicator @ 2PL10J (2LT-459)	11.6-2
2LL-SI075A	Containment Recirc Sump Level Indicating Lights @2PM06J (2LS-0940A)	2.1-0
2LL-SI075B	Containment Recirc Sump Level Indicating Lights @2PM06J (2LS-0941A)	2.1-0
2MS001A	Loop 2A Main Steam Isolation Valve (HO)	18.3-2
2MS001A-DIV21	Loop 2A Main Steam Isolation Valve (HO); Division 21 Actuation Circuit	18.3-2
2MS001A-DIV22	Loop 2A Main Steam Isolation Valve (HO); Division 22 Actuation Circuit	18.3-2
2MS001B	Loop 2B Main Steam Isolation Valve (HO)	18.3-2
2MS001B-DIV21	Loop 2B Main Steam Isolation Valve (HO); Division 21 Actuation Circuit	18.3-2
2MS001B-DIV22	Loop 2B Main Steam Isolation Valve (HO); Division 22 Actuation Circuit	18.3-2
2MS001C	Loop 2C Main Steam Isolation Valve (HO)	18.3-2
2MS001C-DIV21	Loop 2C Main Steam Isolation Valve (HO); Division 21 Actuation Circuit	18.3-2
2MS001C-DIV22	Loop 2C Main Steam Isolation Valve (HO); Division 22 Actuation Circuit	18.3-2
2MS001D	Loop 2D Main Steam Isolation Valve (HO)	18.3-2
2MS001D-DIV21	Loop 2D Main Steam Isolation Valve (HO); Division 21 Actuation Circuit	18.3-2

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2MS001D-DIV22	Loop 2D Main Steam Isolation Valve (HO); Division 22 Actuation Circuit	18.3-2
2MS013A	Main Steam Relief Valve	18.3-2
2MS013B	Main Steam Relief Valve	18.3-2
2MS013C	Main Steam Relief Valve	18.3-2
2MS013D	Main Steam Relief Valve	18.3-2
2MS014A	Main Steam Relief Valve	18.3-2
2MS014B	Main Steam Relief Valve	18.3-2
2MS014C	Main Steam Relief Valve	18.3-2
2MS014D	Main Steam Relief Valve	18.3-2
2MS015A	Main Steam Relief Valve	18.3-2
2MS015B	Main Steam Relief Valve	18.3-2
2MS015C	Main Steam Relief Valve	18.3-2
2MS015D	Main Steam Relief Valve	18.3-2
2MS016A	Main Steam Relief Valve	18.3-2
2MS016B	Main Steam Relief Valve	18.3-2
2MS016C	Main Steam Relief Valve	18.3-2
2MS016D	Main Steam Relief Valve	18.3-2
2MS017A	Main Steam Relief Valve	18.3-2
2MS017B	Main Steam Relief Valve	18.3-2
2MS017C	Main Steam Relief Valve	18.3-2
2MS017D	Main Steam Relief Valve	18.3-2
2MS018A	Steam Generator 2A Power Operated Relief Valve (HO)	18.3-2
2MS018B	Steam Generator 2B Power Operated Relief Valve (HO)	18.3-2
2MS018C	Steam Generator 2C Power Operated Relief Valve (HO)	18.3-2
2MS018D	Steam Generator 2D Power Operated Relief Valve (HO)	18.3-2
2MS019A	Steam Generator 2A Atmospheric Relief Isolation Valve (MV)	18.3-2
2MS019B	Steam Generator 2B Atmospheric Relief Isolation Valve (MV)	18.3-2
2MS019C	Steam Generator 2C Atmospheric Relief Isolation Valve (MV)	18.3-2
2MS019D	Steam Generator 2D Atmospheric Relief Isolation Valve (MV)	18.3-2
2MS101A	Loop 2A MSIV Bypass Valve (AO)	18.3-2
2MS101B	Loop 2B MSIV Bypass Valve (AO)	18.3-2
2MS101C	Loop 2C MSIV Bypass Valve (AO)	18.3-2
2MS101D	Loop 2D MSIV Bypass Valve (AO)	18.3-2
2MS185A	SG 2A PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS185B	SG 2B PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS185C	SG 2C PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS185D	SG 2D PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS186A	SG 2A PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS186B	SG 2B PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS186C	SG 2C PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS186D	SG 2D PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS187A	SG 2A PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS187B	SG 2B PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS187C	SG 2C PORV Hand Pump Isolation Valve (MV)	18.3-2
2MS187D	SG 2D PORV Hand Pump Isolation Valve (MV)	18.3-2
2NI-0031B	Ch A Source Range Neutron Flux Indicator @ 2PM05J (NE-31)	2.1-0
2NI-0032B	Ch B Source Range Neutron Flux Indicator @ 2PM05J (NE-32)	2.1-0

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2NI-NR005B	Ch A Post Accident Neutron Flux Indicator @ 0PM02J (2NR11E)	2.1-0
2NI-NR005D	Ch A Post Accident Neutron Flux Indicator @ 2PL10J (2NR11E)	11.6-2
2NI-NR006B	Ch B Post Accident Neutron Flux Indicator @ 0PM02J (2NR13E)	2.1-0
2NI-NR006D	Ch B Post Accident Neutron Flux Indicator @ 2PL10J (2NR13E)	11.6-2
2PI-0402	Hot Leg local Pressure Indicator - Loop C	1-2
2PI-0403A	RCS Wide Range Pressure Indicator @ 2PM06J (2PT-403)	2.1-0
2PI-0404	Hot Leg local Pressure Indicator - Loop A	1-2
2PI-0405	RCS Wide Range Pressure Indicator @ 2PM06J (2PT-405)	2.1-0
2PI-0455A	Pressurizer Pressure Indicator @ 2PM05J (2PT-455)	2.1-0
2PI-0455B	Pressurizer Pressure Indicator @ 2PL06J (2PT-455)	11.4C-0
2PI-0456	Pressurizer Pressure Indicator @ 2PM05J (2PT-456)	2.1-0
2PI-0457	Pressurizer Pressure Indicator @ 2PM05J (2PT-457)	2.1-0
2PI-0458	Pressurizer Pressure Indicator @ 2PM05J (2PT-458)	2.1-0
2PI-0514A	Loop 2A SG Pressure Indicator @ 2PM04J (2PT-0514)	2.1-0
2PI-0514B	Loop 2A SG Pressure Indicator @ 2PL04J (2PT-0514)	11.4C-0
2PI-0515A	Loop 2A SG Pressure Indicator @ 2PM04J (2PT-0515)	2.1-0
2PI-0516A	Loop 2A SG Pressure Indicator @ 2PM04J (2PT-0516)	2.1-0
2PI-0524A	Loop 2B SG Pressure Indicator @ 2PM04J (2PT-0524)	2.1-0
2PI-0524B	Loop 2B SG Pressure Indicator @ 2PL05J (2PT-0524)	11.4C-0
2PI-0525A	Loop 2B SG Pressure Indicator @ 2PM04J (2PT-0525)	2.1-0
2PI-0526A	Loop 2B SG Pressure Indicator @ 2PM04J (2PT-0526)	2.1-0
2PI-0534A	Loop 2C SG Pressure Indicator @ 2PM04J (2PT-0534)	2.1-0
2PI-0534B	Loop 2C SG Pressure Indicator @ 2PL05J (2PT-0534)	11.4C-0
2PI-0535A	Loop 2C SG Pressure Indicator @ 2PM04J (2PT-0535)	2.1-0
2PI-0536A	Loop 2C SG Pressure Indicator @ 2PM04J (2PT-0536)	2.1-0
2PI-0544A	Loop 2D SG Pressure Indicator @ 2PM04J (2PT-0544)	2.1-0
2PI-0544B	Loop 2D SG Pressure Indicator @ 2PL04J (2PT-0544)	11.4C-0
2PI-0545A	Loop 2D SG Pressure Indicator @ 2PM04J (2PT-0545)	2.1-0
2PI-0546A	Loop 2D SG Pressure Indicator @ 2PM04J (2PT-0546)	2.1-0
2PI-CC107	Component Cooling Pump Common Discharge Header Pressure Indicator @ 2PM06J (2P	2.1-0
2PI-MS193	Loop 2A SG Pressure Indicator @ 2PL10J (2PT-0514)	11.6-2
2PI-MS194	Loop 2B SG Pressure Indicator @ 2PL10J (2PT-0525)	11.6-2
2PI-RY033	Pressurizer Pressure Indicator @ 2PL10J (2PT-455)	11.6-2
2RC014A	Reactor Vessel Head Vent Valve - Train A (SO) (HLP)	1-2
2RC014B	Reactor Vessel Head Vent Valve - Train B (SO) (HLP)	1-2
2RC014C	Reactor Vessel Head Vent Valve - Train A (SO) (HLP)	1-2
2RC014D	Reactor Vessel Head Vent Valve - Train B (SO) (HLP)	1-2
2RC01BA	Steam Generator 2A	1-2
2RC01BB	Steam Generator 2B	1-2
2RC01BC	Steam Generator 2C	1-2
2RC01BD	Steam Generator 2D	1-2
2RC01R	Reactor Vessel	1-2
2RH01PA	Residual Heat Removal Pump 2A	11.2A-2
2RH01PB	Residual Heat Removal Pump 2B	11.2D-2
2RH02AA	Residual Heat Removal Heat Exchanger 2A	11.3B-2
2RH02AB	Residual Heat Removal Heat Exchanger 2B	11.3E-2
2RH606	RHR HX 2A Discharge Valve (AO)	11.3B-2

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2RH607	RHR HX 2B Discharge Valve (AO)	11.3E-2
2RH610	RHR Pump 2A Miniflow Valve (MO)	11.3B-2
2RH611	RHR Pump 2B Miniflow Valve (MO)	11.2-0
2RH618	RHR HX 2A Bypass Valve (AO)	11.3B-2
2RH619	RHR HX 2B Bypass Valve (AO)	11.3E-2
2RH8701A	RHR Pump 2A Isolation Valve (MO) (HLP)	1-2
2RH8701B	RHR Pump 2A Isolation Valve (MO) (HLP)	1-2
2RH8702A	RHR Pump 2B Isolation Valve (MO) (HLP)	1-2
2RH8702B	RHR Pump 2B Isolation Valve (MO) (HLP)	1-2
2RH8716A	RHR HX 2A Discharge Crosstie Valve (MO)	11.3-2
2RH8716B	RHR HX 2B Discharge Crosstie Valve (MO)	11.3-2
2RY01S	Pressurizer	1-2
2RY32MA	PORV Accumulator Tank 2A	1-2
2RY32MB	PORV Accumulator Tank 2B	1-2
2RY455A	Pressurizer PORV (AO) (HLP)	1-2
2RY456	Pressurizer PORV (AO) (HLP)	1-2
2RY8000A	PORV Block Valve (MO) (HLP)	1-2
2RY8000B	PORV Block Valve (MO) (HLP)	1-2
2SI01T	Refueling Water Storage Tank	16.1-2
2SI8801A	Charging Pump to Cold Leg Injection Isol'n Valve (MO)	11.3-2
2SI8801B	Charging Pump to Cold Leg Injection Isol'n Valve (MO)	11.3-2
2SI8804B	RHR HX 2B to SI Pump Isolation Valve (MO)	11.3F-2
2SI8806	SI Pump Suction RWST Isolation Valve (MO)	11.3F-2
2SI8807A	SI/CV Pump Suction Header Crosstie Valve (MO)	11.3A-2
2SI8807B	SI/CV Pump Suction Header Crosstie Valve (MO)	11.3A-2
2SI8808A	SI Accumulator 2A Discharge Isolation Valve	1-2
2SI8808B	SI Accumulator 2B Discharge Isolation Valve	1-2
2SI8808C	SI Accumulator 2C Discharge Isolation Valve	1-2
2SI8808D	SI Accumulator 2D Discharge Isolation Valve	1-2
2SI8809A	RHR HX 2A to RC Cold Leg Isolation Valve (MO)	11.3-2
2SI8809B	RHR HX 2B to RC Cold Leg Isolation Valve (MO)	11.3-2
2SI8811A	LPSI Containment Sump Supply Isolation Valve (MO)	11.3-2
2SI8811B	LPSI Containment Sump Supply Isolation Valve (MO)	11.3-2
2SI8812A	LPSI RWST Supply Isolation Valve (MO)	11.2B-2
2SI8812B	LPSI RWST Supply Isolation Valve (MO)	11.2D-2
2SI8840	RHR HX to RC Hot Leg Isolation Valve (MO)	11.3-2
2SI8923A	SI Pump 2A Suction Valve (MO)	11.3A-2
2SI8924	SI/CV Pump Suction Header Crosstie Isolation Valve (MO)	11.3A-2
2SX001A	Essential Service Water Pump 2A Suction Valve (MO)	11.1A-0
2SX001B	Essential Service Water Pump 2B Suction Valve (MO)	11.1B-0
2SX004	Unit 2 Component Cooling HX ESW Inlet Valve (MO)	11.1A-0
2SX005	Component Cooling HX "0" ESW Inlet Valve (MO)	11.1B-0
2SX007	Unit 2 Component Cooling HX ESW Outlet Valve (MO)	11.2-0
2SX010	Unit 2 Return Header Crosstie Valve (MO)	11.2-0
2SX011	Unit 2 Return Header Crosstie Valve (MO)	11.2-0
2SX016A	RCFC 2A/2C Inlet Containment Isolation Valve (MO)	11.3-2
2SX016B	RCFC 2B/2D Inlet Containment Isolation Valve (MO)	11.3-2

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2SX01AA	Essential Service Water Pump 2A Oil Cooler	11.1A-0
2SX01AB	Essential Service Water Pump 2B Oil Cooler	11.1B-0
2SX01K	AFW Pump 2B Engine Closed Cycle Heat Exchanger	11.4A-2
2SX01PA	Essential Service Water Pump 2A	11.1A-0
2SX01PA-C	Essential Service Water Pump 2A Lube Oil Pump	11.1A-0
2SX01PB	Essential Service Water Pump 2B	11.1B-0
2SX01PB-C	Essential Service Water Pump 2B Lube Oil Pump	11.1B-0
2SX027A	RCFC 2A/2C Outlet Containment Isolation Valve (MO)	11.3-2
2SX027B	RCFC 2B/2D Outlet Containment Isolation Valve (MO)	11.3-2
2SX02K	AFW Pump 2B Right Angle Gear Oil Cooler	11.4A-2
2SX033	ESW Pump 2A Discharge Crosstie Isolation Valve (MO)	11.1A-0
2SX034	ESW Pump 2B Discharge Crosstie Isolation Valve (MO)	11.1B-0
2SX04P	AFW Pump 2B Cooling Water Pump (Engine Driven)	11.4A-2
2SX101A	AFW Pump 2A Oil Cooler Outlet Valve (SO)	11.4-0
2SX136	Unit 2 Return Header Crosstie Valve (MO)	11.2-0
2SX147A	Containment Chiller Condenser Bypass Valve (AO)	11.5-2
2SX147B	Containment Chiller Condenser Bypass Valve (AO)	11.5-2
2SX169A	Diesel Generator 2A Service Water Isolation Valve (AO)	9.2-2
2SX169B	Diesel Generator 2B Service Water Isolation Valve (AO)	9.1-2
2SX173	AFW Pump 2B SX Supply Isolation Valve (AO)	11.4A-2
2SX178	AFW Pump 2B SX Return Isolation Valve (AO)	11.4A-2
2TI-0413A	Loop 2A Wide Range Hot Leg Temperature Indicator @ 2PM05J (2TE-RC022A)	2.1-0
2TI-0413B	Loop 2A Wide Range Cold Leg Temperature Indicator @ 2PM05J (2TE-RC022B)	2.1-0
2TI-0423A	Loop 2B Wide Range Hot Leg Temperature Indicator @ 2PM05J (2TE-RC023A)	2.1-0
2TI-0423B	Loop 2B Wide Range Cold Leg Temperature Indicator @ 2PM05J (2TE-RC023B)	2.1-0
2TI-0433A	Loop 2C Wide Range Hot Leg Temperature Indicator @ 2PM05J (2TE-RC024A)	2.1-0
2TI-0433B	Loop 2C Wide Range Cold Leg Temperature Indicator @ 2PM05J (2TE-RC024B)	2.1-0
2TI-0443A	Loop 2D Wide Range Hot Leg Temperature Indicator @ 2PM05J (2TE-RC025A)	2.1-0
2TI-0443B	Loop 2D Wide Range Cold Leg Temperature Indicator @ 2PM05J (2TE-RC025B)	2.1-0
2TI-0604	RHR Hx 2A Outlet Temperature Indicator @ 2PM06J (2TE-604)	2.1-0
2TI-0605	RHR Hx 2B Outlet Temperature Indicator @ 2PM06J (2TE-605)	2.1-0
2TI-0608	RHR Hx 2RH02AA Outlet Temperature Indicator	11.3B-2
2TI-0609	RHR Hx 2RH02AB Outlet Temperature Indicator	11.3E-2
2TI-IT001	Division 21 Incore Thermocouple Display Insert @ 2PM05J	2.1-0
2TI-IT002	Division 22 Incore Thermocouple Display Insert @ 2PM05J	2.1-0
2TI-RC005A	Loop 2A Wide Range Hot Leg Temperature Indicator @ 2PL05J (2TE-RC022A)	11.4C-0
2TI-RC005B	Loop 2A Wide Range Cold Leg Temperature Indicator @ 2PL05J (2TE-RC022B)	11.4C-0
2TI-RC006A	Loop 2B Wide Range Hot Leg Temperature Indicator @ 2PL05J (2TE-RC023A)	11.4C-0
2TI-RC006B	Loop 2B Wide Range Cold Leg Temperature Indicator @ 2PL05J (2TE-RC023B)	11.4C-0
2TI-RC007A	Loop 2C Wide Range Hot Leg Temperature Indicator @ 2PL05J (2TE-RC024A)	11.4C-0
2TI-RC007B	Loop 2C Wide Range Cold Leg Temperature Indicator @ 2PL05J (2TE-RC024B)	11.4C-0
2TI-RC008A	Loop 2D Wide Range Hot Leg Temperature Indicator @ 2PL05J (2TE-RC025A)	11.4C-0
2TI-RC008B	Loop 2D Wide Range Cold Leg Temperature Indicator @ 2PL05J (2TE-RC025B)	11.4C-0
2TI-RC022A	Loop 2A Wide Range Hot Leg Temperature Indicator @ 2PL10J (2TE-RC022A)	11.6-2
2TI-RC022B	Loop 2A Wide Range Cold Leg Temperature Indicator @ 2PL10J (2TE-RC022B)	11.6-2
2TI-RC023A	Loop 2B Wide Range Hot Leg Temperature Indicator @ 2PL10J (2TE-RC023A)	11.6-2
2TI-RC023B	Loop 2B Wide Range Cold Leg Temperature Indicator @ 2PL10J (2TE-RC023B)	11.6-2

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2TI-RC024A	Loop 2C Wide Range Hot Leg Temperature Indicator @ 2PL10J (2TE-RC024A)	11.6-2
2TI-RC024B	Loop 2C Wide Range Cold Leg Temperature Indicator @ 2PL10J (2TE-RC024B)	11.6-2
2TI-RC025A	Loop 2D Wide Range Hot Leg Temperature Indicator @ 2PL10J (2TE-RC025A)	11.6-2
2TI-RC025B	Loop 2D Wide Range Cold Leg Temperature Indicator @ 2PL10J (2TE-RC025B)	11.6-2
2UL-AN012-A7	RWST LEVEL LO-3 Annunciator Alarm	2.1-0
2UL-AN012-B7	RWST LEVEL LO-2 Annunciator Alarm	2.1-0
2UL-AN012-C7	RWST LEVEL LOW Annunciator Alarm	2.1-0
2VA01CA	SX Pump 2A Cubicle Cooler Fan	11.1A-0
2VA01CB	SX Pump 2A Cubicle Cooler Fan	11.1A-0
2VA01CC	SX Pump 2A Cubicle Cooler Fan	11.1A-0
2VA01CD	SX Pump 2A Cubicle Cooler Fan	11.1A-0
2VA01CE	SX Pump 2B Cubicle Cooler Fan	11.1B-0
2VA01CF	SX Pump 2B Cubicle Cooler Fan	11.1B-0
2VA01CG	SX Pump 2B Cubicle Cooler Fan	11.1B-0
2VA01CH	SX Pump 2B Cubicle Cooler Fan	11.1B-0
2VA01SA	SX Pump 2A Cubicle Cooler	11.1A-0
2VA01SB	SX Pump 2B Cubicle Cooler	11.1B-0
2VA02CA	RHR Pump 2A Cubicle Cooler Fan	11.2A-2
2VA02CB	RHR Pump 2A Cubicle Cooler Fan	11.2A-2
2VA02CC	RHR Pump 2B Cubicle Cooler Fan	11.2D-2
2VA02CD	RHR Pump 2B Cubicle Cooler Fan	11.2D-2
2VA02SA	RHR Pump 2A Cubicle Cooler	11.2A-2
2VA02SB	RHR Pump 2B Cubicle Cooler	11.2D-2
2VA06CA	Charging Pump 2A Cubicle Cooler Fan	11.3D-2
2VA06CB	Charging Pump 2A Cubicle Cooler Fan	11.3D-2
2VA06CC	Charging Pump 2B Cubicle Cooler Fan	11.3G-2
2VA06CD	Charging Pump 2B Cubicle Cooler Fan	11.3G-2
2VA06SA	Charging Pump 2A Cubicle Cooler	11.3D-2
2VA06SB	Charging Pump 2B Cubicle Cooler	11.3G-2
2VA08CB	Auxiliary Feedwater Pump Cubicle Cooler Fan (Engine-driven)	11.4A-2
2VA08S	Auxiliary Feedwater Pump Cubicle Cooler	11.4A-2
2VD01CA	Diesel Generator Room 2A Supply Fan	18.2-2
2VD01CB	Diesel Generator Room 2B Supply Fan	18.1-2
2VD01YA	Diesel Generator Room 2B Outside Air Intake Damper	18.1-2
2VD01YB	Diesel Generator Room 2B Outside Air Intake Damper	18.1-2
2VD02YA	Diesel Generator Room 2B Return Air Damper	9.1-2
2VD02YB	Diesel Generator Room 2B Return Air Damper	9.1-2
2VD09YA	Diesel Generator Room 2A Outside Air Intake Damper	18.2-2
2VD09YB	Diesel Generator Room 2A Outside Air Intake Damper	18.2-2
2VD10YA	Diesel Generator Room 2A Return Air Damper	9.2-2
2VD10YB	Diesel Generator Room 2A Return Air Damper	9.2-2
2VD16YA	Diesel Generator Room 2B Fire Damper	18.1-2
2VD16YA	Diesel Generator Room 2B Fire Damper	9.1-2
2VD16YB	Diesel Generator Room 2B Fire Damper	18.1-2
2VD16YB	Diesel Generator Room 2B Fire Damper	9.1-2
2VD17YA	Diesel Generator Room 2B Fire Damper	8.3-2
2VD17YA	Diesel Generator Room 2B Fire Damper	9.1-2

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2VD17YB	Diesel Generator Room 2B Fire Damper	8.3-2
2VD17YB	Diesel Generator Room 2B Fire Damper	9.1-2
2VD23YA	Diesel Generator Room 2A Fire Damper	18.2-2
2VD23YA	Diesel Generator Room 2A Fire Damper	9.2-2
2VD23YB	Diesel Generator Room 2A Fire Damper	18.2-2
2VD23YB	Diesel Generator Room 2A Fire Damper	9.2-2
2VD24YA	Diesel Generator Room 2A Fire Damper	8.3-2
2VD24YA	Diesel Generator Room 2A Fire Damper	9.2-2
2VD24YB	Diesel Generator Room 2A Fire Damper	8.3-2
2VD24YB	Diesel Generator Room 2A Fire Damper	9.2-2
2VE01C	Division 22 MEER Supply Fan	5.4-2
2VE01Y	Division 22 MEER Outside Air Intake Damper	18.1-2
2VE02Y	Division 22 MEER Return Air Damper	5.4-2
2VE04Y	Division 22 MEER Fire Damper	18.1-2
2VE04Y	Division 22 MEER Fire Damper	5.3-2
2VE05Y	Division 22 MEER Fire Damper	5.6-2
2VE05Y	Division 22 MEER Fire Damper	8.6-0
2VE06Y	Division 21 MEER Fire Damper	18.2-2
2VE06Y	Division 21 MEER Fire Damper	5.4-2
2VE07Y	Division 21 MEER Fire Damper	5.6-2
2VE07Y	Division 21 MEER Fire Damper	8.6-0
2VE12Y	Division 21 MEER Fire Damper	5.4-2
2VE12Y	Division 21 MEER Fire Damper	5.6-2
2VE17Y	Division 22 MEER Fire Damper	5.3-2
2VE17Y	Division 22 MEER Fire Damper	5.4-2
2VP01AA	Essential Service Water Coil	1-2
2VP01AB	Essential Service Water Coil	1-2
2VP01AC	Essential Service Water Coil	1-2
2VP01AD	Essential Service Water Coil	1-2
2VP01CA	RCFC Fan A	1-2
2VP01CB	RCFC Fan B	1-2
2VP01CC	RCFC Fan C	1-2
2VP01CD	RCFC Fan D	1-2
2VX01C	Division 22 ESF Switchhear Room Supply Fan	18.1-2
2VX01Y	Division 22 ESF Swgr Room Outside Air Intake Damper	18.1-2
2VX02Y	Division 22 ESF Swgr Room Return Air Damper	5.1-2
2VX04C	Division 21 ESF Switchgear Room/MEER Supply Fan	18.2-2
2VX04Y	Division 21 ESF Swgr Room Outside Air Intake Damper	18.2-2
2VX05C	ESW Cooling Tower 0A Division 21 Electric Substation Bus 231Z Supply Fan	18.14B-2
2VX05Y	D1vision 21 ESF Swgr Room Return Air Damper	5.2-2
2VX06C	ESW Cooling Tower 0B Division 22 Electric Substation Bus 232Z Supply Fan	18.14A-2
2VX16Y	Division 22 ESF Swgr Room Fire Damper	18.1-2
2VX16Y	Division 22 ESF Swgr Room Fire Damper	5.1-2
2VX17Y	Division 22 ESF Swgr Room Fire Damper	5.1-2
2VX17Y	Division 22 ESF Swgr Room Fire Damper	8.5-2
2VX20Y	Division 21 ESF Swgr Room Fire Damper	5.2-2
2VX20Y	Division 21 ESF Swgr Room Fire Damper	8.5-2

TABLE 2.4-2 (Cont'd)

SAFE SHUTDOWN EQUIPMENT LIST

Equipment Number	Equipment Description	Equipment Zone
2VX22Y	Division 21 ESF Swgr Room Fire Damper	18.2-2
2VX22Y	Division 21 ESF Swgr Room Fire Damper	5.2-2
2VX30Y	ESW Cooling Tower 0A Division 21 Electric Substation Bus 231Z Outside Air Intake	18.14B-2
2VX32Y	ESW Cooling Tower 0A Division 21 Electric Substation Bus 231Z Return Air Damper	18.14B-2
2VX33Y	ESW Cooling Tower 0B Division 22 Electric Substation Bus 232Z Outside Air Intake	18.14A-2
2VX35Y	ESW Cooling Tower 0B Division 22 Electric Substation Bus 232Z Return Air Damper	18.14A-2