Draft ITAAC Maintenance Examples for Discussion w/NRC on March 18, 2009
Revised 3/13/09

Pumps

1. During a scheduled pump run there is internal damage to the pump rotating assembly resulting in damage to the pump casing which requires the pump to be replaced with a new pump from the same vendor and the same model number

- This issue will be documented in the CAP Process
- New pump installed per the maintenance procedure
- Post maintenance testing performed IAW plant procedures, mfr recommendations, etc.
- Pump replacement IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is an entire component replacement and thus would be included in a notification to the NRC that the ITAAC component has been replaced
- The ITAAC Closure Package is updated to reflect the component replacement as notified to NRC

2. During a scheduled pump run there is catastrophic damage to the pump which requires the pump to be replaced with a new pump. An identical pump is not available and similar pump is obtained from a different vendor.

- This issue will be documented in the CAP Process
- An engineering evaluation will document the functional equivalence of the replacement pump
- The new pump will be installed via the maintenance program
- Post maintenance testing performed IAW plant procedures, mfr recommendations, etc.
- Pump replacement IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is an entire component replacement and thus would be included in a notification to the NRC that the ITAAC component has been replaced
- The ITAAC Closure Package is updated to reflect the component replacement as notified to NRC

3. During a routine surveillance test the pump does not achieve the required flow and testing determines that there is damage to the impeller. The rotating element is replaced like-for-like.

- This issue will be documented in the CAP Process
- The new rotating element is installed via the maintenance program

- The required re-tests (see chart) are re-performed
- The repaired pump is verified to remain on the original pump curve for flow vs. head
- Pump repair IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is a component repair, not a component replacement, and thus would not be included in any written ITAAC closure status update notification to the NRC

4. NRC Pump Example

During testing, RNS Pump A is observed to provide flow to the RCS that, while still exceeding the 1400 gpm minimum requirement, is noted to be substantially less then the initial flow identified in the ITAAC 2.3.6.9b.ii closure letter. During subsequent troubleshooting by the licensee, the pump impeller is found to be significantly degraded. The cause of the degradation is determined to be the result of high vibration. The impeller is replaced with a new impeller that has a higher tolerance for vibration. Post-replacement testing results in the ITAAC acceptance criteria again being met

- This issue will be documented in the CAP Process
- An equivalence evaluation is documented for the new impeller
- The new rotating element is installed via the maintenance program
- The required re-tests (see chart) are re-performed
- The replacement pump is verified to remain on the original pump curve for flow vs. head
- Pump repair IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is a component repair, not a component replacement, and thus would not be included in any written ITAAC closure status update notification to the NRC

5. SLC Pump Maintenance

A SLC pump is damaged and is be replaced with an identical pump

- The original ITAAC test was two fold:

- The SLC System delivers at least 378 L/min of solution with both pumps operating when the reactor pressure is less than or equal to 8.72 MPaA. Determination method for Acceptance Criteria is:

    - Tests will be conducted on the as-built SLC System using installed controls, power supplies and other auxiliaries. Demineralized water will be injected from the storage tank into the reactor with both pumps running against a discharge pressure of greater than or equal to 8.72 MPaA.

- The SLC System delivers at least 189 L/min of solution with either pump operating when the reactor pressure is less than or equal to 8.72 MPaA.

- This issue will be documented in the CAP Process
- The new pump will be run to verify that the pump will still deliver the required flow
- In this case, while the re-test verifies that the original AC have been met (flow rate) the test methodology (determination method) is different then the original as the storage tank now has sodium pentaborate and cannot not be used to flow water to the vessel. The retest would use the installed test tank and a test flow path similar to that used during the quarterly surveillance tests
- Pump replacement IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is an entire component replacement and thus would be included in a notification to the NRC that the ITAAC component has been replaced
- The ITAAC Closure Package is updated to reflect the component replacement as notified to NRC

6. During a pump run the seal begins to leak and the seal has to be replaced

- The issue is documented in CAP
- The seal is replaced in accordance with the maintenance procedure
- A pump run is performed to verify the leak has been resolved
- The pump run verifies the pump is still operating properly and system is leak tight
- Pump repair IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is a component repair, not a component replacement, and thus would not be included in any written ITAAC closure status update notification to the NRC

7. A pump has to be disassembled for rotating element inspection after a specified number of hours of operation in accordance with manufacturer's recommendations
    - This is a required scheduled PM Preventative Maintenance and thus does not affect the ITAAC closure
    - Pump is reassembled after maintenance
    - Pump is run for verified to remain on the original pump curve
    - Pump maintenance IAW approved procedures maintains the validity of the original ITAAC closure letter
    - This is a component maintenance, not a component replacement, and thus would not be included in any written ITAAC closure status update notification to the NRC

PMT Verification(s) ➔ Maintenance Activities ➔	Suction and Discharge Head pressure	Flow	Vibration	Bearing Temp/ Cool Flow	Speed	General Leak Test @ Normal Operating Temp/Press	Motor Current and Voltage	Verify Lubrication Levels Prior to Start and Running
Pump Disassembly or Replacement	X	X	X	X	X	X	X	X
Pump Coupling Repair or Alignment Work			X			X		
Seal Replacement/Repair	X	X	X	X		X	X	
Bearing Repair/Replacement			X	X	X	X	X	X
Repairs Affecting Pump Bearing Coolant				X		(Note 2)		
Packing Adjustment						(Note 1)	X	
Packing Replacement			X			(Note 1)	X	
Piping/Pipe Support Maintenance Adjacent to Pump			X	X		X		
Repairs Affecting Auto Start of the Pumps					Auto Start Test			
Pump Speed Gear Repair/Replacement			X	X	X		X	X

Pump ITAACs For reference *(from the ABWR DCD)*

- Individual RIPs and motors provide at least 6912 m3/h flow with a total developed head (TDH) of at least 32.6m with water at least 278 °C and 7.25 MPa or less, during 10 RIPs operation. During 9 RIPs operation, the individual RIP provides at least 8291 m3/h with a TDH of at least 35.8m at the same temperature and pressure conditions.
- The individual RIPs and motors have a dry rotating inertia of ≥ 17.5 and ≤

  26.5 kg ·m2.

- The SLC System delivers at least 378 L/min of solution with both pumps operating when the reactor pressure is less than or equal to 8.72 MPaA.
- The SLC System delivers at least 189 L/min of solution with either pump operating when the reactor pressure is less than or equal to 8.72 MPaA.
- In the suppression pool cooling mode, the RHR tube side heat exchanger flow rate is 954 m3/h minimum, per division.
- The RHR pumps have sufficient NPSH.
- In the shutdown cooling mode, the RHR tube side heat exchanger flow rate is greater than or equal to 954 m3 /h.
- The HPCF System flow in each division is not less than a value corresponding to a straight line between a flow of 182 m3/h at a differential pressure of 8.12 MPa and a flow of 727 m3/h at a differential pressure of 0.69 MPa.
- In the RPV water makeup mode, the RCIC pump delivers a flow rate of at least 182 m3/h against a maximum differential pressure (between the RPV and the pump suction) of 8.12 MPa.
- The RCIC turbine delivers the speed and torque required by the pump at the above conditions.

Motor Operated Valves:

- US-APWR, Emergency Core Cooling System
- Emergency Letdown Isolation Valves, SIS-MOV-031B, 031D, 032B, 032D

These valves are:

- Located inside the Containment
- ASME Section III Class 1
- Seismic Category 1
- Remotely Operated
- Class 1E Qualified for a Harsh Environment
- With an Active Safety Function
- Fail “As-Is” on a Loss-of-Power
- There are NO leak-before-break (LLB) requirements for these valves

- The MOV components identified in the DCD for these valves include both the valve and the electric motor.
- The MOVs have position display and control functions in the Main Control Room and Remote Shutdown Console.
- These valves are shown on the Functional Arrangement diagram.

MOV Scenario 1

Testing on the RHR system will require injecting water into the RPV and the Reactor Vessel Level is going to be controlled via the Emergency Letdown Isolation Valves, SIS-MOV-031B, and 032B. As the Inboard valve is opened the Torque Switch fails and the motor does not cut-off as it should. The valve motor breaker eventually trips on over current. During the repair maintenance it is determined that the motor is undamaged, but the Valve Stem and Valve Disk have been damaged and need to be replaced along with the torque switches. The repairs are made with identical, like-for-like, same model, parts.

- This MOV repair is performed and documented IAW CAP and Maintenance Program procedures
- This is considered a component repair because the component as identified in the ITAAC (valve/motor combo) was not replaced
- Component repair IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is a component repair, not a component replacement, and thus would not be included in any written ITAAC closure status update notification to the NRC

MOV Scenario 2.

Same as above except during the repair maintenance it is determined that the valve motor was damaged before the breaker tripped and the motor needs to be replaced. The licensee decides to replace the entire MOV.Since the motor is a DCD component NRC notification would be made in the letter issued around the 225-day notification.

- In this case the component identified in the ITAAC is replaced (valve/motor combo)
- Component replacement IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is an entire component replacement and thus would be included in a notification to the NRC that the ITAAC component has been replaced
- The ITAAC Closure Packages is are updated to reflect the component replacement as notified to NRC

Scenario 3 – NRC MOV Example

During construction, it is noted that the motor operator for MOV RNS-PL-V001A has been physically damaged. The licensee decides to replace the MOV operator with a new one that is from the same manufacturer, and is the identical size and type as the original. During replacement, it is observed that the new operator has terminal blocks and torque switch that are different than the original. Post-replacement testing results in the MOV performing as required.

- New motor operator will be installed by the maintenance process
- The valve will tested as post maintenance testing IAW applicable maintenance procedures
- An engineering equivalence evaluation for the differing terminal blocks and torque switch will be performed

Scenario 3.a – The differing terminal blocks and torque switch are determined to be encompassed by the original EQ test report referenced in the ITAAC close-out letter.

- The MOV EQ ITAAC 2.4.4-5, 6.a.ii Closure Package would be supplemented to reference the equivalence evaluation
- This is considered a component repair because the component as identified in the ITAAC (valve/motor combo) was not replaced
- Component repair IAW approved procedures maintains the validity of the original ITAAC closure letter

– This is a component repair, not a component replacement, and thus would not be included in any written ITAAC closure status update notification to the NRC

Scenario 3.b – The differing terminal blocks and torque switch are determined to NOT be encompassed by the original EQ test report referenced in the ITAAC close-out letter.

– A supplemental EQ evaluation would be performed to determine the acceptability of the differing terminal blocks and torque switch
– This is considered a component repair because the component as identified in the ITAAC (valve/motor combo) was not replaced
– A supplement to the original ITAAC closure letter to the NRC (for the MOV EQ ITAAC 2.4.4-5, 6.a.ii) is required because the original ITAAC determination basis is rendered incomplete by the operator replacement.
– Component repair IAW approved procedures maintains the validity of all other aspects of the original ITAAC closure letter
– The ITAAC Closure Package is updated to reflect the supplemental EQ evaluation and Closure Letter to NRC
– Because this is not a component replacement (valve operator combo), this repair would not be included in any written ITAAC closure status update notification to the NRC

Applicable APWR MOV ITAAC:

- ITAAC 2.4.4-5, 1.a The as-built ECCS conforms to the functional arrangement as described in the Design Description of this Subsection 2.4.4.1 and as shown in Figure 2.4.4-1.
- ITAAC 2.4.4-5, 1.b Each mechanical division of the as-built ECCS is physically separated from other mechanical divisions of the system by structural and/or fire barriers.
- ITAAC 2.4.4-5, 2.a The ASME Code Section III design reports exist and conclude that the as-built components identified in Table 2.4.4-2 are reconciled with the design documents.
- ITAAC 2.4.4-5, 2.b The ASME code Section III design reports exist and conclude that the as-built piping identified in Table 2.4.4-3 are reconciled with the design documents.
- ITAAC 2.4.4-5, 3.a The ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds.
- ITAAC 2.4.4-5, 3.b The ASME Code Section III requirements are met for non-destructive examination of as-built pressure boundary welds.
- ITAAC 2.4.4-5, 4.a The results of the hydrostatic test of the as-built components identified in Table 2.4.4-2 as ASME Code Section III conform with the requirements of the ASME Code Section III.
- ITAAC 2.4.4-5, 4.b The results of the hydrostatic test of the as-built piping identified in Table 2.4.4-3 as ASME Code Section III conform with the requirements of the ASME Code Section III.
- ITAAC 2.4.4-5, 5.a.i The seismic Category I as-built equipment identified in Table 2.4.4-2 is located in the Containment and Reactor Building.
- ITAAC 2.4.4-5, 5.a.ii The results of the type tests and/or analyses concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
- ITAAC 2.4.4-5, 5.a.iii The as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions.
- ITAAC 2.4.4-5, 5.b Each of the as-built seismic category piping identified in Table 2.4.4-3 meets the seismic category requirements.
- ITAAC 2.4.4-5, 6.a.i The results of the type tests and/or analyses concludes that the Class 1E equipment identified in Table 2.4.4-2 as being qualified for a harsh environment can withstand the environmental conditions.
- **ITAAC 2.4.4-5, 6.a.ii The as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.4.4-2 as being qualified for a harsh environment are bounded by type tests and/or analyses.**
- ITAAC 2.4.4-5, 6.b The simulated test signal exists at the as-built Class 1E equipment identified in Table 2.4.4-2 under tests in the as-built ECCS.
- ITAAC 2.4.4-5, 6.c The as-built Class 1E electrical cables with only one division are routed in raceways assigned to the same division. There are no other safety division electrical cables in a raceway assigned to a different division.

- ITAAC 2.4.4-5, 8. Controls in the MCR operate to open and close the as-built remotely operated valves listed in Table 2.4.4-2.
- ITAAC 2.4.4-5, 9.a.i Each motor-operated and air operated valve changes position as indicated in Table 2.4.4-2 under design conditions.
- ITAAC 2.4.4-5, 9.a.ii Each as-built motor operated and air operated valve changes position as indicated in Table 2.4.4-2 under pre-operational test conditions.
- ITAAC 2.4.4-5, 9.b. Upon loss of motive power, each as-built remotely operated valve identified in Table 2.4.4-2 assumes the indicated loss of motive power position.
- ITAAC 2.4.4-5, 11 The displays identified in Table 2.4.4-4 can be retrieved in the as-built MCR.
- ITAAC 2.4.4-5, 12 Displays and/or controls exist on the as-built RSC as identified in Table 2.4.4-4.

Table 2.4.4-2 Emergency Core Cooling System Equipment Characteristics (Sheet 3 of 4)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category 1	Remotely Operated Valve	Class 1E/ Qual. For Harsh Envir.	Active Safety Function	Loss of Motive Power Position
Accumulator Injection Line 1st Check Valves	SIS-VLV-102 A, B, C, D	1	Yes	No	-	Transfer Open	-
Accumulator Injection Line 2nd Check Valves	SIS-VLV-103 A, B, C, D	1	Yes	No	-	Transfer Open	-
Direct Vessel Injection Line 1st Check valves	SIS-VLV-012 A, B, C, D	1	Yes	No	-	Transfer Open	-
Direct Vessel Injection Line 2nd Check Valves	SIS-VLV-013 A, B, C, D	1	Yes	No		Transfer Open	-
Emergency Letdown Line 1st Isolation Valves	SIS-VLV-031 A, B, C, D	1	Yes	Yes	Yes / Yes	Transfer Open/ Transfer Closed	As Is
Emergency Letdown Line 2nd Isolation Valves	SIS-VLV-032 A, B, C, D	1	Yes	Yes	Yes / Yes	Transfer Open/ Transfer Closed	As Is

Table 2.4.4-4 Emergency Core Cooling System Equipment, Alarms, Displays and Control Functions (Sheet 1 of 2)

Equipment/Instrument Name	MCR Alarm	MCR Display	Control Function	RSC Display
Safety Injection Pumps (SIS-RPP-001A,B,C,D)	No	Yes	Yes	Yes
Safety Injection Pump Suction Isolation Valves (SIS-MOV-001A,B,C,D)	No	Yes	Yes	Yes
Safety Injection Pump Discharge Containment Isolation Valves (SIS-MOV-009A,B,C,D)	No	Yes	Yes	Yes
Direct Vessel Safety Injection Line Isolation Valves (SIS-MOV-011A,B,C,D)	No	Yes	Yes	Yes
Emergency Letdown Line 1st, 2nd Isolation Valves (SIS-MOV-031B,D and 032B,D)	No	Yes	Yes	Yes

NRC Pipe Support Example

ITAAC 2.3.4.2.ii – During late construction, damage to a fire protection system steel pipe support occurs after a motorized lift swings into it. The support is slightly bent, but the support's Hilti concrete anchor bolts and bases are pulled from the surrounding concrete.

It is not unusual for support drawings to allow some tolerance on the placement of the support anchors. That is, the anchors will be shown with a plus or minus 3 inch location.

Scenario 1

- Replacement/relocation of the pipe support within the location tolerance would be performed and documented IAW applicable maintenance procedures
- Repairs IAW approved procedures maintain the validity of the original ITAAC closure letter
- This action would not be included in any written ITAAC closure status update notification to the NRC

Scenario 2

1. If the repair could not be performed within the allowed tolerance, then a design change would be processed to authorize the repair.
2. The ITAAC Close-out Package would be updated to reflect the additional engineering evaluation
3. NRC would be notified of the change IAW applicable design change reporting requirements
4. This action would not be included in any written ITAAC closure status update notification to the NRC

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2. The FPS piping identified in Table 2.3.4-4 remains functional following a safe shutdown earthquake.	i) Inspection will be performed to verify that the piping identified in Table 2.3.4-4 is located on the Nuclear Island. ii) ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	iii) The piping identified in Table 2.3.4-4 is located on the Nuclear Island. iv) ii) The as-built piping stress report exists and concludes that the piping remains functional following a safe shutdown earthquake.

Table 2.3.4-4 FPS Piping Which Must Remain Functional Following a Safe Shutdown Earthquake

L049	L114	L142	L188
L090A	L115	L143	L189
L090B	L116	L144	L190
L091A	L117	L145	L191
L091B	L118	L146	L192
L091C	L119	L147	L193
L092A	L120	L148	L194

ITAAC Maintenance Example – EQ Testing/ADS

Example 1

A Fourth Stage ADS Squib Valve, RCS-PL-V004D is replaced because the valve body has been damaged beyond repair. However, when the valve is replaced the valve is purchased from another vendor that was not qualified by the initial EQ Testing.

- This issue will be documented in the CAP Process
- New Valve will be installed by the maintenance process
- The valve will tested as post maintenance testing IAW applicable maintenance procedures
- This is a change to determination basis of the original ITAAC closure letter to the NRC (for AP1000 ITAACs 2.1 02.05ai, ii, & iii)) and requires a Supplemental ITAAC closure letter to the NRC
- This component replacement would also be included in a notification to the NRC regarding ITAAC components that have been replaced
- The ITAAC Closure Package is updated to reflect the component replacement as notified to NRC and to incorporate the EQ documentation for the replacement valve

Example 2

The same Fourth Stage ADS Squib Valve, RCS-PL-V004D is replaced because the valve body has been damaged beyond repair. This time the valve is replaced with a "like for like" component from the original EQ tested vendor.

- This issue will be documented in the CAP Process
- Valve will be installed and post maintenance tested in accordance with the applicable maintenance procedures.
- This is an entire component replacement and thus would be included in a notification to the NRC regarding ITAAC components that have been replaced
- Valve replacement IAW approved procedures maintains the validity of the original ITAAC closure letter
- The ITAAC Closure Package is updated to reflect the component replacement as notified to NRC

AP1000 ITAACs 2.1 02.05ai, ii, & iii

5.a) The seismic Category I equipment identified in Table 2.1.2-1 can withstand seismic design basis loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.1.2-1 are located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.	i) The seismic Category I equipment identified in Table 2.1.2-1 is located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function. iii) A report exists and concludes that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions

ITAAC Maintenance Example – Hydrogen Igniter Testing

AP1000 ITAAC 2.3 09.03.ii

Design Commitment:	Inspections, Tests, Analyses:	Acceptance Criteria:
The VLS provides the nonsafety-related function to control the containment hydrogen concentration for beyond design basis accidents.	Operability testing will be performed on the igniters.	The surface temperature of the igniter exceeds 1700°F.

Hydrogen igniters VLS-EH-01 referenced in the DCD ITAAC Table is replaced and re-tested, like for like.

- This issue will be documented in the CAP Process
- Igniter will be installed and post maintenance tested in accordance with the applicable maintenance processes.
- Igniter replacement IAW approved procedures maintains the validity of the original ITAAC closure letter
- This is an entire component replacement and thus would be included in a notification to the NRC regarding ITAAC components that have been replaced
- The ITAAC Closure Package is updated to reflect the component replacement as notified to NRC

ITAAC Maintenance example – Electrical Separation

Example #1:

During Preoperational Testing it is determined that the instrumentation and controls for a system should be modified. As a result, a new instrument must be installed and new cable routed.

The problem is identified and tracked within the CAP Program.

A design change is processed to resolve the problem. (By definition for this example this is not a Tier 1 Design Change.) Design documents and drawings are issued or revised as required to provide implementation instructions for the change.

New cable and or raceway will be installed and verified to be in compliance with the separation criteria.

The NRC will be notified of the change IAW applicable design change reporting requirements

This ITAAC remains closed and the original ITAAC closure letter remains valid.

The ITAAC Closure Package is updated to reflect the change

Example #2:

During the demobilization of the Construction forces from an area, a conduit is damaged. As a result, the conduit is bent and violates physical separation requirements.

The problem is identified and tracked within the CAP Program.

A nonconformance is initiated in the Corrective Action Program to report the damage and to disposition how to resolve the issue. The separation violation is found to be minor and can be accepted as is within the analyzed design margin without the installation of additional barriers.

The ITAAC Closure Package is updated to reflect the engineering evaluation of the separation violation.

The engineering evaluation maintains the closure of the ITAAC and the original ITAAC closure letter remains valid.

ITAAC Statement – AP1000 ITAAC Item 3.3-6 7d on Electrical Separation

Design Commitment

ITAAC Table 3.3-6 7d) Physical separation is maintained between Class 1E divisions and between Class 1E divisions and non-Class 1E cables

Inspection/Test/Analysis

Inspections of the as-built Class 1E raceways will be performed to confirm that the separation between Class 1E raceways of different divisions and between Class 1E raceways and non-Class 1E raceways is consistent with the following:

- Within the main control room and remote shutdown room, the minimum vertical separation is 3 inches and the minimum horizontal separation is 1 inch.

- Within other plant areas (limited hazard areas), the minimum separation is defined by one of the following:
  1) The minimum vertical separation is 5 feet and the minimum horizontal separation is 3 feet.
  2) The minimum vertical separation is 12 inches and the minimum horizontal separation is 6 inches for raceways containing only instrumentation and control and low-voltage power cables <2/0 AWG.
  3) For configurations that involve exclusively limited energy content cables (instrumentation and control), the minimum vertical separation is 3 inches and the minimum horizontal separation is 1 inch.
  4) For configurations involving an enclosed raceway and an open raceway, the minimum vertical separation is 1 inch if the enclosed raceway is below the open raceway.
  5) For configuration involving enclosed raceways, the minimum separation is 1 inch in both horizontal and vertical directions.

- Where minimum separation distances are not maintained, the circuits are run in enclosed raceways or barriers are provided.

- Separation distances less than those specified above and not run in enclosed raceways or provided with barriers are based on analysis

– Non-Class 1E wiring that is not separated from Class 1E or associated wiring by the minimum separation distance or by a barrier or analyzed is considered as associated circuits and subject to Class 1E requirements.

Acceptance Criteria

Results of the inspection will confirm that the separation between Class 1E raceways of different divisions and between Class 1E raceways and non-Class 1E raceways is consistent with the following:

– Within the main control room and remote shutdown room, the vertical separation is 3 inches or more and the horizontal separation is 1 inch or more.

– Within other plant areas (limited hazard areas), the separation meets one of the following:

1) The vertical separation is 5 feet or more and the horizontal separation is 3 feet or more except.
2) The minimum vertical separation is 12 inches and the minimum horizontal separation is 6 inches for raceways containing only instrumentation and control and low-voltage power cables <2/0 AWG.
3) For configurations that involve exclusively limited energy content cables (instrumentation and control), the minimum vertical separation is 3 inches and the minimum horizontal separation is 1 inch.
4) For configurations that involve an enclosed raceway and an open raceway, the minimum vertical separation is 1 inch if the enclosed raceway is below the raceway.
5) For configurations that involve enclosed raceways, the minimum vertical and horizontal separation is 1 inch.

– Where minimum separation distances are not met, the circuits are run in enclosed raceways or barriers are provided.

– A report exists and concludes that separation distances less than those specified above and not provided with enclosed raceways or barriers have been analyzed.

– Non-Class 1E wiring that is not separated from Class 1E or associated wiring by the minimum separation distance or by a barrier or analyzed is treated as Class 1E wiring.

ITAAC Maintenance Example – Fire Barrier Maintenance

Example

- During pre-operational testing, a cable is found to be defective. This will require cable replacement by pulling a new cable through a penetration that has already been sealed, inspected and the ITAAC closed.

    - This issue will be documented in the CAP Process

    - The new cable is routed through the penetration, the penetration is resealed using approved procedures (same as initial installation)

    - The applicable portion of the walk-down/inspection Procedure XXXX is re-performed confirming the integrity of the penetration

    - Rework of the penetration and the subsequent inspection are performed and documented IAW applicable maintenance procedures

    - This activity does not involve replacement of a component identified in ITAAC and thus no written ITAAC Closure Status Update notification to the NRC is needed.

    - The original ITAAC closure letter remains valid

Fire Barriers

ABWR

ITAAC 2.15.12 Item 3

ITAAC Number	Design Commitment	Inspections, Tests, or Analysis	Acceptance Criteria
2.15.12.3	Inter-divisional walls, floors, doors and penetrations, and penetrations in the external C/B walls to connecting tunnels, have a three-hour fire rating.	Inspections of the as-installed interdivisional boundaries and external wall penetrations to connecting tunnels will be conducted.	The as-installed walls, floors, doors and penetrations that form the inter-divisional boundaries, and penetrations in the external C/B walls to connecting tunnels, have a three-hour fire rating.