



FOR YOUR EYES ONLY

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October 1, 1981  
LS-81-104

Mr. A. F. Bournia  
U.S. Nuclear Regulatory Commission  
Phillips Building  
7920 Norfolk Avenue  
Bethesda, Maryland 20014

Dear Mr. Bournia:

Enclosed please find three copies of the attachment referred to in Mr. L. O. DelGeorge's recent letter regarding LaSalle County Station's Environmental Qualification program.

The attachment consists of the Component Application Statements which we said would be provided in our recent meeting with you and Mr. Philip A. DiBeneditto on September 16, 1981.

Sincerely,

Loren Stanley  
Group Manager  
Consulting Engineering

LS/bjk

cc: L. O. DelGeorge

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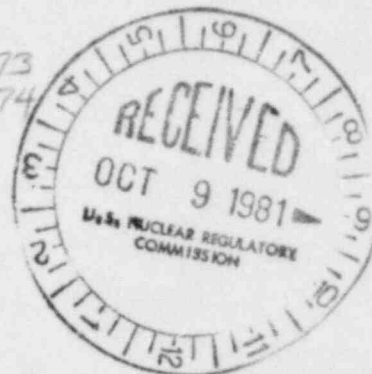


TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component AP-71E

This component is located in the Reactor Building, elevation 761', in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides motive and control power to the components shown in the reference key diagram - 480 volts MCC 135X-1 (Division 1).

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event in the Reactor Building or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will not affect the other 480 volt components in the electrical power distribution system.

(c) Impact on Other Systems

The components in the following systems are affected by the failure of this component; however, their operation is not required for this event.

1. Switchgear Heat Removal System  
VX-02C, VX-03C battery room exhaust fan
2. Hydrogen Recombiner System  
HGO-01B, HGO-02B, HGO-05B, HG-06B recombinder inlet and discharge valves.
3. Containment Monitoring System  
CM-02PA, CM-03PA sample pumps.

The components in the following systems are affected, but their six safety objective functions can be accomplished by the redundant components or alternate systems powered from redundant MCC's located in widely separated areas of the building. Physical obstructions, massive heat sinks, and limited discharge through the small line would limit the extent of the harsh environment such that failure of one is highly unlikely and if one were to fail the others would continue to provide the function.



TABLE M.5-1 (Cont.)

1. Nuclear Boiler System

B21-F019 (Containment isolation function)

The redundant valve B21-F016 is powered from MCC 136Y-2 located at elevation 740'

B21-F067A, B, C & D (Containment isolation function) main steam line drain

The redundant valves are B21-F022A, B, C & D are powered from RPS MG sets.

2. Primary Containment Purge System

VQ-029, VQ-040, VQ-026 (Containment isolation function)

The redundant valves VQ-027, VQ-030, VQ-031 are powered from Division 2 MCC 136X-2 located outside the harsh environment.

VQ-038 (Containment isolation function)

The redundant valve VQ-037 is powered from Division 2 MCC 136X-1 located at elevation 820'-1"

3. Reactor Core Isolation Cooling System

E51-F008, E51-F064 (Safe shutdown and core coverage functions)

The redundant system HPCS is powered from Division 3 MCC 145-1 located outside the harsh environment.

E51-F008, E51-F064 (Containment isolation function)

The redundant valve E51-F063 is powered from Division 2 MCC 136Y-2 located at elevation 740'.

4. Residual Heat Removal

E12-F008 (Containment isolation function)

The redundant valve E12-F009 is powered from Division 2 MCC 136Y-1 located at elevation 710'-6".

E12-F023 (Containment isolation function)

The redundant valves are check valves in the RCIC system.

E12-F008 (Shutdown cooling function)

The redundant valves E12-F004B and C (suppression pool cooling) are powered from Division 2 MCC 136Y-1, 136Y-2 located at elevations 710'-6" and 740'. E12-F312A is not required for H<sub>2</sub> recombiner cooling.

5. Reactor Water Clean-up System

G33-F004 (Containment isolation function)

The redundant valve G33-F001 is powered from Division 2 MCC 136Y-1 located at elevation 710'-6". G33-F040 is not required.

TABLE M.5-1 (Cont.)

6. Primary Containment Ventilation System

VP-053A, B; VP-063A, B (Containment isolation function)

The redundant valves VP-113A, B; VP-114A, B are powered from Division 2 MCC 136Y-1 located at elevation 710'-6"

(d) Operator Action

Essential safety systems are maintained on separate divisional power. Safe shutdown is accomplished with any one entire division failing. Consequently, no operator action is required to meet the six safety objectives for the Instrument Line Break. With respect to LOCA radiation, interim operation with this equipment is justified by the successful testing already completed and documented.

References:

Schematic: 1E-1-4000CT

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component AP-75E

This component is located in the Reactor Building, 740' elevation in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides motive and control power to the components shown in the references key diagram - 480 volts MCC 135Y-1 (Division 1).

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event in the Reactor Building or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will not affect the other 480 volt components in the electrical power distribution system.

(c) Impact on Other Systems

The components in the following systems are affected by the failure of this component; however, their operation is not required for this event.

1. Reactor Recirculation System:  
B33-F023A                      Reactor recirculation suction  
B33-F067A                      Reactor recirculation discharge  
B33-D003A                      Hydraulic control unit
2. Standby Liquid Control System:  
C41-C001A                      SLC pump  
C41-F001A                      SLC storage tank outlet  
C41-D002                      SLC tank heater
3. Control Rod Drive Hydraulic System:  
C11-F003                      CRD cooling water pressure
4. Reactor Water Cleanup System:  
G33-F101                      Drain Valve  
G33-F100                      Recirculation loop line to RWCU
5. Residual Heat Removal System  
E12-F064A                      Minimum flow bypass
6. Nuclear Boiler System  
B21-F065A                      Feedwater isolation

7. MSIV - Leakage Control System:  
E32-F001A,E,J,N MSIV inboard valves  
E32-F002A,E,J,N MSIV inboard valves

The components in the following systems are affected by the failure of this component but their six safety objective functions can be accomplished by the redundant components or alternate systems powered from redundant MCC's which are located in widely separated areas of the building. Physical obstructions, massive heat sinks, and limited discharge through the small line would limit the extent of the harsh environment such that failure of any one is highly unlikely and if one were to fail the others would continue to provide the function.

1. Primary Containment Purge System:

VQ-042, VQ-043 (Containment isolation function)

The redundant valves VQ-027, VQ-030, are powered from Division 2 MCC 136X-2 located outside harsh environment.

VQ-036, VQ-048, VQ-051 (Containment isolation function)

The redundant valves VQ-034, VQ-035, VQ-047, VQ-050 are powered from Division 2 MCC 136Y-1 located at 710'-6" elevation.

VQ-041 (Containment isolation function)

The redundant valve VQ-037 is powered from Division 2 MCC 136X-1 located at 820'-6" elevation

2. Residual Heat Removal System:

E12-F052A, E12-F087A (Residual heat removal function)

The redundant valves E12-F052B and E12-F087B are powered from MCC 136Y-2 located at 740' elevation

E12-F040A, B (Containment isolation function)

The redundant valves E12-F049A, B are powered from Division 2 MCC 136Y-1 located at 710'-6" elevation.

3. Reactor Building Closed Cooling Water System:

WR-029, WR-040 (Containment isolation function)

The redundant valves WR-179 and WR-180 are powered from Division 2 MCC 136Y-2 located at 740' elevation.

4. CSCS-ECWS

DG-035 (Core coverage function)

The redundant system HPCS is powered from Division 3 MCC 143-1 which is located outside the harsh environment.

(d) Operator Action

Essential safety systems are maintained on separate divisional power. Safe shutdown is accomplished with any one entire division failed. Consequently, no operator action is required to meet the six safety objectives for the instrument line break. With respect to LOCA radiation, interim operation with this equipment is justified by the successful testing already completed and documented.

References:

Schematic: 1E-1-4000DV



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component AP-76E

This component is located in the Reactor Building, 710'-6" elevation in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides motive and control power to the components shown in the reference key diagram - 480 volt, MCC 135Y-2 (Division 1).

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event in the Reactor Building or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will not affect the other 480 volt components in the electrical power distribution system.

(c) Impact on Other Systems

The components in the following systems are affected by the failure of this component; however, their operation is not required for this event.

1. Residual Heat Removal:  
E12-F073A, F074A     Heat Exchanger Vent  
E12-F024A             RHR test, containment spray to suppression pool  
E12-F016A, F017A     Containment spray  
                         F027A
2. Low Pressure Core Spray:  
E21-F012              LPCS test bypass to suppression pool  
E21-F011              LPCS minimum flow bypass
3. Reactor Building Equipment Drain System:  
RE-08PA              N.E. reactor building equipment drain sump pump  
RE-07PA              N.W. reactor building equipment drain sump pump
4. Diesel Fuel Oil System:  
OD001P                Diesel generator fuel transfer pump
5. MSIV Leakage Control System  
E32-C001              Inboard system blower  
E32-B001A,E,J,N      Pipe heaters  
E32-F002A,E,J,N      Inboard valves

The components in the following systems are affected by the failure of this component. But the six safety objective functions can be accomplished by the redundant components or alternate systems powered from redundant MCC's which are located in widely separated areas of the building. Physical obstructions, massive heat sinks, and limited discharge through the small line would limit the extent of the harsh environment such that failure of any one is highly unlikely and if one were to fail, the others would continue to provide the function.

1. Residual Heat Removal System:

E12-F053A, B (Containment isolation function)

The redundant valves E12-F050A, B are testable check valves. The redundant valves E12-F099A, B are powered from Division 2 MCC 1364-2 located at 740' elevation

E12-F004A, F047A, F048A, F003A, F026A, F068A, F011A, F006A (Residual heat removal function)

The redundant valves E12-F004B, F047B, F048B, F003B, F026B, F068B, F011B, F006B are powered from Division 2 MCC 1364-1 located at 710'-6" elevation.

E12-F042A (Core coverage function)

The redundant valve E12-F042B is powered from MCC 136Y-1 located at 710'-6" elevation. The alternate system HPCS (also available) is powered from Division 3 MCC 143-1 located outside the harsh environment.

2. Low Pressure Core Spray:

E21-F001, F005, C002 (Core coverage function)

The alternate system HPCS is powered from Division 3 MCC 143-1 which is located outside the harsh environment.

3. Core Standby Cooling System:

VY04C RCIC/LPCS pumps cooler fan (LPCS - core coverage, RCIC - safe shutdown functions)

The redundant fan VY02C for HPCS is powered from Division 3 MCC 143-1 which is located outside the harsh environment.

VY01C, (Core coverage function)

The redundant fan VY02C for HPCS is powered from Division 3 MCC 143-1 which is located outside the harsh environment.

VY01C, VY05C (Residual heat removal function)

The redundant fans VY03C, VY06C (RHR B/C) are powered from MCC 136Y-1 located at 710'-6" elevation.

4. Reactor Core Isolation Cooling System:

E51-C003 (Safe shutdown and core coverage).

The alternate system HPCS is powered from Division 3 MCC 143-1 which is located outside the harsh environment.

(d) Operator Action

Essential safety systems are maintained on separate divisional power. Safe shutdown is accomplished with any one entire division failed. Consequently, no operator action is required to meet the six safety objectives for the instrument line break. With respect to LOCA radiation, interim operation with this equipment is justified by the successful testing already completed and documented.

References:

Schematic: 1E-1-4000CV

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component AP-78E

This component is located in the Reactor Building, elevation 820'-6" in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation for the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides motive and control power to the components shown in the reference key diagram - 480 volts MCC 136X-1 (Division 2).

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event in the Reactor Building or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will not affect the other 480 volt components in the electrical power distribution system.

(c) Impact on Other Systems

The components in the following systems are affected by this component failure; however, their failure will not affect achieving the six safety objectives.

1. Reactor Protection MG set room (1) battery room exhaust fan (1VX08C and 1VX05C)
2. Refueling platform (1F21-E003)

The following components are affected by the failure of this MCC, but their six safety objective functions can be accomplished by the redundant components found in the same or other systems powered from redundant MCC's located in widely separated areas of the building. Physical obstructions, massive heat sinks, and limited discharge through the small line would limit the extent of the harsh environment such that failure of any one is highly unlikely and if one were to fail the others would continue to provide the function.

1. Primary Containment Vent Exhaust to Purge Train Isolation Valve (1VQ-037).

The redundant valve is 1VQ-038 which is powered by Division 1 MCC 135X-1 located in elevation 761'.

TABLE M.5-1 (Cont.)

2. Control Room HVAC Supply Fans (OVC-01CA and OVC-02CA)

The redundant control room HVAC supply fans (OVC-01CB and OVC-02CB) are powered by Division 2 MCC 236X-1 located in Unit 2.

3. Standby Gas Treatment Isolation Valves (1VG-001 and 1VG-003), auxiliary relay power for 1VG-01C, 1VG-02C and 1VG-001, standby gas treatment equipment train cooling fan (WG-02C), heating coil (1VG-01A) and supply fan (1VG-01C) will fail should this MCC fails. Unit 2 can be used as a backup for Unit 1 provided isolation valve 1VG-001 can be opened manually by plant personnel.

(d) Operator Action

Essential safety systems are maintained on separate divisional power. Safe shutdown is accomplished with any one entire division failing. Consequently, no operator action is required to meet the six safety objectives for the Instrument Line Break Event. With respect to LOCA radiation, interim operation with this equipment is justified by the successful testing already completed and documented.

References:

Schematic: 1E-1-4000CV



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component AP-82E

This component is located in the Reactor Building, elevation 710'-6", in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside the Containment and high radiation from the LOCA inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides motive and control power to the components shown in the reference key diagram - 480 volts MCC 136Y-1 (Division 2).

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event in the reactor building or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will not affect the other 480 volt components in the electrical power distribution system.

(c) Impact on Other Systems

The components in the following systems are affected by this component failure, however, their failure will not affect achieving the six safety objectives.

1. Main steam line drain valve B21-F020 is not required for containment isolation.
2. RHR Loop B pump minimum flow bypass valve E12-F064B to the suppression pool is not required to operate for this event. RHR system operation is not affected by the failure of this component.
3. RHR B/C water leg pump E12-C003. Failure of this valve does not affect operation of RHR Loop A for this event. LPCS, HPCS and RCIC are available as backup.
4. RHR system emergency make up water cross-tie valve E12-F093. Failure of this valve has no effect in the operation of the RHR system.
5. RHR pump E12-C002B test return line discharge to the suppression pool (E12-F021). This valve is not required for RHR system operation.

TABLE M.5-1 (Cont.)

6. S. E. reactor building sump pump 1A (RE-03PA) and south reactor floor drain sump 1A (RF-02PA) are NON-ESS, therefore, it is not required to function during this event.
7. Diesel generator fuel transfer pump (1D0-01P).
8. Hydrogen recombiner valves 1E12-F312B, 1HG-001A, 1HG-002A, 1HG-006A, 1HG-009, 1HG-003 and 1HG-018 are not required to operate for this event.
9. MSIV-LCS outboard blowers E32-C002B & F are not required to operate for this event.
10. Residual Heat Removal:

E12-F073B, F074B	Heat exchanger vent
E12-F024B	RHR test, containment spray to suppression
E12-F016B, F017B, F027B	pool
E12-F016B, F017B, F027B	Containment spray

The following components are affected by the failure of this MCC, but their function can be accomplished by the redundant components found in the same or other systems powered from redundant MCC's which are located in widely separated areas of the building. Physical obstructions, massive heat sinks, and limited discharge through the small line would limit the extent of the harsh environment such that failure of any one is highly unlikely and if one were to fail the others would continue to provide the function.

1. RHR pump suction valve E12-F004B from the suppression pool.  
The redundant valve is E12-F004A which is located in Division 1 MCC 135Y-2 located at elevation 710'-6"
2. RHR suction cooling inboard isolation valve E12-F009  
The redundant valve for this function is RHR suction cooling outboard isolation valve E12-F008 which is powered by Division 1 MCC 135X-1 located at elevation 761'.
3. RHR discharge to radwaste inboard isolation valve E12-F049A.  
The redundant valve to be used for isolation function is RHR discharge discharge to radwaste outboard isolation valve E12-F040A, B, which is provided by Division 1, MCC 135Y-1 located at elevation 740'.
4. Reactor water clean up system inboard isolation valve G33-F001.  
The redundant valve for this function is the RWCU system outboard isolation valve G33-F004 which is powered by Division 1 MCC 135X-1 located at elevation 761'.
5. RHR pumps B/C cubicle cooler fan IVY-03C  
Failure can occur to RHR pumps E12-L002 B & C due to high ambient temperature. RHR Pump A is available for Loop A to function since RHR Pump A cubicle cooler (IVY-01C) which is powered by Division 1 MCC 135Y-1 located at elevation 710'-6" is still operable.

TABLE M.5-1 (Cont.)

6. RHR service water pumps C,D cubicle cooler fan IVY-06C.  
Failure can occur to RHR Loop B service water pumps due to high ambient temperature. RHR Loop A service water pumps A, B cubicle cooler fan IVY-05C powered by Division 1 MCC 135Y-2 located at elevation 740' is available to service RHR Loop A operation.
7. Drywell Cooler 1A inlet inboard isolation valve IVP-113A, B  
The redundant valve to be used for this isolation function is the drywell cooler 1A outlet outboard isolation valve IVP-063A, B powered by Division 1 MCC 135X-1 located at elevation 761'.
8. Drywell Cooler 1A outlet inboard isolation valve IVP-114A, B  
The redundant valve to be used for this isolation function is the Drywell Cooler 1A outlet outboard isolation valve IVP-053A, B powered by Division 1 MCC 135X-1 located at elevation 761'.
9. Residual Heat Removal Function, E12-F004B, F047B, F003B, F026B, F006B, F068B, F011B  
  
The redundant valves E12-F004A, F047A, F048A, F003A, F026A, F006A, F068A, F011A are powered from Division 1 MCC 135Y-2 located at elevation 710'-6".
10. Core Coverage Function E12-F042B  
The redundant valve is powered from Division 1, MCC 135Y-2 located at elevation 710'-6". The alternate system HPCS (also available) is powered from Division 3, MCC 143-1 located outside the harsh environment.

(d) Operator Action

Essential safety systems are maintained on separate divisional power. Safe shutdown is accomplished with any one entire division failed. Consequently no operator action is required to meet the six safety objectives for the Instrument Line Break Event. With respect to LOCA radiation, interim operation with this equipment is justified by the successful testing already completed and documented.

References:

P&ID:

Schematic: 1E-1-4000CX

FCD:

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

1. Component AP 83E

This component is located in the Reactor Building, 740' elevation, in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside the Containment and high radiation from the LOCA inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides motive and control power to the components shown in the reference Key Diagram - 480V MCC 1364-Z (Div. 2).

(b) Effect of Component Failure

The failure of this component, due to the Instrument Line Break Event in the reactor building or the LOCA event, will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will not affect the other 480V components in the electrical power distribution system.

(c) Impact on Other Systems

The components in the following systems are affected by failure of this component; however, their operation is not required.

1. Reactor Recirculation System:

B33-F023B	Reactor recirculation suction
333-F067B	Reactor recirculation discharge
B33-D003	Hydraulic control unit

2. Standby Liquid Control System:

C41-C001B	SLC pump
C41-F001B	SLC tank outlet
C41-D003	SLC tank heater

3. Residual Heat Removal System:

E12-F094	RHR service water cross-tie
E12-F064C	RHR pump C minimum flow bypass

4. Reactor Core Isolation Cooling System:

E51-F076	RCIC steam line warm-up
E51-F086	RCIC vacuum breaker isolation

TABLE M.5-1 (Cont.)

The components in the following systems are affected by the failure of this component but the six safety objective functions can be accomplished by redundant components or alternate systems powered from redundant MCCs which are located in widely separated areas of the building. Physical obstructions, massive heat sinks, and limited discharge through the small line would limit the extent of the harsh environment such that failure of any one is highly unlikely and if one were to fail the others would continue to provide the function.

1. Nuclear Boiler System

B21-F016 (Containment isolation function)

The redundant valve B21-F019 (outboard isolation) is powered from Div. 1 MCC 135X-1 located at 761' elevation.

2. Residual Heat Removal System

E12-F042C (Core coverage function)

The alternate system HPCS is powered from Div. 3 MCC 143-1 which is located outside the harsh environment.

E12-F004C (Residual heat removal function)

The redundant valve E12-F004A (suppression pool cooling Loop A) is powered from Div. 1 MCC 135Y-2 located at 710'-6" elevation.

E12-F052B, F087B (Residual heat removal function)

The redundant valves E12-F052A, F087A are powered from Div. 1 MCC 135Y-1 located at 740' elevation.

E12-F099A, F099B (Containment isolation function)

The redundant valves E12-F053A, B (outboard isolation) are powered from Div. 1 MCC 135Y-2 located at 710'-6" elevation.

3. Primary Containment Purge System

VQ-034 & VQ-035, VQ-047, VQ-050 (Containment isolation function)

The redundant valves VQ-036, VQ-048, VQ-051 are powered from Div. 1 MCC 135Y-1 located at 740' elevation.

4. Reactor Building Closed Cooling Water System

WR 179, WR 180 (Containment isolation function)

The redundant valves WR 029, WR 040 are powered from Div. 1 MCC 135Y-1.



TABLE M.5-1 (Cont.)

5. Reactor Core Isolation Cooling System

E51-F063 (Containment isolation function)

This redundant outboard isolation valves E51-F003 & F064 are powered from Div. 1 MCC 135X-1 located at 761' elevation.

E51-F063 (Safe shutdown & core coverage functions)

The alternate system HPCS is powered from Div. 3 MCC 143-1 which is located outside the harsh environment.

(d) Operator Action

Essential safety systems are maintained on separate divisional power. Safe shutdown is accomplished with any one entire division failed. Consequently, no operator action is required to meet the six safety objectives for the Instrument Line Break Event. With respect to LOCA radiation, interim operation with the equipment is justified by the successful testing already completed and documented.

References:

Schematic: 1E-1-4000CY

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component DC 06E

This component is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment only for the Instrument Line Break Event in the RCIC/LPCS cubicle (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides motive and control power to the components shown in the reference Key Diagram - 250 VDC MCC 121V (Div. 1).

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event in the RCIC/LPCS cubicle will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will not affect the other 250 VDC or 480V components in the electrical power distribution system.

(c) Impact on Other Systems

The following components in RCIC system are affected by the failure of this component but their operations are not required:

E51-F022	RCIC test bypass to condensate storage tank
E51-F059	RCIC test bypass to condensate storage tank
E51-F080	RCIC vacuum breaker isolation

The following components in the RCIC system are affected; however, the safe shutdown and core coverage functions can be accomplished by HPCS system and the heat removal function can be accomplished by RHR system. The HPCS and RHR systems are powered from 480 V MCCs which are located outside the RCIC/LPCS cubicle and are not powered by separate electrical divisions which are not affected by this event.

RCIC	Barometric condenser vacuum pump
RCIC	Barometric condenser vacuum tank condensate pump
E51-F045	RCIC steam to turbine
E51-F010	RCIC pump suction from condensate storage tank
E51-F013	RCIC pump discharge
E51-F046	RCIC turbine cooling water supply
E51-F031	RCIC pump suction from suppression pool

TABLE M.5-1 (Cont.)

E51-F068	RCIC turbine exhaust
E51-F069	RCIC vacuum pump discharge
E51-C002	RCIC Turbine trip and throttle valve (part of turbine)

The uninterruptible power supply is not required.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Following accident confirmation based on leak detection, emergency procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In the analysis of LOCA and HELB, no credit is given

References:

Schematic: 1E-1-4000EC

OPEN ITEM

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component LT-CM-030; LT-CM-032; LT-CM-062

The Rosemount 1152 water level components are located in the reactor building in environmental zone H5E. Hence, these components are exposed to a harsh environment for the line break inside the HPCS cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the suppression chamber water level and transmit signals to indicators and recorders as part of the Containment Monitoring System.

(b) Effect on Component Failure

These Level Transmitter instruments do not have control functions. The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will not affect any safety function.

(c) Impact on Other Systems

The sole function of these components is to provide signals to suppression chamber level indicators and recorders. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. This device provides information only and performs no automatic function. Alternate similar information may be obtained. The operator will take action in accordance with the emergency procedures.

References:

P&ID: M-156, FSAR Figure 7.5-4, Sheet 3

Schematic: 1E-1-4018ZE, ZG

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PT-CM-027, PT-CM-028, PT-CM-029, PT-CM-031 and PT-CM-081

The Rosemount 1152 pressure transmitter components are located in the reactor building in environmental zone 4A. Hence, these components are exposed to a harsh environment only for the Instrument Line Break Event in the reactor building (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense drywell pressure and transmit signals to an indicator located in the remote shutdown panel and to recorders located in the main control room.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event in the reactor building will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RH, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the drywell pressure indications only. No systems operation is affected by the failure of these sensors. Furthermore, there are other reactor pressure signals available in the NSSS system such as PI-C34-R609, PR-C34-R609, PR-B21-R623AXB.

(c) Impact on Other Systems

The sole function of these components is to provide a drywell pressure signal to indicator and recorders for monitoring use. No other systems are affected by their failure.

(d) Operator Action

For the Instrument Line Break outside Containment, there is no drywell pressurization. Therefore, no operator action is required for this event. Operation procedures direct the operator that any anomalous indications should be ignored. All six safety objectives are met.

References:

P&ID: M-156, Sheet 3, Zone E-7

Schematic Diagram: 1E-1-4018ZG, ZE

FCD: FSAR Figure 7.5-4, Sheet 3



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PT-CM-055 and PT-CM-056

The Rosemount 1152 pressure transmitter components are located in the reactor building in environmental zone 4A. Hence, these components are exposed to a harsh environment only for the Instrument Line Break Event in the reactor building (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense suppression pool pressure and transmit signals to an indicator to monitor suppression pool pressure in the main control room.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event in the reactor building will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the suppression pool pressure readings in the control room. No system operation is affected by the failure of these components.

(c) Impact on Other Systems

The sole function of these components is to monitor the suppression pool pressure reading. No other systems are affected by their failure.

(d) Operator Action

For the Instrument Line Break Outside Containment, there is no containment pressurization. Therefore, no operator action is required for this event. Operation procedures direct the operator that any anomalous indications should be ignored. All six safety objectives are met.

References:

P&ID: M-156, Sheet 3, Zones C6 and C7

Schematic: 1E-1-4018ZF

FCD: FSAR Figure 7.5-4, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component OPDT-VD120, OPDT-VC160

These components are located in the Turbine Building in environmental zone H7. Hence, these components are exposed to a harsh environment for the Line Break Outside Containment (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This Validyne flow transmitter is required to monitor and provide indication of differential pressure between the auxiliary building and the control room.

(b) Effect of Component Failure

Failure of these components may provide false flow indication.

Failure of these components have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components.

(d) Operator Action

These devices provide information only and perform no automatic function. No operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4432BA

FCD: FSAR Figure 9.4-1, Sheet 17

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component OPDT-VC121, OPDT-VC161

These components are located in the turbine building in environmental zone H7. Hence, these components are exposed to a harsh environment for the Line Break Outside the Containment (see Section 4.3, page 4.23, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This Validyne flow transmitter is required to monitor and provide indication of differential pressure between the turbine building and the control room.

(b) Effect of Component Failure

Failure of these components may provide false flow indication.

Failure of these components have no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component.

(d) Operator Action

This device provides information only and performs no automatic function; therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic Diagram: 1E-1-4432BH

FSAR: Figure 9.4-1, Sheet 17

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component OPDT-VE028, OPDT-VE068

These components are located in the turbine building in environmental zone H7. Hence, these components are exposed to a harsh environment for the Feedwater Line Break Outside the Containment (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This Validyne flow transmitter is required to monitor and provide indication of differential pressure between the auxiliary building and the computer room.

(b) Effect of Component Failure

Failure of these components may provide false flow indication.

Failure of these components have no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component.

(d) Operator Action

This device provides information only and performs no automatic function. No operator action is required to achieve any of the six safety objectives.

References:

Schematic Diagram: 1E-1-4432BH

FSAR: Figure 9.4-1, Sheet 17

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component OPDT-VE029, OPDT-VD069

These components are located in the turbine building in environmental zone H7. These components are exposed to a harsh environment for the feedwater line break outside the containment (see Section 4.3, page 4-23 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These validyne transmitters are required to monitor and provide indication of differential pressure between the turbine building and the computer room.

(b) Effect of Component Failure

Failure of these components may provide false flow indication.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component.

(d) Operator Action

These devices provide information only and performs no automatic function. No operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4432BH

FSAR: Figure 9.4-1, Sheet 17



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component FT-VG003

This component is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This Validyne flow transmitter is required to provide flow indication through flow control damper VG002.

(b) Effect of Component Failure

Failure of this component may provide false indication of flow through the damper VG002.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component.

(d) Operator Action

The SGTS is not required for an instrument line break in the Reactor Building. There are two SGTS units that are physically separated such that for an instrument line break, one unit is always available. During the LOCA, the operator will take action in accordance with the emergency procedures.

References:

Schematic Diagram: 1E-1-4074AC

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component FT-VG009

This component is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This Validyne flow transmitter is required to provide flow indication and alarm for the SGTS air flow system.

(b) Effect of Component Failure

Failure of this component may provide false flow indication and alarm.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component.

(d) Operator Action

The SGTS is not required for an instrument line break in the Reactor Building. There are two SGTS units that are physically separated such that for an instrument line break, one unit is always available. During the LOCA, the operator will take action in accordance with the emergency procedures.

References:

Schematic Diagram: 1E-1-4074AC

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components TE-CMO37, TE-CMO38

The Weed type E4B temperature elements are located in the suppression pool in environmental zone H3. Hence, these components are exposed to a harsh environment only for the LOCA Inside Containment (see Section 4.1, page 4-2, of Quadrex Report QUAD-1 31-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense the suppression pool temperature and provide a signal for monitoring and recording.

(b) Effect of Component Failure

The failure of these components due to the LOCA inside containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the monitoring and recording of the suppression pool temperature.

(c) Impact on Other Systems

The sole function of these components is to monitor suppression pool temperature. No other systems are affected by their failure.

(d) Operator Action

These sensors are required only for a small break. The operator can initiate pool cooling per standard emergency procedures. Alternate temperature indication is available from RHR. The ADS can be used to de-pressurize.

References:

P&ID: M-156, Sheet 3

Schematic: IE-1-4018ZJ

FCD: FSAR Figure 7.5-4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component TE-CM029; TE-CM039

The Weed type E4B temperature elements are located in the wet well in environmental zone H3. Hence, this component is exposed to a harsh environment only for the LOCA Inside Containment (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component senses the temperature of the wet well air space and provides a signal for monitoring and recording.

(b) Effect of Component Failure

The failure of this component due to the LOCA inside containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the monitoring and recording of the wet well air space temperature.

(c) Impact on Other Systems

The sole function of this component is to monitor wet well air space temperature. No other systems are affected by this failure.

(d) Operator Action

Given a LOCA inside containment, LPCI will be initiated automatically. Following accident confirmation based on leak detection, using emergency procedures the operator will switch at least one train of LPCI to pool cooling and finally to shutdown cooling. This is done independent of wet well temperature indications. Therefore, no operator action is required for this event to meet the six safety objectives.

References:

P&ID:	M-156, Sheet 3
Schematic:	1E-1-4018ZJ
FCD:	FSAR Figure 7.5-4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components TE-CM058, TE-CM059, TE-CM060, TE-CM061

The Weed type E4B temperature elements are located in the drywell in environmental zone H2A. Hence, these components are exposed to a harsh environment only for the LOCA Inside Containment (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense the temperature of the drywell and provide a signal for monitoring and recording.

(b) Effect of Component Failure

The failure of these components due to the LOCA inside containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, Page 4-2, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the monitoring and recording of the drywell temperature.

(c) Impact on Other Systems

The sole function of these components is to monitor drywell temperature. No other systems are affected by their failure.

(d) Operator Action

These sensors are required only for a small break. Containment spray and drywell cooling are available and the ADS can be used as a backup to depressurize.

References:

P&ID: M-156, Sheet 3

Schematic: 1E-1-4018ZJ

FCD: FSAR Figure 7.5-4



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components TE-CM-057A, C, D, E, F, G, J, K, M, N, P, R, U, V

These Weed Model #611 RTD elements are located in the suppression pool of the reactor building in environmental zone H2. Hence, these components are exposed to a harsh environment only for the LOCA inside the containment (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense suppression pool temperature at distributed locations throughout the suppression pool which provide signals for monitoring and recording the suppression pool temperature information.

(b) Effect of Component Failure

The failure of these components due to the LOCA Inside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the monitoring of the suppression pool temperature.

(c) Impact on Other Systems

The sole function of these components is to monitor temperature in the suppression pool. No other systems are affected by their failure.

(d) Operator Action

These sensors are required only for a small break. The operator can initiate pool cooling per standard emergency procedures. Alternate temperature indication is available from RHR.

References:

P&ID: M-156, Sheet 3

Schematic: 1E-1-4018ZA, ZB, ZC, and ZD

FCD: FSAR Figure 7.5-4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component FC-VG003

This Love series 54 flow controller component is located in the Reactor Building in environmental zone H4B. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component controls the flow in the SGTS by adjusting the damper, and provides indicator signals.

(b) Effect of Component Failure

The failure of this component due to the Line Break Event or a LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the flow in the SGTS and 120V AC Division II power to the controls of the SGTS.

(c) Impact on Other Systems

The sole function of this component is to control the damper in the SGTS and provide indicator signals. No other systems are affected by its failure.

(d) Operator Action

The SGTS is not required for an instrument line break in the reactor building, and no operator action is necessary to meet the six safety objectives. In the event of high radiation from a LOCA inside containment, the SGTS will be available until the radiation levels reach some significant level ( $1 \times 10^7$  rads). There are two SGTS units which are physically separated with one unit always available. Following a LOCA, the operator may be required to switch to the alternate SGTS after a significant period of time ( $>10$  minutes).

References:

Schematic: 1E-1-4074AC

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components TY-CM057AA, AB, CA, CB, DA, DB, EA, EG, FA, FB, GA, GB, JA, JB, KA, KB, MA, MB, NA, NB, PA, PB, RA, RB, UA, UB, VA, VB

These Love series 54 temperature controllers are located in the reactor building in environmental zone H4. Hence, these components are exposed to a harsh environment only for the Instrument Line Break Event (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components provide water temperature information from various locations in the suppression pool to recorders for monitoring purposes.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the monitoring of the suppression pool water temperature.

(c) Impact on Other Systems

The sole function of these components is to provide signals for monitoring the suppression pool water temperature. No other systems are affected by their failure.

(d) Operator Action

This system is not required for an instrument line break outside containment; therefore, no operator action is required to meet the six safety objectives.

References:

FSAR: Figure 7.5-4

Schematic: 1E-1-4018ZA, ZB, ZC, and ZD

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component FS-VG009

This Love Controls, series 56, flow switch is located in the Reactor Building in environmental zone H4B. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides a switching function based on air flow, sends a permissive to the SGTS, and provides an alarm signal.

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the SGTS heater, the primary fan, and trip of the 15 ampere circuit breaker in Division II 120V AC power.

(c) Impact on Other Systems

The sole function of these components is to provide flow signals to the SGTS. No other systems are affected by their failure.

(d) Operator Action

The SGTS is not required for an instrument line break in the reactor building, and no operator action is necessary to meet the six safety objectives. In the event of high radiation from a LOCA inside containment, the SGTS will be available until the radiation levels reach some significant level ( $1 \times 10^7$  rads.). There are two SGTS units which are physically separated with one unit always available. Following a LOCA, the operator may be required to switch to the alternate SGTS after a significant period of time ( $> 10$  minutes).

References:

Schematic: 1E-1-4074AA, AC, AE

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component FS-VG036

This component is located in the reactor building in environmental zone H4B. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components provide a switching function based on air flow, and provide an alarm signal.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the alarming of the SGTS and trip of a 15 ampere current breaker in the 120V AC Division II power system.

(c) Impact on Other Systems

The sole function of these components is to provide flow alarm signals for the SGTS. No other systems are affected by their failure.

(d) Operator Action

The SGTS is not required for an instrument line break in the reactor building, and no operator action is necessary to meet the six safety objectives. In the event of high radiation from a LOCA inside containment, the SGTS will be available until the radiation levels reach some significant level ( $1 \times 10^7$  rads.). There are two SGTS units which are physically separated with one unit always available. Following a LOCA, the operator may be required to switch to the alternate SGTS after a significant period of time ( $> 10$  minutes).

References:

Schematic: 1E-1-4074AC, AE



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PL-17.1

The Systems Control local panel components are located in the reactor building in environmental zone H4B. Hence, these components are exposed to a harsh environment only for the Instrument Line Break Event (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852) and to high radiation for the LOCA event. The impact of component failure is considered only for these events.

(a) Component Function

These panels house the local components for the standby gas treatment system (SGTS) in the reactor building.

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event Outside Containment or high radiation from the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for these events will affect the ability to control the SGTS in the unit in which the accident occurs. The backup SGTS in the non-accident unit can provide the necessary function using its unaffected local control panel.

(c) Impact on Other Systems

The sole function of this panel is to house local components for the SGTS. No other systems are affected by their failure.

(d) Operator Action

The SGTS is not required for an instrument line break in the reactor building and no operator action is necessary to meet the six safety objectives. In the event of high radiation from a LOCA inside containment the SGTS will be available until the radiation levels reach some significant level ( $1 \times 10^7$  rads). There are two SGTS units which are physically separated with one unit always available. Following a LOCA, the operator may be required to switch to the alternate SGTS after a significant period of time ( $>10$  minutes).

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PL76J, PL77J

The Delphi K-IV Hydrogen-Oxygen Analyzer Panel components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components contain the post-LOCA primary containment  $H_2-O_2$  percentage recorders, and also provide inputs to the plant computer.

(b) Effect of Component Failure

The failure of these components due to the Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the capability to sample the  $H_2-O_2$  percentage inside the primary containment. This capability is not required for the Instrument Line Break Outside Containment event.

(c) Impact on Other Systems

The sole function of these components is to sample  $H_2-O_2$  percentage in the containment. No other systems are affected by their failure due to the Instrument Line Break Outside Containment.

(d) Operator Action

These devices are not required when the harsh environment caused by the line break exists. No operator action is required to achieve any of the six safety objectives for the instrument line break event. With respect to LOCA radiation, interim operation with this equipment is justified by the successful testing already completed and documented.

References:

P&ID: M-156, Sheets 1 and 2

Schematic: 1E-14018AH, AJ, and AM

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PLF5J

This Systems Control custom built RTD power supply cabinet is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This RTD power supply cabinet utilizes the 120 VAC source to power half of the RTDs (CM057A, C, E, F, M, P, V) used to monitor suppression pool temperature. RTD element 1 is powered by Bus A and element 2 by Bus B.

(b) Effect of Component Failure

Failure of this component for this event will affect monitoring of the suppression pool temperature and will trip the Bus A and B breakers which supply power to this cabinet.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The sole function of these components is to supply power to the suppression pool RTDs which monitor suppression pool temperature. No other systems are affected by this failure.

(d) Operator Action

The suppression pool temperature monitoring system is not required for the instrument line break outside of containment. This equipment is required only for a small break inside containment. The operator will initiate pool cooling in accordance with standard emergency procedures. Alternate temperature indication is available from the RHR system.

References:

P&ID: M-156, Sheet 3  
Schematic: 1E-1-4018ZA, ZG  
FCD: FSAR Figure 7.5-4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

1. Component PLF6J

This Systems Control custom built RTD power supply cabinet is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This RTD power supply cabinet utilizes the 120 VAC RPS source to power half of the RTDs (CM057D, G, J, K, N, R, V) used to monitor suppression pool temperature. RTD element 1 is powered by Bus A and element 2 by Bus B.

(b) Effect of Component Failure

Failure of this component for this event will affect the monitoring of the suppression pool temperature and will trip Bus A and B breakers which supply power to this cabinet.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The sole function of this component is to supply power to the suppression pool RTDs which monitor suppression pool temperature. No other systems are affected by this failure.

(d) Operator Action

The suppression pool temperature monitoring system is not required for the instrument line break outside of containment. This equipment is required only for a small break inside containment. The operator will initiate pool cooling in accordance with standard emergency procedures. Alternate temperature indication is available from the RHR system.

References:

P&ID: M-156, Sheet 3  
Schematic: 1E-1-4018ZC, ZD  
FCD: FSAR Figure 7.5-4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component FZ-VG003

The ITT General Controls NH-91 valve actuators are located in the reactor building in environmental zone H4A. This component is exposed to a harsh environment for the Instrument Line Break Outside the Containment and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components actuate flow control valves 1 and 2 VG002 located in the intake lines to the SGTS inlet lines in Units 1 and 2.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the operation of the SGTS in the unit subjected to the harsh environment. The backup unit in the non-accident will provide the alternate functional capability.

(c) Impact on Other Systems

The sole function of these components is to actuate the SGTS flow control valves located in the intake lines. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. For LOCA, the backup is the SGTS in the unaffected unit. The operator will take action in accordance with the emergency procedures.

References:

P&ID:	M-89, FSAR Figure 6.5-1
Schematic:	1E-1-4074AC
FCD:	FSAR Figure 7.3-21, Sheet 2, Zone B-6



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component OVC01AA, AB

The CVI electric heating coils are located in the Auxiliary Building in the environmental zone H9. Hence, these components are exposed to a harsh environment only for a LOCA event.

The sole function of these components is to heat the outside air entering the control room HVAC emergency makeup air filter train upstream of the filters.

The failure of the heating coils will not affect any other system.

The original conservative radiation calculations determined that these components were located in a harsh environment with a radiation level of  $5 \times 10^6$  rads. These components are therefore stated as being located in zone H9 (see page M.3-1.19 of this appendix). However, updated radiation dose calculations, summarized on the next page, indicate that the realistic dose will be  $9 \times 10^3$  rads.

It is therefore concluded that these components are in a mild environment and do not require qualification to NUREG 0588. Nevertheless, these components are provided with 100% redundancy.

# RADIATION DOSE CALCULATION SUMMARY

Item No.	Dose Component	<u>Dose Calculated</u>		<u>Realistic Dose</u>	
		<u>Rads</u>	<u>Location</u>	<u>Rads</u>	<u>Location</u>
1	Immersion Dose	$0.1 \times 10^3$	At Component	$0.1 \times 10^3$	At Component
2	From Refueling Floor	$3.0 \times 10^4$	At Point Adjacent to Refueling Floor	$3.0 \times 10^3$	At Component, shielded by 6 in. concrete from refueling floor.
3	From SGTS Piping	$8.7 \times 10^3$	1 in. from SGTS Piping	$1.0 \times 10^3$	At Component, located at least 10 ft. from SGTS piping.
4	From Filter	$7.5 \times 10^3$	3 ft. 6 in. from Filter	$3.1 \times 10^3$	At Component, located at least 5 ft. from filter.
5	Total Gamma Radiation (Items 1+2+3+4)	$4.6 \times 10^4$	-	$7.2 \times 10^3$	At Component
6	40 Year Normal Dosage	$0.7 \times 10^3$	-	$0.7 \times 10^3$	At Component
7	Beta Radiation	$0.1 \times 10^3$	-	$0.1 \times 10^3$	At Component
8	Total Radiation (Items 5+6+7)	$4.7 \times 10^4$	-	$8 \times 10^3$	At Component
9	10% Margin	$4.7 \times 10^3$	-	$8 \times 10^2$	At Component
10	Total Radiation Dose (Items 8+9)	$5.2 \times 10^4$	-	$9 \times 10^3$	At Component

## References:

P&ID: FSAR Fig. 9.4-1, Sheets 1 and 10  
Schematic: 1E-0-4432-AP

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VG01A

The CVI electric heating coils are located in the reactor building in environmental zone H4B. Hence, this component is exposed to a harsh environment only for the Instrument Line Break Event Outside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852) and to high radiation for the LOCA event. The impact of component failure is considered only for these events.

(a) Component Function

This component heats the SGTS gas upstream of the HEPA filter located in Units 1 and 2.

(b) Effect of Component Failure

The loss of this component due to the Instrument Line Break Event Outside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the operation of the SGTS in the unit subjected to the harsh environment. The backup system in the non-accident unit will provide the alternate functional capability.

(c) Impact on Other Systems

The sole function of this component is to heat SGTS gas upstream of the HEPA filter. No other systems are affected by their failure.

(d) Operator Action

The SGTS is not required for an Instrument Line Break in the reactor building and no operator action is necessary to meet the six safety objectives. In the event of high radiation from a LOCA Inside Containment, the SGTS will be available until the radiation levels reach some significant level ( $1 \times 10^7$  rads). Vendor certification for this component is  $6 \times 10^7$  rads. There are two SGTS units which are physically separated with one unit always available. Following a LOCA the operator may be required to switch to the alternate SGTS after a significant period of time ( $> 10$  minutes).

References:

P&ID: M-89

Schematic: 1E-1-4074AA

FCD: FSAR Figure 7.3-21, Sheet 2, Zone B-6

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HG01A

The Atomics International 211A (for unit 1) and 211B (for unit 2), Part No. N116000024-03, Hydrogen Recombiners are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components control the concentration of combustible gases in the primary containment following a LOCA, taking suction from the drywell area and returning the discharge to the suppression pool area in Units 1 or 2.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for these events will affect the operation of the Hydrogen Recombiner in the unit subjected to the harsh environment. The backup unit in the non-accident unit will provide the alternate functional capability.

(c) Impact on Other Systems

The sole function of these components is to control combustible gas concentration in Units 1 and 2. No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break Outside Containment exists. For LOCA considerations, the hydrogen recombiner on the unaffected unit serves as a back-up. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	M-130, Sheets 1 and 2
Schematic:	1E-1-4103AF
FCD:	FSAR Figure 6.2-33, Sheets 1 and 2

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F060A, B

These RHR system solenoid valves manufactured by Valcor, Model No. V52600-5292-2, are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the line break inside the RHR cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for obtaining water samples from the heat exchanger discharge and provide isolation function for the sample line.

(b) Effect of Component Failure

Failure of these components prevent obtaining water samples from the heat exchanger discharge. Failure of these components has no effect on the RHR system operation. E12-F075A & B are available as backup for isolating the sample line.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other systems, nor do they affect the operation of the RHR system.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. This device provides information only and performs no automatic function. Alternate similar information may be obtained from other sampling stations. The operator will take action in accordance with the emergency procedures.

References:

P&ID:	M-96, Sheet 4, Zones C2 and C7
Schematic:	1E-1-4220AV
FCD:	FSAR Figure 7.3-12, Sheet 4



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F075A, B

These RHR system solenoid valves manufactured by Valcor, Model No. V52600-5202-2, are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the line break inside the RHR cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for obtaining water samples from the heat exchanger discharge and provide isolation function for the sample line.

(b) Effect of Component Failure

Failure of these components prevent obtaining water samples from the heat exchanger discharge. Failure of these components has no effect on the RHR system operation. E12-F060A & B are available as backup for isolating the sample line.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other systems, nor do they affect the operation of the RHR system.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. This device provides information only and performs no automatic function. Alternate similar information may be obtained from other sampling stations. The operator will take action in accordance with the emergency procedures.

References:

P&ID:	M-96, Sheet 4, Zones C2 and C7
Schematic:	1E-1-4220AV
FCD:	FSAR Figure 7.3-12, Sheet 4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F097

The RHR cross-tie vent to radwaste valve (E12-F097) is manufactured by Valcor, Model No. V56200-5292-2 and located in the RHR cubicle in environmental zone H6. This component is exposed to a harsh environment for the instrument line break outside the containment and the high radiation from the LOCA inside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR service water cross-tie vent to the radwaste system.

(b) Effect of Component Failure

Failure of these components causes the valves to fail open and provide a permanent vent into the radwaste system. E12-F093 and F094 are available as backup to shut off the RHR service water vent to the radwaste system.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other systems, nor do they affect the operation of the RHR system.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	M-96, Sheet 4, Zone F-2
Schematic:	1E-1-4220CE
FSAR:	7.3-11, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component IN100, IN101

These Valcor V52600-5800-1 solenoid valves are located in the reactor building in environmental zone H4A. This component is exposed to a harsh environment for the Instrument Line Break Outside the Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4.32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These solenoid valves are required for isolating the pneumatic system lines serving the drywell for maintenance.

(b) Effect of Component Failure

Failure of these components may disable the drywell pneumatic system but operation of these components is not required to achieve the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

For these events, no other systems are affected by the failure of these components. These components have no electrical interface with components of any other system.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break Outside the Containment and the high radiation from the LOCA inside the containment exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-66, Sheet 7

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PC001A, B, C, D (Limit Switch)

These limit switches are located in the Drywell in environmental zone H2A. Hence these components are exposed to a harsh environment only for the LOCA (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components are used for vacuum breaker valve position indications only.

(b) Effect of Component Failure

Failure of these components could provide a false indication of vacuum breaker valve positions.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other systems, nor do they affect the operation of the vacuum breaker valves PC001A, B, C, D.

(d) Operator Action

These devices perform their surveillance function before they are affected by the LOCA harsh environment. Diverse indication is available such as dry well and suppression pool pressure compared to expected LOCA parameters. These devices provide information only and perform no automatic function. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 2, Zone D-6, D-3

Schematic: IE-1-4232-AL

FCD: FSAR Figure, None

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-F001

The Limitorque Type SMB is located in the drywell in environmental zone H2A. Hence, this component is exposed to a harsh environment only for the LOCA inside the drywell (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component is used for reactor head vent discharge to the radwaste system.

(b) Effect of Component Failure

Failure of this component prevents operation of this valve and disables the reactor head vent discharge to the radwaste system. This valve is used in conjunction with B21-F002 to provide a discharge path to the radwaste system. Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components on this system or any other system.

(d) Operator Action

This component is not required for this event. This valve is closed during reactor operation and no operator action is required to meet the six safety objectives, because this device is in the position to perform its intended safety function.

References:

P&ID: M-139, Sheet 4, Zone E-2

Schematic: 1E-1-4200 AB

FCD/FSAR: Fig. 7.3-13, Sheet 5, Zone B-7



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-F002

The Limitorque Type SMB is located in the drywell in environmental zone H2A. Hence, this component is exposed to a harsh environment only for the LOCA inside the drywell (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component is used for reactor head vent discharge to the radwaste system.

(b) Effect of Component Failure

Failure of this component prevents operation of this valve and disables the reactor head vent discharge to the radwaste system. This valve is used in conjunction with B21-F001 to provide a discharge path to the radwaste system. Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components on this system or any other systems.

(d) Operator Action

This component is not required for this event. The valve is closed during reactor operation and no action is required. Consequently, no operator action is required to meet the six safety objectives, because this device is in the position to perform its intended safety function.

References:

P&ID: M-139, Sheet 4, Zone E-2

Schematic: 1E-1-4200 AB

FCD/FSAR: Fig. 7.3-13, Sheet 5, Zone B-7

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-F005

The Limitorque type SMB is located in the drywell in environmental zone H2A. Hence, this component is exposed to a harsh environment only for the LOCA inside the drywell (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component is used for reactor head vent discharge to main steam line "A".

(b) Effect of Component Failure

Failure of this component prevents closure of this valve and maintains the reactor head vent discharge to main steam line A. This valve is not required to function during an accident. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves. Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components on this system or any other system.

(d) Operator Action

This component is not required for this event. The valve is open during reactor operation and no further action is required. Consequently, no operator action is required to meet the six safety objectives, because this device is in the position to perform its intended safety function.

References:

P&ID: M-55, Sheet 1, Zone C-7

Schematic: 1E-1-4200 AB

FCD/FSAR: Fig. 7.3-13, Sheet 5, Zone B-7

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-F016

This motor operated valve is located in the primary containment in environmental zone H2A. Hence, this component is exposed to a harsh environment only for the LOCA inside the containment (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852).

(a) Component Function

This motor operated valve is required for containment isolation of the main steam drain line.

(b) Effect of Component Failure

Failure of the valve operator under the worst condition will prevent valve closure upon receiving isolation signals from the primary containment and reactor vessel isolation system. Containment isolation is achieved by automatic closing of the outboard isolation valve B21-F019, which is located outside the containment and is not affected by this event. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of this component due to the LOCA inside containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity, and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this valve is for containment isolation. No other systems are affected by failure of this valve motor operator.

(d) Operator Action

Since isolation is achieved by the outboard valve, no operator action is required to meet the six safety objective.

References:

P&ID: M-116, Sheet 7, Zone B-7

Schematic: 1E-1-4232AF; 1E-1-4203AM

FCD: FSAR Figure 7.3-13, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F009

This motor operated valve is located in the primary containment in environmental zone H2A. Hence, this component is exposed to a harsh environment only for the LOCA inside the containment (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for this event.

(a) Component Function

This motor operated valve is required for containment isolation of the RHR system.

(b) Effect of Component Failure

Failure of the valve operator in the worst condition will prevent valve closure upon receiving isolation signals from the primary containment and reactor vessel isolation system. Containment isolation is achieved by automatic closing of the outboard isolation valve E12-F008, which is located outside the containment and is not affected by this event. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of this component due to the LOCA inside containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this valve is for containment isolation. No other systems are affected by failure of this valve motor operator.

(d) Operator Action

The isolation function is accomplished by the outboard valve. For the LOCA event, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-142, Sheet 3, Zone D-7

Schematic: 1E-1-4220BD

FCD: FSAR Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F099A, B

These motor operated valves are located in the primary containment in environmental zone H2A. Hence, these components are exposed to a harsh environment only for the LOCA inside the containment (see Section 4.1, Page 4-2, of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for this event.

(a) Component Function

These motor operated valves are required for RHR shutdown cooling warmup.

(b) Effect of Component Failure

These valves are normally closed and are open only during warmup of the shutdown cooling lines. Failure of these valve operators during warmup will prevent closure of these valves upon receiving isolation signals from the primary containment and reactor vessel isolation system. Containment isolation is achieved by automatic closure of outboard valves E12-F053A and B which are located outside the containment. Therefore, they are not affected by the LOCA event. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of these components due to the LOCA inside containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these valves are for warming up the RHR shutdown cooling lines. No other systems are affected by failure of these valve motor operators.

(d) Operator Action

Since isolation is achieved by the outboard valve, no operator action is required to meet the six safety objectives.

References:

P&ID: M-96, Sheet 1, Zone C-7, C-8

Schematic: 1E-1-4220CH

FCD: FSAR Figure 7.3-12, Sheet 3



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F063

This motor operated valve is located in the primary containment in environmental zone H2A. Hence, this component is exposed to a harsh environment only for the LOCA inside containment (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for this event.

(a) Component Function

This motor operated valve is required for containment isolation of the RCIC steam line.

(b) Effect of Component Failure

Failure of the valve operator under the worst condition will prevent valve closure upon receiving an isolation signal. Containment isolation is achieved by automatic closing of out-board isolation valve E51-F064. This valve is located outside containment and is not affected by this event. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of this component due to the LOCA inside containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this valve is for containment isolation upon receiving RCIC isolation signals. No other systems are affected by the failure of this valve motor operator.

(d) Operator Action

This valve is not required for the LOCA inside containment. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-101, Sheet 1, Zone E-8

Schematic: 1E-1-4226AX; 1E-1-4226AF

FCD: FSAR Figure 7.4-2, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F076

This motor operated valve is located in the primary containment in environmental zone H2A. Hence, this component is exposed to a harsh environment only for the LOCA inside the containment (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for this event.

(a) Component Function

The motor operated valve is required for containment isolation in the RCIC steam line.

(b) Effect of Component Failure

Failure of the valve operator under the worst condition will prevent valve closure upon receipt of an isolation signal. Containment isolation is by automatic closing of the outboard isolation valve E51-F064. This valve is located outside the containment; therefore, it is not affected by this event. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of this component due to the LOCA inside containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this valve is containment isolation upon receiving the RCIC isolation signal. No other systems are affected by the failure of this valve motor operator.

(d) Operator Action

This valve is not required for the LOCA inside containment. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-101, Sheet 1, Zone E-8

Schematic: 1E-1-4226AX; 1E-1-4226AF

FCD: FSAR Figure 7.4-2, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component G33-F001

The Limitorque Type SMB is located in the drywell in environmental zone H2A. Hence, this component is exposed to a harsh environment only for the LOCA inside the drywell (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component is used for RWCU system isolation and pump suction from the RPV to the regenerative heat exchangers.

(b) Effect of Component Failure

Failure of this component prevents operation of RWCU pumps (C001 A, B and C) and disables inboard isolation function of this valve. Outboard isolation valve G33-F004 is available as a backup to isolate the suction line from the RPV to the RWCU heat exchanger. Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components of other systems, nor does it affect the isolation function of the outboard isolation valve G33-F004.

(d) Operator Action

RWCU is a closed loop system back to the vessel and no isolation is necessary for this event. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-143, Sheet 1, Zone E-7

Schematic: 1E-1-4228AK

FCD: FSAR Figure 7.7-14

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component G33-F102

This valve will be deleted from Appendix M list since it serves no safety function and does not need to be qualified.

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VP-113A & B

These motor operated valves are located in the primary containment in environmental zone H2A. Hence, these components are exposed to a harsh environment only for the LOCA Inside Containment (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-82-852). The impact of this component failure is considered only for this event.

(a) Component Function

These motor operated valves are required for containment isolation of the primary containment chilled water systems.

(b) Effect of Component Failure

Failure of these valve operators in the worst condition will prevent closure of these valves upon receiving an isolation signal from the primary containment and reactor vessel isolation system. Containment isolation is achieved by automatic closure of outboard valves VP-063A & B, which are located outside the containment, and are not affected by this event. In addition, this is a closed system within primary containment. The failure of these components due to the LOCA Inside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852). No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

The sole function of these valves is to serve as an inlet/isolation valve for the primary containment chilled water coolers. No other systems are affected by failure of these valves.

(d) Operator Action

These valves are not required for the LOCA Inside Containment. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-86, Zone D-2, B-2

Schematic: 1E-1-4081AK & AL



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VP-114A & B

These motor operated valves are located in the primary containment in environmental zone H2A. Hence, these components are exposed to a harsh environment only for the LOCA Inside Containment (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for this event.

(a) Component Function

These motor operated valves are required for primary containment isolation.

(b) Effect of Component Failure

Failure of these valve operators in the worst condition will prevent closure of these valves upon receiving isolation signals from the primary containment and reactor vessel isolation systems. However, containment isolation is achieved by automatically closing outboard valves VP-053A & B, which are located outside the containment and are not affected by this event. In addition, this is a closed system within primary containment. The failure of this component due to the LOCA Inside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852). No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

The sole function of these valves is to serve as an outlet/isolation valve for the primary containment chilled water coolers. No other systems are affected by failure of these valves.

(d) Operator Action

These valves are not required for the LOCA Inside Containment. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-86, Zone E-2, C-2

Schematic: 1E-1-4081AK & AL

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component WR 179, WR 180

These components are located in the drywell in environmental zone H2A. Hence, these components are exposed to a harsh environment only for the LOCA inside containment (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components are required for Reactor Building Closed Cooling Water (RBCCW) line isolation (inboard).

(b) Effect of Failure

Failure of these components will prevent isolation of RBCCW line (inboard). WR 029 and WR040 outboard isolation valves are located outside the primary containment and are not affected by this event and are available for isolation.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other components or systems are affected by these components. These components have no electrical interface with other components of this system or any other systems.

(d) Operator Action

Since the outboard isolation valves are not affected for a LOCA inside containment, automatic isolation will occur. In addition, the RBCCW system is a closed system back to the drywell. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-90, Sheet 2, Zone B-7

Schematic: 1E-1-4096AE

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-F019

This motor operated valve is located in the Main Steam Tunnel in environment zone H5C. Hence, this component is exposed to a harsh environment for the Line Break inside the steam tunnel, (see Section 4.2, page 4-12 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for isolation of the main steam drain lines.

(b) Effect of Component Failure

Failure of the valve operator will prevent valve closure upon receiving isolation signals from the primary containment and reactor vessel isolation system. Isolation is achieved by automatically closing the inboard isolation valve B21-F016, which is located inside the containment and is not affected by this event. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this valve is containment isolation. No other systems are affected by failure of the MOV.

(d) Operator Action

This device performs its functions before it is affected by the LOCA radiation harsh environment and isolation is achieved by the inboard valve; therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-116, Sheet 7, Zone B-7

Schematic: 1E-1-4232-AF, 1E-1-4203-AM

FCD/FSAR: Figure 7.3-13, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-F065A & B

The Limitorque type SMBs are located in the Main Steam Tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment for the Line Break in the steam tunnel and high radiation from the LOCA Inside Containment (see Section 4.2, page 4-12 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for long term isolation of the feedwater supply into the RPV.

(b) Effect on Component Failure

Failure of these components prevents operation of these valves and prevents complete isolation of the feedwater supply to the RPV. These valves are not required during an accident to provide make-up water to the RPV; other ECCS are available for this purpose. Two check valves in series will assure isolation. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of these components has no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other systems, nor do they affect the operation of the safeguard systems.

(d) Operator Action

Feedwater is not required for this event; however, if the valve is open, feedwater remains available as a makeup inventory source. If the valve is closed, feedwater is lost and the ECCS systems provide make-up as designed; consequently, no operator action is required to meet the six safety objectives.

References

P&ID: M-57, Sheet 1, Zone B-5 & C-5

Schematic Diagram: 1E-1-42200AD

FCD: FSAR Fig. 7.3-13, Sheet 5

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-F067 A, B, C, D

The Limitorque Type GMBs are located in the main steam tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment for the Line Break in the Steam Tunnel and high radiation from the LOCA Inside Containment (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for draining condensate from main steam lines A, B, C and D to the main condenser and also provide out-board isolation for main steam drain lines A, B, C and D. These valves are closed during reactor operation above 50% power.

(b) Effect of Component Failure

Failure of these components prevents draining condensate from the main steam lines to the main condenser and prevents isolation of the drain lines at less than 50% power. The inboard isolation valves B21-F022A, B, C and D are available as backup to provide steam line isolation required to maintain containment integrity. Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other components or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other system.

(d) Operator Action

The valves are closed during reactor operation above 50% power and no operation action is required. If the valve fails open, at or below 50% power during these events, diverse signals will automatically initiate closure of the inboard MSIV's. No operator action is required to meet the six safety objectives.

References:

P&ID:	M-55, Sheet 7, Zones E-5, 6 and 7
Schematic:	1E-1-4203 AL, AM
FCD:	FSAR Figure 7.3-13, Sheet 5



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

1. Component C41-F001A & B

The Limitorque type SMBs are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment only for the Instrument Line Break in the reactor building (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components are used for standby liquid control storage tank pump suction.

(b) Effect of Component Failure

Failure of these components prevents operation of these valves and shutoff the standby liquid tank supply suction line to the standby liquid control pumps. These components are not required for reactor scram, containment isolation or for core coverage during an accident. Therefore, failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

These valves have no electrical interface with other components or other systems, nor do they affect the operation of other safeguard systems.

(d) Operator Action

The Standby Liquid Control System is not used for any break. Therefore, no operator action is required for this event and the six safety objectives are met.

References:

P&ID: M-99, Zones B-3 & C-3

Schematic Diagrams: 1E-1-4209AC

FCD: FSAR Figure 7.4-4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component DG035

This motor operated valve is located in the RCIC/LPCS cubicle which is in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for LPCS pump cooling.

(b) Effect of Component Failure

This is a normally open valve in the position to perform its safety function and would fail as-is. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components on this system or any other systems.

(d) Operator Action

This device is in the position to perform its intended safety function. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-87, Sheet 2, Zone E4

Schematic: 1E-1-4009AQ

TABLE M.5-1

m) COMPONENT APPLICATION STATEMENT

Component E12-F003A, B

These MOVs are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the Line Break Outside the Containment in the RHR cubicle and high radiation from the LOCA inside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves control the shell side discharge of the RHR heat exchangers.

(b) Effect of Component Failure

Failure of these components will affect the flow of the RHR system on the output of the shell side of the heat exchanger. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves. The failure of these components due to the Instrument Line Break Outside the Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide control for the RHR flow from the outlet of the heat exchanger. No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the line break exists. They are in the position to perform their intended safety function. The RHR heat exchanger in the unaffected loop is available to provide cooling. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 4  
Schematic: 1E-1-4220AX, AY  
FCD: FSAR Figure 7.3-11

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F004A, B, C

These motor operated valves are located in the reactor building in environmental zone H5E. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for these events.

(a) Component Function

These motor operated valves isolate the suppression pool suction line to the RHR pumps.

(b) Effect of Component Failure

These valves are always in the position to perform their intended safety function. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of these components due to the Instrument Line Break Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

No other systems are affected by failure of these valve motor operators.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break and LOCA radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheets 1, 2, 3, Zones A-7, B-7, C-7

Schematic: 1E-1-4220-AX, AZ, AL, 3L

FCD/FSAR: Figure 7.3-12

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F006 A, B

These motor operated valves are located in the Reactor Building in environmental zone H6. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for these events.

(a) Component Function

These motor operated valves are required for RHR shutdown cooling.

(b) Effect of Component Failure

These valves are always in the position to perform their intended safety function. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of these components due to the Instrument Line Break Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these valves is for RHR shutdown cooling. Failure of these valve motor operators does not affect other systems.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break or LOCA radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheets 1, 2, Zones A-6, B-6

Schematic: 1E-1-4220-BA, 1E-1-4220-BB, 1E-1-4220-AH

FCD/FSAR: Figure 7.3-21, Sheet 5



TABLE M.5-1 (Cont.)

M) COMPONENT APPLICATION STATEMENT

Component E12-F008

This motor operated valve is located in the Reactor Building in environmental zone H5B. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-3 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for containment isolation of the RHR system.

(b) Effect of Component Failure

Failure of the valve operator under the worst condition will prevent valve closure upon receiving isolation signals from the primary containment and reactor vessel isolation system. Containment isolation is achieved by automatically closing inboard valve E12-F009, which is located inside containment and is not affected by the instrument line break event. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

The failure of this component due to the Instrument Line Break Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this valve is to serve as an RHR suction cooling outboard isolation valve for the RHR system. No other system is affected by the failure of this valve.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break event exists. It performs its function before it is affected by the LOCA radiation harsh environment. For the LOCA event, no operator action is required to achieve any of the six safety objectives. The operator will take action in accordance with the emergency procedures to initiate shutdown cooling in the case of the instrument line break.

References:

P&ID: M-96, Sheet 3, Zone C-6  
Schematic: 1E-1-4220-BC  
FCD/FSAR: Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F011A&B

These MOVs are located in the RHR cubicles in environmental Zone H6. Hence, these components are exposed to a harsh environment for the Line Break Outside the Containment in the RHR cubicle and high radiation from the LOCA inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operator valves are required for RHR loop A and B heat exchanger discharge to the suppression pool.

(b) Effect of Component Failure

Failure of these components may disable either the RHR Loop A or Loop B steam condensing mode but this mode is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by the failure of these motor operator valves. These valves have no electrical interface with other components of any other systems.

(d) Operation Action

These devices are not required when the harsh environment caused by the Instrument Line Break Outside the Containment and the LOCA radiation harsh environment exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 4, Zone A-3 & A-6

Schematic Diagram: 1E-1-4220BE & BF

FCD: FSAR Figure 7.3-12, Sheet 2

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F016A, B

These motor operated valves are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4.32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for containment spray.

(b) Effect of Component Failure

Failure of these valve operators under the worst condition will prevent the valves from opening and disabling the containment spray capability. Containment spray is not required for the Instrument Line Break Event.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

The failure of these valves have no impact on other systems. They have no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(d) Operator Action

These devices are not required when the harsh environment caused by the instrument line break and LOCA events exist. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheets 1 and 2, Zones E-5 and F-5

Schematic: 1E-1-4220BE, BG

FCD: FSAR Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F017A, B

These motor operated valves are located in the reactor building in environmental zone H4. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves are required for containment spray in the RHR system.

(b) Effect of Component Failure

Failure of these valve operators under worst condition will prevent the valves from opening and operation of containment spray. HPCS and RCIC systems are available to provide core coverage. No failure mechanism at the valve can cause the valves to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of these components has no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of these valves have no impact on other systems. No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on any other system.

(d) Operator Action

These devices are not required when the harsh environment caused by Instrument Line Break exists. These devices perform their function before it is affected by the LOCA radiation. The operator will take action in accordance with the emergency procedures to achieve long term cooling if the valves are inoperable.

References:

P&ID: M-96, Sheets 1 and 2, Zones E5 and F5

Schematic: 1E-1-4220BE, BG

FCD: FSAR Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F021

The Limitorque Type SMB is located in the RHR cubicle in environmental zone H6. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component is used for testing the RHR pump (E12-C002C)

(b) Effect of Component Failure

This valve is normally closed and is opened only for test. Failure of this component prevents testing of the RHR pump; however, failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other components or system is affected by the failure of this component. This valve has no electrical interface with other components on this system or any other system, nor does it affect the operation of the RHR system.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 3, Zone E-6

Schematic: 1E-1-4220BH

FCD: FSAR Figure 7.3-12, Sheet 4



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F024A and B

The Limitorque type SMBs are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR pumps E12-C002A and B test return line to the suppression pool and for suppression pool cooling.

(b) Effect of Component Failure

Failure of these components prevents testing of the RHR pump operation and normal pool cooling. Failure of these components has no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other systems.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	M-96, Sheets 1 and 2, Zones D2 and E1
Schematic:	1E-1-4220BK, BL
FCD:	FSAR Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F023

The Limitorque type SMBs are located in the ECCS cubicle in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component is used for RHR head spray to the reactor vessel after shutdown.

(b) Effect of Component Failure

Failure of the component prevents no safety function as this system is not required to reach cold shutdown. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this component has no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components on this system or any other systems.

(d) Operator Action

This device is in the position to perform its intended safety function. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	M-96, Sheet 1, Zone F-6
Schematic:	1E-1-4220BJ
FCD:	FSAR Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F026A & B

The Limitorque type SMBs are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR heat exchanger steam condensing mode discharge to RCIC pump suction.

(b) Effect of Component Failure

Failure of these components prevents RHR heat exchanger steam condensing mode flow to RCIC pump suction. Steam condensing is still available through the suppression pool. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other systems.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break Event or LOCA Event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 4, Zones B4 and B5

Schematics: 1E-1-4220BK, BM

FCD: FSAR Figure 7.3-12, Sheet 2

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F027A, B

The Limotorque type SMBs are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR heat exchanger flow to suppression pool spray.

(b) Effect of Component Failure

Failure of these components disable suppression pool spray flow from heat exchanger. The alternate loop at RHR is still available for the Instrument Line Break Event. RHR suppression pool cooling is still available to cool the suppression pool. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of these components has no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

There is no electrical interface with any other systems. Suppression pool cooling is not affected by the failure of these components.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheets 1 & 2, Zones: Sheets 1, C-5; Sheet 2, C-4

Schematic: 1E-1-4220BK, BN

FCD: FSAR Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F040 A, B

The Limitorque Type SMBs are located in RHR/ECCS cubicle in environmental zone H6. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-352). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR heat exchanger warm up discharge to reactor building equipment drain tank during normal shutdown cooling initiation. They are not used in any accident mode.

(b) Effect of Component Failure

Failure of these components prevent condensate drainage to the Reactor Building drain tank, and fails the isolation function of these valves if the accident occurs during warm up. Isolation can be achieved by closing E12-F049. Otherwise, the valves are normally closed. Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components in this system or any other system, nor does it affect the operation of the RHR system.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 4, Zones C1 and C8  
Schematic: 1E-1-4220BP  
FCD: FSAR Figure 7.3-12, Sheet 3



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F042A, B, C

The Limitorque type SMBs are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR/LPCI injection to the vessel.

(b) Effect of Failure

Failure of these components under worst condition would prevent opening of these valves and injection of RHR/LPCI cooling water into RPV for core coverage. LPCS, HPCS and RCIC systems are available to provide core coverage. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on any other system.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break exists. They perform their function before they are affected by the LOCA radiation harsh environment. The operator will take action in accordance with the emergency procedures to achieve long term core cooling if the valves are inoperable.

References:

P&ID:	M-96, Sheets 1, 2, 3, Zone:	Sheet 1, D-5 Sheet 2, E-6 Sheet 3, E-6
Schematic:	1E-1-4220 BQ, BR, BS	
FCD/FSAR:	Figure 7.3-12, Sheet 1	

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F047A, B

The Limitorque type SMBs are located in the RHR cubicle in environmental zone H6. Hence these components are exposed to a harsh environment for the Instrument Line Break Outside the Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR pump discharge flow to RHR heat exchangers. These are normally opened valves only closed for normal initiation of steam condensing.

(b) Effect of Component Failure

Failure of these components under worst condition will result in the valves remaining in their as-is position which has no effect on this safety function. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components on this system or any other systems.

(d) Operator Action

These devices are in the position to perform their intended safety function. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	M-96, Sheet 4, Zones E-4 and E-5
Schematic:	1E-1-4220BS, BT
FCD:	FSAR Figure 7.3-12, Sheet 5

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F049 A, B

The Limitorque Type SMBs are located in RHR cubicle in environmental zone H6. Hence this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR heat exchanger warm up discharge to reactor building equipment drain tank during normal shutdown cooling initiation. They are not used in any accident mode.

(b) Effect of Component Failure

Failure of these components prevents condensate drainage to the reactor building drain tank. If the accident occurs during warm up the valves could fail to isolate. Isolation can be achieved by closing E12-F049, otherwise the valves are normally closed. Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components in this system or any other system, nor do they affect the operation of the RHR system.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 4, Zones C-1, D-8  
Schematic: 1E-1-4220BV, BW  
FCD: FSAR Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-FC48 A, B

The Limitorque Type SMBs are located in the RHR cubicle in environmental zone H6. Hence, this component is exposed to a harsh environment for the Instrument Line Break outside the containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for RHR pump discharge to the reactor vessel for core coverage.

(b) Effect of Component Failure

These valves are normally open and aligned for the LPCI mode. Failure of these components under worst condition will prevent diverting LPCI flow through the heat exchangers. RHR pump C002C, LPCS, HPCS and RCIC systems are available to provide core coverage. Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components in this system or any other system.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break exists. They perform their function before they are affected by the LOCA radiation harsh environment. The operator will take action in accordance with the emergency procedures to divert the LPCI flow to the RHR heat exchangers.

References:

P&ID: M-96, Sheet 4, Zones E-1, D-8  
Schematic: 1E-1-4220BS, BU  
FCD: FSAR Figure 7.3-12, Sheet 2

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F052 A, B

The Limitorque Type SMBs are located in the RHR cubicle in environmental zone H6. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside the Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used for isolation of RHR heat exchangers from the steam flowing from the main steam line.

(b) Effect of Component Failure

The valves are normally closed and opened only for the steam condensing mode. Failure of these components disables RHR. Steam condensing is not required. Hence, failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves have no electrical interface with other components in this system or any other system, nor do they affect the operation of the RHR system.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break or LOCA event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	M-96, Sheet 4, Zones C-4, C-5
Schematic:	1E-1-4220BX, BY
FCD:	FSAR Figure 7.3-12, Sheet 2



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F053A, B

These motor operated valves are located in the reactor building in environmental zone H4. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves are required for RHR shutdown injection into the vessel.

(b) Effect of Component Failure

Failure of these valve operators under worst condition may prevent the valves from opening and injection of RHR cooling water into the RPV for core coverage. LPCS, HPCS, and RCIC systems are available to provide core coverage. No failure mechanism at the valve can cause the valves to change position from open to close because the motor control centers are not at the same location as the valves.

Failure of these components has no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No other component or system is affected by failure of these components. These valves have no electrical interference with other components or any other system.

(d) Operator Action

These devices are not required when the harsh environment caused by Instrument Line Break exists. These devices perform their function before it is affected by the LOCA radiation.

References:

P&ID: M-96, Sheets 1 and 2, Zone D5 and D6

Schematic: 1E-1-4220BX and BZ

FCD: FSAR Figure 7.3-12, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12 3

These motor operated valves are located in the reactor building in environmental zone 3. Hence, these components are exposed to a harsh environment during the Instrument Line Break Event Outside Containment and high radiation from the LOCA inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves provide minimum flow bypass to the suppression pool.

(b) Effect of Component Failure

Failure of these valve operators under worst condition may prevent the valves from opening and minimum flow bypass to the suppression pool. No failure mechanism at the valve can cause the valves to change position from open to close because the motor control centers are not at the same location as the valves.

Failure of these valves have no impact on other systems and it has no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by failure of these components. These valves have no electrical interference with other components or any other system.

(d) Operator Action

These devices are not required when the harsh environment caused by Instrument Line Break exists. These devices perform their function before it is affected by the LOCA radiation. The operator will take action in accordance with the emergency procedures to achieve core cooling if the valves are inoperable.

References:

P&ID:

Schematic: 1E-1-4220CA

FCD: FSAR Figure 7.3-12, Sheet 4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F068A, B

These motor operated valves are located in RHR cubicles in environmental zone H6. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves are used in the RHR service water heat exchanger discharge.

(b) Effect of Component Failure

Failure of these components under worst condition would prevent opening the valves for RHR service water flow (discharge). No failure mechanism at the valve can cause the valve to change position from open to close because the motor control centers are not at the same location as the valves.

Failure of these valve operators have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by failure of these components. These valves have no electrical interface with other components.

(d) Operator Action

These devices are not required when the harsh environment caused by Instrument Line Break exists. These devices perform their function before it is affected by the LOCA radiation. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-87, Sheets 1 and 2, Zones F2 and B2

Schematic: 1E-1-4220CB, CC

FCD: FSAR Figure 7.3-12, Sheet 2 (E12-F068A is not shown)

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F073A, B

These motor operated valves are located in RHR cubicle in environmental zone H6. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside the Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves are required for RHR heat exchanger venting during steam condensing mode.

(b) Effect of Component Failure

Failure of these components prevent RHR heat exchanger venting during steam condensing mode which is not a safety function. However, this function is not required for LPCI, suppression pool or shutdown cooling, or steam condensing. No failure mechanism at the valve can cause the valve to change from open or close because the motor control centers are not at the same location as the valves.

Failure of these valve operators has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of these valve motor operators. These valves have no electrical interface with other components on this system or any other systems.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Break or LOCA event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 4, Zones E-3, E-5

Schematic: 1E-1-4220CB, CD

FCD: FSAR Figure 7.3-12, Sheet 5 (E12-F073A is not shown)

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F074A & B

These motor operated valves are located in RHR cubicles in environmental zone H6. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside the Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves are required for RHR heat exchanger venting during steam condensing mode.

(b) Effect of Component Failure

Failure of these components prevent RHR heat exchanger venting during steam condensing mode which is not a safety function. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of these valve operators has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of these valve motor operators. These valves have no electrical interface with other components on this system or any other systems.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Break or LOCA Event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 4, Zones E-2, E-6

Schematic Diagram: 1E-1-4220CD

FCD: FSAR Figure 7.3-12, Sheet 5  
(E12-F074A is not shown)



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-F087A & B

These motor operated valves are located in RHR cubicles in environmental zone H6. Hence this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves are for controlling flow in the steam condensing mode at low pressures.

(b) Effect of Component Failure

Failure of F087A or F087B does not disable the steam condensing mode. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of these valve operators has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of these valve motor operators. These valves have no electrical interface with other components on this system or any other systems.

(d) These devices are not required when the harsh environment caused by the Instrument Line Break or LOCA event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-96, Sheet 4, Zones C-4, C-5

Schematic Diagrams: 1E-1-4200CF, CG

FCD: FSAR Figure 7.3-12  
(E12-F087A is not shown)

TABLE M.5-1 (Co.it.)

m) COMPONENT APPLICATION STATEMENT

Component E21-F001

The Limitorque type SMB is located in the reactor building in environmental zone H5E. Hence, this component is exposed to a harsh environment only for the Instrument Line Break Outside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852), and to high radiation following the LOCA event. The impact of component failure is considered only for these events.

(a) Component Function

This component is used for LPCS pump suction from the suppression pool.

(b) Effect of Component Failure

Failure of this component prevents suppression pool water being supplied to the LPCS pump.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components on this system or any other systems, nor does it affect the operation of LPCS suction from RHR shutdown cooling suction line.

(d) Operator Action

LPCS is not required to mitigate an instrument line break in the reactor building. The valve is normally open for LPCS injection. If the valve fails closed, automatic HPCS is available with automatic ADS and LPCI as backups. The valve would have performed its function prior to being exposed to high radiation from a LOCA. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-94, Sheet 1, Zone B-6

Schematic: 1E-1-4221AB

FCD/FSAR: Figure 7.3-10, Sheet 1, Zone L-4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E21-F005

The Limitorque type SMB is located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment only for the Instrument Line Break outside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852, and to high radiation following the LOCA event. The impact of component failure is considered only for these events.

(a) Component Function

This component is used for LPCS injection to the reactor vessel.

(b) Effects of Component Failure

Failure of this component prevents LPCS injection to the vessel. RHR, HPCS and RCIC are available to provide core coverage.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components in this system or any other systems.

(d) Operator Action

LPCS is not required to mitigate an instrument line break in the reactor building. In the event of a LOCA, the valve would have performed its function prior to being exposed to high radiation. If necessary, automatic HPCS is available with automatic ADS and LPCI as backups. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-94, Sheet 1, Zone D-6  
Schematic: 1E-1-4221AB  
FCD: Figure 7.3-10, Zone L-12

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E21-F011

The Limitorque type SMB is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component is used for LPCS pump minimum flow bypass to the suppression pool.

(b) Effect of Component Failure

Failure of this component would slightly reduce LPCS injection flow, and does not significantly affect the LPCS operation. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this component has no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components on this system or any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-94, Sheet 1, Zone C3

Schematic: 1E-1-4221AB

FCD: FSAR Figure 7.5-10, Sheet 2

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E21-F012

The Limitorque type SMB is located in reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment only for the Instrument Line Break Outside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852) and to high radiation following the LOCA event. The impact of component failure is considered only for these events.

(a) Component Function

This component is used for testing LPCS pump (E21-C001) function with pump taking suction from the suppression pool and discharging back to the suppression pool.

(b) Effect of Component Failure

Failure of this component prevents testing of the LPCS pump.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other components or this system or any other system, nor does it affect the operation of the LPCS.

(d) Operator Action

This system is not required to operate during these events. This valve is normally closed and does not operate for these events. If it is open during a LOCA event, capability to close will be maintained prior to being exposed to high radiation. No operator action is required to meet the six safety objectives.

References:

P&ID: M-94, Sheet 1, Zone C-5

Schematic: 1E-1-4221AC

FCD: FSAR Figure 7.3-10, Sheet 1



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-F001A, E, J, N

The Limitorque type SMBs are located in the Main Steam Tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment only for the Main Steam Line Break Outside Containment in the steam tunnel (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components are used for the operation of inboard MSIV-LCS.

(b) Effect on Component Failure

Failure of these components prevents operation of inboard MSIV Leakage Control System. Outboard MSIV-LCS is still available. The MSIV-LCS is not required for this event.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

These valves have electrical interface with Valves E32-F002A, E, J, N and E32-F003A, E, J, N. However, their failure does not affect the operation of the Outboard MSIV-LCS.

(d) Operator Action

The LCS is used only for LOCA Inside Containment. Since it is not required to mitigate this event, no operator action is required to meet the six safety objectives.

References:

P&ID: M-55, Sheet 8, Zone C-3

Schematic: 1E-1-4225AK

FCD: FSAR Figure 6.7-3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-F002A, E, J, N

The Limotorque type SMBs are located in the Main Steam Tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment only for the Main Steam Line Break Outside Containment in the steam tunnel (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components are used for the operation of inboard MSIV-LCS.

(b) Effect on Component Failure

Failure of these components prevents operation of inboard MSIV Leakage Control System. Outboard MSIV-LCS is still available. The MSIV-LCS is not required for this event.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

These valves have electrical interface with valves E32-F001A, E, J, N and E32-F003A, E, J, N. However, their failure does not affect the operation of the outboard MSIV-LCS.

(d) Operator Action

The LCS is used only for LOCA Inside Containment\*. Since it is not required to mitigate this event, no operator action is required to meet the six safety objectives.

References:

P&ID: M-55, Sheet 8, Zones C-3, D-3, E-3, F-3

Schematic: 1E-1-4225AK, AC, AN, AM

FCD: FSAR Figure 6.7-3, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-F003A, E, J, N

The Limitorque type SMBs are located in the Main Steam Tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment only for the Main Steam Line Break Outside Containment in the steam tunnel (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components are used for the operation of inboard MSIV-LCS.

(b) Effect on Component Failure

Failure of these components prevent operation of inboard MSIV Leakage Control System. Outboard MSIV-LCS is still available. The MSIV-LCS is not required for this event.

Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

These valves have electrical interface with valves E32-F001A, E, J, N and E32-F002A, E, J, N. However, their failure does not affect the operation of the outboard MSIV-LCS.

(d) Operator Action

The LCS is used only for a LOCA inside containment. Since it is not required to mitigate this event, no operator action is required to meet the six safety objectives.

References:

P&ID: M-55, Sheet 8, Zones E-4, D-4, C-4, and B-4

Schematic: 1E-1-4225AK, AL, AM, AN

FCD: FSAR Figure 6.7-3, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-F006

The Limitorque type SMB is located in the Main Steam Tunnel in environmental zone H5C. Hence, this component is exposed to a harsh environment only for the Main Steam Line Break Outside Containment in the steam tunnel (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component is used for the operation of outboard bleed line of the MSIV-LCS.

(b) Effect on Component Failure

Failure of this component prevents the operation of outboard bleed line of MSIV-LCS. An outboard bypass line (depressurization) is still available. The MSIV-LCS is not required for this event.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852).

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

This valve has electrical interface with Valve E32-F007 on this system. However, its failure does not affect the operation of the MSIV-LCS.

(d) Operator Action

The LCS is used only for a LOCA inside containment. Since it is not required to mitigate this event, no operator action is required to meet the six safety objectives.

References:

P&ID: M-55, Sheet 8, Zone B-4

Schematic: 1E-1-4225-AR

FCD: Fig. 6.7-3, Sheet 3

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-F007

The Limitorque type SMB is located in the Main Steam Tunnel in environmental zone H5C. Hence, this component is exposed to a harsh environment only for the Main Steam Line Break Outside Containment inside the steam tunnel (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-352). The impact of component failure is considered only for this event.

(a) Component Function

This component is used for the operation of outboard bleed of MSIV-LCS.

(b) Effect on Component Failure

Failure of this component prevents the operation of outboard bleed line of MSIV-LCS. An outboard bypass line (depressurization) is still available. The MSIV-LCS is not required for this event.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

This valve has electrical interface with Valve E32-F006 on this system. However, its failure does not affect the operation of the MSIV-LCS.

(d) Operator Action

The LCS is used only for a LOCA inside containment. Since it is not required to mitigate this event, no operator action is required to meet the six safety objectives.

References:

P&ID:	M-55, Sheet 8, Zone B-4
Schematic:	1E-1-4225-AR
FCD:	FSAR Fig. 6.7-3, Sheet 3



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-F008

The Limitorque type SMB is located in the Main Steam Tunnel in environmental zone H5C. Hence, this component is exposed to a harsh environment only for the Main Steam Line Break Outside Containment inside the steam tunnel (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component is used for the operation of outboard bypass (depressurization) line of MSIV-LCS.

(b) Effect on Component Failure

Failure of this component prevents the operation of outboard bypass (depressurization) line of MSIV-LCS. The main outboard bleed line of MSIV-LCS is still available. The MSIV-LCS is not required for this event.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact of Other Systems

This valve has electrical interface with Valve E32-F009 of this system. However, its failure does not affect the operation of the MSIV-LCS.

(d) Operator Action

The LCS is used only for a LOCA inside containment. Since it is not required to mitigate this event, no operator action is required to meet the six safety objectives.

References:

P&ID: M-55, Sheet 8, Zone A-3

Schematic: 1E-1-4225 AR

FCD: Fig. 6.7-3, Sheet 4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-F009

The Limitorque type SMB is located in the Main Steam Tunnel in environmental zone H5C. Hence, this component is exposed to a harsh environment only for the Main Steam Line Break Outside Containment inside the steam tunnel (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component is used for the operation of outboard bypass (depressurization) line of MSIV-LCS.

(b) Effect on Component Failure

Failure of this component prevents the operation of outboard bypass (depressurization) line of MSIV-LCS. The main outboard bleed line of MSIV-LCS is still available. The MSIV-LCS is not required for this event.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

This valve has electrical interface with Valve E32-F008 on this system. However, its failure does not affect the operation of the MSIV-LCS.

(d) Operator Action

The LCS is used only for a LOCA inside containment. Since it is not required to mitigate this event, no operator action is required to meet the six safety objectives.

References:

P&ID: M-55, Sheet 8, Zone A-4  
Schematic: 1E-1-4225 AS  
FCD: FSAR Fig. 6.7-3, Sheet 4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F008

The motor operated valve is located in the Reactor Building in environmental zone H5B. Hence, this component is exposed to a harsh environment for the Line Break Outside the Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is used for outboard isolation of the RCIC steam line.

(b) Effect of Component Failure

Failure of this valve operation under the worst condition will prevent the valve to close upon receiving an isolation signal; containment isolation is achieved by automatic closing of the inboard isolation valve E51-F063. This valve is located outside containment and is not affected by this event.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this component due to the LOCA Inside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity, and effluent control (see Section 4.1, page 4-2 of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this valve is for containment isolation upon an isolation signal. No other systems are affected by the failure of this valve motor operator.

(d) Operator Action

This valve is not required for the LOCA Inside Containment. For the Line Break Event, the inboard isolation valve is available. Therefore, no operator action is required to meet the six safety objectives.

References:

P&ID: M-101, Sheet 1, Zone E-7

Schematic: 1E-1-4226AN

FCD: FSAR Figure 7.4-2, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F010

This motor operated valve is located in the Reactor Building in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC pump suction from the condensate storage tank.

(b) Effect of Component Failure

This valve is normally open, but failure of this valve to close could eventually disable RCIC injection, if low level was experienced in the condensate storage tank. Failure of this component may disable RCIC system; however, the alternate system HPCS is available for shutdown cooling or core coverage and RHR system is available for heat removal. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other system.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break Event or LOCA Event exists. It is in the position to perform its intended safety function. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Shcat 2, Zone A5  
Schematic: 1E-1-4226AP  
FCD: FSAR Figure 7.4-2, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F013

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for the RCIC pump discharge to the vessel.

(b) Effect of Component Failure

Failure of this component may disable RCIC system, however, the alternate system HPCS is available. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break Event or LOCA Event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 2, Zone C-7  
Schematic: 1E-1-4226AQ  
FCD: FSAR Figure 7.4-2, Sheet 2



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F019

This motor operated valve is located in the RCIC/LPCS cubicle environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC minimum flow bypass to suppression pool.

(b) Effect of Component Failure

Failure of this component may reduce RCIC flow, however, the alternate system HPCS is available. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break Event or LOCA Event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 2, Zone B-5

Schematic: 1E-1-4226AR

FCD: FSAR Figure 7.4-2

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F022

This motor operated valve is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC test bypass to condensate storage tank.

(b) Effect of Component Failure

This valve is normally in the closed position performing its safety function. Failure of this component during test may disable RCIC system; however, the alternate system HPCS is available.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) This device is not required when the harsh environment caused by the instrument line break or LOCA event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 2, Zone E-6

Schematic Diagram: 1E-1-4226AS

FCD: FSAR Figure 7.4-2, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F031

This motor operator valve is located in the Reactor Building in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC pump suction from suppression pool.

(b) Effect of Component Failure

Failure of this component may disable RCIC system, however, the alternate system HPCs is available. This valve is normally in the closed position which is the position to perform its safety function. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break Event or LOCA Event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 2, Zone B-7

Schematic: 1E-1-4226AT

FCD: FSAR Figure 7.4-2, Sheet 2

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F045

This motor operated valve is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC steam to turbine.

(b) Effect of Component Failure

This valve is normally closed. Failure of this component will disable RCIC system, however the alternate system HPCS is available. Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break or LOCA event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 1, Zone D-5

Schematic Diagram: 1E-1-4226AU

FCD: FSAR Figure 7.4-2, Sheet 4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F046

This motor operated valve is located in RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC turbine cooling water supply.

(b) Effect of Component Failure

Failure of this component may disable RCIC system, however, the alternate system HPCS is available.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break or LOCA Event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 2, Zone D-3

Schematic Diagram: 1E-1-4226AV

FCD: FSAR Figure 7.4-2. Sheet 4



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F059

This motor operated valve is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This motor operated valve is required for RCIC test bypass to condensate storage tank.

(b) Effect of Component Failure

This valve is normally in the closed position performing its safety function. Failure of this component during test may disable RCIC system, however, the alternate system HPCS is available. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operation Action

This device is not required when the harsh environment caused by the Instrument Line Break or LOCA Event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 2, Zone E-5

Schematic Diagram: 1E-1-4226AW

FCD: FSAR Figure 7.4-2, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F064

This motor operated valve is located in the reactor building in environmental zone H5B. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside the containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for the RHR steam condensing mode.

(b) Effect of Component Failure

This valve is normally closed which is the position to perform its safety function of isolation. Failure of this component may disable RHR steam condensing mode which is not required.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break or LOCA events exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 1, Zone E-7

Schematic Diagram: 1E-1-4226AM

FCD: FSAR Figure 7.4-2, Sheet 2

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F068

This motor operated valve is located in the reactor building in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1 81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC turbine exhaust to suppression pool.

(b) Effect of Component Failure

This valve is normally open which is the position to perform its safety function. Failure of this component may disable RCIC system; however, the alternate system HPCS is available.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break or LOCA event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 1, zone C-7

Schematic Diagram: 1E-1-4226AY

FCD: FSAR Figure 7.4-2, Sheet 5

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components E51-F069

This motor operated valve is located in the reactor building in environmental zone H5E. Hence this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment. (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC vacuum pump discharge to suppression pool.

(b) Effect of Component Failure

This valve is normally open which is the position to perform its safety function. Failure of this component may disable RCIC system, however, the alternate system HPCS is available. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break or LOCA event exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 1, Zone B-7

Schematic: 1E-1-4226AZ

FCD: FSAR Figure 7.4-2, Sheet 5

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F080

This motor operated valve is located in the reactor building in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for RCIC vacuum breaker isolation.

(b) Effect of Component Failure

Failure of this component may disable RCIC system; however, the alternate system HPCS is available.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 1, Zone C-7

Schematic Diagram: 1E-1-4226BA

FCD: FSAR Figure 7.4-2, Sheet 4



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-F086

This motor operated valve is located in the reactor building in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment.

(a) Component Function

This motor operated valve is required for RCIC vacuum breaker isolation.

(b) Effect of Component Failure

Failure of this component may disable RCIC system, however, the alternate system HPCS is available. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-101, Sheet 1, Zone C-7

Schematic Diagram: 1E-1-4226-BB

FCD: FSAR Figure 7.4-2, Sheet 4

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component G33-F004

This motor operated valve is located in RWCU equipment area in environment zone H5D. Hence, this component is exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for reactor water cleanup system isolation.

(b) Effect of Component Failure

Failure of this component would prevent isolation but the inboard valve will cause isolation. In addition, the RWCU system is a closed system and isolation is not required for a LOCA Inside Containment.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

The Reactor Water Cleanup System (RWCU) is automatically isolated for accidents using diverse signals. Containment isolation will also automatically occur when signals reach their trip point. This device performs its function before it is affected by the LOCA radiation harsh environment. No operator action is required to meet the six safety objectives.

References:

P&ID: M-97, Sheet 1, Zone F7

Schematic: 1E-1-4228AK, AH

FCD: PSAR Figure 7.7-14

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component G33-F040

This motor operated valve is located in the main steam tunnel in environmental zone H5C. Hence, this component is exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of the component failure will be considered only for these events.

(a) Component Function

This motor operated valve is required for long term containment isolation of the reactor water cleanup system. This valve is used for outboard isolation in the RWCU return line.

(b) Effect of Component Failure

Failure of the valve operator under worst condition will prevent the valve from closing. Containment isolation is achieved by check valves B21-F010A, B and B21-F032A, B, as described in Quadrex Report QUAD-1-81-852, page 4-16. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves. The failure of this valve motor operator has no effect in achieving the six safety objectives.

(c) Impact on Other Systems

The sole function of this MOV is long term outboard isolation of the RWCU return line. No other systems are affected by failure of this valve motor operator.

(d) Operator Action

This device is not required when the harsh environment caused by the line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. In addition the RWCU is a closed system. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-97, Sheet 1, Zone F-4

Schematic: 1E-1-4228AB

FCD: FSAR Figure 7.7-14

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HG001A, B

These motor operated valves are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves (inlet - inboard) are required for H<sub>2</sub> recombiner operation following a LOCA in containment.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside the Containment or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the operation of the Hydrogen Recombiner in the unit subjected to the harsh environment. The backup unit in the non-accident unit will provide the alternate functional capability. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valve.

(c) Impact on Other Systems

The sole function of these valves is to open to control combustible gas concentration in Units 1 and 2 following a LOCA inside containment. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-130, Sheet 1 Zone F7, E7  
Schematic: 1E-1-4103AB, AC  
FCD: FSAR Figure, none

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HG003

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside the Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This motor operated valve is required for H<sub>2</sub> recombiner discharge for Unit 1 to the suppression pool.

(b) Effect of Component Failure

The loss of this component due to the Instrument Line Break Event Outside the Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

The sole function of this valve is to open to control combustible gas concentration in Units 1 or 2 following a LOCA inside containment. No other systems are affected by their failure.

(d) This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-130, Sheet 1, Zone C-6

Schematic: 1E-1-4103AA



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HG005 A, B

These Limitorque Type SMP motor operated valves are located in the reactor building in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside the containment and high radiation from the LOCA Event Inside Containment. (See Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852.) The impact of component failure is considered only for this event.

(a) Component Function

These motor operated valves are required for recombination discharge (inboard) into suppression pool

(b) Effect of Component Failure

Failure of these components will disable the capability of Unit 1 and Unit 2 recombiners to discharge into the Unit 1 suppression pool. If these components fail in one unit, discharge into the suppression pool of the other unit is still possible. Failure of these valve operators has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valves can cause the valves to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of these components. These valves are manually operated and have no electrical interface with other components on this system or any other systems.

(d) Operator Action

These devices are not required when the harsh environment caused by the instrument line break exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-130, Sheet 1, Zone B-7, A-7

Schematic: 1E-1-4103-AB, AD

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HG006 A, B

These Limitorque Type SMB motor operated valves are located in the reactor building in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside the Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves (outboard) are required for H<sub>2</sub> recombiner discharge into suppression pool

(b) Effect of Component Failure

Failure of this component will disable the capability of Unit 1 recombiner discharge to the Unit 1 suppression pool. If this component fails for one unit, the other unit is still available. Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve is manually operated and has no electrical interface with other components on this system or any other systems.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-130, Sheet 1, Zone B-7, A-7  
Schematic: 1E-1-4103-AC, AD

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HG009

This Limitorque Type SMB motor operated valve is located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside the containment and high radiation from the LOCA Event Inside Containment. (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is used for aligning the discharge in either unit's recombiners to the other unit's suppression pool.

(b) Effect of Component Failure

Failure of this component will disable the crosstie capability between Unit 1 and Unit 2 recombiner discharge to the suppression pool. If this component fails for one unit, the other unit is still available. Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve is manually operated and has no electrical interface with other components on this system or any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-130, Sheet 1, Zone C-6  
Schematic: 1E-1-4103-AA

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HG-018

This motor operated valve is located in the reactor building in environmental zone H6A. Hence, this Event component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Event Inside Containment. (see Section 4.4, Page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for the hydrogen re-combiner cooling water crossover.

(b) Effect of Component Failure

The loss of these components or the LOCA event due to the Instrument Line Break Event Outside the Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the operation of the Hydrogen Recombiner in the unit subjected to the harsh environment. The backup unit in the non-accident unit will provide the alternate functional capability.

(c) Impact on Other Systems

The sole function of these valves are to open to control combustible gas concentration in Units 1 or 2 following a LOCA inside containment. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-130, Sheet 1, Zone F-4

Schematic: 1E-4103 AA

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VG001

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside the Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for SGTS suction.

(b) Effect of Component Failure

Failure of the valve operator under the worst condition will prevent the suction from the affected unit. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves. The SGTS in the non-accident unit is available. The failure of this valve motor operator has no effect in achieving the six safety objectives.

(c) Impact on Other Systems

The sole function of the MOV is to provide suction to SGTS. No other systems are affected by failure of this valve motor operator.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-89, Zone A-7

Schematic: 1E-1-4074AB

FCD/FAR: Fig. 7.3-21



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VG003

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the instrument line break outside the containment and high radiation from the LOCA inside containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is the discharge valve from the equipment train in SGTS.

(b) Effect of Failure

Failure of the valve operator under the worst condition will prevent discharge from the affected unit. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves. The SGTS in the non-accident unit is available.

(c) Impact on Other Systems

The sole function of this MOV is to provide a discharge flow path from SGTS. No other systems are affected by failure of this valve motor operator.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-89, Zone B-1

Schematic Diagram: 1E-1-4074AB

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VP053A, B

These motor operated valves are located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These motor operated valves are required for primary containment chilled water outboard isolation.

(b) Effect of Component Failure

Failure of these valve operators in the worst condition will prevent these valves to close upon receiving an isolation signal from the primary containment and reactor vessel isolation system. Containment isolation is achieved by automatically closing inboard isolation valves which are located inside the containment, therefore, they are not affected by the instrument line break. In addition, this is a closed system within primary containment. The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Quadrex Report QUAD-1-81-852).

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this motor operator valve. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-86, Zones E2 and C2

Schematic: 1E-1-4081AE

FCD: FSAR Figure 7.3-23, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VP063A,B

These motor operated valves are located in the reactor building in environmental zone H4A, hence this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These motor operated valves are required for drywell cooler outboard isolation.

(b) Effect of Component Failure

Failure of these valve operators in the worst condition will prevent these valves to close upon receiving an isolation signal from the primary containment and reactor vessel isolation system. Containment isolation is achieved by automatically closing inboard isolation valves which are located inside the containment, therefore, they are not affected by the instrument line break. In addition, this is a closed system within primary containment. The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Quadrex Report QUAD-1-81-852).

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

This device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-86, Zones D2 and B2  
Schematic: 1E-1-4081AE, AF  
FCC: FSAR Figure 7.3-23, Sheet 1

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-026

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for suppression pool purge line isolation.

(b) Effect of Component Failure

Failure of this component may disable the Primary Containment Purge System but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone C2

Schematic: 1E-1-4082AC

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION / STATEMENT

Component VQ-027

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operator valve is required for the suppression pool purge line isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Ventilation System, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone C3

Schematic: 1E-1-4082AC



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-029

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for drywell purge line isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge System, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone D2

Schematic: 1E-1-4082AD

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-030

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operator valve is required for drywell purge line isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge System, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone D3

Schematic: 1E-1-4082AD

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-031

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for the suppression pool purge line isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge System, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone C7

Schematic: 1E-4082AE

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-032

This motor operated valve is located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for the suppression pool purge line isolation. This valve provides bypass for valve VQ-031.

(b) Effect of Component Failure

Failure of this component will not prevent Primary Containment Isolation as it is backed up by redundant valves. Operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1

Schematic: 1E-1-4028AE

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-034

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for drywell purge line isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge System, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone E6  
Schematic: 1E-1-4082AF



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-035

This motor operated valve is located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these vents.

(a) Component Function

This motor operated valve is required for drywell vent line Isolation. These are required for drywell pressure adjustments (2" motor operated valve).

(b) Effect of Component Failure

Failure of this component may prevent Primary Containment Isolation but it is backed up by redundant valves. Operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852.

No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the high radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone F6

Schematic: 1E-1-4082-AF

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-036

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for drywell purge line isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge System, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone E7

Schematic: 1E-1-4082AG

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-037

This motor operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for vent exhaust to purge line.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge System, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone B8

Schematic: 1E-1-4082AH

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-038

This motor-operated valve is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor-operated valve is required for vent exhaust to primary containment purge air filter package.

(b) Effect of Component Failure

Failure of this component may disable the primary containment purge system but this system is not required for this event. Failure of this valve operator has no effect in achieving the six safety objectives as described in Quadrex Report, Section 4.4, QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, this isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(d) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components on this system or any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone B7

Schematic: 1E-1-4082AH

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-040

This motor operated valve is located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-12 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for the suppression pool vent line isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge system, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report, QUAD-1-81-852. The valves are normally closed and are open only during shutdown. Therefore, their isolation function is assured. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone C-8

Schematic: 1E-1-4082-AG



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-041

This motor operated valve is located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the instrument line break outside the containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32 of Quadrex Report QJAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for isolating the reactor building.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge system, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852. The valve is normally closed and is only open when testing SGTS. Failure of this valve in the open position would disable the associated SGTS, however, the backup SGTS is available. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone A-8

Schematic: 1E-1-4082-AJ

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-042

This motor operated valve is located in the reactor building in environmental zone H4. This component is exposed to a harsh environment for the Instrument Line Break outside the containment and the high radiation from the LOCA Event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD 1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for drywell nitrogen inerting isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge system, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD 1-81-852.

The failure of the valve to perform its isolation function is not required because of the inboard valve. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone D-2

Schematic: 1E-1-4082-AL

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-043

This motor operated valve is located in the reactor building in environmental zone H4A. This component is exposed to a harsh environment for the Instrument Line Break outside the containment and the high radiation from the LOCA Event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD 1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for suppression pool inerting isolation.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge system, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report, QUAD 1-81-852.

The failure of the valve to perform its isolation function is not required because of the inboard valve. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone C-2

Schematic: 1E-1-4082-AL

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-047

This motor operated valve is located in the reactor building in environmental zone H4. This component is exposed to a harsh environment for the Instrument Line Break outside the containment and the high radiation from the LOCA Event inside containment (see Section 4.4, page 4-32 of Quadrex Report 1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for drywell nitrogen make-up.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge system, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report, QUAD 1-81-852.

The failure of the valve to perform its isolation function is not required because of the inboard valve. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone D-3

Schematic: 1E-1-4082-AM

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-048

This motor operated valve is located in the reactor building in environmental zone H4A. This component is exposed to a harsh environment for the Instrument Line Break outside the containment and the high radiation from the LOCA Event inside containment (see Section 4.4, page 4-32 of Quadrex Report 1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for drywell nitrogen make-up.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge system, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852.

The failure of the valve to perform its isolation function is not required because of the inboard valve. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(c) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone D-3

Schematic: IE-1-4082-AM



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-050

This motor operated valve is located in the reactor building in environmental zone H4A. This component is exposed to a harsh environment for the Instrument Line Break outside the containment and the high radiation from the LOCA Event inside containment (see Section 4.4, page 4-32, of Quadrex Report-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for suppression pool nitrogen make-up.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge system, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report QUAD-1-81-852.

The failure of the valve to perform its isolation function is not required because of the inboard valve. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any systems.

(d) This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1, Zone C-3

Schematic: 1E-1-4082-AN

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component VQ-051

This motor operated valve is located in the reactor building in environmental zone H4A. This component is exposed to a harsh environment for the Instrument Line break outside the containment and the high radiation from the LOCA Event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for suppression pool nitrogen make-up.

(b) Effect of Component Failure

Failure of this component may disable Primary Containment Purge system, but operation of this system is not required to meet the six safety objectives as described in Quadrex Report, QUAD-1-81-852.

The failure of the valve to perform its isolation function is not required because of the inboard valve. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-92, Sheet 1

Schematic: IE-1-4082-AM

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component WR-029

This motor operated valve is located in the Reactor Building environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This motor operated valve is required for outboard isolation of the Reactor Building Closed Cooling Water System (RBCCW).

(b) Effect of Component Failure

Failure of this component may disable the RBCCW, but this system is not required for any of the six safety objectives as described in Quadrex Report QUAD-1-81-852. The failure of the valve to perform its isolation function is not required because this is a closed system. Additionally, the inboard isolation valves are available as back-up. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other systems are affected by failure of this valve motor operator. This valve has no electrical interface with other components of any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break Event exists. It performs its function before it is affected by the LOCA radiation environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-90, Sheet 2, Zone B-7

Schematic: 1E-1-4096AB

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component WR-040

This motor operated valve is located in the Reactor Building environmental zone 14A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component (outboard isolation valve) provides containment isolation in RBCCV drywell cooling upon receiving an isolation signal.

(b) Effect of Component Failure

The failure of the valve to perform its isolation function is not required because this is a closed system. The inboard isolation valves are available as back-up. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other components or systems are affected by the failure of this component. This valve has no electrical interface with other components of this system or any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break Event exists. It performs its function before it is affected by the LOCA radiation environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-90, Sheet 2, Zone B-4  
Schematic: 1E-1-4096AB  
FCD/FSAR: None

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components OFZ-VC010B; OFZ-VC050B

The ITT General Controls AH91 valve actuators are located in the auxiliary building in environmental zone H9. Hence, these components are exposed to a harsh environment only for a LOCA event.

The sole function of these components is to actuate the control room HVAC emergency makeup from outlet dampers. The failure of the valve actuators will not affect any other system.

The original conservative radiation calculations determined that these components were located in a harsh environment with a radiation level of  $5 \times 10^6$  rads. These components were therefore stated as being located in zone H9 (see page M.3-1.21 of this appendix). However, updated radiation dose calculations, summarized on the next page, indicates that the realistic dose will be  $9 \times 10^3$  rads.

It is therefore concluded that these components are in a mild environment and do not require qualification to NUREG 0588. Nevertheless, these components are provided with 100% redundancy.



# RADIATION DOSE CALCULATION SUMMARY

Item No.	Dose Component	Dose Calculated		Realistic Dose	
		Rads.	Location	Rads	Location
1	Immersion Dose	$0.1 \times 10^3$	At Component	$0.1 \times 10^3$	At Component
2	From Refueling Floor	$3.0 \times 10^4$	At Point Adjacent to Refueling Floor	$3.0 \times 10^3$	At Component, shielded by 6 in. concrete from refueling floor.
3	From SGTS Piping	$8.7 \times 10^3$	1 in. from SGTS Piping	$1.0 \times 10^3$	At Component, located at least 10 ft. from SGTS piping.
4	From Filter	$7.5 \times 10^3$	3 ft. 6 in. from Filter	$3.1 \times 10^3$	At Component, located at least 5 ft. from filter.
5	Total Gamma Radiation (Items 1+2+3+4)	$4.6 \times 10^4$	-	$7.2 \times 10^3$	At Component
6	40 Year Normal Dosage	$0.7 \times 10^3$	-	$0.7 \times 10^3$	At Component
7	Beta Radiation	$0.1 \times 10^3$	-	$0.1 \times 10^3$	At Component
8	Total Radiation (Items 5+6+7)	$4.7 \times 10^4$	-	$8 \times 10^3$	At Component
9	10% Margin	$4.7 \times 10^3$	-	$8 \times 10^2$	At Component
10	Total Radiation Dose (Items 8+9)	$5.2 \times 10^4$	-	$9 \times 10^3$	At Component

## References:

P&ID: FSAR Fig. 9.4-1, Sheet 10

Schematic: 1E-0-4432 AE and AH

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components OVC05CA, B; OVE04CA, B

The carrier refrigeration compressor motors are located in the auxiliary building in environmental zone H9. Hence, these components are exposed to a harsh environment only for a LOCA event.

The sole function of motors OVC05CA and CB is to drive the control room HVAC system refrigeration compressors and the sole function of motors OVE04CA and CB is to drive the auxiliary electric equipment room HVAC system refrigeration compressors. The failure of the motors will not affect any other system.

The original conservative radiation calculations determined that these components were located in a harsh environment with a radiation level of  $5 \times 10^6$  rads. These components were therefore stated as being located in zone H9. (see pages M.3-1.20 and 28 of this appendix). However, updated radiation dose calculations, summarized on the next page, indicate that the realistic dose will be  $9 \times 10^3$  rads.

It is therefore concluded that these components are in a mild environment and do not require qualification to NUREG 0588. Nevertheless, these components are provided with 100% redundancy.

# RADIATION DOSE CALCULATION SUMMARY

Item No.	Dose Component	Dose Calculated		Realistic Dose	
		Rads.	Location	Rads	Location
1	Immersion Dose	$0.1 \times 10^3$	At Component	$0.1 \times 10^3$	At Component
2	From Refueling Floor	$3.0 \times 10^4$	At Point Adjacent to Refueling Floor	$3.0 \times 10^3$	At Component, shielded by 6 in. concrete from refueling floor.
3	From SGTS Piping	$8.7 \times 10^3$	1 in. from SGTS Piping	$1.0 \times 10^3$	At Component, located at least 10 ft. from SGTS piping.
4	From Filter	$7.5 \times 10^3$	3 ft. 6 in. from Filter	$3.1 \times 10^3$	At Component, located at least 5 ft. from filter.
5	Total Gamma Radiation (Items 1+2+3+4)	$4.6 \times 10^4$	-	$7.2 \times 10^3$	At Component
6	40 Year Normal Dosage	$0.7 \times 10^3$	-	$0.7 \times 10^3$	At Component
7	Beta Radiation	$0.1 \times 10^3$	-	$0.1 \times 10^3$	At Component
8	Total Radiation (Items 5+6+7)	$4.7 \times 10^4$	-	$8 \times 10^3$	At Component
9	10% Margin	$4.7 \times 10^3$	-	$8 \times 10^2$	At Component
10	Total Radiation Dose (Items 8+9)	$5.2 \times 10^4$	-	$9 \times 10^3$	At Component

## References:

P&ID: FSAR Fig. 9.4-1, Sheets 3 and 4; 9.4-2, Sheets 3 and 4

Schematic: 1E-0-4432 AQ and AK  
1E-0-4434 AK and AL

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component TC-VG-029

This component is located in the reactor building in environment zone H4B. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides control for the electric heater for the Standby Gas Treatment System.

(b) Effect of Component Failure

Failure of this component may prevent the SGTS from performing its function. The SGTS in the other unit is available for effluent control if required.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This component does not have electrical interface with any other system.

(d) Operator Action

If the SGTS fails to perform its function, the operator can start the SGTS in the unaffected unit to service the affected unit.

References:

Schematic: 1E-1-4074AA

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component TCVG-030

This component is located in the reactor building in environmental zone H4B. Hence, this component is exposed to a harsh environment for the Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides control for the electric heater for the Standby Gas Treatment System.

(b) Effect of Failure

Failure of this component may prevent the SGTS from performing its function. The SGTS in the other unit is available for effluent control if required.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This component does not have electrical interface with any other system.

(d) Operator Action

If the SGTS is unable to perform its function, the operator can start the SGTS in the unaffected unit to service the affected unit.

References:

Schematic: 1E-1-4074AA



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PL-32J

This component is located in the basement floors outside ECCS equipment cubicles in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides control and indication for HPCS cubicle ventilation.

(b) Effect of Component Failure

Failure of this component may disable the ventilation system for HPCS cubicle but the ventilation system for RCIC/LPCS cubicle is available for the alternate RCIC and LPCS systems. (The control panel for RCIC/LPCS is in zone H5A).

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This component does not have electrical interface with any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation. Alternate systems are available to provide core coverage and cooling. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4089AA

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PL-33J

This component is located in the basement floor outside ECCS equipment cubicles in environment zone H5E. Hence, this component is exposed to a harsh environment for the Line Break Outside Containment in the RHR cubicle and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides control and indication for RHR B&C cubicle ventilation.

(b) Effect of Component Failure

Failure of this component may disable the ventilation system for RHR B&C cubicle but the ventilation system for RHR A cubicle is available for RHR system (Division 1). The control panel PL-34J for RHR A cubicle is in zone H5E but widely separated from panel PL 33J.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This component does not have electrical interface with any other system.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation. Alternate systems are available to provide core coverage and cooling. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematics: 1E-1-4089AA

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component PL-34J

This component is located in the basement floor outside ECCS equipment cubicles in environment zone H5E. Hence, this component is exposed to a harsh environment for the Line Break Outside Containment in the RHR cubicle and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides control and indication for RHR A cubicle ventilation.

(b) Effect of Component Failure

Failure of this component may disable the ventilation system for RHR A cubicle, but the ventilation system for RHR E&C cubicles is available for RHR system (Division 2). The control panel PL33J for RHR B&C is in zone H5E but widely separated from panel PL-34J.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This component does not have electrical interface with any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation. Alternate systems are available to provide core coverage and cooling. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4089AA

TABLE M.5-1 (Cont)

m) COMPONENT APPLICATION STATEMENT

Component PL-35J

This component is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides control and indication for RCIC/LPCS cubicle ventilation system.

(b) Effect of Component Failure

Failure of this component may disable the ventilation system for RCIC/LPCS cubicle but the ventilation systems for HPCS and RHR cubicles are available for the alternate HPCS and RHR systems. (The control panel for HPCS/RHR cubicles are in zone H5E).

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This component does not have electrical interface with any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation. Alternate systems are available to provide core coverage and cooling. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4089AB

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components RE-CM011, RE-CM017

These gross gamma detectors are located in the drywell area in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment, and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense radiation in the drywell area and provide signals for monitoring and recording radiation in the drywell.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event Outside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the monitoring and recording of the radiation inside the drywell.

(c) Impact on Other Systems

The sole function of these components is to monitor and record radiation inside the drywell. No other systems are affected by its failure.

(d) Operator Action

These devices provide information only and perform no automatic function. Alternate similar information may be obtained from the HRSS system and/or portable radiation detectors. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: FSAR Figure 7.5-4, Sheet 3

Schematic: 1E-1-4018ZA



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HS-VY001

These General Electric SBM switches are located in the reactor building in environmental zone H6. These components provide local manual operation of the RHR pump A cubicle cooler fan for maintenance. This valve will be deleted from Appendix M list since it serves no safety function and does not have to be qualified.

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HS-VY002

These General Electric SBM control switches are located in the reactor building in environmental zone H6. These components provide local manual operation of the HPCS cubicle cooler fan for maintenance. This valve will be deleted from Appendix M list since it serves no safety function and does not have to be qualified.

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HS-VY003

The General Electric SBM control switches are located in the reactor building in environmental zone H6. These components provide manual operation of the RHR pumps B/C cubicle cooler fan for maintenance. This valve will be deleted from Appendix M list since it serves no safety function and does not have to be qualified.

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component HS-VY004

This General Electric SBM control switch is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides manual operation of the LPCS and RCIC cubicle cooler fan.

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the manual operation of the LPCS and RCIC cubicle cooler fan.

(c) Impact on Other Systems

The sole function of this component is to provide manual operation of the LPCS and RCIC cubicle cooler fan. No other systems are affected by its failure.

(d) Operator Action

For a break in the RCIC/LPCS cubicle, the RCIC/LPCS is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC/LPCS. Following accident confirmation based on leak detection, emergency operating procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In addition, this device is not required when the harsh environment caused by the instrument line break or the LOCA exists.

References:

Schematic: 1E-1-4089AB

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component TS-VY001

The United Electric temperature switch model #C302P-103 components are located in the reactor building in environmental zone H6. Hence, this component is exposed to a harsh environment for the Line Break inside the RHR cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense RHR Pump A cubicle temperature and initiate automatic operation of the cubicle cooler fan.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to automatically turn on the RHR pump A cubicle cooler fan. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

Reference:

Schematic: 1E-1-40894A



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component TS-VY002

The United Electric Temperature switch model #C302P-103 components are located in the reactor building in environmental zone H6. Hence, this component is exposed to a harsh environment for the Line Break inside the RHR cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, Page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense HPCS cubicle temperature and initiate automatic operation of the cubicle cooler fan.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the automatic operation of the HPCS cubicle cooler fan.

(c) Impact on Other Systems

The sole function of these components is to automatically turn on the HPCS cubicle cooler fan. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4089AA

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component TS-VY003

The United Electric temperature switch model #C302P-103 is located in the reactor building in environmental zone H6. Hence, this component is exposed to a harsh environment for the Line Break inside the RHR cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense RHR Pump B and C cubicle temperature and initiate automatic operation of the cubicle cooler fan.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to automatically turn on the RHR pumps B and C cubicle cooler fan. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

Reference:

Schematic: 1E-1-4089AA

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-S500

This General Electric CR-2940 control switch is located in the Reactor Building in environmental zone H4A. This component is exposed to a harsh environment for the Instrument Line Break Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This local control switch provides local control of the RHR suction cooling inboard isolation valve E12-F009 from Division I power.

(b) Effect of Component Failure

This switch is provided to ensure an alternate shutdown cooling mode during normal, hot accident, conditions. In fact, the switch is locked open and de-energized by a breaker such that it cannot be operated except under the most controlled circumstances.

(c) Impact on Other Systems

No other components or systems are affected by the failure of these components since they are locked open.

(d) Operator Action

This device is not required under any accident condition. Therefore, no operator action is required to achieve the six safety objectives.

TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components OVC05CA, B; OVE04CA, B

The carrier refrigeration compressor motor control panels are located in the auxiliary building in environmental zone H9. Hence, these components are exposed to a harsh environment only for a LOCA event.

The sole function of panels OVC05CA and CB is to provide controls for the control room HVAC system refrigeration compressor motors and the sole function of panels OVE04CA and CB is to provide controls for the auxiliary electric equipment room HVAC system refrigeration compressor motors. The failure of the control panels will not affect any other system.

The original conservative radiation calculations determined that these components were located in a harsh environment with a radiation level of  $5 \times 10^6$  rads. These components were therefore stated as being located in zone H9 (see pages M.3-1.20 and 28 of this appendix). However, updated radiation dose calculations, summarized on the next page, indicate that the realistic dose will be  $9 \times 10^3$  rads.

It is therefore concluded that these components are in a mild environment and do not require qualification to NUREG 0588. Nevertheless, these components are provided with 100% redundancy.

# RADIATION DOSE CALCULATION SUMMARY

Item No.	Dose Component	<u>Dose Calculated</u>		<u>Realistic Dose</u>	
		<u>Rads.</u>	<u>Location</u>	<u>Rads</u>	<u>Location</u>
1	Immersion Dose	$0.1 \times 10^3$	At Component	$0.1 \times 10^3$	At Component
2	From Refueling Floor	$3.0 \times 10^4$	At Point Adjacent to Refueling Floor	$3.0 \times 10^3$	At Component, shielded by 6 in. concrete from refueling floor.
3	From SGTS Piping	$8.7 \times 10^3$	1 in. from SGTS Piping	$1.0 \times 10^3$	At Component, located at least 10 ft. from SGTS piping.
4	From Filter	$7.5 \times 10^3$	3 ft. 6 in. from Filter	$3.1 \times 10^3$	At Component, located at least 5 ft. from filter.
5	Total Gamma Radiation (Items 1+2+3+4)	$4.6 \times 10^4$	-	$7.2 \times 10^3$	At Component
6	40 Year Normal Dosage	$0.7 \times 10^3$	-	$0.7 \times 10^3$	At Component
7	Beta Radiation	$0.1 \times 10^3$	-	$0.1 \times 10^3$	At Component
8	Total Radiation (Items 5+6+7)	$4.7 \times 10^4$	-	$8 \times 10^3$	At Component
9	10% Margin	$4.7 \times 10^3$	-	$8 \times 10^2$	At Component
10	Total Radiation Dose (Items 8+9)	$5.2 \times 10^4$	-	$9 \times 10^3$	At Component

## References:

Schematic: 1E-0-4432 AQ and AR  
1E-0-4434 AK and AL



TABLE M.5-1 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components OVC05CA, B; OVE04CA, B

The carrier refrigeration compressor motor power panels are located in the auxiliary building in environmental zone H9. Hence, these components are exposed to a harsh environment only for a LOCA event.

The sole function of panels OVCC5CA and CB is to provide power to the control room HVAC system refrigeration compressor motors and the sole function of panels OVE04CA and CB is to provide power to the auxiliary electric equipment room HVAC system refrigeration compressor motors. The failure of the power panels will not affect any other system.

The original conservative radiation calculations determined that these components were located in a harsh environment with a radiation level of  $5 \times 10^6$  rads. These components were therefore stated as being located in zone H9 (see pages M.3-1.20 and 28 of this appendix). However, updated radiation dose calculations, summarized on the next page, indicate that the realistic dose will be  $9 \times 10^3$  rads.

It is therefore concluded that these components are in a mild environment and do not require qualification to NUREG 0588. Nevertheless, these components are provided with 100% redundancy.

# RADIATION DOSE CALCULATION SUMMARY

Item No.	Dose Component	<u>Dose Calculated</u>		<u>Realistic Dose</u>	
		<u>Rads.</u>	<u>Location</u>	<u>Rads</u>	<u>Location</u>
1	Immersion Dose	$0.1 \times 10^3$	At Component	$0.1 \times 10^3$	At Component
2	From Refueling Floor	$3.0 \times 10^4$	At Point Adjacent to Refueling Floor	$3.0 \times 10^3$	At Component, shielded by 6 in. concrete from refueling floor.
3	From SGTS Piping	$8.7 \times 10^3$	1 in. from SGTS Piping	$1.0 \times 10^3$	At Component, located at least 10 ft. from SGTS piping.
4	From Filter	$7.5 \times 10^3$	3 ft. 6 in. from Filter	$3.1 \times 10^3$	At Component, located at least 5 ft. from filter.
5	Total Gamma Radiation (Items 1+2+3+4)	$4.6 \times 10^4$	-	$7.2 \times 10^3$	At Component
6	40 Year Normal Dosage	$0.7 \times 10^3$	-	$0.7 \times 10^3$	At Component
7	Beta Radiation	$0.1 \times 10^3$	-	$0.1 \times 10^3$	At Component
8	Total Radiation (Items 5+6+7)	$4.7 \times 10^4$	-	$8 \times 10^3$	At Component
9	10% Margin	$4.7 \times 10^3$	-	$8 \times 10^2$	At Component
10	Total Radiation Dose (Items 8+9)	$5.2 \times 10^4$	-	$9 \times 10^3$	At Component

## References:

Schematic: 1E-0-4432 AQ and AR  
1E-0-4434 AK and AL

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-F013 A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, U, V

The solenoid valves associated with ADS valves are located in the drywell in environmental zone H2A. These valves are exposed to a harsh environment during Line Breaks within the primary containment (see Section 4.1, page 4-2, of Quadrex Report QUAD-1-81-852).

(a) Component Function

These components are used to actuate the ADS valves. The ADS valves are used to depressurize the RPV, if required, to permit the low pressure ECCS to provide core coverage upon an assumed failure of the HPCS.

(b) Effect of Component Failure

The complete loss of these components for all line break cases inside the containment, except the small Line Break Event, will not preclude achieving the six safety objectives. For the line break cases outside containment, these components are not subjected to the associated harsh environment; and, therefore, will perform their required function.

For the small line break case inside containment, the radiation levels associated with this event are far lower than those associated with the design basis LOCA and currently assigned to zone H2. An assessment of the radiation exposures for these components associated with a small line break inside containment has been performed and indicates exposure levels are below the qualification level of the solenoid valves of  $3 \times 10^7$  rads.

The dose currently calculated for Zone H2 is  $2 \times 10^8$  rads. The assumptions supporting this number are:

NUREG 0588 source terms

40 yr + accident + 20% margin

no  $\gamma$  credit for actuator assembly housing

dose calculated for 365 days versus 100 days

85% availability factor for 40 year dose

$\beta$  dose calculated at a metal depth of 35 mills

$$8.86 \times 10^7 \quad \gamma$$

$$6.1 \times 10^7 \quad \beta$$

$$1.6 \times 10^7 \quad 40 \text{ yrs}$$

$$\hline 16.56 \times 10^7$$

$$+ 20\% \text{ margin} = \underline{2 \times 10^8 \text{ rads}}$$

TABLE M.5-2 (Cont.)

(b) Effect of Component Failure (Cont.)

The dose for equipment in H2 from a small line break is estimated to be  $2.4 \times 10^7$  rads. The assumptions supporting this number are:

gap activity source term (10% halogens and nobles, 30% K<sub>A</sub>85)

5 yr + accident + 10% margin

no  $\gamma$  credit for actuator assembly housing

dose calculated for 365 days versus 100 days

85% availability factor for 5 year dose

$\beta$  dose calculated at a metal depth of 5 mills

$$1.1 \times 10^7 \quad \gamma$$

$$0.9 \times 10^7 \quad \beta$$

$$0.2 \times 10^7 \quad 5 \text{ yrs}$$

$$\hline 2.2 \times 10^7$$

$$+ 10\% \text{ margin} = \underline{2.4 \times 10^7 \text{ rads}}$$

(c) Impact on Other Systems

For the small Line Break Inside Containment, the HPCS will serve as the primary system to mitigate the small break. ADS is available as a back-up.

(d) Operator Action

The actuator assemblies will function as designed for the small line break inside containment. No operator action is required. For a large break, the ADS function is not required to depressurize the reactor vessel and no operator action is specifically required in the event the solenoids fail.

Based on this analysis, these components will be qualified to NUREG 0588 Cat. II, when the documentation file is updated.

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C71-N006A, B, C, D

These NAMCO EA170 limit switches are located in the turbine building area (accessible) in environmental zone H7. Hence, these components are exposed to a harsh environment only for the Line Break Event in the Turbine Building area (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense turbine stop valve closure, and initiate automatic reactor scram and recirc pump trip above 30% power.

(b) Effect of Component Failure

The failure of these components due to the Line Break in the Turbine Building will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-82-852).

Failure of these components for this event will eliminate the TSV reactor scram and recirc pump trip. Diverse RPS trips, such as reactor high pressure and neutron flux, are provided as a backup.

(c) Impact on Other Systems

The sole function of these components is to provide a trip for RPS scram and recirc pump trip control logic. Other signals, such as turbine control valve fast closure can be used as an alternate signal to automatically scram the reactor and also trip the recirc pump. No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the break in the turbine building exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic Diagram: 1E-1421bAM, AC, AD, AE & AF

IED: FSAR Figure 7.2-1



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N015 A, B, C & D

The Barksdale BIT-M12SS-GE steam line pressure components are located in the accessible area of the Turbine Building in environmental zone H7. These components are exposed to a harsh environment for a Line Break Outside the Containment (see Section 4.3, page 4-23 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for this event.

(a) Component Function

These components sense main steam line pressure just upstream of the turbine stop valves and provide a trip to close the main steam isolation and drain valves.

(b) Effect of Component Failure

The loss or failure of these devices will prevent isolation of the main steam lines and drain lines on loss of pressure in the main steam line. Diverse isolation signals are available that are not affected by the line break outside containment. The loss of these components will not affect safe shutdown, containment isolation, core coverage, RHR, containment integrity, and effluent control as described in Quadrex Report, QUAD-1-81-852.

(c) Impact on Other Systems

The sole function of these components is to initiate main steam line and drain line isolation on loss of pressure in the main steam line.

(d) Operator Action

Due to physical and electrical separation, these devices will perform their function before they are affected by this event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-55, Sheet 3

Schematic: 1E-1-4232AB, AC, AD, AE

FCD: FSAR Figure 7.3-13, Sheet 2 (B-5)



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N020A, B, C, & D

The Barkdale BIT-M12SS-GE reactor pressure measurement components are located in the reactor building in environmental zone H4A. Hence these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-23, of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for these events.

(a) Component Function

These components sense vessel pressure and initiate scram on high vessel pressure with MSIs closed.

(b) Effect of Component Failure

The loss or failure of these devices disables one of the sensing functions which initiate scram on high reactor vessel pressure. Diverse signals are available for scram. Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of components affects only the reactor protection and the primary containment and reactor vessel isolation systems.

(d) Operator Action

Due to physical and electrical separation, these devices will perform their function before they are affected by this event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

F&ID: M-93, Sheets 4 & 5

Schematic: 1E-1-4215AC, AD, AE, AF; 1E-1-4232, 1E-1-4203

FCD: FSAR Figure 7.3-13, 7.2-1, 7.3-7

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N023 A, B, C, and D

The Barksdale BIT-M12SS-GE reactor pressure measurement components are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and the high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-23 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for this event.

(a) Component Function

These components sense vessel pressure and initiate reactor scram on high pressure.

(b) Effect of Component Failure

The loss or failure of these devices disables one of the sensing functions which initiate scram on high reactor vessel pressure (half-scram mode). Diverse signals are available for scram. Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

These components affect only the reactor protector system.

(d) Operator Action

Due to physical and electrical separation, these devices will perform their function before they are affected by this event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-93, Sheets 4 & 5

EC&I: 1E-1-4215

FSAR: 7.2-1, 7.3-7

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N039 CC, DD, EE, KK, PP, SS, UU

The Barksdale BIT-M12SS-6E reactor pressure components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break outside the containment and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-23 of Quadrex Report QUAD-1-81-852). The impact of failure is considered only for these events.

(a) Component Function

These components are located in Division II of the low-low-set relief function.

(b) Effect of Failure

The failure or loss of these devices will disable the low-low-set relief function. This function is not required for these events.

(c) Impact on Other Systems

Failure of these devices will only affect the low-low set function. There is no effect on any other system.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break or LOCA event in Containment exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

B21-N039 (Division II only)

Schematic: 1E-1-4201AQ, AR, AJ, AK

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N045A, B, C, and D

These Barksdale BIT-M1255-GE pressure switches are located in the Reactor Building in Environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (See Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852.) The impact of component failure is considered only for these events.

(a) Component Function

These components sense reactor vessel pressure and provide a signal to the recirculation system for trip (ATWS) of the recirc pump motors on high reactor pressure.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, R<sub>UP</sub> containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for these events will affect the trip (ATWS) of the recirculation pump motors on high reactor pressure. These events will not result in high reactor pressure or a need for these components to function.

(c) Impact on Other Systems

The sole function of these components is to trip the recirc pump motors on reactor high pressure. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the other division components. This device is not required when the harsh environment caused by any break exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-93, Sheet 5  
Schematic: 1E-1-4205AB, AM  
FCD: FSAR Figure G.A-2, Sheet 6

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N060 S, SS, U, UU

The Barksdale BIT-M12SS-GE reactor pressure measurement components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break outside the containment and the high radiation from the LOCA event inside containment (see Section 4.4, para 4-23 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for these events.

(a) Component Function

These components are used in operation of the low-low-set relief function.

(b) Effect of Component Failure

The failure or loss of these devices will disable the low-low-set function. This function is not required for these events.

(c) Impact on Other Systems

Failure of these devices will only affect the low-low-set function. There is no effect on any other systems.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break and LOCA event in Containment exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4201 AG, AK



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N061 C, CC, D, DD, E, EE, K, KK, P, PP, S, SS, U, UU

The Barksdale BIT-M12SS-GE reactor pressure measurement components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break outside the containment and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-23 of Quadrex Report QUAD-1-81-852). The impact of this component failure is considered only for these events.

(a) Component Function

These components which sense vessel pressure are used in the operation of the low-low-set function.

(b) Effect of Component Failure

The failure or loss of these devices will disable the low-low-set relief function. This function is not required for these events.

(c) Impact on Other Systems

Failure of these devices will only affect the low-low-set function. There is no effect on any other system.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break and LOCA event in Containment exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

B21-N061

Schematic: 1E-1-4201 AC, AD, AE, AF, AG, AJ, AK, AR



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C71-N003 A, B, C, D

The Barksdale B17-M12SS-GE pressure components are located in the accessible area of the turbine building in environmental zone H7. These components are exposed to a harsh environment for a line break in the Turbine Building. (See Section 4.3, page 4-23 of Quadrex Report QUAD-1-81-852.) The impact of this component failure is considered only for this event.

(a) Component Function

These components sense turbine 1st stage pressure and provide a permissive to scram and RPT when the reactor power is equal to or greater than 30% of reactor power.

(b) Effect of Component Failure

The loss or failure of these devices could eliminate the scram/RPT on Turbine valve fast closure (RPT) when the reactor is above 30% of rated power. Failure of these components has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

This failure only affects the RPS and recirculation systems.

(d) Operator Action

Due to physical and electrical separation, these devices will perform their function before they are affected by this event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4215 AC, AC, AE, AF, AM  
1E-1-4205 AG and AS

FSAR (FED): Figure 7.2-1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N009A, B

These components are located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components monitor pressure of the RCIC steam turbine exhaust and send signals to the trip throttle valve of the steam supply to the auxiliary turbine.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event inside RCIC/LPCS cubicle or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide remote trip logic on high turbine exhaust pressure. No other systems are affected by their failure.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Following accident confirmation based on leak detection, emergency operating procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In the analysis of LOCA and HELB, no credit is given for RCIC. In addition, this device is not required when the harsh environment caused by the instrument line break or LOCA exists.

References:

P&ID: FSAR Figure 7.4-1, Sheet 2, Zone H9

Schematic: 1E-1-4226AC

FCD: FSAR Figure 7.4-2, Sheet 5, Zones F-8 and F-9

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N012A, B, C, D

These components are located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components monitor pressure of the RCIC steam turbine exhaust diaphragm and sends signals to the trip throttle valve of the steam supply to the auxiliary turbine.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event inside RCIC/LPCS cubicle or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide remote trip logic on high turbine exhaust diaphragm pressure. No other systems are affected by their failure.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Following accident confirmation based on leak detection, emergency operating procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In the analysis of LOCA and HELB, no credit is given for RCIC. In addition, this device is not required when the harsh environment caused by the instrument line break or LOCA exists.

References:

P&ID: FSAR Figure 7.4-1, Sheet 2, Zones D-10 and E-10

Schematic: 1E-1-4226AE

FCD: FSAR Figure 7.4-2, Sheet 1, Zones F-9, H-9, D-11 and E-11

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N021

This component is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component monitors RCIC pump suction pressure.

(b) Effect of Component Failure

The loss of this component due to the Instrument Line Break Event inside RCIC/LPCS cubicle or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this component is to provide an alarm for RCIC pump high suction pressure. No other systems are affected by its failure.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Following accident confirmation based on leak detection, emergency operating procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In the analysis of LOCA and HELB, no credit is given for RCIC. In addition, this device is not required when the harsh environment caused by the instrument line break or LOCA exists.

References:

P&ID: FSAR Figure 7.4-1, Sheet 2, Zone E-8

Schematic: 1E-1-4226AJ

FCD: FSAR Figure 7.4-2, Sheet 3, Zone C-3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E21-N001; E21-N009

The Barksdale PIH pressure indicating switches are located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and the high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the LPCS pump discharge pressure and provide permissive signal to the Automatic Depressurization System (ADS) in Division I logic.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event or the LOCA in the RCIC/LPCS cubicle will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for these events will affect the automatic operation of the ADS Division I LPCS only.

(c) Impact on Other Systems

The sole function of these components is to provide permissive signal to the ADS Division I LPCS logic. No other systems are affected by their failure.

(d) Operator Action

For a break in the LPCS cubicle, the Division I LPCS is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, ADS, RHR, and HPCS are available to mitigate the event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4201-AB

FCS: FSAR Figure 7.3-13, Sheet 3



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N020

The Barksdale PIH pressure indicating switches are located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for a line break in the RCIC/LPCS cubicle or the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses the RCIC pump discharge pressure and provides signal to open the RCIC minimum flow bypass valve E51-F019 at high pressure.

(b) Effect of Component Failure

The loss of this component due to the Line Break Event in the RCIC/LPCS cubicle or the LOCA will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the automatic operation of the RCIC system minimum bypass operation only.

(c) Impact on Other Systems

The sole function of this component is to open the RCIC minimum bypass valve at high RCIC pump discharge pressure. No other systems are affected by its failure.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Since the RCIC turbine will not function with a line break in the RCIC cubicle, nor can it function following a LOCA due to the fact there is no steam pressure to drive the turbine, the turbine need not be qualified for LOCA radiation environment. Based on these facts, this component does not require qualification to NUREG-0588 and will be removed from the qualification program.

References:

P&ID: FSAR Figure 7.4-1, Sheet 1

Schematic: 1E-1-4226AR

FCD: FSAR Figure 7.4-2, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C71-N005A, B, C, D

The Barksdale TC-9622 pressure switch components are located in the turbine building area (accessible) in environmental zone H7. Hence, these components are exposed to a harsh environment only for the Line Break Event in the turbine building area (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense hydraulic pressure to indicate turbine control valve fast closure. This function is used for automatic reactor scram and recirc pump trip on reactor power above 30%.

(b) Effect of Component Failure

The failure of these components due to the Line Break Event in the turbine building will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will eliminate the turbine CVFC signal used for automatic reactor scram and recirc pump trip. Other signals, such as stop valves closure and high reactor pressure, are available for reactor scram and recirc pump trip.

(c) Impact on Other Systems

The sole function of these components is to provide a turbine control valve fast closure signal for reactor scram and recirc pump trip. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the components in the other three RPS divisions. These devices are not required when the harsh environment caused by the line break in the turbine building exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4215AC, AD, AE, AF and AM

FCD: FSAR Figure 7.2-1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N056A, B, C, and D

The Barksdale DIT Condenser Vacuum components are located in the turbine building in environmental zone H7. Hence, these components are exposed to a harsh environment only for the Line Break Event Outside Containment (see Section 4.3, page 4-23 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense condenser vacuum and provide a trip to automatically close the main steam line isolation and drain valves.

(b) Effect of Component Failure

The loss of these components due to the Line Break Event Outside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will eliminate the condenser low vacuum signal used to automatically initiate the isolation of the main steam line and drain valves only. Manual and automatic MSIV closure on other diverse signals, such as low steam line pressure, are available.

(c) Impact on Other Systems

The sole function of these components is to provide a trip to automatically isolate the main steam line and drain valves on low condenser vacuum. No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the line break event outside containment exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-56, Sheets 2 and 3

Schematic: 1E-1-4232AB, AC, AD, AE

FCD: 7.3-B, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-N009 A, B, C

The Barton 288 differential pressure switch components are located in the RHR cubicle in environmental zone H4A. Hence these components are exposed to a harsh environment for the Line Break inside the cubicle and the high radiation from the LOCA event inside containment.

(a) Component Function

These components sense the differential pressure across injection valves which are used as a permissive to open the RHR injection valves.

(b) Effect of Component Failure

The failure of these components due to the Line Break Event or the LOCA will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect only the LPCI mode of RHR injection. HPCS or other ECCS systems will be available for core cooling and coverage.

(c) Impact on Other Systems

The sole function of these components is to permit opening of injection valves. No other systems are affected by their failure.

(d) Operator Action

These components are not required when the harsh environment caused by the Instrument Line Break exists. These components perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: FSAR Figure 7.3-11, Sheets 1 & 2  
Schematic: 1E-1-4220-AH  
FCD/FSAR: Figure 7.3-12, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E21-N006

The Barton 288 differential pressure switch component is located in the RCIC/LPCS cubicle in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Line Break Inside the cubicle and the high radiation from the LOCA event inside containment.

(a) Component Function

This component senses the differential pressure across the injection valve which is used as a permissive interlock to open the LPCS injection valve.

(b) Effect of Component Failure

The failure of this component due to the Line Break Event or the LOCA will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect only the LPCS. HPCS or other ECCS systems will be available for core cooling and coverage.

(c) Impact on Other Systems

The sole function of this component is to permit opening of injection valve. No other systems are affected by their failure.

(d) Operator Action

This component is not required when the harsh environment caused by the Instrument Line Break exists. This component performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-94, Zone C-5

Schematic: 1E-1-4221-AD

FCD/FSAR: Figure 7.3-10, Sheet 1



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N007 A, B

The Barton 288 differential pressure switch components are located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the line break in the cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered Only for this event.

(a) Component Function

These components sense the differential pressure in the RHR steam condensing supply line and close the isolation valve.

(b) Effect of Component Failure

The valve is normally closed except during steam condensing mode. The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). Diverse signals are available for isolation.

(c) Impact on Other Systems

The sole function of these components is to isolate the RHR steam condensing supply line. No other systems are affected by their failure.

(d) Operator Action

These components are not required when the harsh environment caused by the line break exists. Due to physical and electrical separation, these and other redundant devices will perform their function before they are affected by this event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: FSAR Figure 7.3-15

Schematic: 1E-4226 AD

FCD: FSAR Figure 7.4-2, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components E31-N008A, B, C, & D

The Barton 288 differential pressure indicator switch components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the main steam line flow and initiate Primary Containment and Reactor Vessel Isolation Control System (PCRVICES).

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event in the reactor building will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-181-852).

Failure of these components will affect only the automatic initiation of containment isolation which is not required for the Instrument Line Break Event Outside Containment. These components are not required for the LOCA Event Inside Containment.

(c) Impact on Other Systems

The sole function of these components is to initiate containment isolation (PCRVICES). No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the Instrument Line Break Event and LOCA exists. Therefore, no operator action is required to achieve any of the six safety objectives. Due to physical separation, failure of one instrument line will not impact the components in the other 3 PCRVICES divisions.

References:

P&ID: M-15, Sheet 2, Zone F-2

Schematic: 1E-1-4232AB, AC, AD, and AE

IED: FSAR Figure 7.3-15, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N009A, B, C, and D

The Barton 288, differential pressure indicator switch components are located in the reactor building in environmental zone H<sub>4</sub>. Hence, these components are exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense main stream line high flow and initiate Primary Containment and Reactor Vessel Isolation.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to initiate containment isolation (PCRVCS). No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the line break in the tunnel exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-155, Sheet 2, Zone F-2

Schematic: 1E-14232AB, AC, AD, AE

FCD: FSAR Figure 7.3-15, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N010A, E, C, D

The Barton 288, differential pressure indicator switch components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense main stream line high flow and initiate Primary Containment and Reactor Vessel Isolation.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to initiate containment isolation (PCRVCIS). No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the line break in the tunnel exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-155, Sheet 2, Zone F-2

Schematic: 1E-14237AB, AC, AD, AE

FCD: FSAR Figure 7.3-15, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N011A, B, C, and D

The Barton 288, differential pressure indicator switch components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense main stream line high flow and initiate Primary Containment and Reactor Vessel Isolation.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to initiate containment isolation (PCRVCs). No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the line break in the tunnel exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-155, Sheet 2, Zone F-2

Schematic: 1E-14232AB, AC, AD, AE

FCD: FSAR Figure 7.3-15, Sheet 2



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N012A, B

The Barton 288 differential pressure switch components are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the line break in the cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense high flow in the RHR shutdown suction line and isolate shutdown cooling flow.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to isolate the shutdown cooling flow in RHR. No other systems are affected by their failure.

(d) Operator Action

These components are not required when the harsh environment caused by the line break exists. Due to physical and electrical separation, these and other redundant devices will perform their function before they are affected by this event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-155, Sheet 2, Zone F-2

Schematic: 1E-1-4232AK

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N013A, B

The Barton 288 differential pressure switch components are located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the line break in the cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the RCIC steam flow, isolate the RCIC steam supply (on high flow) and provide annunciation in the main control room.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect only the RCIC system. HPCS will be available for safe shutdown, core coverage and RHR system will be available for residual heat removal.

(c) Impact on Other Systems

The sole function of these components is to isolate the RCIC steam supply. No other systems are affected by their failure.

(d) Operator Action

These components are not required when the harsh environment caused by the line break exists. Due to physical and electrical separation, these and other redundant devices will perform their function before they are affected by this event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-155, Sheet 2, Zone F-2

Schematic: 1E-1-4226-AF

FCD/FSAR: Figure 7.4-2, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components B21-N024A, B, C, and D

The Barton 288A reactor level components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense reactor vessel water level and trips HPCS and RCIC at Level 8, and reactor scram at low water level (Level 3).

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity, and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

For the instrument line break in the reactor building open area, there is no automatic scram since the transient effects are not large enough to cause automatic initiation of the RPS. The reactor operator recognizes the situation and manually initiates shutdown, core cooling, and inventory control via the RPS.

Failure of these components for these events will affect the automatic trip logic for RPS and HPCS of Division III only. This does not inhibit manual scram and manual HPCS trip.

(c) Impact on Other Systems

The sole function of these components is to provide a reactor high water level trip to the HPCS and RCIC as well as low water level scram. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the components in other ECCS and RPS divisions. These devices are not required when the harsh environment caused by the instrument line break exists and the Level 8 trip function is not required when the LOCA radiation harsh environment exists. They perform their Level 3 function before they are affected by the LOCA radiation and harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95  
Schematic: 1E-1-4215; 4226AF, 4226AC  
FCD: FSAR Figure 7.2-1, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components B21-N031A, B, C, and D

The Barton 288A reactor water level components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and the high radiation from the LOCA inside containment. (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense reactor vessel water level and initiate HPCS at Level 2.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for these events will affect the automatic initiation in Division III of HPCS only. However, the Instrument Line Break event does not require automatic initiation of HPCS.

(c) Impact on Other Systems

The sole function of these components is to provide a low reactor water level initiation signal to the HPCS. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the components in the other two ECCS divisions. Hence, these devices are not required when the harsh environment caused by the Instrument Line Break exists. They perform their function before they are affected by the LOCA radiation. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95  
Schematic: 1E-1-4223  
FCD: FSAR Figure 7.3-6, Sheets 1 and 3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components B21-N037A, B, C, and D

The Barton 288A reactor water level components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense reactor water level, and provide a permissive for ADS and initiate LPCS and RHR (LPCI) at Level 1.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of B21-N037A and C for this event will affect the automatic initiation of LPCS, ADS, and RHR of Division 1 only. The Division 2 ADS and RHR, and Division 3 HPCS are available as backup.

Failure of B21-N037B and D for this event will affect the automatic initiation of ADS and RHR of Division 2 only. The Division 1 LPCS, ADS, RCIC, and RHR, and Division 3 HPCS are available as backup. Core coverage is maintained at all times.

(c) Impact on Other Systems

The sole function of these components is to provide a low reactor water level permissive signal to the ADS, and initiation of LPCS and RHR-LPCI. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the components in the other two ECCS divisions. These devices are not required when the harsh environment caused by the instrument line break exists. They perform their function before they are affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives

References:

P&ID: M-94, M-87

Schematic: 1E-1-4221AD, AE; 1E-1-4201

FCD: FSAR Figure 7.3-10, Sheet 1, 2; FSAR Figure 7.3-13, Sheet 3



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Components B21-N038A and B

The Barton 288A level components are located in the reactor building in environmental zone H4A. Hence these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment. (See Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852.) The impact of component failure is considered only for these events.

(a) Component Function

These components sense reactor water level at Level 3 and are a permissive for automatic ADS.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity, and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide a low reactor water level confirmation signal for automatic ADS. No other systems are affected by their failure.

(d) Operator Action

ADS permissive logic is given for Division 1 and Division 2. Due to physical separation, regardless of the failure, at least one division of ADS would get a permissive signal. These components are not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-55

Schematic: 1E-1-4201

FCD: FSAR Figure 7.3-13, Sheet 3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-N010, A, B, C

These components are located in the RHR cubicle in environmental zone H6. Hence these components are exposed to a harsh environment for the line break in the cubicle and the high radiation from the LOCA Event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These differential pressure indicating switches sense the flow rate in the RHR discharge and controls the RHR pump's minimum flow bypass valves.

(b) Effect of Component Failure

These are normally open valves. The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide minimum flow bypass logic to control RHR pump minimum flow bypass valves E12-F064 A,B, C. No other systems are affected by their failure.

(d) Operator Action

For a break in the RHR cubicle, the RHR is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. These components are not required when the harsh environment caused by the Instrument Line Break exists. These components perform their function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: FSAR Figure 7.3-11, Sheets 1 and 2

Schematic: 1E-1-4220AJ, AM, AH, AK, CA

FCD: FSAR Figure 7.3-12, Sheet 4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E21-N004

This component is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This flow indicating switch is used for sensing LPCS pump discharge flow.

(b) Effect on Component Failure

The failure of this component due to the Instrument Line Break Event inside RCIC/LPCS cubicle or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this component is to control LPCS minimum flow bypass valve E21-F011. No other systems are affected by its failure.

(d) Operator Action

For a break in the RCIC/LPCS cubicle, the LPCS is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable LPCS. Following accident confirmation based on leak detection, emergency operating procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In addition, this device is not required when the harsh environment caused by the Instrument Line Break or LOCA Event exists. This device performs its function before it is affected by the LOCA radiation harsh environment.

References:

Schematics: 1E-1-4221 AD, AB

FCD/FSAR: Fig. 7.3-10, Sheet 2, Zone H-1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-N006

The Barton 239 differential pressure switch is located in the HPCS cubicle in environmental zone H6. This component is exposed to a harsh environment for the Line Break Inside the cubicle and the high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This flow switch is used to sense HPCS flow.

(b) Effect of Component Failure

The failure of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this component is to provide HPCS flow logic to control HPCS minimum flow bypass to suppression pool valve E22-F012. No other systems are affected by its failure.

(d) Operator Action

For a break in the HPCS cubicle, the HPCS is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95, Zone C-3  
Schematic: 1E-1-4222AC, AE  
FCD: FSAR Figure 7.3-6, Sheet 2, Zone B-2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N002

This component is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This flow switch is used for sensing high/low RCIC flow.

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event inside the RCIC/LPCS cubicle or the LOCA event will not preclude achieving the six safety objectives, namely safe shut-down, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of this component is to control RCIC minimum flow bypass valve E51-F019 to the suppression chamber. No other systems are affected by its failure.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Following accident confirmation based on leak detection, emergency operating procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In the analysis of LOCA and HELB, no credit is given for RCIC. In addition, this device is not required when the harsh environment caused by the instrument line break or LOCA event exists. It performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID: FSAR Figure 7.4-1, Sheet 1, Zone F-10

Schematic: 1E-1-4226AR

FCD: Figure 7.4-2. Sheet 2, Zone 3-3



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N026A, B, C, & D

The Barton 760 reactor water level components are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense reactor vessel water level and automatically initiate MSIV closure, RWCU isolation, and SGTS at Level 2.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, Page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the automatic initiation of SGTS, MSIV closure and RWCU isolation valves. Containment isolation and RWCU isolation are not required for this event. Isolation can be achieved by manually initiating MSIV closure.

(c) Impact on Other Systems

The sole function of these components is to provide a low reactor water level initiation signal to the Reactor Water Cleanup isolation valve, SGTS, and Main Steam Isolation Valves. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the other division's components. These devices are not required when the harsh environment caused by the Instrument Line Break Event or LOCA Event exists. These devices perform their function before it is affected by the LOCA radiation. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-93, Sheets 4 & 5  
Schematic: Figure 1E-1-4232AB, AC, AD & AE  
FCD: 7.3-13

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N044A & B

The Barton 760 reactor water level components are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside the Containment and high radiation from the LOCA Event Inside Containment (see Section 4., page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components transmit reactor vessel water level to a recorder and indicator located in the control room.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4- of Quadrex Report QUAD-1-81-852).

Failure of these components has no effect on RHR system operation.

(c) Impact on Other Systems

The sole function of these components is to provide reactor water level indication in the control room. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not effect the components in other ECCS, RPS and PCRVCS divisions. These devices provide information only and perform no automatic function. Alternate similar information may be obtained from other level indicators such as water level in the fuel zone indicators. If all level indications are ultimately lost due to long term radiation effects, the operator will take action in accordance with the emergency procedures to ensure that the ECCS systems are running.

References:

P&ID: M-93, Sheet 3

Schematic: 1E-1-4220AN

FCD: FSAR Figure - None

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C11-N013A, B, C, and D

The Magnetrol 751 reactor water level components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense water level in the scram discharge volume and scram the reactor at high level.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will prevent the automatic scram function for high scram discharge volume only. It does not affect the other automatic scrams or the manual scram capability.

(c) Impact on Other Systems

The sole function of these components is to sense the high water level in the scram discharge volume and initiate automatic scram. No other systems are affected by their failure.

(d) Operator Action

These devices perform their function before they are affected by the Instrument Line Break Event or LOCA event. Therefore, no operator action is required to achieve any of the six safety objectives. Due to physical separation, failure of one instrument line will not impact the components in the other 3 RPS divisions.

References:

P&ID: FSAR Figure 7.7-2, Sheet 1, M-100, Sheet 2

Schematic: 1E-1-4215AC, AD, AE and AF

IED: FSAR Figure 7.2-1, Sheet 2 of 4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C11-N013E and F

The Magnetrol 751 reactor water level components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense water level in the scram discharge volume piping and block the control rod withdrawal in the Reactor Manual Control System at high level. Control room annunciation is also provided.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment on the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will not affect any safety function.

(c) Impact on Other Systems

The sole function of these components is to block further control rod withdrawal by the Reactor Manual Control System. No other systems are affected by their failure.

(d) Operator Action

These devices perform their function before they are affected by the Instrument Line Break or LOCA event. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-100, Sheet 2

Schematic: 1E-1-4206AK, AL

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N010

The Magnetrol 751 water level component is located in the reactor building in environmental zone H5A RCIC/LPCS Cubicle. This component is exposed to a harsh environment for the line break inside the cubicle and the high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses high water level in the RCIC steam line drain pot and opens a valve which permits the condensate flow to the main condenser.

(b) Effect of Component Failure

This component is not an ESF component. The loss of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will not affect any safety function.

(c) Impact on Other Systems

The sole function of this component is to open a valve and permit condensate to flow to the main condenser. No other systems are affected by their failure.

(d) Operator Action

Since the RCIC turbine will not function with a line break in the RCIC cubicle, nor can it function following a LOCA due to the fact there is no steam pressure to drive the turbine, the turbine need not be qualified for LOCA radiation environment. Based on these facts, this component does not require qualification to NUREG-0588 and will be removed from the qualification program.

References:

P&ID: M-101, Sheet 1, Zone D-6

Schematic: 1E-14226-AG

FCD: FSAR Figure 7.4-2, Sheet 3, Zone J-9



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N035A, E

The Magnetrol 751 water level components are located in environmental zone H7. Hence, these components are exposed to a harsh environment only for the Line Break Event Outside Containment (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense water levels in the condensate storage tank and the suppression pool, and align the RCIC pump suction valves.

(b) Effect of Component Failure

The loss of these components due to the Line Break Event Outside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide water level signals for alignment of pump suction valves. No other systems are affected by their failure.

(d) Operator Action

Failure of these components in the worst case would result in loss of RCIC inventory. However, ADS is available as a back-up and would automatically provide adequate inventory makeup. Therefore, no operator action is required to meet the six safety objectives.

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B33-N018A and B

The Static-O-Ring 5N/6N pressure switches are located in the RHR equipment cubicle in environmental zone H6. Hence these components are exposed to a harsh environment for the Instrument Line Break in the cubicle and the high radiation from the LOCA Event Inside Containment, (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense recirculation system suction line pressure used to prevent initiation of RHR system at high pressure.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to prevent RHR initiation at high pressure. No other systems are affected by their failure.

(d) Operator Action

For a break in the RHR cubicle, one division of RHR is considered unavailable. The required shutdown cooling function will be performed by the other RHR systems. This device performs its function before it is affected by the LOCA radiation. For the Instrument Line Break, the operator will take action in accordance with the emergency procedures to achieve shutdown.

References:

P&ID: M-93, Sheets 1 and 2  
Schematic: 1E-1-4232AK, 1E-1-4220BX, BZ  
FCD: FSAR Figure 7.3-12, Sheet 3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-N016A, B, and C

The Static-O-Ring 5N/6N pressure switches are located in the RHR equipment cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense RHR pump discharge pressure permissive for initiating ADS.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will not affect ADS initiation. Low pressure core spray pump discharge pressure permissive is available to initiate ADS.

(c) Impact on Other Systems

The sole function of these components is to provide RHR pump discharge permissive signal to the ADS. No other systems are affected by their failure.

(d) Operator Action

For a break in the RHR cubicle, the RHR is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. These components are not required when the harsh environment caused by the Instrument Line Break exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	FSAR Figure 7.3-11, Sheets 1 and 2
Elementary:	1E-1-4201AB, AH
FCD:	FSAR Figure 7.3-13, Sheet 3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E12-N019A, B, C

The Static O-Rint 5N/6N pressure switches are located in the RHR equipment cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense RHR pump discharge pressure permissive for initiating ADS.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide RHR pump discharge pressure permissive signal to ADS. No other systems are affected by their failure.

(d) Operator Action

For a break in the RHR cubicle, the RHR is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. These components are not required when the harsh environment caused by the Instrument Line Break exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: FSAR Figure 7.3-11, Sheets 1 and 2  
Schematic: 1E-1-4201AB, AH  
FCD: FSAR Figure 7.3-13, Sheet 3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-N012

The Static-O-Ring 5N/6N pressure switches are located in the HPCS equipment cubicle in environmental zone H6. Hence, this component is exposed to a harsh environment for the Line Break outside and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense HPCS pump discharge pressure permissive for opening minimum flow to suppression pool valve MO-F012.

(b) Effect of Component Failure

The loss of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will not prevent manually opening valve MO-F012.

(c) Impact on Other Systems

The sole function of this component is to provide HPCS pump discharge pressure permissive to automatically open valve MO-F012. No other systems are affected by their failure upon receipt of HPCS low flow signal.

(d) Operator Action

For a break in the HPCS cubicle, the HPCS is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	FSAR Figure 7.3-3
Schematic:	1E-1-4222-AE, AC
FCD:	FSAR Figure 7.3-6, Sheet 2



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N022A, B, C, and D

The Static-O-Ring 5N/6N pressure switches are located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense reactor vessel low pressure, and automatically close RCIC system isolation valves E51-F008, E51-F063, and E51-F076.

(b) Effect of Component Failure

The loss of these components due to the instrument line break in the RCIC/LPCS cubicle or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of components E31-N022A and C will affect automatic closure of inboard isolation valves in Division I only. Failure of E31-N022B and D will affect automatic closure of outboard isolation valves in Division II only. Manual isolation is not affected by the failure of any one of these components.

(c) Impact on Other Systems

The sole function of these components is to provide a low reactor pressure trip for automatically closing RCIC system isolation valves. No other systems are affected by their failure.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Following accident confirmation based on leak detection, emergency operating procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In the analysis of LOCA and HELB, no credit is given for RCIC. In addition, this device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID: FSAR Figure 7.3-15, Sheet 3  
Schematic: 1E-1-4226AD, AE, and AF  
FCD: FSAR Figure 7.4-2, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N006

The Static-O-Ring SN/6N pressure switch is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Line Break inside the cubicle and the high radiation from the LOCA event inside containment (see Section 4-4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component senses RCIC pump suction pressure and initiates RCIC turbine trip logic at low pressure.

(b) Effect of Component Failure

The loss of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4-4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the automatic initiation of RCIC turbine trip. Manual initiation is not affected.

(c) Impact on Other Systems

The sole function of this component is to provide a low RCIC pump suction pressure signal to automatic initiation of RCIC turbine trip. No other systems are affected by its failure.

(d) Operator Action

Since the RCIC turbine will not function with a line break in the RCIC cubicle, nor can it function following a LOCA due to the fact there is no steam pressure to drive the turbine, the turbine need not be qualified for LOCA radiation environment. Based on these facts, this component does not require qualification to NUREG-0588 and will be removed from the qualification program.

References:

P&ID:	FSAR Figure 7.4-1, Sheet 2
Schematic:	1E-1-4226AC
FCD:	FSAR Figure - None

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N047A, B, C, and D

The Static-C-Ring N12 pressure switches are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense high drywell pressure and initiate HPCS.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the automatic initiation on high drywell pressure in Division III HPCS only. High drywell pressure will not result from the Instrument Line Break.

(c) Impact on Other Systems

The sole function of these components is to provide a high drywell pressure initiation signal to the HPCS. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of instrument line will not impact the other 2 ECCS divisions. This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M93, Sheets 4 and 5

Schematic: 1E-1-4222AB, AC, AD, AE

FCD: FSAR Figure 7.3-6, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N048A, and C

The Static-O-Ring N12 pressure switches are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4-4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense drywell pressure and initiate Division I RHR, ADS, RCIC and LPCS at high drywell pressure.

(b) Effect of Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4-4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide a high drywell pressure initiation signal to Division I RHR, ADS, RCIC, and LPCS. No other systems are affected by their failure.

These components are not required when the harsh environment caused by the Instrument Line Break exists. These components perform their function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-93, Sheet 5

Schematic: 1E-4221-AB, 4226-AD, 4220-AJ

FDC: FSAR Figures 7.3-10, Sheet 1 and 7.3-13, Sheet 3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N048B, D

The Static-O-Ring N12 pressure switches are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense drywell pressure and initiate Division II RHR, ADS, and RCIC at high drywell pressure.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

(c) Impact on Other Systems

The sole function of these components is to provide a high drywell pressure initiation signal to Division II of ADS, RHR, and RCIC. No other systems are affected by their failure.

(d) Operator Action

These components are not required when the harsh environment caused by the Instrument Line Break exists. These components perform their function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-93, Sheet 4  
Schematic: 1E-1-4201-AH, 4220-AK, 4009-AE  
FCD: FSAR Figure 7.3-12



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C71-N002A, B, C, D

The Static-O-Ring N12 pressure switches are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense drywell pressure, and initiate reactor scram containment isolation except for the MSIV's.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this function will affect the drywell pressure automatic scram and automatic isolation of some lines except the main steam line. Manual scram and manual isolation capability is available. This event does not require scram or containment isolation on high drywell pressure so no safety function is affected.

(c) Impact on Other Systems

The sole function of these components is to provide a high drywell pressure scram and isolation function. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the other 3 RPS and PCRVICS divisions. This device is not required when the harsh environment caused by the Instrument Line Break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

IED: FSAR Figure 7.2-1, Sheet 3

Elementary: 1E-1-4215AC, AD, AE, AF; 1E-1-4252AF, AM

FCD: FSAR Figure 7.2-1, Sheet 2 and 7.3-12, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E21-N003

The Rosemount 1151 flow transmitter is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Line Break inside the cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component senses LPCS pump discharge flow, controls the minimum flow valve, and provides information to a flow indicator located in the main control room.

(b) Effect of Component Failure

The loss of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RH containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the LPCS minimum flow valve and pump discharge flow indication in the control room.

(c) Impact on Other Systems

The sole function of this component is to control the minimum flow valve and provide LPCS pump discharge flow signal to an indicator located in the main control room. No other systems are affected by its failure.

(d) Operator Action

For a break in the LPCS cubicle, the LPCS is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. This device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-94

Schematic: 1E-1-4421-AE

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-N005

This component is located in the HPCS cubicle in environmental zone H6. Hence, this component is exposed to a harsh environment for the Line Break inside the cubicle and the high radiation from the LOCA inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component is required for HPCS pump discharge flow indication (E22-R613).

(b) Effect of Component Failure

Failure of this component may provide false indication for HPCS pump discharge flow on E22-R603. Indication of flow is available from diverse sources.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other system is affected by the failure of this component. This differential pressure transmitter has no electrical interface with other systems.

(d) Operator Action

For a break in the HPCS cubicle, the HPCS is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. This device is not required when the harsh environment caused by the Instrument Line Break exists. This device provides information only and performs no automatic function. Alternate similar information may be obtained from vessel level indications, etc. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	Figure 7.3-3
Schematic:	1E-1-4222AA
FCD:	None

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N015

The Rosemount 1151 flow transmitter is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Line Break Outside Containment and the high radiation from the LOCA event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses RWCU system flow to the main condenser.

(b) Effect of Component Failure

The loss of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the automatic isolation of RWCU system valves G33-F001 and G33-F004. Manual isolation of these valves is not affected.

(c) Impact on Other Systems

The sole function of this component is to provide a RWCU flow to main condenser signal to the RWCU logic for automatic isolation of RWCU system isolation valves G33-F001 and G33-F004. No other systems are affected by its failure.

(d) Operator Action

RWCU is not required for an Instrument Line Break Event Outside Containment. Therefore, no operator action is required to meet the six safety objectives. Redundant and divers instrumentation will perform the required isolation in the event of the Line Break Outside Containment. This device is not required when the harsh environment caused by the LOCA radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95

Schematic: 1E-1-4222AA

FCD: FSAR Figure 7.3-3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N035

The Rosemount 1151 flow transmitter is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Line Break Outside Containment and the high radiation from the LOCA event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses flow from RWCU System to the reactor by feedwater line.

(b) Effect of Component Failure

The loss of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the automatic isolation of RWCU system valves G33-F001 and G33-F004. Manual isolation of these valves is not affected.

(c) Impact on Other Systems

The sole function of this component is to provide RWCU flow to feedwater signal to the RWCU logic for automatic isolation of RWCU system isolation valves G33-F001 and G33-F004.

(d) Operator Action

The Reactor Water Cleanup System (RWCU) is automatically isolated for accidents using diverse signals. Containment isolation will also automatically occur when signals reach their trip point. No operator action is required to meet the six safety objectives. Redundant and diverse instrumentation will perform the required isolation in the event of the line break outside containment. This device is not required when the harsh environment caused by the LOCA radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: FSAR Figure 7.3-15, Sheet 3

Schematic: 1E-1-4224AB



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N036

The Rosemount 1151 flow transmitter is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Line Break Outside Containment and the high radiation from the LOCA event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses recirculation pump suction flow from the reactor to the RWCU system.

(b) Effect of Component Failure

The loss of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the automatic isolation of RWCU system valves G33-F001 and G33-F004. Manual isolation of these valves is not affected.

(c) Impact on Other Systems

The sole function of this component is to provide a recirculation pump suction flow from the reactor to the RWCU system signal to the RWCU logic for automatic isolation of RWCU system isolation valves G33-F001 and G33-F004. No other systems are affected by its failure.

(d) Operator Action

The Reactor Water Cleanup System (RWCU) is automatically isolated for accidents using diverse signals. Containment isolation will also automatically occur when signals reach their trip point. No operator action is required to meet the six safety objectives. Redundant and diverse instrumentation will perform the required isolation in the event of the Line Break Outside Containment. This device is not required when the harsh environment caused by the LOCA radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: FSAR Figure 7.3-15, Sheet 3

Schematic: 1E-1-4224AB

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N054

The Rosemount 1151 pressure transmitter is located in the reactor building in environmental zone H7. Hence, this component is exposed to a harsh environment only for the Instrument Line Break Event Outside Containment (see Section 4-4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component senses pressure at the MSIV-LCS exhaust blower inlet and provides information to a pressure indicator at the main control room and the trip function on low air flow.

(b) Effect of Component Failure

The loss of this component due to the Instrument Line Break Event Outside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4-4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event could affect the MSIV-LCS exhaust blower inlet pressure indication at the control room and could trip off the blower.

(c) Impact on Other Systems

The sole function of this component is to provide a MSIV-LCS exhaust blower inlet pressure signal to an indicator at the control room and permissive for the trip of the blower. This signal has no impact on the MSIV-LCS operation. No other systems are affected by its failure.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. The operator will take action in accordance with the emergency procedures to control MSIV leakage.

References:

P&ID: FSAR Figure 6.1-1, Sheet 1

Schematic: 1E-1-4225-AJ

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N058

The Rosemount 1151 pressure transmitter is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses reactor pressure and provides a permissive to manually initiate outboard MSIV-LCS at low reactor pressure.

(b) Effect of Component Failure

The loss of this component due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will eliminate this function as a permissive for MSIV-LCS initiation. However, the MSIV-LCS is not required for the instrument line break event.

(c) Impact on Other Systems

The sole function of this component is to provide a reactor pressure permissive for outboard MSIV-LCS initiation. No other systems are affected by its failure.

(d) Operator Action

This system normally requires manual initiation about 20 minutes after the LOCA event. However, no operator action is required to achieve any of the six safety objectives. This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID:	M-93, Sheet 4
Schematic:	1E-1-4225AH
FCD:	FSAR Figure 6.7-3, Sheet 4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N059

The Rosemount 1151 Pressure transmitter is located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses reactor pressure at the MSIV-LCS exhaust blower C002 inlet and provides information to a pressure indicator at the main control room.

(b) Effect of Component Failure

The loss of this component due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the MSIV-LCS exhaust blower inlet pressure indication at the control room. However, the MSIV-LCS is not required for the instrument line break event.

(c) Impact on Other systems

The sole function of this component is to provide MSIV-LCS exhaust blower inlet pressure signal to an indicator at the control room. This signal has no impact on the MSIV-LCS operation.

(d) Operator Action

This system normally requires manual initiation about 20 minutes after the LOCA event. Therefore, no operator action is required to achieve any of the six safety objectives. This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID: FSAR Figure 6.7-1, Sheet 2  
Schematic: 1E-1-4225-AH  
FCD: FSAR - None

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-1060

The Rosemount 1151 pressure transmitter is located in the reactor building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses reactor pressure and provides a permissive to manually initiate inboard MSIV-LCS at low reactor pressure.

(b) Effect of Component Failure

The loss of this component due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will eliminate this function as a permissive for MSIV-LCS initiation. However, the MSIV-LCS is not required for the Instrument Line Break event.

(c) Impact on other Systems

The sole function of this component is to provide a reactor pressure permissive for inboard MSIV-LCS initiation. No other systems are affected by its failure.

(d) Operator Action

This system normally requires manual initiation about 20 minutes after the LOCA event. Therefore, no operator action is required to achieve any of the six safety objectives. This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID:	M-93, Sheet 5
Schematic:	1E-14225AJ
FCD:	FSAR Figure 6.7-3, Sheet 2



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-N003

The Rosemount 1151 flow transmitter is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-582). The impact of component failure is considered only for these events.

(a) Component Function

This component senses RCIC turbine pump discharge flow and provides input to the RCIC turbine speed control.

(b) Effect of Component Failure

The loss of this component due to the instrument line break in the RCIC/LPCS cubicle or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of this component for this event will affect the automatic initiation of RCIC turbine trip. Manual initiation is not affected.

(c) Impact on Other Systems

The sole function of this component is to provide a flow signal to the turbine speed control logic. No other systems are affected by its failure.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Following accident confirmation based on leak detection, emergency operating procedures are followed for long term core and containment cooling using the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. In the analysis of LOCA and HELB, no credit is given for the RCIC. In addition, this device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID: FSAR Figure 7.4-1, Sheet 1

Schematic: 1E-1-4226AB, 1E-1-4214AC

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B33-N014A, B, C, D

The Rosemount flow transmitter components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside the Containment and the high radiation from the LOCA Event Inside Containment. (See Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852.) The impact of component failure is considered only for these events.

(a) Component Function

These components sense the reactor recirculation flow which are used as references in thermal power scram trip for APRM (Neutron Monitoring System).

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

These components are not used for this event.

(c) Impact on Other Systems

The sole function of these components is to provide flow references for APRM, Neutron Monitoring System. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by any break exists. Therefore, no operator action is required to achieve any of the six safety objectives. It is intended to remove this component from the environmental qualification program since it is not used to mitigate any events when it is exposed to a harsh environment.

References:

P&ID:	M-93, Sheets 1 and 2, Zone A-7
Schematic:	1E-1-4211-ER, ES
IED/FSAR:	Fig. 7.6-2, Sheet 2, Section 7.6.1.3.4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B33-N024A, B, C, D

The Rosemount flow transmitter components are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the reactor recirculation flow which are used as references in thermal power scram trip for APRM (Neutron Monitoring System).

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event in the reactor building or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). These components are not used for either event.

(c) Impact on Other Systems

The sole function of these components is to provide flow references for APRM, Neutron Monitoring System. No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the other RPS division components. This device is not required when the harsh environment caused by the instrument line break or LOCA event exists. It is used only to mitigate effects of transients, and not accidents. Therefore, this device does not require qualification per NUREG-0588.

References:

P&ID:	M-93, Sheet 1, Zone A7, Sheet 2, Zone A7
Schematic:	1E-1-4211ER, ES
IFD:	FSAR Figure 7.6-2, Sheet 2, Section 7.6.1.3.4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N050

The Rosemount pressure transmitter component is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (See Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses the reactor pressure which is used as a permissive interlock for MSIV-LCS initiation.

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). This component is not used for the Instrument Line Break event.

(c) Impact on Other Systems

The sole function of this component is to permit initiation of MSIV-LCS. No other systems are affected by its failure.

(d) Operator Action

This component normally requires manual initiation about 20 minutes after the LOCA event. Therefore, no operator action is required to achieve any of the six safety objectives. This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID:	M-93, Sheet 5, Zone D-6
Schematic:	1E-1-4225-AJ
FCD:	FSAR Figure 6.7-3, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N051A, E, J, N

The Rosemount pressure transmitter components are located in the Reactor Building in environmental zone H4A. Hence these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (See Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852.) The impact of component failure is considered only for these events.

(a) Component Function

These components sense main steam line pressure which is used as a permissive interlock for MSIV-LCS initiation.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). These components are not used for the Instrument Line Break event.

(c) Impact on Other Systems

The sole function of these components is to permit initiation of MSIV-LCS. No other systems are affected by their failure.

(d) Operator Action

This component normally requires manual initiation about 20 minutes after the LOCA event. Therefore, no operator action is required to achieve any of the six safety objectives. This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID: FSAR Figure 6.7-1, Sheet 1  
Schematic: 1E-1-4225-AG  
FCD: FSAR Figure 6.7-3, Sheet 2



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N055

The Rosemount pressure transmitter component is located in the Reactor Building in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses the outboard main steam line header pressure which is used as a permissive interlock for MSIV-LCS. outboard system initiation.

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). This component is not used for the Instrument Line Break Event.

(c) Impact on Other Systems

The sole function of this component is to permit initiation of the MSIV-LCS, outboard system. No other systems are affected by its failure.

(d) Operator Action

This component normally required manual initiation about 20 minutes after the LOCA event. Therefore, no operator action is required to achieve any of the six safety objectives. This device is not required when the harsh environment caused by the Instrument Line Break Event exists. It performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID: FSAR Figure 6.7-1, Sheet 2

Schematic: 1E-1-4225AH

FCD: FSAR Figure 6.7-3, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N056

The Rosemount pressure transmitter component is located in the Reactor Building in environmental zone H5E. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (See Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852.) The impact of component failure is considered only for these events.

(a) Component Function

This component senses the outboard main steam line header pressure which is used as a permissive interlock for MSIV-LCS (outboard system) initiation and annunciation in the main Control Room.

(b) Effect of Component Failure

The failure of this component due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). This component is not used for the Instrument Line Break Event.

(c) Impact on Other Systems

The sole function of this component is to permit initiation of MSIV-LCS (outboard system) and annunciation. No other systems are affected by its failure.

(d) Operator Action

This component normally requires manual initiation about 20 minutes after the LOCA event. Therefore, no operator action is required to achieve any of the six safety objectives. This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment.

References:

P&ID: FSAR Figure 6.7-1, Sheet 2

Schematic: 1E-1-4225AH

FCD: FSAR Figure 6.7-3, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N061A, E, J, N

The Rosemount pressure transmitter components are located in the turbine building area in environmental zone H7. Hence, these components are exposed to a harsh environment only for the Line Break in the turbine building. (See Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852.) The impact of component failure is considered only for this event.

(a) Component Function

These components sense main steam line pressure which is used as a permissive interlock for MSIV-LCS initiation.

(b) Effect of Component Failure

The failure of these components due to the Line Break in the turbine building will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852). These components are not used for this event.

(c) Impact on Other Systems

The sole function of these components is to permit initiation of MSIV-LCS. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the Line Break in the turbine building exists. Therefore, this device does not require qualification per NUREG 0583.

References:

P&ID: FSAR Figure 6.7-1, Sheet 1

Schematic: 1E-1-4225-AJ

FCD: FSAR Figure 6.7-3, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-N036A, B, C, and D

The Yarway 4418C reactor water level components are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Event-Inside Containment (see Section 4-4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense reactor vessel water level and trip the recirculation pumps (RPT) at Level 2.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4-4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the automatic trip of the recirculation pumps only.

(c) Impact on Other Systems

The sole function of these components is to provide a low reactor water level trip signal to the recirculation pumps. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break or LOCA radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

Reference:

P&ID: M-93, Sheet 4, Zone B-7 and Sheet 5, Zone D-4

Schematic: 1E-; -4205-AB and AM

FCD: FSAR Figure 6.A-2, Sheet 5, Zone H-3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N006 A, E, J, N

These components are located in the upper basement floor outside of ECCS equipment cubicle in environmental zone H5E. Hence, these components are exposed to a harsh environment for the line break outside the containment and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the inboard system flow into the low pressure manifold. This signal is used as a permissive for isolating MSIV-LCS inboard system valves on high leakage flow in the steam lines.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure could trip the inboard MSIV-LCS system but the outboard system would remain available.

(c) Impact on Other Systems

The sole function of these components is to provide a high leakage flow signal to isolate MSIV-LCS inboard valves. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the line break exists. For LOCA considerations, the outboard MSIV-LCS would perform the required function in the unlikely event that the inboard MSIV-LCS becomes inoperable later in the event. The operator will take action in accordance with the emergency procedures to control MSIV leakage.

References:

P&ID:	M-55, Sheet 8
Schematic:	1E-1-4225-AG
FCD/FSAR:	Fig. 6.7-3, Sheet 2



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-N053A, E, J, N

The S&K flow transmitters are located in the turbine building accessible area in environmental zone H7. Hence, these components are exposed to a harsh environment only for the Line Break Event in the turbine building. (See Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852.) The impact of component failure is considered only for this event.

(a) Component Function

These components sense the inboard system steam lines flow into the low pressure manifold. This signal is used as a permissive for isolating MSIV-LCS inboard system valves on high leakage flow in the steam lines.

(b) Effect of Component Failure

The failure of these components due to the Line Break Event in the turbine building will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852). These components are not used for this event.

(c) Impact on Other Systems

The sole function of these components is to provide a high leakage flow signal to isolate the MSIV-LCS inboard valves. Manual isolation of these valves can alleviate the effect of these valves on the standby gas treatment system. No other systems are affected by their failure.

(d) Operator Action

These systems require manual initiation. Since it is not required to mitigate this event, no operator action is required to meet the six safety objectives.

References:

P&ID: M-55, Sheet 8

Schematic: IE-1-4225-AG

FCD: FSAR Figure 6.7-3, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B21-W051A, B

These Bailey 556 pressure transmitter components are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense reactor pressure and transmit this signal to the main control room recorder.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). Failure of these components for this event will affect the recorder readings in the main control room. There are other reactor pressure indicators in the control room from other NSSS systems such as PI-R660 and PI-R658 of the MSIV-LCS. No system operation is affected by the failure of these instruments. These components are not affected by the instrument line break.

(c) Impact on Other Systems

No other systems are affected by their failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the other ECCS, RPS, and PCRVICS divisions. This device is not required when the harsh environment caused by the instrument line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. This device provides information only and performs no automatic function. Alternate similar information may be obtained from other pressure instrumentation. The operator will take action in accordance with the emergency procedures to maintain reactor level and core cooling functions.

References:

P&ID: M-92, Sheet 4, Zones C8 and F7

Schematic: 1E-1-4203AK

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N001A, B, C, D, E, F, G, H, J, and K

The Pyco N/S temperature elements are located in the Reactor Building in environmental zone H5D. Hence, these components are exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the space temperatures in the Reactor Water Clean-Up (RWCU) system pump and heat exchanger cucibles and provide isolation signals to the RWCU system inboard and outboard valves.

(b) Effect of Component Failure

The loss of these components can result in the loss of the RWCU system which is not an ESF system. The loss of these components due to the Line Break Event Outside Containment or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the automatic isolation of the RWCU, however, other back-up isolation signals exist.

(c) Impact on Other Systems

E31-N001A, C, G, J and E - The sole function of these components is to provide isolation signals to the RWCU system outboard isolation valve G33-F004. No other systems are affected by their failure.

E31-N001B, D, H, K and F - The sole function of these components is to provide isolation signals to the RWCU system inboard isolation valve G33-F001.

(d) Operator Action

These devices are not required when the harsh environment caused by the LOCA exists. These devices perform their function before they are affected by the break in the cubicle. In addition, isolation occurs automatically on RWCU high differential flow. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

IED: FSAR Figure 7.3-15, Sheets 3 and 4

Schematic: 1E-4224AD, AE, AF, AG and 1E-4232AH

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N002A, B, C, D, E, F, G, H, J, K

The Pyco temperature elements are located in the Reactor Building in environmental zone H5D. Hence, these components are exposed to a harsh environment for the Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the ventilation air inlet and outlet temperatures in the Reactor Water Clean-Up (RWCU) system pump and heat exchanger rooms and provide isolation signals to the RWCU system inboard and outboard isolation valves.

(b) Effect of Component Failure

The loss of these components can result in the loss of the RWCU system which is not an ESF system. The loss of these components due to the Line Break Event Outside Containment or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the automatic isolation of the RWCU system valves at high differential temperatures in the pump and heat exchanger room ventilation system ducts; however, other back-up isolation signals exist.

(c) Impact on Other Systems

E31-N002A, C, G, J and E - The sole function of these components is to provide isolation signals to the RWCU system outboard isolation valve G33-F004.

E31-N002B, D, H, K and F - The sole function of these components is to provide isolation signals to the RWCU system inboard isolation valve G33-F001.

(d) Operator Action

These devices are not required when the harsh environment caused by the LOCA exists. These devices perform their function before they are affected by the break in the cubicle. In addition, isolation occurs automatically on RWCU high differential flow. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4224AE, AF, AG

IED: FSAR Figure 7.3-15, Sheets 2 and 3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N003A, B, C, D, E, F, G, H, J, and K

The Pyco model N/S temperature elements are located in the Reactor Building in environmental zone H5D. Hence these components are exposed to a harsh environment for the Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the span temperature in the RWCU pump and heat exchanger areas and provide isolation signals to the RWCU system inboard and outboard valve.

(b) Effect of Component Failure

The loss of these components due to the Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The loss of the components can result in the loss of the RWCU system.

Failure of these components for this event will affect the automatic isolation of the RWCU system at high ambient temperature in the pump and heat exchanger rooms; however, other back-up isolation signals exist.

(c) Impact on Other Systems

The sole function of E31-N003A, C, E, G, and J is to provide isolation signals to RWCU outboard isolation valve G33-F004. The sole function of E31-N003B, D, F, H, and K is to provide isolation signals to the RWCU inboard isolation valve G33-F001.

(d) Operator Action

These devices are not required when the harsh environment caused by the LOCA exists. These devices perform their function before they are affected by the break in the cubicle. In addition, isolation occurs automatically on RWCU high differential flow. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4224AE, AF, and AG

FCD: FSAR Figure 7.3-15, Sheets 2 and 3 (IED)



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N004A & B

The Pyco model N/S temperature elements are located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the Line Break Outside the Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the space temperature in the RCIC equipment area and provide isolation signals to the RCIC system inboard and outboard isolation valve and to the steam line warm up valve.

(b) Effect of Component Failure

The loss of these components due to the Line Break Event in the RCIC/LPC cubicle or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The loss of the components can result in the loss of the RCIC system.

Failure of these components for this event will affect the automatic isolation of the RCIC system at high ambient temperatures in the RCIC equipment area, however, other back-up RCIC isolation signals exist.

(c) Impact on Other Systems

The sole function of E31-N004A is to provide isolation to the RCIC outboard isolation valve E51-F008. The sole function of E31-N004B is to provide isolation signal to the RCIC inboard isolation valve E51-F063 and the steam line warm up valve E51-F076. No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the LOCA exists. They perform their function before they are affected by the break in the cubicle. If not, isolation occurs on high differential flow. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4224AC, AD, and AG; 1E-104226AD, AF, AM, AN, and AX

FCD: FSAR Figure 7.3-15, Sheet 3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N005A & B

The Pyco model N14SC3224 temperature element components are located in the RCIC cubicle in environment zone H5A. Hence, these components are exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components sense RCIC equipment area vent air inlet temperature and in conjunction with E31-N006A & B (which sense vent outlet temperature) provide a differential temperature measurement between the vent inlet and outlet. A high temperature measurement will provide an isolation signal to the RCIC system inboard and outboard isolation valves and to the steam line warm up valve.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the automatic isolation of the RCIC system at high differential temperatures between the inlet and outlet of the air vents.

(c) Impact on Other Systems

The sole function of E31-N005A in conjunction with E-31-N006A is to provide an isolation signal for the RCIC outboard isolation valve E51-F008.

The sole function of E31-N005B in conjunction with E-31-N006B is to provide an isolation signal for the RCIC inboard isolation valve E51-F063 and the steam line warm up valve E51-F076.

No other systems are affected by their failure.

(d) Operator Action

Redundant and diverse indications exist to perform the required isolation. These devices are not required when the harsh environment caused by the LOCA radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-155, Sheet 2

Schematics: 1E-1-4224AC, AD, & AG; 1E-1-4226AD, AF, AM, AN, & AX

FCD: FSAR Figure 7.3-15, Sheet 4

m) COMPONENT APPLICATION STATEMENTComponent E31-N005A & B

The Pycro model N/S temperature elements are located in the RCIC/LPC cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense RCIC equipment area vent air outlet temperature and in conjunction with E31-N005A & B (which sense vent inlet temperature) provide a differential temperature measurement between the vent inlet and outlet. A high temperature measurement will provide an isolation signal to the RCIC system inboard and outboard isolation valves and to the steam line warm up valve.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment inside the RCIC/LPCS cubicle or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

The loss of these components can result in the loss of the RCIC system. Failure of these components for this event will affect the automatic isolation of the RCIC system at high differential temperature between the inlet and outlet of the air vents. However, other backup RCIC isolation signals exist.

(c) Impact on Other Systems

The sole function of E31-N006A in conjunction with E31-N005A is to provide an isolation signal for the RCIC outboard isolation valve E51-N008.

The sole function of E31-N006B in conjunction with E31-N005B is to provide an isolation signal for the RCIC inboard isolation valve E51-F063 and the steam line warm up valve E51-F076. No other systems are affected by their failure.

(d) Operator Action

These devices are not required when the harsh environment caused by the LOCA exists. They perform their function before they are affected by the break in the cubicle. If not, isolation occurs on high differential flow. Therefore, no operator action is required to achieve any of the six safety objectives.

TABLE M.5-2 (Cont.)

References:

Schematic: 1E-1-4224AC, AD, and AG; 1E-1-4226AD, AF, AM, AN, and AX

FCD: FSAR Figure 7.3-15, Sheet 4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N018A, B, C, and D

The PYCO model N/S temperature element components are located in the RHR cubicle in environmental zone H5A. Hence, these components are exposed to a harsh environment for the Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense ambient temperature in the RHR equipment area and provide isolation trips to the RHR and RCIC system for high space temperature. E31-N018A and C provide an isolation signal to RCIC valve E51-F064 (outboard isolation valve-RCIC steam supply to the RHR heat exchanger).

A trip is also provided to RHR valves E12-F000 (outboard suction for shutdown cooling) and E12-F023 (outboard head spray). Isolation to other RHR shutdown cooling valves is provided when the Level 3 trip or High Drywell Pressure is also present.

E31-N018B and D provides an isolation signal to RCIC inboard isolation valve E51-F063 and steam line warm up valve E51-F076. Isolation signals are also provided to the RHR system for the inboard suction shutdown cooling valve E12-F009 if Level 3 trip or High Drywell Pressure is present; isolation is provided to other isolation valves of the RHR shutdown cooling system.

(b) Effects of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32 of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the isolation of RHR shutdown cooling and components of the RCIC system.

(c) Impact on Other Systems

The sole function of these components is to provide isolation for the RCIC and RHR systems. No other systems are affected by their failure.



TABLE M.5-2 (Cont.)

(d) Operator Action

These devices are not required when the harsh environment caused by the LOCA radiation harsh environment exists. They perform their function before they are affected by the break in the RHR cubicle. In addition, isolation on high flow exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-155, Sheet 2

Scnematic: 1E-1-4224AH, AD  
1E-1-4232AK, AF, AM  
1E-1-4226AF, AE  
1E-1-4220BD, BR, BV, BW, BU, CA, BP

FCD: FSAR Figure 7.3-17

TABLE M-5.2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N024A & B

The PYCO model N/A temperature element components are located in the Reactor Building in environmental zone H5B. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense the space temperature in the RCIC pipe routing area and provide isolation signals to the RCIC system inboard and outboard isolation valve and to the steam line warm up valve.

(b) Effect of Component Failure

The loss of these components due to the Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

The loss of the components can result in the loss of the RCIC system. Failure of these components for this event will affect the automatic isolation of the RCIC system at high ambient temperatures in the RCIC equipment area. Other isolation signals exist to detect RCIC line break.

(c) Impact on Other Systems

The sole function of E31-NJ24A is to provide an isolation signal to the RCIC outboard isolation valve E51-F008. The sole function of E31-N004B is to provide an isolation signal to the RCIC inboard isolation valve E51-F063 and the steam line warm up valve E51-F076. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the LOCA exists. This device performs its function before it is affected by the Line Break harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4224AC, AD, AE, & AF

FCD: FSAR Figure 7.3-15, Sheet 4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N025A & B

The PYCO model N/S temperature element components are located in the Reactor Building in environmental zone H5B. Hence, these components are exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment. (See Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense RCIC pipe routing area vent air inlet temperature and in conjunction with E31-N026A & B (which sense vent outlet temperature) provide a differential temperature measurement between the vent inlet and outlet. A high temperature measurement will provide an isolation signal to the RCIC system inboard and outboard isolation valves and to the steam line warm up valve.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

The loss of these components can result in the loss of the RCIC system. Failure of these components for this event will affect the automatic isolation of the RCIC system at high differential temperatures between the inlet and outlet of the air vent. Other isolation signals exist to detect RCIC Line Break.

(c) Impact on Other Systems

The sole function of E31-N025A in conjunction with E31-N026A is to provide an isolation signal for the RCIC outboard isolation valve E51-F008.

The sole function of E31-N025B in conjunction with E31-N026B is to provide an isolation signal for the RCIC inboard isolation valve E51-F063 and the steam line warm valve E51-F076.

No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the LOCA exists. This device performs its function before it is affected by the Line Break harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

TABLE M.5-2 (Cont.)

References:

Schematic: 1E-1-4224AC, AD, AE, & AF  
1E-1-4226AD, AF, AM, AN, & AX

FCD: FSAR Figure 7.3-15, Sheet 4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N026A & B

The PYCO model N/S temperature element components are located in the Reactor Building in environmental zone H5B. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment. (See Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense RCIC pipe routing area vent air inlet temperature and in conjunction with E31-N025A & B (which sense vent inlet temperature) provide a differential temperature measurement between the vent inlet and outlet. A high temperature measurement will provide an isolation signal to the RCIC system inboard and outboard isolation valves and to the steam line warm up valve.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

The loss of these components can result in the loss of the RCIC system. Failure of these components for this event will affect the automatic isolation of the RCIC system at high differential temperatures between the inlet and outlet of the air vents. Other isolation signals exist to detect RCIC line break.

(c) Impact on Other Systems

The sole function of E31-N026A in conjunction with E-31-N025A is to provide an isolation signal for the RCIC outboard isolation valve E51-F008.

The sole function of E31-N026B in conjunction with E31-N025B is to provide an isolation signal for the RCIC inboard isolation valve E51-F063 and the steam line warm up valve E51-F076.

No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the LOCA exists. This device performs its function before it is affected by the Line Break harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.



TABLE M.5-2 (Cont.)

References:

Schematic: 1E-1-4224AC, AD, AE, & AF  
1E-1-4226AD, AF, AM, AN, & AX

FCD: FSAR Figure 7.3-15, Sheet 4

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N027A, B, C, & D

The PYCO motel N/S temperature element components are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the line break inside the cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-352). The impact of component failure is considered only for these events.

(a) Component Function

These components in conjunction with E31-N028A, B, C & D sense temperature differential between the vent air inlet and outlet of the RHR equipment area. E31-N027A and C provide an isolation to signal to RCIC valve E51-F064 (outboard isolation valve). A trip is also provided to RHR valves E12-F008 (outboard suction cooling) and E12-F023 (outboard head spray) when Level 3 is present. Isolation to other RHR valves is provided when the Level 3 trip and High Drywell Pressure is present.

E31-N027B & D provide an isolation signal to RCIC inboard isolation valves E51-F063 and steam line warm up valve E51-F076. Isolation signals are also provided to the RHR system if Level 3 trip is present for closing inboard suction cooling valve E12-F009. If Level 3 and High Drywell Pressure is present isolation is provided to other valves of the RHR isolation system.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the isolation of RHR and components of the RCIC system.

(c) Impact on Other Systems

The sole function of these components is to provide isolation for the RHR and RCIC system. No other systems are affected by their failure.

TABLE M.5-2 (Cont.)

Component E31-N027A, B, C & D (Cont.)

(d) Operator Action

For a break in the RHR cubicle, the RHR is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RHR. Following accident confirmation based on leak detection, emergency operating procedures are followed for the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives.

Redundant and diverse indications exist to perform the required isolation.

This device is not required when the harsh environment caused by the LOC/ radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic Diagrams: 1E-1-4224AH, AD  
1E-1-4232AK, AF, AM  
1E-1-4226AF, AE  
1E-1-4220BD, BX, BR, BV, BW, BU, BP, CH

FCD: FSAR Figure 7.3-17

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N028A, B, C, & D

The PYCO model N/S temperature element components are located in the RHR cubicle in environmental zone H6. Hence, these components are exposed to a harsh environment for the line break inside the cubicle and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components in conjunction with E31-N027A, B, C & D sense temperature differential between the vent air inlet and outlet of the RHR equipment area. E31-N028A and C provide an isolation to signal to RCIC valve E51-F064 (outboard isolation valve). A trip is also provided to RHR values E12-F008 (outboard suction cooling) and E12-F023 (outboard head spray) when Level 3 trip is present. Isolation to other RHR values is provided when the Level 3 trip and High Drywell Pressure is present.

E31-N028B & D provide an isolation signal to RCIC inboard isolation valves E51-F063 and steam line warm up valve E51-F075. Isolation signal are also provided to the RHR system if Level 3 trip is present for closing inboard suction cooling valve E12-F009. If Level 3 and High Drywell Pressure is present, isolation is provided to other valves of the RHR isolation system.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely, safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the isolation of RHR and components of the RCIC system.

(c) Impact on Other Systems

The sole function of these components is to provide isolation for the RHR and RCIC system. No other systems are affected by their failure.

TABLE M.5-2 (Cont.)

Component E31-N028A, B, C, & D (Cont.)

(d) Operator Action

For a break in the RHR cubicle, the RHR is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RHR. Following accident confirmation based on leak detection, emergency operating procedures are followed for the remaining two divisions (no action prior to 10 minutes after the event) resulting in meeting all six safety objectives. Redundant and diverse indications exist to perform the required isolation.

This device is not required when the harsh environment caused by the LOCA radiation exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic Diagrams: 1E-1-4224AH, AD  
1E-1-4232AK, AF, AM  
1E-1-4226AF, AE  
1E-1-4220BD, BX, BR, BV, BW, BU, BP, CH

FCD: FSAR Figure 7.3-17



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N029A, B, C, D

The PYCO mode N/S temperature element components are located in the Steam Line Tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment for the Steam Line Break outside the tunnel and the high radiation from the LOCA Inside Containment (see Section 4.2, page 4-12, of Quadrex Report AD-1-81-852). The impact of component failure is considered for these events.

(a) Component Function

E31-N029A and B (Division 1) sense vent air inlet temperature of the main steam line pipe tunnel and E31-N029C and D (Division 2) sense vent air outlet temperature of the pipe tunnel. They are used in conjunction with E31-N030A and B (Division 1) and E31-N030C and D (Division 2) to provide main steam isolation if high differential temperature is detected between the vent inlet and outlet.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the isolation of the main steam line upon detection of a high differential temperature between the inlet and outlet vents of the main steam line pipe tunnel.

(c) Impact on Other Systems

The sole function of these components is to provide an isolation signal to the main steam line isolation valves if high temperature differential is detected between the vent inlets and outlets. No other systems are affected by their failure.

(d) Operator Action

Redundant and diverse indications exist to perform the required isolation. These devices are not required when the harsh environment caused by the line break in the steam tunnel exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4224AC, AH; 1E-1-4224AB, AD

FCD: FSAR Figure 7.3-17

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component† E31-N030A, B, C, D

The PYCO model N/S temperature element components are located in the Steam Line Tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment for the Steam Line Break outside the tunnel and the high radiation from the LOCA Inside Containment (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered for these events.

(a) Component Function

E31-N030A and B (Division 1) sense vent air inlet temperature of the main steam line pipe tunnel and E31-N030C and D (Division 2) sense vent air outlet temperature of the pipe tunnel. They are used in conjunction with E31-N029A and B (Division 1) and E31-N029C and D (Division 2) to provide main steam isolation if high differential temperature is detected between the vent inlet and outlet.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the isolation of the main steam line upon detection of a high differential temperature between the inlet and outlet vents of the main steam line pipe tunnel.

(c) Impact on Other Systems

The sole function of these components is to provide an isolation signal to the main steam line isolation valves if high temperature differential is detected between the vent inlets and outlets. No other systems are affected by their failure.

(d) Operator Action

Redundant and diverse indications exist to perform the required isolation. These devices are not required when the harsh environment caused by the line break in the steam tunnel exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4224AC, AH; 1E-1-4232AB, AD

FCD: FSAR Figure 7.3-17

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E31-N031A, B, C, D

The PYCO model N/S temperature element components are located in the Main Steam Tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment for the Steam Line Break outside the tunnel and the high radiation from the LOCA Inside Containment (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered for these events.

(a) Component Function

These components sense ambient temperature in the main steam line pipe tunnel and provide an isolation signal for the main steam line isolation valves.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the isolation of the main steam line on high ambient temperatures in the pipe tunnel.

(c) Impact on Other Systems

The sole function of these components is to provide an isolation signal for the main steam line valves when high ambient temperature is detected in the pipe tunnel. No other systems are affected by their failure.

(d) Operator Action

Redundant and diverse indications exist to perform the required isolation. These devices are not required when the harsh environment caused by the line break in the steam tunnel exists. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-155, Sheet 2

Schematic: 1E-1-4224AH, AC; 1E-1-4232AB, AD

FCD: FSAR Figure 7.3-17

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C41-C001A, B

The General Electric 36ST motors are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and the high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components are used to drive the standby liquid control pumps.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the operation of the standby liquid control pumps.

These components are not required for this event.

(c) Impact on Other Systems

The sole function of these components is to drive the standby liquid control pumps. No other systems are affected by their failure.

(d) Operator Action

Standby Liquid Control (boron) is not required to mitigate these events. No operator action is required to meet the six safety objectives.

References:

P&ID: M-99

FCD: FSAR Figure 7.4-3

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C51-K002A,B,C,D

These components are located in the annular region outside primary containment in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment only for the Instrument Line Break Event and the LOCA Event (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-181-852). The impact of component failure is considered only for this event.

(a) Component Function

These components condition the output signals from the IRM detectors to the IRMs.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event in annular region outside primary containment in the Reactor Building will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The IRMs are not required for the LOCA Event.

Failure of these components for this event will affect the trip signal to the RPS. IRMs are used for reactor startup only and not for this event.

(c) Impact on Other Systems

The sole function of these components is to provide a conditioned signal to IRMs that generates a trip signal to the RPS to prevent fuel damage. No other systems are affected by their failure.

(d) Operator Action

For the postulated events and their analyzed durations, there is no required operator action for the IRMs.

References:

Schematic: 1E-1-4210AE, AG



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C51-N002A,B,C,D,E,F,G, and H

These Intermediate Range Neutron detectors are located in the reactor vessel in environmental zone H1. Hence, these components are normally exposed to a harsh environment.

(a) Component Function

These components monitor neutron level in the reactor and provide a scram signal to the reactor protection system during startup.

(b) Effect of Component Failure

These failure of components are not affected by the LOCA and will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control.

Failure of these components for this event will not affect the automatic scram of the reactor. Diverse variables, such as reactor pressure, provide the required safety function.

(c) Impact on Other Systems

The sole function of these components is to provide neutron monitoring and a scram signal to the Reactor Protection System. No other systems are affected by their failure.

(d) Operator Action

No operator action is required for this event as the IRM is only used during plant startup and is not required for LOCA mitigation. All six safety objectives are met.

References:

Schematics: 1E-1-4210AE, AF, AG, AH; 1E-1-4215AC

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component D18-N003A, B, C, D

The GE radiation detector NA05 components are located in the main steam tunnel in environmental zone H5C. Hence, these components are exposed to a harsh environment for the Line Break in the steam tunnel and the high radiation from the LOCA event inside containment (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components sense gross radiation and provide a trip in the event of release of fission products into the main steam line.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852).

Failure of these components will eliminate the reactor scram and MSIV isolation on high radiation. Other signals outside the steam tunnel are available to initial MSIV isolation and scram for this event.

(c) Impact on Other Systems

The sole function of these components is to initiate reactor scram and MSIV closure on high radiation level. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the line break exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	M-153, Sheet 4
Schematic:	1E-1-4218-AE
FSAR:	Figure 7.3-14, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component B13-D193

These LPRM Power Range Detectors are located inside the RPV in environmental zone H1. This component is not subjected to harsh environment due to a Feedwater Line Break, LOCA, Instrument Line Break, or Main Steam Line Break. Reactor scram, MSIV isolation and ECCS initiation are not affected by the failure of this component.

(a) Component Function

This component monitors neutron flux levels and at predetermined limits, trips the RPS and scrams the reactor.

(b) Effect of Component Failure

The failure of this component will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.2, page 4-12, of Quadrex Report QUAD-1-81-852). Reactor scram, ECCS initiation and MSIV isolation will be initiated by reactor low water level, high reactor pressure, etc.

(c) Impact on Other Systems

The sole function of this component is to provide an automatic scram of the reactor on high neutron flux. No other systems are affected by its failure.

(d) Operator Action

Failure to scram on high neutron flux is backed up by many redundant and diverse automatic scram signals. Thus, no operator action is required to meet the six safety objectives. Therefore, the LPRMS do not require qualification to NUREG-0588 and will be deleted from the program.

References:

Schematic Diagram: 1E-1-4211

FCD: FSAR 7.6-2, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Sensors and Convertors D18-N009A, B, C, D are provided by G.E.

These components are located in the turbine building area (inaccessible) in environmental zone H8. Hence, these components are exposed to a harsh environment only for the Line Break Event Outside Containment (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

These components isolate secondary containment and initiate SGTS on high radiation in Reactor Building exhaust.

(b) Effect of Failure

The failure of these components due to the Line Break Event Outside Containment will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.3, page 4-23, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will eliminate isolation of secondary containment and initiation of SGTS from high radiation level. Isolation & SGTS occur on diverse signals.

(c) Impact on Other Systems

No other systems are affected by their failure.

(d) Operator Action

This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-14218AK, AL, AM and 4232AP

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Sensors and Convertors D18-N015A, B, C, D are provided by G.E.

These components are located in the reactor building area in environmental zone H4A. Hence, these components are exposed to a harsh environment for the line break outside the containment and the high radiation from the LOCA Event Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components isolate secondary containment and initiate SGTS on high radiation in the fuel pool ventilation exhaust.

(b) Effect of Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components will fail to initiate isolation of secondary containment and initiation of SGTS. Isolation and SGTS occur on diverse signals.

(c) Impact on Other Systems

No other systems are affected by their failure.

(d) Operator Action

This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4218AX, AL, Ail and 4232AP



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C51-J004A, B, C, D, and E

The solenoid valve and guide tube valve components are located in the Reactor Building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are used to isolate the TIP system following any abnormal or accident condition. The guide tube assembly is a pressure boundary.

(b) Effect of Component Failure

The failure of these components due to the Instrument Line Break Event in the reactor building the LOCA event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will prevent isolation of the TIP system. There is an explosive shear valve in series with the ball valve which can be operated by a keylock switch. This valve will close and isolate the TIP system when the solenoid guide tube valve assembly fails.

(c) Impact on Other Systems

The sole function of these components is to isolate the TIP system. These components do not have any electrical interface with other components on this system or any other systems. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break Event exists. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Schematic: 1E-1-4213AC; 1E-1-4232AG

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Terminal Board (EB-5), H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides connections between the wiring in the panels and field wiring or cables.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operation of those instruments associated with one division and/or logic channel of the safeguard system within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Back-up ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-B001A, E, J, N

The General Electric 47D518673 heater assemblies are located in the reactor building in environmental zone H5E. Hence, these components are exposed to a harsh environment for the line break outside the containment and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

The MSIV-LCS heaters heat the condensate from the MSIV drain line following the LOCA.

(b) Effect of Component Failure

The loss of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

This system is not required for a line break outside containment. For a LOCA, it is manually initiated.

(c) Impact on Other Systems

The sole function of these components is to heat and evaporate MSIV drain line condensate following LOCA when manually turned on. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the line break exists. For LOCA considerations, the outboard MSIV-LCS would perform the required function in the unlikely event that the inboard MSIV-LCS becomes inoperable.

The operator will take action in accordance with the emergency procedures to control MSIV leakage.

References:

P&ID: M-116, Sheet 8

Schematic: 1E-1-4225AP and AS

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E32-C001, E32-C002B, F

The Siemens 2CH6, modified General Electric 47A518663, Blower/Motors are located in the Recator Building in environmental zone H5E. Hence, these components are exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components are manually turned on after LOCA to divert leakage through the MSIV-LCS into the SGTS system for processing in order to maintain offsite dosage to within acceptable leakages.

(b) Effect of Component Failure

The loss of these components due to the Instrument Line Break Event Outside Containment or the LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the capability to process leakage through the SGTS system after a LOCA. Failure of these components will not prevent achieving the six safety objectives. The MSIV-LCS is not required for the Instrument Line Break Event.

(c) Impact on other Systems

The sole function of these components is to divert leakage through the MSIV-LCS into the SGTS system. No other systems are affected by their failure.

(d) Operator Action

This system normally requires manual initiation about 20 minutes after the LOCA Event. Therefore, no operator action is required to achieve any of the six safety objectives. This device is not required when the harsh environment caused by the Instrument Line Break exists. This device will essentially perform its function before it is affected by the LOCA radiation harsh environment to a significant enough degree to potentially render the component inoperable.

References:

P&ID: M-116, Sheet 8

Schematic: 1E-i-4225AQ

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C41-F004A and B

The Conax 1832-159-01 control valves are located in the reactor building in environmental zone H4A. Hence, these components are exposed to a harsh environment for the instrument line break outside the containment and the high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

These components permit injection of borated water into the reactor pressure vessel.

(b) Effect of Component Failure

The failure of these components will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

These components are not required for these events.

(c) Impact of Other Systems

The sole function of these components is to permit the standby liquid control system borated water injection into the reactor pressure vessel. No other systems are affected by their failure.

(d) Operator Action

If the Conax valves actuate due to the instrument line break, the valve cannot be reclosed but boron injection will not occur until manual injection. This is not required for these events. Consequently, since standby liquid control (boron) is not needed for this event, there is no other postulated failure. No operator action is required to meet the six safety objectives.

References:

P&ID: M-99  
Schematic: FSAR Figure 7.4-4  
FCD/FSAR: Figure 1E-1-4209-AA



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-F012

This component is located in the HPCS cubicle in environmental zone H6. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides minimum flow bypass to suppression pool.

(b) Effect of Component Failure

Failure of this component prevents minimum flow to the suppression pool. This valve is not required for safe shutdown or core coverage functions. Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other components or systems are affected by the failure of this component. This valve has no electrical interface with other components of this system or any other system.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break and LOCA exits. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95, Zone C-3

Schematic: 1E-1-4222AE

FCD: FSAR Figure 7.3-6, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-F001

This component is located in the Reactor Building in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component is used for HPCS pump suction from the condensate storage tank.

(b) Effect of Component Failure

Failure of this component under the worst condition will prevent closing of this valve and HPCS pump cooling will eventually be lost. RCIC and the other two EUS divisions are available as backup. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface to any other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95, Sheet 1, Zone A-4

Schematic: 1E-1-422AD

FCD: FSAR Figure 7.3-6, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-F015

This component is located in the basement floor outside of the HPCS equipment cubicle in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component is used for HPCS pump suction from suppression pool.

(b) Effect of Component Failure

Failure of this component under the worst condition will prevent opening of this valve and suction from suppression pool to HPCS pump will be lost. RCIC system is available as a backup along with ADS. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other system is affected by the failure of this component. This valve has no electrical interface to any other systems. No other systems are affected by their failure.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95, Zone B-6  
Schematic: 1E-1-4222AE  
FCD: Figure 7.3-6, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-F011

This component is located in the basement outside of the HPCS equipment cubicle in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides a test bypass to the condensate storage tank.

(b) Effect of Component Failure

This valve is normally closed and is opened only for test. Failure of this component prevents test bypass to the condensate storage tank and may prevent the opening of valve F015 suction from suppression pool. However, RCIC and ADS are available for safe shutdown and core coverage functions. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves. Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This valve has no electrical interface with other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95, Zone D-3

Schematic: 1E-1-4222AE

FCD: FSAR Figure 7.3-6, Sheet 2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-F010

This component is located in the basement floor outside of the HPCS equipment cubicle in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides a test bypass to the condensate storage tank.

(b) Effect of Component Failure

This valve is normally closed and is opened only for test. Failure of this component prevents test bypass to the condensate storage tank and may prevent the opening of valve F015 suction from suppression pool. However, RCIC and ADS are available for safe shutdown and core coverage functions. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves. Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This valve has no electrical interface with other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives

References:

P&ID: M-95, Zone D4

Schematic: 1E-1-4222AD

FCD: FSAR Figure 7.3-6, Sheet 2



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-F023

This component is located in the basement floor area outside of the HPCS equipment cubicle in environmental zone H5E. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides a test bypass to the suppression pool.

(b) Effect of Component Failure

This valve is normally closed and is opened only for test. Failure of this component prevents test bypass to the suppression pool. This valve is not required for safe shut-down or core coverage function, and RCIC and ADS are available. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves. Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other components or other systems are affected by the failure of this component. This valve has no electrical interface with other components of this system or any other system.

(d) Operator Action

This device is not required when the harsh environment caused by the instrument line break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID: M-95, Zone C-5  
Schematic: 1E-14222AF  
FCD: Figure 7.3-6, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E22-F004

This component is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, Page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component is used for HPCS injection into RPV.

(b) Effect of Component Failure

Failure of this component under the worst condition prevents HPCS injection into RPV. RCIC and ADS systems are available as backup. No failure mechanism at the valve can cause the valve to change position from open or close because the motor control centers are not at the same location as the valves.

(c) Impact on Other Systems

No other component or system is affected by the failure of this component. This valve has no electrical interface with other systems.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. It performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

P&ID:	M-95, Zone D-6
Schematic:	1E-1-4222AD
FCD:	FSAR Figure 7.3-6, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component C34-N017

Statham PD 2000 reactor water level component is located in the Reactor Building in environmental zone H4A. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component senses reactor vessel water level wide range and provides control room display information only for the Emergency Operating Procedures.

(b) Effect of Component Failure

The loss of this component due to the Instrument Line Break Event Outside Containment or a LOCA Event will not preclude achieving the six safety objectives, namely safe shutdown, containment isolation, core coverage, RHR, containment integrity and effluent control (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852).

Failure of these components for this event will affect the reactor vessel water level wide range indication in the control room and subsequent operator action, such as manual ADS.

(c) Impact on Other Systems

The sole function of this component is to provide a reactor vessel water level signal to an indicator located in the main control room. No other systems are affected by its failure.

(d) Operator Action

Due to physical separation, failure of one instrument line will not impact the other division's components. This device is not required when the harsh environment caused by the Instrument Line Break Event exists. It performs its function before it is affected by the LOCA radiation harsh environment. In addition, it provides information only and performs no automatic function. Alternate similar information may be obtained from other level instrumentation. The operator will take action in accordance with the emergency procedures to maintain reactor level and core cooling functions.

References:

Schematic Diagram: 1E-1-4208AN

FCD: FSAR Figure 7.7-10, Sheet 1

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component E51-C002

This component is located in the RCIC/LPCS cubicle in environmental zone H5A. Hence, this component is exposed to a harsh environment for the Line Break Event Outside Containment and high radiation from the LOCA Inside Containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for these events.

(a) Component Function

This component provides motive power to the RCIC pump.

(b) Effect of Component Failure

The failure of this component will disable the RCIC system. However, the alternate system HPCS is available for safe shutdown and core coverage functions.

Failure of this component has no effect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

No other systems are affected by the failure of this component. This RCIC turbine has no electrical interface with other systems.

(d) Operator Action

For a break in the RCIC cubicle, the RCIC is considered unavailable. This occurs only in one of three ECCS divisions. Therefore, two full divisions are available to mitigate the event. No operator action is required with the unavailable RCIC. Since the RCIC turbine will not function with a line break in the RCIC cubicle, nor can it function following a LOCA due to the fact that there is no steam pressure to drive the turbine, the turbine need not be qualified for LOCA radiation environment. Based on these facts, this component does not require qualification to NUREG-0588 and will be removed from the qualification program.

References:

P&ID: M-101, Sheet 1, Zone D-2

Schematic: 1E-1-4226

FCD: FSAR Figure 7.4-2

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Electrical Insulated Wire, H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component carries instrumentation signals from the instruments in the racks to the terminal boards.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operation of those instruments associated with one division and/or logic channel of the safeguard system within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Backup ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Electrical Insulating Wire, H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component carries control signals from devices in the panels to the terminal boards.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operations of those instruments associated with one division and/or logic channel of the safeguard system; within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operation Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Backup ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Conduit, H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component protects the electrical wiring in the panels.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operation of those instruments associated with one division and/or logic channel of the safeguard system within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Backup ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Conduit Connector (45<sup>0</sup> and 90<sup>0</sup>), H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides connections between conduits and enclosures or boxes.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operation of those instruments associated with one division and/or logic channel of the safeguard system within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Backup ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Conduit Connector (Straight) H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-82-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides connection between conduits and enclosures or boxes.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operation of those instruments associated with one division and/or logic channel of the safeguard system within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-G1-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Backup ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Ring Terminal Lugs, H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides termination of wires in the panel to the terminal boards.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operation of those instruments associated with one division and/or logic channel of the safeguard system within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Backup ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.



TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Oil Tight Box, H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides mounting and protection for devices.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operation of those instruments associated with one division and/or logic channel of the safeguard system within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Backup ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.

TABLE M.5-2 (Cont.)

m) COMPONENT APPLICATION STATEMENT

Component Enclosure, H22-POXX

This component is located in the reactor building in environmental zone H5. Hence, this component is exposed to a harsh environment for the Instrument Line Break Event Outside Containment and high radiation from the LOCA event inside containment (see Section 4.4, page 4-32, of Quadrex Report QUAD-1-81-852). The impact of component failure is considered only for this event.

(a) Component Function

This component provides mounting and protection for devices.

(b) Effect of Component Failure

Failure of this component for this event on one rack will only affect the operation of those instruments associated with one division and/or logic channel of the safeguard system within the rack. Redundant safeguard system instrument racks are physically separated around the reactor building. These instrument racks are available to perform the functions required for initiating safeguard systems needed to mitigate this event.

Failure of this component will have no affect in achieving the six safety objectives as described in Quadrex Report QUAD-1-81-852.

(c) Impact on Other Systems

The failure of this component only affects the operation of one rack and will not affect other redundant divisional instrument racks which are electrically and physically separated around the reactor building.

(d) Operator Action

This device is not required when the harsh environment caused by the Instrument Line Break exists. Back-up ESF systems are available. This device performs its function before it is affected by the LOCA radiation harsh environment. Therefore, no operator action is required to achieve any of the six safety objectives.

References:

Local rack arrangement drawing and wiring diagram - GE supplied.