ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.6 The accident monitoring instrumentation channels shown in Table 3.3-10 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

a. With the number of OPERABLE accident monitoring channels less than the Required Number of Channels shown in Table 3.3-10, take the action identified in Table 3.3-10.

b. With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-10, take the action identified in Table 3.3-10.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.6 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-7.

TABLE 3.3-10

ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	REQUIRED NUMBER OF CHANNELS	MINIMUM CHANNELS OPERABLE	ACTION
1. Containment Pressure	2	1	29,30
2. Reactor Coolant Outlet Temperature - T_{Hot} (Wide Range)	2	1	29,30
3. Reactor Coolant Inlet Temperature - T_{Cold} (Wide Range)	2	1	29,30
4. Reactor Coolant Pressure - Wide Range	2	1	29,30
5. Pressurizer Water Level	2	1	29,30
6. Steam Generator Pressure	2/steam generator	1/steam generator	29,30
7. Steam Generator Water Level - Narrow Range	2/steam generator	1/steam generator	29,30
8. Steam Generator Water Level - Wide Range	1/steam generator**	1/steam generator**	29,30
9. Refueling Water Storage Pool Water Level	2	1	29,30
10. Emergency Feedwater Flow Rate	1/steam generator**	1/steam generator**	29,30
11. Reactor Cooling System Saturation Margin Monitor	2	1	29,30
12. Safety Valve Position Indicator	1/valve	1/valve	29,30
13. Containment Water Level (Narrow Range)	1***	1***	29,30
14. Containment Water Level (Wide Range)	2	1	29,30
15. Core Exit Thermocouples	4/core quadrant	2/core quadrant	29,30
16. Containment Isolation Valve Position Indicators*	1/valve#	1/valve#	29,30
17. Condensate Storage Pool Level	2	1	29,30
18. Reactor Vessel Level Monitoring System	2****	1	31,32

#If the containment isolation valve is declared inoperable and the provisions of Specification 3.6.3 are complied with, position indicators may be inoperable; otherwise, comply with the provisions of Specification 3.3.3.6.

*Containment isolation valves governed by Specification 3.6.3 (Category 1).

**These corresponding instruments may be substituted for each other.

***Operation may continue for up to 30 days with less than the Minimum Channels OPERABLE requirement.

****A channel is eight sensors in a probe. A channel is operable if four or more sensors, one or more in the upper three and three or more in the lower five, are operable.

TABLE 3.3-10

ACTION STATEMENTS

ACTION 29 - With the number of OPERABLE accident monitoring channels less than the Required Number of Channels shown in Table 3.3-10, either restore the inoperable channel to OPERABLE status within 7 days, or be in HOT SHUTDOWN within the next 12 hours.

ACTION 30 - With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-10; either restore the inoperable channel(s) to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours.

ACTION 31 - With the number of OPERABLE accident monitoring channels, less than the Required Number of Channels, either restore the system to OPERABLE status within 7 days if repairs are feasible without shutting down or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

ACTION 32 - With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE in Table 3.3-10, either restore the inoperable channel(s) to OPERABLE status within 48 hours if repairs are feasible without shutting down or:

1. Initiate an alternate method of monitoring the reactor vessel inventory;

2. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status; and

3. Restore the system to OPERABLE status at the next scheduled refueling.

TABLE 4.3-7

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
1. Containment Pressure	M	R
2. Reactor Coolant Outlet Temperature - T_{Hot} (Wide Range)	M	R
3. Reactor Coolant Inlet Temperature -T_{Cold} (Wide Range)	M	R
4. Reactor Coolant Pressure - Wide Range	M	R
5. Pressurizer Water Level	M	R
6. Steam Generator Pressure	M	R
7. Steam Generator Water Level - Narrow Range	M	R
8. Steam Generator Water Level - Wide Range	M	R
9. Refueling Water Storage Pool Water Level	M	R
10. Emergency Feedwater Flow Rate	M	R
11. Reactor Coolant System Saturation Margin Monitor	M	R
12. Safety Valve Position Indicator	M	R
13. Containment Water Level (Narrow Range)	M	R
14. Containment Water Level (Wide Range)	M	R
15. Core Exit Thermocouples	M	R
16. Containment Isolation Valve Position	M	R
17. Condensate Storage Pool Level	M	R
18. Reactor Vessel Level Monitoring System	M	R

3/4.3.3.6 ACCIDENT MONITORING INSTRUMENTATION

The OPERABILITY of the accident monitoring instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables following an accident. This capability is consistent with the recommendations of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Plants to Assess Plant Conditions During and Following an Accident," December 1980 and NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations." Table 3.3-10 includes Regulatory Guide 1.97 Category I key variables. The remaining Category I variables are included in their respective specifications.

The Subcooled Margin Monitor (SMM), the Heated Junction Thermocouple (HJTC), and the Core Exit Thermocouples (CET) comprise the Inadequate Core Cooling (ICC) instrumentation required by Item II.F.2 NUREG-0737, the Post TMI-2 Action Plan. The function of the ICC instrumentation is to enhance the ability of the plant operator to diagnose the approach to existence of, and recovery from ICC. Additionally, they aid in tracking reactor coolant inventory. These instruments are included in the Technical Specifications at the request of NRC Generic Letter 83-37. These are not required by the accident analysis, nor to bring the plant to Cold Shutdown.

In the event more than four sensors in a Reactor Vessel Level channel are inoperable, repairs may only be possible during the next refueling outage. This is because the sensors are accessible only after the missile shield and reactor vessel head are removed. It is not feasible to repair a channel except during a refueling outage when the missile shield and reactor vessel head are removed to refuel the core. If only one channel is inoperable, it should be restored to OPERABLE status in a refueling outage as soon as reasonably possible. If both channels are inoperable, at least one channel shall be restored to OPERABLE status in the nearest refueling outage.

3/4.3.3.7 CHEMICAL DETECTION SYSTEMS

The chemical detection systems are the chlorine and broad range toxic gas detection systems.

The OPERABILITY of the chemical detection systems ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chemical release.

The chemical detection systems provide prompt detection of toxic gas releases which could pose an actual threat to safety of the nuclear power plant or significantly hamper site personnel in performance of duties necessary for the safe operation of the plant.

The broad range toxic gas detection system operates on the principle of gas photoionization, and therefore, the system is sensitive to a broad range of gases.* The system is therefore sensitive to both atmospheric and chemical composition normal fluctuations affecting the Waterford 3 site. The setpoint

*Including Amononia

for the system is thus based on testing and operating experience, and the setpoint is set at the lowest achievable IDLH gas concentration providing reliable operation and the optimum detection of toxic gases. The setpoint is therefore subject to change wherein necessitated by operating experience such as a result of changes in the Waterford 3 area chemical atmospheric profile. The setpoint is established and controlled by procedure.

3/4.3.3.8 This section deleted

3/4.3.3.9 This section deleted

NPF-38-175

ATTACHMENT B

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.6 The accident monitoring instrumentation channels shown in Table 3.3-10 shall be OPERABLE.

APPLICABILITY : MODES 1, 2, and 3.

ACTION :

a. With the number of OPERABLE accident monitoring channels less than the Required Number of Channels shown in Table 3.3-10, take the action identified in Table 3.3-10.

b. With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-10, take the action identified in Table 3.3-10.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.6 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-7.

TABLE 3.3-10

ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT		REQUIRED NUMBER OF CHANNELS	MINIMUM CHANNELS OPERABLE	ACTION
1.	Containment Pressure (Wide Range)	2	1	29,30
2.	Containment Pressure (Wide Wide Range)	2	1	29,30
3~~2~~.	Reactor Coolant Outlet Temperature - T_{Hot} (Wide Range)	2	1	29,30
4~~3~~.	Reactor Coolant Inlet Temperature - T_{Cold} (Wide Range)	2	1	29,30
5~~4~~.	Reactor Coolant Pressure - Wide Range	2	1	29,30
6~~5~~.	Pressurizer Water Level	2	1	29,30
~~6. Steam Generator Pressure~~		~~2/steam generator~~	~~1/steam generator~~	~~29,30~~
7.	Steam Generator Water Level - Narrow Range	2/steam generator	1/steam generator	29,30
8.	Steam Generator Water Level - Wide Range	2~~1~~/steam generator~~**~~	1/steam generator~~**~~	29,30
~~9. Refueling Water Storage Pool Water Level~~		~~2~~	~~1~~	~~29,30~~
~~10. Emergency Feedwater Flow Rate~~		~~1/steam generator**~~	~~1/steam generator**~~	~~29,30~~
~~11. Reactor Cooling System Saturation Margin Monitor~~		~~2~~	~~1~~	~~29,30~~
~~12. Safety Valve Position Indicator~~		~~1/valve~~	~~1/valve~~	~~29,30~~
~~13. Containment Water Level (Narrow Range)~~		~~1***~~	~~1***~~	~~29,30~~
9~~14~~.	Containment Water Level (Wide Range)	2	1	29,30
10~~15~~.	Core Exit Thermocouples	4/core quadrant	2/core quadrant	29,30
11~~16~~.	Containment Isolation Valve Position Indicators*	1/valve~~#~~	N/A ~~1/valve#~~	29~~,30~~
12~~17~~.	Condensate Storage Pool Level	2	1	29,30
13~~18~~.	Reactor Vessel Level Monitoring System**	2~~****~~	1	29,31~~31,32~~
14.	Log Power Indication (Neutron Flux)***	2	1	29,30

*~~#~~If the containment isolation valve is declared inoperable and the provisions of Specification 3.6.3 are complied with, action requirements of this specification are not applicable. ~~position indicators may be inoperable; otherwise, comply with the provision of Specification 3.3.3.6.~~

~~*Containment isolation valves governed by Specification 3.6.3 (Category 1).~~

~~**These corresponding instruments may be substituted for each other.~~

~~***Operation may continue for up to 30 days with less than the Minimum Channels OPERABLE requirement.~~

~~****~~A channel is eight sensors in a probe. A channel is operable if four or more sensors, one or more in the upper three and three or more in the lower five, are operable.

***Channels C and D only (ENIIJI0001C and ENIIJI0001D). These instruments are also covered by Specification 3.3.1, "Reactor Protective Instrumentation."

TABLE 3.3-10

ACTION STATEMENT

ACTION 29 - With the number of OPERABLE accident monitoring channels less than the Required Number of Channels shown in Table 3.3-10, either restore the inoperable channel to OPERABLE status within 30~~7~~ days, or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels to OPERABLE status.~~or be in HOT SHUTDOWN within the next 12 hours.~~

ACTION 30 - With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-10; either restore the inoperable channel(s) to OPERABLE status within 7 days~~48 hours~~ or be in at least HOT SHUTDOWN within the next 12 hours.

~~ACTION 31 With the number of OPERABLE accident monitoring channels, less than the Required Number of Channels, either restore the system to OPERABLE status within 7 days if repairs are feasible without shutting down or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.~~

ACTION 31~~2~~ - With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE in Table 3.3-10, either restore the inoperable channel(s) to OPERABLE status within 7 days~~48 hours if repairs are feasible without shutting down or:~~ or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels to OPERABLE status.

~~1. Initiate and alternate method of monitoring the reactor vessel inventory;~~

~~2. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status; and~~

~~3. Restore the system to OPERABLE status at the next scheduled refueling.~~

TABLE 4.3-7

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT		CHANNEL CHECK	CHANNEL CALIBRATION
1.	Containment Pressure (Wide Range)	M	R
2.	Containment Pressure (Wide Wide Range)	M	R
3~~2~~.	Reactor Coolant Outlet Temperature - T_{Hot} (Wide Range)	M	R
4~~3~~.	Reactor Coolant Inlet Temperature -T_{Cold} (Wide Range)	M	R
5~~4~~.	Reactor Coolant Pressure - Wide Range	M	R
6~~5~~.	Pressurizer Water Level	M	R
~~6. Steam Generator Pressure~~		~~M~~	~~R~~
7.	Steam Generator Water Level - Narrow Range	M	R
8.	Steam Generator Water Level - Wide Level	M	R
~~9. Refueling Water Storage Pool Water Level~~		~~M~~	~~R~~
~~10. Emergency Feedwater Flow Rate~~		~~M~~	~~R~~
~~11. Reactor Coolant System Saturation Margin Monitor~~		~~M~~	~~R~~
~~12. Safety Valve Position Indicator~~		~~M~~	~~R~~
~~13. Containment Water Level (Narrow Range)~~		~~M~~	~~R~~
9~~14~~.	Containment Water Level (Wide Range)	M	R
10~~15~~.	Core Exit Thermocouples	M	R
11~~16~~.	Containment Isolation Valve Position	M	R
12~~17~~.	Condensate Storage Pool Level	M	R
13~~18~~.	Reactor Vessel Level Monitoring System	M	R
14.	Log Power Indication (Neutron Flux)	M	R

3/4.3.3.6 ACCIDENT MONITORING INSTRUMENTATION

The OPERABILITY of the accident monitoring instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables following an accident. The availability of accident monitoring instrumentation is important so that responses to corrective actions can be observed and the need for, and magnitude of, further actions can be determined. These essential instruments are identified by plant specific documents addressing the recommendations of Regulatory Guide 1.97, as required by Supplement 1 to NUREG-0737, "TMI Action Items." ~~This capability is consis- tent with the recommendations of Regulatory Guide 1.97, "Instrumentation for Light Water Cooled Nuclear Plants to Assess Plant Conditions During and Following an Accident," December 1980 and NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations." Table 3.3-10 includes Regulatory Guide 1.97 Category I key variables. The remaining Category I variables are included in their respective specifications.~~ Table 3.3-10 includes most of the plant's RG 1.97 Type A and Category 1 variables. The remaining Type A/Category 1 variables are included in their respective specifications. Type A variables are included in this LCO because they provide the primary information required to permit the control room operator to take specific manually controlled actions, for which no automatic control is provided, that are required for safety systems to accomplish their safety functions for Design Basis Accidents (DBAs). Category 1 variables are the key variables deemed risk significant because they are needed to: (1) Determine whether other systems important to safety are performing their intended functions; (2) Provide information to the operators that will enable them to determine the potential for causing a gross breach of the barriers to radioactivity release; and (3) Provide information regarding the release of radioactive materials to allow for early indication of the need to initiate action necessary to protect the public as well as to obtain an estimate of the magnitude of any impending threat.

With the number of OPERABLE accident monitoring channels less than the Required Number of Channels shown in Table 3.3-10, the inoperable channel should be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on operating experience and takes into account the remaining OPERABLE channel (or in the case of a Function that has only one required channel, other non-Regulatory Guide 1.97 instrument channels to monitor the Function), the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring accident monitoring instrumentation during this interval. If the 30 day AOT is not met, a Special Report approved by PORC is required to be submitted to the NRC within the following 14 days. This report discusses the results of the root cause evaluation of the inoperability and identifies proposed restorative Actions. This Action is appropriate in lieu of a shutdown requirement, given the likelihood of plant conditions that would require information provided by this instrumentation. Also, alternative Actions are identified before a loss of functional capability condition occurs.

With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-10; at least one of the inoperable channels should be restored to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrumentation operation and the availability of alternate means to obtain the required information.

Continuous operation with less than the Minimum Channels OPERABLE requirements is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the accident monitoring instrumentation. Therefore, requiring restoration of one inoperable channel limits the risk that the variable will be in a degraded condition should an accident occur. If the 7 day requirement is not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 4 within 12 hours. The completion time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

TS 3/4.3.3.6 applies to the following instrumentation: ESFIPI6750 A, ESFIPR6750 B, ESFIPR6755 A&B, RC ITI0122 HA, RC ITI0112 HB, RC ITI0122 CA, RC ITI0112 CB, RC IPI0102 A,B,C,&D, RC ILI0110 X&Y, SG ILI1113 A,B,C,&D, SG ILI1123 A,B,C,&D, SG ILI1115 A2&B2, SG ILI1125 A2&B2, SI ILI7145 A, SI ILR7145 B, all CET's, all Category 1 Containment Isolation Valve Position Indicators, EFWILI9013 A&B, HJTC's, and ENIIJI0001 C&D.

~~The Subcooled Margin Monitor (SMM), the Heated Junction Thermocouple (HJTC), and the Core Exit Thermocouples (CET) comprise the Inadequate Core Cooling (ICC) instrumentation required by Item II.F.2 NUREG-0737, the Post-TMI-2 Action Plan. The function of the ICC instrumentation is to enhance the ability of the plant operator to diagnose the approach to existence of, and recovery from ICC. Additionally, they aid in tracking reactor coolant inventory. These instruments are included in the Technical Specifications at the request of NRC Generic Letter 83-37. These are not required by the accident analysis, nor to bring the plant to Cold Shutdown.~~

~~In the event more than four sensors in a Reactor Vessel Level channel are inoperable, repairs may only be possible during the next refueling outage. This is because the sensors are accessible only after the missile shield and reactor vessel head are removed. It is not feasible to repair a channel except during a refueling outage when the missile shield and reactor vessel head are removed to refuel the core. If only one channel is inoperable, it should be restored to OPERABLE status in a refueling outage as soon as reasonably possible. If both channels are inoperable, at least one channel shall be restored to OPERABLE status in the nearest refueling outage.~~

3/4.3.3.7 CHEMICAL DETECTION SYSTEMS

The chemical detection systems are the chlorine and broad range toxic gas detection systems.

The OPERABILITY of the chemical detection systems ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chemical release.

The chemical detection systems provide prompt detection of toxic gas releases which could pose an actual threat to safety of the nuclear power plant or significantly hamper site personnel in performance of duties necessary for the safe operation of the plant.

The broad range toxic gas detection system operates on the principle of gas photoionization, and therefore, the system is sensitive to a broad range of gases*. The system is therefore sensitive to both atmospheric and chemical composition normal fluctuations affecting the Waterford 3 site. The setpoint for the system is thus based on testing and operating experience, and the set- point is set at the lowest achievable IDLH gas concentration providing reliable operation and the optimum detection of toxic gases.

* Including Ammonia