CATEGORY 1 - ABNORMAL PRIMARY LEAK RATE

CATEGORY 2 - ABNORMAL PRIMARY-TO-SECONDARY LEAK

CATEGORY 3 - CORE FUEL DAMAGE

CATEGORY 4 - SECONDARY COOLANT ANOMALY

CATEGORY 5 - ABNORMAL EFFLUENT

CATEGORY 6 - MAJOR ELECTRICAL FAILURES

CATEGORY 7 - SECURITY EVENTS

CATEGORY 8 - FIRE

CATEGORY 9 - HAZARDS TO PLANT OPERATION

CATEGORY 1
ABNORMAL PRIMARY LEAK RATE

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Loss of Primary System Integrity and Containment Integrity With the Potential for Fuel Damage

Emergency Action Levels:

All of the following:

1. Primary system leakage >1000 gpm as indicated by mass balance

2. Containment integrity lost as indicated by visual observation or one or more containment isolation status lights are off

3. Core exit thermocouples >700 ^{o}F, average

Plant Specific Information:

This initiating condition (IC) addresses loss-of-coolant accidents (LOCAs). Steam generator tube rupture (SGTR) accidents are covered by this set of ICs as well as Category B ICs.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can be readily evaluated by the operator in the control room.

At primary system pressures above the shutoff head for the RHR system (approximately 150 psig), leak rates in excess of 1000 gpm challenge the safety injection (SI) systems ability to maintain primary system pressure. At high primary system pressures, leak rates above approximately 1500 gpm can not be met by the SI system. A primary leak rate of 1000 gpm is classified as a medium or large loss-of-coolant-accident (LOCA). Leak rates of this magnitude are caused by pipe breaks exceeding two inches. This indication is also used because an excessive leak rate increases the potential for the occurrence of core damage due to void formation.

Loss of containment integrity is indicated by one or more containment isolation lights not being fully illuminated or by visual observation. When a containment isolation light is not fully illuminated, the associated containment isolation valve is in a non-safeguards position. To address containment integrity failures involving the structure itself or malfunctions of the containment integrity status system, visual observation is used as the indicator.

Potential loss of fuel integrity is indicated by core exit thermocouple readings. Readings greater than 700 $^{\circ}$F are strong indication of potential fuel clad damage. The temperature of 700 $^{\circ}$F is an important value because it is near the critical point for water and is a good indication of the presence of superheated steam. The presence of steam in the primary system suggests possible fuel damage.

With the loss of the reactor coolant and the containment system barriers, release of radioactivity from the reactor core will result in the release of radioactive material to the environment and subsequent undue risk to the health and safety of the public, possibly in excess of 10 CFR 100 values.

Therefore, this initiating condition which is indicative of grave plant system conditions with adverse consequences on the public health and safety is classified as a GENERAL EMERGENCY.

Source Documents/References Calculations:

4, 23, 24, 27, 28, 38, 43, 46, 62, 63, 64, 65, 69, 70, 73, 74, 89, 93

CATEGORY 1
ABNORMAL PRIMARY LEAK RATE

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Loss of Primary System Integrity With the Potential For Fuel Damage (FSAR 14.3.2)

Emergency Action Levels:

All of the following:

1. "Volume control tank level Hi-Lo" alarm [LI-141 and/or LI-112 <8%]

2. Decreasing pressurizer level or level offscale low [LI-426, LI-427, LI-428]

3. All available pumps running as indicated by the red light at the switch

4. Increasing core exit thermocouple temperature

Plant Specific Information:

This initiating condition addresses conditions where leakage from the reactor coolant system is greater than available makeup capacity, including charging and ECCS. Under these conditions, the makeup systems capacity is less than core heat generation, thus subcooling will be lost as core heat is removed by boiling of the coolant. "Available" encompasses both equipment out-of-service considerations and system pressures that are higher than pump shutoff head or the ECCS accumulator pressure is inadequate to the extent that subcooling is lost.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can be readily evaluated by the operator in the control room.

The volume control tank (VCT) level is normally maintained between 28 and 56 percent of full level. The "Volume Control Tank Hi-Lo" alarm occurs at a tank level of eight percent and decreasing. The occurrence of this alarm indicates that the charging flow to the primary system is occurring at a rate exceeding the makeup flow rate to the VCT.

Pressurizer level is normally maintained between 12 and 70 percent of span. Decreasing pressurizer level and pressure indicates that the combination of reactor coolant system (RCS) cooldown and mass loss is beyond the capability of the makeup systems and the pressurizer heaters to maintain primary system pressure.

A makeup flow rate from two charging pumps is typically adequate to maintain pressurizer level long enough for the operator to respond without activating the ECCS for a break through a 3/8 inch diameter hole.

At primary system pressures above the shutoff head for the RHR system (approximately 150 psig), leak rates in excess of 1000 gpm challenge the safety injection (SI) systems ability to maintain primary system pressure. At high primary system pressures, leak rates above approximately 1500 gpm can not be met by the SI system. A primary leak rate of 1000 gpm is classified as a medium or large loss-of-coolant-accident (LOCA). To cause a leak rate of this magnitude, a pipe break of at least two inches is needed. This indication is also used because an excessive leak rate increases the potential for the occurrence of core damage due to void formation.

Potential loss of fuel integrity is indicated by rising core exit thermocouple readings. Readings greater than 700 °F are strong indications of potential fuel clad damage. The temperature of 700 °F is an important value because it is near the critical point for water and is a good indication of the presence of superheated steam. The presence of steam in the primary system suggests possible fuel damage.

With the loss of the reactor coolant system barrier, release of radioactivity from the core will result in radioactive material in the containment with the containment barrier serving as the last barrier to adverse consequences on the public health and safety.

Therefore, this initiating condition which is indicative of serious plant conditions with possible adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a GENERAL EMERGENCY under Core Fuel Damage - Containment High Radiation With Actual or Potential Loss of Containment Integrity may be appropriate based on containment radiation monitor readings.

Source Documents/References/Calculations:

4, 23, 24, 27, 28, 38, 43, 46, 62, 63, 64, 65, 69, 73, 74, 89, 93

CATEGORY 1
ABNORMAL PRIMARY LEAK RATE

Emergency Classification Level: **ALERT**

Initiating Condition: Primary System Leakage Greater Than 50 GPM

Emergency Action Levels:

All of the following:

1. "Volume control tank level Hi-Lo" alarm [LI-141 and/or LI-112 <8%]

2. Decreasing pressurizer level [LI-426, LI-427, LI-428]

3. "Charging Pump Speed Hi" alarm

4. Charging line flow [FI-128] >50 gpm more than letdown flow [FI-134]

Plant Specific Information:

This initiating condition (IC) addresses conditions where leakage from the reactor coolant system can not be maintained by normal operation of the chemical and volume control system (CVCS) which is considered one reciprocating charging pump discharging to the charging header. A reactor coolant leak greater than 50 gpm represents an uncontrolled situation and hence, a potential degradation in the level of safety. This initiating condition addresses LOCA events where fuel integrity is not imperiled.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can be readily evaluated by the operator in the control room.

Abnormal operation of the CVCS is indicated by the volume control tank level hi-lo alarm, the pressurizer low pressure alarm and the charging pump speed high alarm.

The volume control tank (VCT) level is normally maintained between 28 and 56 percent of full level. The "Volume Control Tank Hi-Lo" alarm occurs at a tank level of eight percent and decreasing. The occurrence of this alarm indicates that the charging flow to the primary system is occurring at a rate exceeding the makeup flow rate to the VCT.

Pressurizer level is normally maintained between 12 and 70 percent of span. Decreasing pressurizer level and pressure indicates that the combination of reactor coolant system (RCS) cooldown and mass loss is beyond the capability of the makeup systems and the pressurizer heaters to maintain primary system pressure.

The "Charging Pump Speed Hi" alarm occurs when the charging flow rate is such that at least one charging pump is running at its maximum speed.

Charging flow in excess of the letdown flow is used as a confirmatory indication that a leak exists in the primary system at a rate greater than 50 gpm.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a SITE EMERGENCY under Abnormal Primary Leak Rate - Primary System Leak Rate In Excess of Available Pump Capacity may be appropriate based on safety injection flow rate and fuel clad barrier status.

Source Documents/References/Calculations:

4, 23, 24, 27, 28, 38, 43, 46, 62, 63, 64, 65, 66, 69, 73, 74, 89, 93

CATEGORY 1
ABNORMAL PRIMARY LEAK RATE

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Primary System Leakage Exceeding Technical Specification Limit of 10 gpm (FSAR 14.3.1)

Emergency Action Levels:

When shutdown commences as determined by DSS and DCS.

Plant Specific Information:

This initiating condition addresses conditions that may be a precursor of more serious conditions and is considered to be a potential degradation of the level of the safety of the plant.

A primary leak rate of 10 gpm is the Technical Specification limit and is well within the capacity of a single charging pump. Primary system makeup is available even when offsite power is not available. The Technical Specifications require a plant shutdown within 24 hours when a leak rate of this size is detected.

If the leakage is to the containment, it may be identified by one or more of the following methods:

a. By containment air particulate monitor. This instrument is sensitive to a leakage rate of 0.013 gpm within twenty minutes, assuming the presence of corrosion product activity.

b. By containment radiogas monitor. The sensitivity range of this instrument is 2 to greater than 10 gpm.

c. By humidity detector. The sensitivity range of this instrument is 2 to 10 gpm.

d. By the use of containment sump A. This system determines leakage losses from water and steam systems in the containment. By collecting and measuring moisture condensed from the containment atmosphere by cooling coils of the main recirculation units, condensate flows of 0.5 to 10 gpm can be measured. The sensitivity range of this method is 0.5 to greater than 10 gpm.

This initiating condition is entered when the Duty Shift Superintendent (DSS) or Duty and Call Superintendent (DCS) determines that an unidentified leak rate of 10 gpm or greater from the primary system is indicated.

This initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

Escalation to an ALERT under Abnormal Primary Leak Rate - Primary System Leak Rate Greater Than 50 GPM may be appropriate based on primary system leakage rate measurement results.

Source Documents/References/Calculations

4, 24, 28, 43, 44, 46, 62, 66, 69, 73, 74, 89, 93

CATEGORY 2
ABNORMAL PRIMARY-TO-SECONDARY LEAK

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Abnormal Primary-to-Secondary Leak With the Potential for Fuel Damage

Emergency Action Levels:

All of the following:

1. "Pressurizer Low Press SI" alarm with 2/3 <1735 psig [PI-429, PI-430, PI-431]

2. SI flow >1000 gpm [FI-924, FI-925]

3. At least one of the following:

   a. "Steam Generator A Level Hi" alarm with 2/3 >70% [LI-461, LI-462, LI-463]

   OR

   b. "Steam Generator B Level Hi" alarm with 2/3 >70% [LI-471, LI-472, LI-473]

   OR

   c. Increasing steam generator level
   [A SG: LI-461, LI-462, LI-463]
   [B SG: LI-471, LI-472, LI-473]

4. Core exit thermocouples >700 ^{O}F, average

Plant Specific Information:

This initiating condition (IC) addresses steam generator tube rupture (SGTR) accidents. Loss-of-coolant accidents (LOCA) are covered by a separate set of ICs.

This IC addresses ruptured steam generators corresponding to the loss of two out of three fission product barriers (reactor coolant system and containment system barriers). This IC will always result in loss of the containment barrier. This allows the direct release of radioactive fission and activation products to the environment. Resultant offsite doses are a function of many variables, including coolant activity, actual leak rate, steam generator carryover, iodine partitioning, and meteorology.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can be readily evaluated by the operator in the control room. The EALs include the indication of the reduction in primary coolant pressure, increased secondary radiation levels, and an uncontrolled or complete depressurization of the ruptured steam generator. Secondary system radiation increases should be observed via radiation monitoring of the condenser air ejector discharge, steam generator blowdown, main steam, or steam generator sampling. Determination of the uncontrolled depressurization of the ruptured steam generator should be based on indication that the pressure decrease in the ruptured steam generator is not a function of operator action. This should prevent declaration based on a depressurization that results from induced cooldown of the reactor coolant system that does not involve the prolonged release of contaminated secondary coolant from the affected steam generator to the environment.
An abnormal primary/secondary leak is indicated by the "Pressurizer Low Pressure SI" alarm or by a safety injection flow rate greater than 1000 gpm. The "Pressurizer Low Pressure SI" alarm occurs at a primary system pressure of 1735 psig. Actuation of two of three channels of this alarm activates the safety injection system. This alarm indicates that the pressurizer is unable to maintain primary system pressure. This is caused by the combination of reactor coolant system cooldown and mass loss beyond the capabilities of the makeup systems and the pressurizer heaters. A primary leak rate of 1000 gpm is classified as a medium or large loss-of-coolant-accident (LOCA). This indication is also used because an excessive leak rate increases the potential for the occurrence of core damage due to void formation.

Increasing steam generator water inventory is indicated by the "Steam Generator A Level Hi", "Steam Generator B Level Hi", or "Increasing Steam Generator Level" alarm which indicates that the water level in the associated steam generator is at 70 percent. This level could signify a failure in the steam generator level control system or a primary to secondary leak that is adding inventory to the steam generator at a rate that is faster than the level control system can handle.

Potential loss of fuel integrity is indicated by core exit thermocouple readings. Readings greater than 700 °F are strong indication of potential fuel clad damage. The temperature of 700 °F is an important value because it is near the critical point for water and is a good indication of the presence of superheated steam. The presence of steam in the primary system suggests possible fuel damage.

With the loss of the reactor coolant and the containment system barriers, release of radioactivity from the reactor core will result in the release of radioactive material to the environment and subsequent undue risk to the health and safety of the public, possibly in excess of 10 CFR 100 values.

Therefore, this initiating condition which is indicative of grave plant system conditions with adverse consequences on the public health and safety is classified as a GENERAL EMERGENCY.

Source Documents/References/calculations:

40, 41, 42, 44, 59, 91, 100

CATEGORY 2
ABNORMAL PRIMARY-TO-SECONDARY LEAK

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Rapid Failure of >10 SG Tubes (4000 gpm)

Emergency Action Levels:

All of the following:

1. "Pressurizer Lo Press SI" alarm with 2/3 <1735 psig [PI-429, PI-430, PI-431]

2. SI flow >4000 gpm indicated by mass balance

3. At least one of the following:

   a. "Steam Generator A Level Hi" alarm with 2/3 >70 percent [LI-461, LI-462, LI-463]

   OR

   b. "Steam Generator B Level Hi" alarm with 2/3 >70 percent [LI-471, LI-472, LI-473];

   OR

   c. Increasing steam generator level
   A SG [LI-461, LI-462, LI-463]
   B SG [LI-471, LI-472, LI-473]

Plant Specific Information:

This IC addresses ruptured steam generators with an unisolable secondary line break corresponding to the loss of two out of three fission product barriers (reactor coolant system and containment system barriers). This IC will always result in loss of the containment barrier. This allows the direct release of radioactive fission and activation products to the environment. Resultant offsite doses are a function of many variables, including coolant activity, actual leak rate, steam generator carryover, iodine partitioning, and meteorology.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can be readily evaluated by the operator in the control room. The EALs include the indication of the reduction in primary coolant pressure, increased secondary radiation levels, and an uncontrolled or complete depressurization of the ruptured steam generator. Secondary radiation increases should be observed via radiation monitoring of the condenser air ejector discharge, steam generator blowdown, main steam, or steam generator sampling. Determination of the uncontrolled depressurization of the ruptured steam generator should be based on indication that the pressure decrease in the ruptured steam generator is not a function of operator action. This should prevent declaration based on a depressurization that results from induced cooldown of the reactor coolant system that does not involve the prolonged release of contaminated secondary coolant from the affected steam generator to the environment.

An abnormal primary/secondary leak is indicated by the "Pressurizer Low Pressure SI" alarm or by a safety injection flow rate greater than 4000 gpm. The "Pressurizer Low Pressure SI" alarm occurs at a primary system pressure of 1735 psig. Actuation of two of three channels of this alarm activates the safety injection system. This alarm indicates that the pressurizer is unable to maintain primary system pressure. This is caused by primary system cooldown in excess of the ability of the pressurizer heaters or a loss of water inventory in the primary system. A primary leak rate of 1000 gpm is classified as a medium or large loss-of-coolant-accident (LOCA). To cause a leak rate of this magnitude, a pipe break of at least two inches is needed. This indication is also used because an excessive leak rate increases the potential for the occurrence of core damage due to void formation.

Increasing steam generator water inventory is indicated by the "Steam Generator A Level Hi", "Steam Generator B Level Hi", or "Increasing Steam Generator Level" alarm indicates that the water level in the associated steam generator is at 70 percent. This level could signify a failure in the steam generator level control system or a primary to secondary leak that is adding inventory to the steam generator at a rate that is faster than the level control system can handle.

With the loss of the reactor coolant and the containment system barriers, any release of radioactivity from the reactor core will result in the release of radioactive material to the environment and subsequent undue risk to the health and safety of the public, possibly in excess of 10 CFR 100 values. However, the analyses of this accident has determined that fuel clad is not expected to occur and, therefore, the only radioactive material that will be released is the material contained in the primary and secondary systems.

Therefore, this initiating condition which is indicative of serious plant system conditions with possible adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a GENERAL EMERGENCY under Abnormal Primary/Secondary Leak - Abnormal Primary/Secondary Leak With Potential for Fuel Damage may be appropriate based on core exit thermocouple readings.

Source Documents/References/Calculations:

40, 41, 42, 44, 59, 91, 100

CATEGORY 2
ABNORMAL PRIMARY-TO-SECONDARY LEAK

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Gross Failure of 1 SG Tube (>400 gpm) and Loss of Offsite Power (FSAR 14.2.4)

Emergency Action Levels:

All of the following first-out control room panel annunciators with confirming indication:

1. Annunciators

   a. "Pressurizer Lo Press SI" alarm with 2/3 <1735 psig [PI-429, PI-430, PI-431]

   b. At least one of the following:

      (1). "Steam Generator A Level Hi" alarm with 2/3 >70% [LI-461, LI-462, LI-463]

      OR

      (2). "Steam Generator B Level Hi" alarm with 2/3 >70% [LI-471, LI-472, LI-473]

      OR

      (3). Increasing steam generator level
      A SG [LI-461, LI-462, LI-463]
      B SG [LI-471, LI-472, LI-473]

   c. "4.16 kV Bus Undervoltage" alarm and 0 V on A-03 and A-04 voltmeters.

2. Confirming Indications

   a. X-04 to A-03 ammeter on C-02 (0 amps)

   b. X-04 to A-04 ammeter on C-02 (0 amps)

   c. SI flow >400 gpm indicated by FI-924 and FI-925 pump discharge pressure corresponding to flow

   d. Any steam generator with indications of high radiation:
   - Main steam line RMS high alarm [1(2)RE-231, 1(2)RE-232]
   - Condenser air ejector RMS high alarm [RE-215, RE-225]
   - Steam generator blowdown RMS high alarm [RE-219, RE-222]
   - Steam generator samples
   - Portable survey instrument readings

Plant Specific Information:

The initiating condition addresses steam generator tube rupture accidents with a loss of offsite power. The significance of the loss of offsite power is that it results in the loss of the main condenser cooling. It therefore becomes necessary to temporarily exhaust steam directly to the atmosphere to cool the reactor, resulting in the release of radiation to the atmosphere until the steam generator is isolated (the design accident time duration for this is 30 minutes). The auxiliary feedwater system maintains the water level above the top of the U-tubes during the entire accident. The capture of fission products by the water is an important feature in limiting the size of the radiation release.

This initiating condition was examined in the Final Safety Analysis Report.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can be readily evaluated by the operator in the control room. The EALs include the indication of the reduction in primary coolant, increased secondary radiation levels, and loss of offsite power. Secondary radiation increases should be observed via radiation monitoring of the steam line, condenser air ejector discharge, steam generator blowdown, main steam, or steam generator sampling.

Indications of primary coolant system reduction include "Pressurizer Low Pressure SI" alarm which occurs at a primary system pressure of 1735 psig. Actuation of two of three channels of this alarm activates the safety injection system. This alarm indicates that the pressurizer is unable to maintain primary system pressure. This is caused by the combination of reactor coolant system cooldown and mass loss beyond the capabilities of the makeup systems and the pressurizer heaters.

The "Steam Generator A Level Hi", "Steam Generator B Level Hi", or "Increasing Steam Generator Level" alarm indicates that the water level in the associated steam generator is at 70 percent. This level could signify a failure in the steam generator level control system or a primary to secondary leak that is adding inventory to the steam generator at a rate that is faster than the level control system can handle.

A "4.16 kV Bus Undervoltage" alarm indicates that the AC voltage on the associated bus fell to 77 percent of the required level for one-third of a second. This alarm on the A03, A04, A05, and A06 buses indicates a loss of AC power to the two unit supply buses and the two safeguards equipment distribution buses, respectively.

The X-04 to A-03 and the X-04 to A-04 ammeters on C-02 are meters indicating current supplied from the 4.16 kV source. Loss of AC power to these supply buses indicates loss of offsite AC power.

With the loss of the reactor coolant and the containment system barriers, any release of radioactivity from the reactor core will result in the release of radioactive material to the environment and subsequent undue risk to the health and safety of the public, possibly in excess of 10 CFR 100 values. However, the analyses of this accident has determined that fuel clad damage is not expected to occur and, therefore, the only radioactive material that will be released is that material contained in the primary and secondary systems.

Therefore, this initiating condition which is indicative of serious plant system conditions with possible adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a GENERAL EMERGENCY may be appropriate if the steam generator can not be isolated and there are indications that a large number of steam generator tubes have been damaged.

Source Documents/References/Calculations:

40, 41, 42, 44, 59, 91, 100

CATEGORY 2
ABNORMAL PRIMARY-TO-SECONDARY LEAK

Emergency Classification Level: **ALERT**

Initiating Condition: Rapid Failure of Steam Generator Tubes (several hundred gpm primary-to-secondary leakage)

Emergency Action Levels:

All of the following:

1. "Pressurizer Lo Press SI" alarm with 2/3 <1735 psig [PI-429, PI-430, PI-431]

2. SI flow between 400 - 4000 gpm indicated by mass balance and/or [FI-924, FI-925]

3. At least one of the following:

   a. "Steam Generator A Level Hi" alarm with 2/3 >70% [LI-461, LI-462, LI-463]

   OR

   b. "Steam Generator B Level Hi" alarm with 2/3 >70% [LI-471, LI-472, LI-473]

   OR

   c. Increasing steam generator level
   A SG [LI-461, LI-462, LI-463]
   B SG [LI-471, LI-472, LI-473]

Plant Specific Information:

This initiating condition is based on the inability to maintain normal liquid inventory within the reactor coolant system by normal operation of the chemical and volume control system. Normal operation is considered as one reciprocating charging pump discharging to the charging header.

This initiating condition was examined in the Final Safety Analysis Report.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can be readily evaluated by the operator in the control room. The EALs address reactor coolant system inventory and steam generator secondary side inventory. Annunciators will alarm to alert the operators of abnormal conditions.

The "Pressurizer Low Pressure SI" alarm occurs at a primary system pressure of 1735 psig. Actuation of two of three channels of this alarm activates the safety injection system. This alarm indicates that the pressurizer is unable to maintain primary system pressure. This is caused by primary system cooldown in excess of the ability of the pressurizer heaters or a loss of water inventory in the primary system.

The "Steam Generator A Level Hi", "Steam Generator B Level Hi", or "Increasing Steam Generator Level" alarm indicates that the water level in the associated steam generator is at 70 percent. This level could signify a failure in the steam generator level control system or a primary to secondary leak that is adding inventory to the steam generator at a rate that is faster than the level control system can handle.
Safety injection flow rates exceeding 400 gpm are an indication that more than one steam generator tube is damaged.

With the loss of the reactor coolant and the containment system barriers, any steam generator relief valve releases will release radioactive material to the environment. The analyses of this accident has determined that fuel clad damage is not expected to occur and, therefore, the only radioactive material that will be released is the material contained in the primary and secondary systems.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a SITE EMERGENCY under Abnormal Primary/Secondary Leak - Gross Failure of Steam Generator Tubes and Loss of Offsite Power may be appropriate based on indications that would result from loss of offsite power.

Source Documents/References/Calculation:

40, 41, 42, 44, 59, 91, 100

CATEGORY 2
ABNORMAL PRIMARY-TO-SECONDARY LEAK

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Primary-to-Secondary Leakage Exceeding Technical Specification Limit of 500 gpd

Emergency Action Levels:

When shutdown commences as determined by the DSS and the DCS.

Plant Specific Information:

This initiating condition addresses conditions where leakage through walls of the primary system could be indicative of materials failure such as stress corrosion cracking. If depressurization, isolation and/or other safety measures are not taken promptly, these small leaks could develop into much larger leaks. Therefore, the nature of the leak, as well as the magnitude of the leak, must be considered.

This technical specification limit provides an additional margin of safety with regard to the potential for large steam generator tube failure.

This IC is entered when shutdown commences as determined by the DSS and the DCS.

This initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse consequences on the public health and safety is classified as an UNUSUAL EVENT.

Escalation to ALERT under Abnormal Primary/Secondary Leak - Rapid Failure of Steam Generator Tubes may be appropriate based on the calculated leakage rate in the faulty steam generator.

Source Documents/References/Calculations:

40, 41, 42, 44, 59, 91, 100

CATEGORY 3
CORE FUEL DAMAGE

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Containment High Radiation With Actual or Potential Loss of Containment Integrity

(Containment high radiation indicates core fuel damage and a loss of primary system integrity.)

Emergency Action Levels:

Both of the following:

1. Two of three containment high-range area monitors [1(2)RM-126, RM-127, RM-128] ≥ 6.0E03 R/hr

2. Any of the following:

   a. "Containment Spray" alarm with 2/3 plus 2/3 >25 psig [PI-945, PI-947, PI-949], [PI-946, PI-948, PI-950]

   b. Three of four containment hydrogen monitors >3% concentration [HI-964, HI-965, HI-966, HI-967]

   c. One or more containment isolation status lights are off

   d. Structural damage to containment as determined by the DSS or DCS

Plant Specific Information:

This initiating condition addresses LOCA conditions in containment that are indicative of serious plant system conditions and which will have adverse consequences on the public health and safety if the containment barrier is degraded or lost.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can readily evaluated by the operator in the control room.

Containment radiation dose rates greater than 6000 r/h are indicative of a LOCA with fuel clad damage. The containment radiation dose rates are calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 µCi/g dose equivalent I-131 into the containment atmosphere. Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations allowed within technical specifications and are therefore indicative of fuel damage (approximately two to five percent clad damage depending on core inventory and reactor coolant system volume).

Loss of containment integrity is indicated by one or more containment isolation lights not being fully illuminated or by visual observation. When a containment isolation light is not fully illuminated, the associated containment isolation valve is in a non-safeguards position. To address containment integrity failures involving the structure itself or malfunctions of the containment integrity status system, visual observation is used as the indicator.

A potential loss of containment integrity is indicated by three out of four hydrogen monitors indicating greater than three percent concentration. This indication is reflective of pressure conditions on the containment structure that may exceed its design limit of 60 psig.

Failed fuel monitor readings are not used as an emergency action level because the primary sampling system is isolated upon a safety injection signal.

With the loss of the reactor coolant and fuel clad barriers, a large radioactive source term is present in the containment structure which if released to the environment would present undue risk to the health and safety of the public, possibly in excess of 10 CFR 100 values.

Therefore, this initiating condition which is indicative of grave plant system conditions with adverse consequences on the public health and safety is classified as a GENERAL EMERGENCY.

Source Documents/References/Calculations:

4, 11, 23, 24, 27, 29, 47, 48, 64, 69, 72, 115

CATEGORY 3
CORE FUEL DAMAGE

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Massive Fuel Damage and Loss of Containment Integrity With the Potential for Loss of RCS Integrity

Emergency Action Levels:

All of the following:

1. Failed fuel monitor [1(2)RE-109] ≥600 mR/hr.
2. At least one of the following:
   a. Sample room monitor [1(2)RE-106] confirms high radiation levels in the sample room
   b. Handheld survey instrument confirms high radiation levels in the sample room
   c. Chemical analysis shows fission product concentration ≥300 µCi/gm
3. Containment integrity lost as indicated by visual observation or one or more containment isolation status lights are off
4. Any of the following:
   a. Cold leg temperature decrease >100 °F in the last 60 minutes and cold leg temperature <285 °F
   b. RCS pressure >2365 psig and increasing
   c. Loss of all means of decay heat removal capability

Plant Specific Information:

This initiating condition addresses conditions in containment that are indicative of serious plant system conditions and which will have adverse consequences on the public health and safety if the primary system is degraded or lost.

The Emergency Action Levels (EALs) listed for this IC address the underlying indicators that can readily evaluated by the operator in the control room.

Failed fuel monitor readings greater than 600 mR/h are indicative of fuel clad damage. The failed fuel monitor readings are calculated assuming the instantaneous release and dispersal of the reactor core iodine inventory associated with a concentration of 300 µCi/g dose equivalent I-131 into the reactor coolant system. Confirmatory indications are the sample room monitor reading, a handheld survey instrument reading in the sample room, or chemical analysis measurement of fission product concentration greater than 300 µCi/g.

Loss of containment integrity is indicated by one or more containment isolation lights not being fully illuminated or by visual observation. When a containment isolation light is not fully illuminated, the associated containment isolation valve is in a non-safeguards position. To address containment integrity failures involving the structure itself or malfunctions of the containment integrity status system, visual observation is used as the indicator.

A cold leg temperature decrease greater than 100 °F in 60 minutes and a cold leg temperature less than 285 °F could lead to breaching of the primary system. The occurrence of these two conditions concurrently can place excessive stress on the reactor vessel wall, specifically the beltline weld area. The occurrence of these two events concurrently results in a Red Path in the Critical Safety Trees and directs the operators to initiate Critical Safety Procedure (CSP) P.1, "Response to Imminent Pressurized Thermal Shock Condition."

With the loss of the fuel clad and containment barriers, a large radioactive source term is present in the reactor coolant which if released to the containment and subsequently the environment would present undue risk to the health and safety of the public, possibly in excess of 10 CFR 100 values.

Therefore, this initiating condition which is indicative of grave plant system conditions with adverse consequences on the public health and safety is classified as a GENERAL EMERGENCY.

Source Documents/References/Calculations:

4, 11, 26, 29, 47, 48, 64, 71, 72, 95

CATEGORY 3
CORE FUEL DAMAGE

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Containment High Radiation

Emergency Action Levels:

Two of three containment high range area monitors [1(2)RM-126, RM-127, RM-128] ≥6.0 E03R/hr

Plant Specific Information:

This initiating condition addresses a LOCA with fuel clad damage in the containment.

This initiating condition indicates significant fuel damage well in excess of the EALs associated with both a loss of the fuel clad and reactor coolant system barriers. A major release of radioactivity requiring offsite protective actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant. Regardless of whether containment is challenged, this amount of activity in containment, if released, could have such severe consequences that it is prudent to treat this as a potential loss of containment, such that a General Emergency declaration is warranted. NUREG-1228, "Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents," indicates that such conditions do not exist when the amount of clad damage is less than 20 percent.

This condition is entered when the containment high radiation monitors indicate a dose rate greater than 6000 R/h.

A dose rate of greater than 6000 R/h on the containment high range radiation monitor indicates core fuel damage and breach of the primary system. The dose rate was calculated assuming a LOCA occurs and one percent of the fuel melts. The emergency declaration is based on the calculated dose rates at the site boundary following a core melt event without the actuation of the containment spray system. Leakage to the environment occurs at the design basis leak rate and the assumed atmospheric dispersion is the worst case. The released radioactivity results in calculated dose rates greater than 500 mR/h whole body and greater than 2500 mR/h thyroid over a two minute duration. To prevent the declaration of an emergency class from a false positive reading, two out of the three containment high range monitors must indicate dose rates greater than 6000 R/h.

With the loss of the reactor coolant and fuel clad barriers, a large radioactive source term is present in the containment structure which if released to the environment would present undue risk to the health and safety of the public, possibly in excess of 10 CFR 100 values.

Therefore, this initiating condition which is indicative of serious plant system conditions with possible adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a GENERAL EMERGENCY under Core Fuel Damage - Containment High Radiation With Actual Or Potential Loss of Containment Integrity may be appropriate with actual loss of containment integrity or increased pressure in the containment which is indicative of potential containment breach

Therefore, this initiating condition which is indicative of serious plant system conditions with possible adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Source Documents/References/Calculations:

24, 115

CATEGORY 3
CORE FUEL DAMAGE

Emergency Classification Level: **ALERT**

Initiating Condition: Massive Fuel Damage

Emergency Action Levels:

Both of the following:

1. Failed fuel monitor [1(2)RE-109] ≥600 mR/h

2. At least one of the following:

   a. Sample room monitor [1(2)RE-106] confirms high radiation levels in the sample room

   b. Handheld survey instrument confirms high radiation levels in the sample room

   c. Chemical analysis shows fission product concentration ≥300 µCi/gm

Plant Specific Information:

This initiating condition corresponds to a 300 µCi/g dose equivalent I-131 reactor coolant activity and is well above that expected for iodine spikes and corresponds to approximately five to ten percent fuel clad damage. This amount of clad damage indicates significant clad heating and thus the fuel clad barrier is considered lost.

This condition is entered when it is confirmed that the failed fuel monitor indicates a reading greater than 600 mR/h.

A dose rate greater than 600 mR/h on the failed fuel monitor indicates the occurrence of clad damage of over five percent of the fuel. To prevent the declaration of an accident due to a false positive reading, the reading is verified by confirming at least one other indicator. These other indicators include high dose rate levels in the sample room or fission product concentrations greater than 300 µCi/g.

With the loss of the fuel clad barrier, a large radioactive source term is present in the primary coolant system. Release to the environment would require the failure of both the primary coolant and containment barriers.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to SITE EMERGENCY under Core Fuel Damage - Containment High Radiation may be appropriate based on containment radiation readings if there are no indications of potential containment breach. Increased pressure in containment is indicative of potential containment breach which warrants escalation to GENERAL EMERGENCY under Core Fuel Damage - Massive Fuel Damage and Loss of Containment Integrity and Potential Loss of Containment Integrity.

Source Documents/References/Calculations:

115

CATEGORY 3
CORE FUEL DAMAGE

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Gross Fuel Damage

Emergency Action Levels:

Both of the following:

1. Failed fuel monitor [1(2)RE-109] ≥120 mR/h

2. At least one of the following:

   a. Sample room monitor [1(2)RE-106] confirms high radiation levels in the sample room

   b. Handheld survey instrument confirms high radiation levels in the sample room

   c. Chemical analysis shows fission product concentrations ≥60 µCi/gm

Plant Specific Information:

This initiating condition is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems. Site specific radiation monitor readings such as the failed fuel monitor can indicate if fuel clad degradation has occurred.

This condition is entered when it is confirmed that the failed fuel monitor indicates dose rates greater than 120 mR/h.

A dose rate greater than 120 mR/h on the failed fuel monitor indicates that greater than 0.1 percent of the fuel has clad damage. To prevent the declaration of an event due to a false positive reading, the reading is verified by confirming that high dose rates exist in the sample room or fission product concentrations are greater than 60 µCi/g.

With the loss of the fuel clad barrier, an elevated radioactive source term is present in the primary coolant system. Release to the environment would require the failure of both the primary coolant and containment barriers. Elevated primary system activity may present increased radiation hazards to plant personnel.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse consequences to the public health and safety is classified as an UNUSUAL EVENT.

Escalation to an ALERT under Core Fuel Damage - Severe Loss of Fuel Cladding may be appropriate based on increased failed fuel monitor readings.

Source Documents/References/Calculations:

11, 74

CATEGORY 4
SECONDARY COOLANT ANOMALY

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Loss of Feedwater, Followed by Loss of Auxiliary Feedwater for Greater Than 30 Minutes (FSAR 14.1.10)

Emergency Action Levels:

Both of the following:

1. Decreasing steam generator levels [A SG: LI-461, LI-462, LI-463; B SG: LI-471, LI-472, LI-473]

2. No auxiliary feedwater flow [FI-4002, FI-4007, FI-4014, FI-4036, FI-4037].

Plant Specific Information:

This initiating condition addresses the complete loss of the ultimate heat sink required for hot shutdown with the reactor at temperature and pressure.

A loss of normal feedwater results in a reduction in capability of the secondary system to remove the heat generated in the reactor core. If the reactor is not tripped during this accident, primary plant damage could possibly result from a sudden loss of heat sink. If an alternate supply of feedwater were not supplied to the plant, residual heat following reactor trip would heat the primary system water to the point where water relief from the pressurizer occurs, and significant loss of water from the reactor coolant system could lead to core damage.

A delay of greater than 30 minutes in the initiation of auxiliary feedwater flow to the steam generators results in degraded capability of the steam generators to remove decay heat with resultant core damage. The steam generators will boil dry over the 30 minute time period that feedwater is unavailable.

Decreasing steam generator levels are an indication of loss of feedwater flow.

The normal source of auxiliary feedwater flow is from the condensate storage tanks. Operators would be alerted to the loss of this source by the receipt of low suction pressure alarms on the auxiliary feedwater pumps.

With the loss of normal and auxiliary feedwater flow, core damage will occur and, ultimately, containment failure.

With the loss of the fuel clad, reactor coolant, and containment barriers, no barriers exist to prevent the release of radioactive materials which would present undue risk to the health and safety of the public, possibly in excess of 10 CFR 100 values.

Therefore, this initiating condition which is indicative of grave plant system conditions with adverse consequences on the public health and safety is classified as a GENERAL EMERGENCY.

Source Documents/References/Calculations:

1, 5, 25, 49, 50, 55, 70, 75, 80, 90, 92, 101, 112, 113, 114

CATEGORY 4
SECONDARY COOLANT ANOMALY

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Steam Line Break With >50 gpm Primary-to-Secondary Leakage and an Indication of Fuel Damage

Emergency Action Levels:

All of the following:

1. Either of the first-out annunciators:

   a. "Steam Line Loop A Lo-Lo press" alarm with 2/3 <530 psig [PI-468, PI-469, PI-482]

   OR

   b. "Steam Line Loop B Lo-Lo press" alarm 2/3 <530 psig [PI-478, PI-479, PI-483]

2. Confirmed primary-to-secondary leakage greater than 50 gpm

3. Either:

   a. "Steam Line Loop A Isol Channel Alert" alarm with 1/2 >3.9 x 10^6 lbm/hr [FI-464, FI-465]

   OR

   b. "Steam Line Loop B Isol Channel Alert" alarm with 1/2 >3.9 X 10^6 lbm/hr [FI-474, FI-475]

4. Failed fuel monitor [1(2)RE-109] ≥120 mR/hr

5. At least one of the following:

   a. Sample room monitor [1(2)RE-106] confirms high radiation levels in the sample room

   b. Handheld survey instrument confirms increased radiation levels in the sample room

   c. Chemical analysis shows fission product concentrations ≥60 µCi/gm.

Plant Specific Information:

A rupture of a steam pipe is assumed to include any accident which results in an uncontrolled steam release from a steam generator. The release can occur due to a break in a steam pipe or due to a valve malfunction. The steam release results in an initial increase in steam flow which decreases during the accident as the steam pressure falls. The energy removal from the reactor coolant system causes a reduction of coolant temperature and pressure.

The rupture of a steam pipe with a concurrent steam generator tube leak provides a release path directly to the environment. Any radioactivity contained in the reactor coolant will be released with the steam being released to the environment.

The Emergency Action Levels (EALs) for this IC address low steam line pressure, steam generator tube leakage, steam line isolation activation, and failed fuel indications.

Low steam line pressure is indicated by the "Steam Line Loop A Lo-Lo Press" or the "Steam Line Loop B Lo-Lo Press" alarm. This alarm annunciates at a pressure of 530 psig and decreasing. Actuation of two out of three channels of this alarm will initiate safety injection. Low steam line pressure is caused by excessive steam demand such as a steam line break or an accidental steam release. The setpoint for this alarm is well above the steam pressure that would be expected in the steam line during a large steam line break accident.

Excessive steam flow is indicated by the "Steam Line Loop A Isol Channel Alert" or the "Steam Line Loop B Isol Channel Alert" alarm. This alarm annunciates at a steam flow greater than 3.9E+06 lb/h or when the primary system low T_{avg} is less than 543 °F and the steam flow is greater than 4.77E+05 lb/h. The concurrent occurrence of high steam flow and low average coolant temperature will be caused by an excessive steam demand as expected during a steam line break or an accidental steam release. The high steam flow limit is set at approximately 20 percent of the nominal full load flow at the no-load pressure and 120 percent of the nominal full flow at the full load pressure. The low T_{avg} limit is set below its hot shutdown value.

A dose rate greater than 120 mR/h on the failed fuel monitor indicates that greater than 0.1 percent of the fuel has clad damage. To prevent the declaration of an event due to a false positive reading, the reading is verified by confirming that high dose rates exist in the sample room or fission product concentrations are greater than 60 µCi/g.

With the loss of the fuel clad, reactor coolant, and containment barriers, no barriers exist to prevent the release of radioactive materials to the environment.

Therefore, this initiating condition which is indicative of serious plant system conditions with adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a GENERAL EMERGENCY under Abnormal Primary/Secondary Leak - Abnormal Primary/Secondary Leak With Potential Fuel Damage may be appropriate based on primary-to-secondary leakage rates and core temperatures as determined by core exit thermocouple readings or subcooling indications.

Source Documents/References/Calculations:

7, 39, 60, 94

CATEGORY 4
SECONDARY COOLANT ANOMALY

Emergency Classification Level: **ALERT**

Initiating Condition: Steam Line Break With Primary-to-Secondary Leakage In Excess of 10 gpm (FSAR 14.2.5)

Emergency Action Levels:

All of the following:

1. Either of the first-out annunciators:

   a. "Steam Line Loop A Lo-Lo press" alarm with 2/3 <530 psig [PI-468, PI-469, PI-482]

   OR

   b. "Steam Line Loop B Lo-Lo press" alarm with 2/3 <530 psig [PI-478, PI-479, PI-483]

2. Confirmed primary-to-secondary leakage >10 gpm

3. Either of the following:

   a. "Steam Line Loop A Isol Channel Alert" alarm with 1/2 >3.9 X 10^6 lb/hr [FI-464, FI-465]

   OR

   b. "Steam Line Loop B Isol Channel Alert" alarm with 1/2 >3.9 X 10^6 lb/hr [FI-474, FI-475]

Plant Specific Information:

This initiating condition addresses conditions where leakage through walls of the primary system could be indicative of materials failure such as stress corrosion cracking. If depressurization, isolation and/or other safety measures are not taken promptly, these small leaks could develop into much larger leaks. Therefore, the nature of the leak, as well as the magnitude of the leak, must be considered.

This initiating condition also addresses conditions where the leakage path is directly to the environment.

This condition is entered when there are indications of low steam line pressure, primary-to-secondary leakage greater than 10 gpm, and excessive steam flow.

Low steam line pressure is indicated by the "Steam Line Loop A Lo-Lo Press" or the "Steam Line Loop B Lo-Lo Press" alarm. This alarm annunciates at a pressure of 530 psig and decreasing. Actuation of two out of three channels of this alarm will initiate safety injection. Low steam line pressure is caused by excessive steam demand such as a steam line break or an accidental steam release. The setpoint for this alarm is well above the steam pressure that would be expected in the steam line during a large steam line break accident.

Excessive steam flow is indicated by the "Steam Line Loop A Isol Channel Alert" or the "Steam Line Loop B Isol Channel Alert" alarm. This alarm annunciates at a steam flow greater than 3.9E+06 lb/h or when the primary system low T_{avg} is less than 543 °F and the steam flow is greater than 4.77E+05 lb/h. The concurrent occurrence of high steam flow and low average coolant temperature will be caused by an excessive steam demand as expected during a steam line break or an accidental steam release. The high steam flow limit is set at approximately 20 percent of the nominal full load flow at the no-load pressure and 120 percent of the nominal full flow at the full load pressure. The low T_{avg} limit is set below its hot shutdown value.

The rupture of a steam pipe is analyzed in Section 14.2.5 of the Final Safety Analysis Report. This analysis was performed to demonstrate that the reactor core remains in place and essentially intact when this accident occurs and there is a stuck rod and minimum engineered safety features. The analysis also demonstrated that insignificant cladding rupture occurs when there is no stuck rod and all equipment is operating at design capacity.

With the loss of the reactor coolant and containment barriers, the fuel clad barrier is the last remaining barrier to prevent the release of radioactive materials to the environment.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a SITE EMERGENCY under Secondary Coolant Anomaly - Steam Line Break With Greater Than 50 GPM Primary-to-Secondary Leakage and Indication of Fuel Damage or under Abnormal Primary/Secondary Leak - Rapid Failure of Greater Than Ten Steam Generator Tubes may be appropriate based on steam generator tube leakage rates.

Source Documents/References/Calculations:

39, 60, 94

CATEGORY 4
SECONDARY COOLANT ANOMALY

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Reduction In Feedwater Enthalpy (FSAR 14.1.6)

Emergency Action Levels:

All of the following:

1. Unexpected power increase (>5%) on all excore nuclear instrumentation from ≥90% reactor power.

2. Decreasing feedwater temperature:

   a. As indicated by TO-418A and TO-438A on PPCS

   b. Confirmed by the local temperature indicator on outlet of No. 5 feedwater heater;

3. No reactor trip.

Plant Specific Information:

This initiating condition addresses a condition where core power could be increased above full power. Operation of the reactor core above full power could lead to fuel clad damage and increased reactor coolant radioactive contamination.

The reduction in feedwater enthalpy incident increases the core power above the rated full power. This incident is caused by a sudden reduction in feedwater temperature to the steam generator. The reduced feedwater temperature creates a greater load demand on the primary system which can lead to a power excursion. The net effect is that the reactor will reach a new equilibrium condition at a power level corresponding to the new temperature differential across the steam generator.

The indications used to detect this incident are an unexpected power increase on all excore nuclear instrumentation when reactor power level is at 90 percent or greater, decreasing feedwater temperature as indicated on the plant process computer and at the outlet of the #5 feedwater heater, and no reactor trip. The no reactor trip is used as an indication because analysis has shown that even with the worst case assumption (opening of the feedwater bypass valve at 100 percent reactor power) no reactor trip would occur as a result of the transient.

This initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse consequences on the public health and safety is classified as an UNUSUAL EVENT.

Escalation to an ALERT under Core Fuel Damage - Severe Loss of Fuel Cladding may be appropriate based on failed fuel monitor readings.

Source Documents/References/Calculations:

1, 54

CATEGORY 5
ABNORMAL EFFLUENT

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Release of Airborne Radioactive Material At Levels Requiring Offsite Protective Action Recommendations

Emergency Action Levels:

Any of the following:

1. Airborne effluent monitors detect levels corresponding to either:

   a. 1 R/hr whole body

   b. 5 R/hr thyroid

   at the Site Boundary under actual meteorological conditions

2. Either of the above dose rates measured in environs

3. Either of the above dose rates projected, based on other plant parameters

Plant Specific Information:

This initiating condition addresses conditions indicative of abnormal effluent releases with adverse consequences on the public health and safety.

The EALs used to evaluate this IC include a valid reading with airborne effluent monitors that exceeds the IC conditions, a valid dose assessment that indicates dose rates greater than 1000 mR/h to the whole body or 5000 mR/h to the thyroid, or field survey results that indicate site boundary dose rates exceeding 1000 mR/h expected to continue for more than one hour or analyses of field survey samples that indicate a thyroid dose commitment of 5000 mR for one hour of inhalation.

Valid means that a radiation monitor reading has been confirmed to be correct.

The 1000 mR whole body and the 5000 mR thyroid integrated dose are based on the EPA protective action guidance which indicates that public protective actions are indicated if the dose exceeds 1 rem whole body or 5 rem thyroid. This is consistent with the emergency class description for a General Emergency. This level constitutes the upper level of the desirable gradient for the Site Emergency. Actual meteorology is specifically identified in the initiating condition since it gives the most accurate dose assessment. Actual meteorology should be used whenever possible.

Integrated dose is generally not monitored in real-time. In establishing the emergency action levels, it is suggested that a duration of one hour be assumed, and that the EALs be based on site boundary doses for either whole body or thyroid, whichever is more limiting. If individual site analyses indicate a longer or shorter duration for the period in which the substantial portion of the activity is released, these dose rates should be adjusted.

The FSAR source terms applicable to each monitored pathway should be used in conjunction with annual average meteorology in determining indications for the monitors on that pathway.

This condition is entered when these dose rate conditions are reported to the DSS or POM. This condition is also entered if either the dose rates are measured in the environs or are projected based on other plant parameters.

Therefore, this initiating condition which is indicative of abnormal effluent releases with adverse consequences on the public health and safety is classified as a GENERAL EMERGENCY.

Source Documents/References/Calculations:

8, 58, 77

CATEGORY 5
ABNORMAL EFFLUENT

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Release of Airborne Radioactive Material At Levels Greatly Exceeding Technical Specification Limits and Offsite Protective Action Recommendations are Possible.

Emergency Action Levels:

Any of the following:

a. Airborne effluent monitors detect levels corresponding to any of the following:

(1) >50 mR/h whole body for ½ hour;

(2) >250 mR/h to the thyroid for ½ hour;

(3) >500 mR/h whole body for 2 minutes;

(4) >2500 mR/h to the thyroid for 2 minutes.

at the Site Boundary for adverse meteorology.

b. Any of the above dose rates measured in the environs

c. Any of the above dose rates at the site boundary, based on plant parameters.

Plant Specific Information:

The Emergency Action Levels (EALs) used to evaluate this IC include a valid reading with airborne effluent monitors that exceeds the IC conditions, a valid dose assessment that indicates dose consequences greater than 50 mR/h whole body or 250 mR/h thyroid for one-half hour or 500 mR/h whole body or 2500 mR/h thyroid for two minutes, or field survey results that indicate site boundary dose rates exceeding these values.

Valid means that a radiation monitor reading has been confirmed to be correct.

This condition is entered when these dose rate conditions are reported to the DSS or POM. This condition is also entered if either the dose rates are measured in the environs or are projected based on other plant parameters.

This initiating condition which is indicative of serious plant system conditions with adverse impact on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a GENERAL EMERGENCY under Abnormal Effluent may be appropriate based on dose rates measured or calculated at the site boundary.

Source Documents/References/Calculations:

8, 58, 77

CATEGORY 5
ABNORMAL EFFLUENT

Emergency Classification Level: **ALERT**

Initiating Condition: Airborne Radiological Effluent Greatly Exceeding Technical Specification Limits

Emergency Action Levels:

1. Radiological effluents >10 times Technical Specification instantaneous limits (An instantaneous rate which, if continued for > 2 hours, would result in a dose of about 1 mR at the Site Boundary under average meteorological conditions.)

Plant Specific Information:

This initiating condition addresses conditions where releases of radioactive material to unrestricted areas will cause radiation exposures to exceed the limits corresponding to the 10 CFR 50 Appendix I dose objectives. This is an instantaneous release rate which, if continued for greater than two hours, would result in a dose of approximately one millirem at the site boundary under average meteorological conditions.

The Technical Specification release limits are derived from the dose evaluation performed in accordance with 10 CFR 50 Appendix I. In the evaluation, certain maximum calculated doses to an individual result from the calculated effluent releases. Release limits are defined by scaling calculated releases upward to the point at which corresponding doses reach the applicable limit specified in 10 CFR 50 Appendix I.

Monitor indications should be calculated on the basis of the methodology of the Offsite Dose Calculation Manual (ODCM) and adjusted upwards by a factor of ten. Annual average meteorology should be used.

The radioactive liquid and gaseous effluent instrumentation is provided to monitor and control the releases of radioactive materials in liquid and gaseous effluent during actual or potential releases.

This condition is entered when it is detected that the release rate of airborne effluent is greater than ten times the Technical Specification instantaneous limit. A separate condition applies to liquid effluent.

This initiating condition which is indicative of abnormal effluent releases with possible adverse consequences on the public health and safety is classified as a ALERT.

Escalation to a SITE EMERGENCY under Abnormal Effluent may be appropriate based on measured or calculated dose rates at the site boundary.

Source Documents/References/Calculations:

8, 58, 77, 82, 83

CATEGORY 5
ABNORMAL EFFLUENT

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Airborne Radiological Effluent Exceeding Technical Specification Limits (FSAR 14.2.3)

Emergency Action Levels:

Radiological effluent >1 but ≤10 times Technical Specification limits.

Plant Specific Information:

This initiating condition addresses conditions where releases of radioactive material to unrestricted areas will cause radiation exposures that will exceed the limits corresponding the 10 CFR 50 Appendix I dose objectives.

The Technical Specification release limits are derived from the dose evaluation performed in accordance with 10 CFR 50 Appendix I. In the evaluation, certain maximum calculated doses to an individual result from the calculated effluent releases. Release limits are defined by scaling calculated releases upward to the point at which corresponding doses reach the applicable limit specified in 10 CFR 50 Appendix I.

Monitor indications should be calculated on the basis of the methodology of the Offsite Dose Calculation Manual (ODCM) and adjusted upwards by a factor of ten. Annual average meteorology should be used.

This condition is entered when it is detected that liquid effluent are being released at a rate that exceeds the technical specification limit. A separate condition applies to airborne effluent.

This initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as a UNUSUAL EVENT.

Escalation to a SITE EMERGENCY may be appropriate based on measured or calculated dose rates at the site boundary.

Source Documents/References/Calculations:

8, 58, 67, 77, 82, 83

CATEGORY 5
ABNORMAL EFFLUENT

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Liquid Radiological Effluent Exceeding Technical Specification Limits (FSAR 14.2.2)

Emergency Action Levels:

Radiological Effluent Technical Specification limits exceeded.

Plant Specific Information:

This initiating condition addresses conditions where releases of radioactive material to unrestricted areas will cause radiation exposures that will exceed the limits corresponding the 10 CFR 50 Appendix I dose objectives.

The Technical Specification release limits are derived from the dose evaluation performed in accordance with 10 CFR 50 Appendix I. In the evaluation, certain maximum calculated doses to an individual result from the calculated effluent releases. Release limits are defined by scaling calculated releases upward to the point at which corresponding doses reach the applicable limit specified in 10 CFR 50 Appendix I.

Monitor indications should be calculated on the basis of the methodology of the Offsite Dose Calculation Manual (ODCM) and adjusted upwards by a factor of ten. Annual average meteorology should be used.

This condition is entered when it is detected that liquid effluent are being released at a rate that exceeds the technical specification limit. A separate condition applies to airborne effluent.

This initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as a UNUSUAL EVENT.

Escalation to a SITE EMERGENCY may be appropriate based on measured or calculated dose rates at the site boundary.

Source Documents/References/Calculations:

8, 58, 67, 77, 82, 83

CATEGORY 6
MAJOR ELECTRICAL FAILURES

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Loss of Offsite Power and Loss of All Onsite AC Power With Loss of All Auxiliary Feedwater For >30 Minutes

Emergency Action Levels:

All of the following:

1. "4.16 kV bus undervoltage" alarm with 0 V on A-01, A-02, A-03, A-04, A-05, and A-06

2. X-04 to A-03 ammeter on C-02 (0 amps)

3. X-04 to A-04 ammeter on C-02 (0 amps)

4. No auxiliary feedwater flow [FI-4036, FI-4037]

5. Decreasing or offscale low SG level
   A SG: [LI-461, LI-462, LI-463]
   B SG: [LI-471, LI-472, LI-473]

Plant Specific Information:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, containment heat removal, and the ultimate heat sink. Prolonged loss of all AC power will lead to loss of fuel clad, reactor coolant system, and containment. The site blackout coping analysis assumed that AC power could be restored in one hour.

This IC is specified to assure that in the event of a prolonged station blackout, timely recognition of the seriousness of the event occurs and that declaration of a General Emergency occurs as early as is appropriate, based on a reasonable assessment of the event trajectory.

The likelihood of restoring at least one emergency bus should be based on a realistic appraisal of the situation since a delay in an upgrade decision based on only a chance of mitigating the event could result in a loss of valuable time in preparing and implementing public protective actions.

In addition, under these conditions, fission product barrier monitoring capability may be degraded. Although it may be difficult to predict when power can be restored, it is necessary to give the Emergency Director a reasonable idea of how quickly the Director may need to declare a General Emergency based on two major considerations:

1. Are there any present indications that core cooling is already degraded to the point that loss or potential loss of fission product barriers is imminent?

2. If there are no present indications of such core cooling degradation, how likely is it that power can be restored in time to assure that a loss of two barriers with a potential loss of a third barrier can be prevented?

Thus, indication of continuing core cooling degradation must be based on fission product barrier monitoring with particular emphasis on Emergency Director judgment as it relates to imminent loss or potential loss of fission product barriers and degraded ability to monitor fission product barriers.

Loss of feedwater and loss of all AC power are loss of heat sink events. Both events result in a reduction of the capability of the secondary system to remove heat generated in the reactor core. For the loss of AC power event, the loss of heat removal is attributed to a loss of main feedwater and loss of forced reactor coolant flow.

Loss of feedwater results in a decrease in the steam generator inventory and a rapid increase in coolant temperature, a surge of water into the pressurizer, and a resultant pressure in the reactor coolant system, as well as a pressure increase in the main steam system.

A loss of AC power accident results from a loss of offsite power coincident with the trip of the turbine generator. A loss of AC power would result in loss of power to reactor coolant pumps, steam generator feed pumps, condensate pumps, circulating water pumps, and heater drain tank pumps.

Loss of offsite power is also indicated by the readings on the X-04 to A-03 and the X-04 to A-04 ammeters. These ammeters indicate the current supplied by the offsite 4.16 kV source. Zero ampere readings on these ammeters indicate loss of offsite power.

Loss of offsite AC power is indicated by the "4.16 kV Bus Undervoltage" alarm. This alarm annunciates when the voltage on the associated bus falls to 77 percent of the required value for one-third of a second. This alarm on the A-01, A-02, A-03, A-04, A-05, and A-06 buses indicates a loss of AC power to the unit supply and the safeguards equipment distribution buses.

Therefore, this initiating condition which is indicative of grave plant system conditions with adverse consequences on the public health and safety is classified as a GENERAL EMERGENCY.

Source Documents/References/Calculations:

1, 3, 6, 7, 32, 34, 35,36, 37, 55, 56

CATEGORY 6
MAJOR ELECTRICAL FAILURES

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Loss of Offsite Power and Loss of All Onsite AC Power for >15 Minutes

Emergency Action Levels:

All of the following:

1. "4.16 kV bus undervoltage" 0 V on A-01, A-02, A-03, A-04, A-05, and A-06

2. X-04 to A-03 ammeter on C-02 (0 amps)

3. X-04 to A-04 ammeter on C-02 (0 amps)

Plant Specific Information:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, containment heat removal, and the ultimate heat sink. Prolonged loss of all AC power will cause core uncovering and loss of containment integrity, thus this event can escalate to a General Emergency. The site blackout coping analysis assumed that AC power could be restored in one hour.

A time duration greater than 15 minutes is used to exclude transient or momentary power losses.

Loss of offsite power is indicated by the readings on the X-04 to A-03 and the X-04 to A-04 ammeters. These ammeters indicate the current supplied by the offsite 4.16 kV source. Zero ampere readings on these ammeters indicate loss of offsite power.

Loss of offsite AC power is indicated by the "4.16 kV Bus Undervoltage" alarm. This alarm annunciates when the voltage on the associated bus falls to 77 percent of the required value for one-third of a second. This alarm on the A-01, A-02, A-03, A-04, A-05, and A-06 buses indicates a loss of AC power to the unit supply and the safeguards equipment distribution buses.

Therefore, this initiating condition which is indicative of serious plant system conditions with adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a GENERAL EMERGENCY under Core Fuel Damage - Containment High Radiation based on containment radiation readings may be appropriate.

Source Documents/References/Calculations:

1, 3, 6, 7, 32, 34, 35,36, 37, 55, 56

CATEGORY 6
MAJOR ELECTRICAL FAILURES

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Loss of All Vital Onsite DC Power >15 Minutes

Emergency Action Levels:

Both of the following:

1. "Annunciator power failure" alarm on C-01, C-02, C-03, and C-04

2. <100 V on voltmeters for all batteries.

Plant Specific Information:

Loss of all DC power compromises the ability to monitor and control plant safety functions. Prolonged loss of all DC power will cause core uncovering and loss of containment integrity when there is significant decay heat and sensible heat in the reactor coolant system.

The time period of fifteen minutes was selected to exclude transient or momentary power losses.

Loss of DC power to any AC bus creates the following concerns:

1. Associated breakers can not be electrically opened or closed from the remote or local control stations;

2. Electrical protection/interlock tripping of associated breakers is rendered inoperable including undervoltage stripping. The one exception to this is the 480 V individual breaker overloads which remain operable;

3. All associated breaker positions remain as is upon loss of DC control power.

This condition is entered when there is less than 100 volts on the batteries and there is an "Annunciator Power Failure" alarm.

Loss of all vital onsite DC power is indicated by an "Annunciator Power Failure" occurring concurrently with voltage readings less than 100 volts on all emergency batteries. The "Annunciator Power Failure" indicates a loss of DC power to the annunciators on the control panel. This alarm on panels C-01, C-02, C-03, and C-04 indicates a loss of DC power to all annunciators.

Therefore, this initiating condition which is indicative of possible loss of the reactor coolant and containment barriers with adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a GENERAL EMERGENCY under Core Fuel Damage - Containment High Radiation based on containment radiation readings may be appropriate.

Source Documents/References/Calculations:

2, 76

CATEGORY 6
MAJOR ELECTRICAL FAILURES

Emergency Classification Level: **ALERT**

Initiating Condition: Loss of Offsite Power and Loss of All Onsite AC Power for ≤15 Minutes

Emergency Action Levels:

All of the following:

1. "4.16 kV bus undervoltage" 0 V on A-01, A-02, A-03, A-04, A-05, and A-06

2. X-04 to A-03 ammeter on C-02 (0 amps)

3. X-04 to A-04 ammeter on C-02 (0 amps).

Plant Specific Information:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, containment heat removal, and the ultimate heat sink. Prolonged loss of all AC power will cause core uncovering and loss of containment integrity, thus this event can escalate to a General Emergency. The site blackout coping analysis assumed that AC power could be restored in one hour.

This condition is entered when there are indications of voltage sag on the unit buses and indications of loss of offsite power to the unit buses.

Voltage sag on the unit buses is indicated by the "4.16 kV Bus Undervoltage" alarm. This alarm annunciates when the voltage on the associated bus falls to 77 percent of the required value for one-third of a second. This alarm on the A-03 and A-04 buses indicates a loss of AC power to the unit supply buses. This alarm on the A-05 and A-06 buses indicates a loss of onsite AC power. Loss of offsite power is also indicated by the readings on the X-04 to A-03 and the X-04 to A-04 ammeters. These ammeters indicate the current supplied by the offsite 4.16 kV source. Zero ampere readings on these ammeters indicate loss of offsite power.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a SITE EMERGENCY under Major Electrical Failures - Loss of Offsite Power and Loss of All Onsite Power for Greater Than 15 Minutes may be appropriate based on loss of all AC power for greater than 15 minutes.

Source Documents/References/Calculations:

1, 3, 6, 7, 32, 34, 35, 36, 37, 55, 56

CATEGORY 6
MAJOR ELECTRICAL FAILURES

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Sustained Loss of Offsite Power >15 Minutes

Emergency Action Levels:

All of the following:

1. "4.16 kV bus undervoltage" and 0 V on A-01, A-02, A-03m and A-04 voltmeters

2. X-04 to A-03 ammeter on C-02 (0 amps)

3. X-04 to A-04 ammeter on C-02 (0 amps).

Plant Specific Information:

Prolonged loss of offsite AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete loss of AC power (station blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, containment heat removal, and the ultimate heat sink. Upon loss of offsite power, the emergency diesel generators autostart and provide AC power to the vital buses, thereby providing electrical power to essential equipment needed by the operators to bring the plant to a safe shutdown condition.

This accident was evaluated in the FSAR and showed that the natural circulation flow available is sufficient to provide adequate core decay heat removal following reactor trip and RCP coastdown.

The loss of AC power to the station auxiliaries does not cause any adverse condition in the core, since it does not result water relief from the pressurizer relief or safety valves.

This initiating condition is entered when there are indications of a loss of offsite power to the unit supply buses. Offsite power is supplied to the unit buses by the 345 kV offsite power lines through the high voltage station auxiliary transformers. Loss of the offsite power lines or the station auxiliary transformers is addressed by the first two initiating conditions. Since the station auxiliary transformers can be cross-connected in less than fifteen minutes, the third initiating condition addresses the loss of this cross-connecting capability.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse consequences on the public health and safety is classified as an UNUSUAL EVENT.

Escalation to an ALERT under Major Electrical Failures - Loss of Offsite Power and Loss of All Onsite Power for Less Than 15 Minutes may be appropriate based on indications of offsite power availability.

Source Documents/References/Calculations:

1, 3, 6, 7, 32, 34, 35, 36, 37, 56

CATEGORY 6
MAJOR ELECTRICAL FAILURES

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Sustained Loss of Onsite AC Power >15 Minutes

Emergency Action Levels:

"4.16 kV bus undervoltage" and 0 V on A-05 and A-06 voltmeters.

Plant Specific Information:

Prolonged loss of AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete loss of AC power (station blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This condition is entered when there are indications of unavailability of the emergency diesels.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse consequences on the public health and safety is classified as an UNUSUAL EVENT.

Escalation to an ALERT under Major Electrical Failures - Loss of Offsite Power and Loss of All Onsite Power for Less Than 15 Minutes may be appropriate based on indications of offsite power availability.

Source Documents/References/Calculations:

34, 35, 36, 37, 56, 79

CATEGORY 7
SECURITY EVENTS

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Security Event Resulting In Loss of Ability to Reach and Maintain Cold Shutdown

Emergency Action Levels:

Either of the following:

1. Loss of physical control of the Control Room

2. Loss of physical control of the remote shutdown stations.

Plant Specific Information:

This initiating condition encompasses conditions under which a hostile force has taken physical control of vital areas required to reach and maintain safe shutdown.

Consideration should be given to augmenting the plant and Security staffs. protection of Operations personnel responding to control the plant and protection of alternate equipment.

A plan should be developed for mitigation of the event. Augmented personnel could be assembled in alternate locations for safety. The Security Shift Commander should be provided direction and be prepared to suspend safeguards in accordance with 10 CFR 50.54(x) and (y) if conditions dictate.

Source Documents/References/Calculations:

84, 97, 98

CATEGORY 7
SECURITY EVENTS

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Security Event in Vital Area

Emergency Action Levels:

Intrusion into plant Vital Area by a hostile force.

Plant Specific Information:

This class of security events represents an escalated threat to plant safety above that contained in the Alert Initiating Condition in that a hostile force has progressed from the Protected Area to the Vital Area.

This emergency action level addresses the imminent loss of physical control of the plant.

Consideration should be given to identify other vital equipment/areas needing protection as well as plant personnel. Notification of plant management, state and local emergency government agencies and local security forces must be made.

Emergency response organization personnel could assemble in alternate locations for safety. The Security Shift Commander should be provided direction and be prepared to suspends safeguards in accordance with 10 CFR 50.54(x) and (y).

Source Documents/References/Calculations:

84, 97, 98

CATEGORY 7
SECURITY EVENTS

Emergency Classification Level: **ALERT**

Initiating Condition: Security Event in the Protected Area

Emergency Action Levels:

Intrusion into plant Protected Area by a hostile force.

Plant Specific Information:

This initiating condition addresses an escalated threat to plant safety above that contained in the Unusual Event. For the purpose of this initiating condition, a civil disturbance which penetrates the Protected Area boundary can be considered a hostile force. Intrusion into a Vital Area by a hostile force will escalate this event to a Site Emergency.

Consideration should be given to notify plant emergency response personnel and identifying alternate response actions for safety. Additional protection of plant and Operations personnel may be necessary.

The Security Shift Commander should be provided direction and be prepared to suspend safeguards in accordance with 10 CFR 50.54(x) and (y).

Source Documents/References/Calculations:

84, 97, 98

CATEGORY 7
SECURITY EVENTS

Emergency Classification Level: **ALERT**

Initiating Condition: Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant Vital Areas

Emergency Action Levels:

Bomb device discovered within plant Vital Area.

Plant Specific Information:

This initiating condition is based on Modified Amended Site Security Plan. Security events which do not represent at least a potential degradation in the level of safety of the plant, are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72. The plant Protected Area is typically that part within the security isolation zone and is defined in the security plan.

The emergency action level addresses an ongoing security compromise.

Therefore, this initiating condition which is indicative of actual or potential degradation of the level of plant safety and may have a potential impact on public safety is classified as an ALERT.

Consideration should be given to identifying equipment/areas needing additional protection and the need for additional plant/security personnel to augment the shift. Notification of plant management, state and local emergency government agencies, local security forces, and the bomb squad will be necessary.

The Security Shift Commander should be provided direction and be prepared to suspend safeguards in accordance with 10 CFR 50.54(x) and (y).

Source Documents/References/Calculations:

84, 97, 98

CATEGORY 7
SECURITY EVENTS

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant Protected Areas

Emergency Action Levels:

Bomb device discovered within plant Protected Area and outside plant Vital Areas.

Plant Specific Information:

This initiating condition is based on Modified Amended Site Security Plan. Security events which do not represent at least a potential degradation in the level of safety of the plant, are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72. The plant Protected Area is typically that part within the security isolation zone and is defined in the security plan. Bomb devices discovered within the Vital Area would result in emergency class escalation.

The emergency action level addresses the attempted entry of a hostile force into the plant protected area or the attempted sabotage of vital equipment.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

Consideration should be given to isolating impacted areas, protecting plant personnel and providing direction to the Security Shift commander in being prepared to suspend safeguards in accordance with 10 CFR 50.54(x) and (y).

Source Documents/References/Calculations:

84, 97, 98

CATEGORY 8
FIRE

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Fire Affecting Two (2) Trains of Safety Systems

Emergency Action Levels:

As reported by Fire Brigade Chief.

Plant Specific Information:

Safety systems as used here designates systems with safety related functions. Listed below are the systems with safety related functions.

Designator	System	Safety Related Functions
AF	Auxiliary Feedwater	Feedwater supply, monitoring
AMSAC	ATWS Mitigation System Actuation Circuitry	Non-safety related isolation
BS	Boron Recycle	Safety injection
CCW	Radwaste Systems Component Cooling Water	Non-safety related isolation
COMP	Computers	Monitoring
CONT	Containment Structures	Containment integrity
CP	Containment Penetrations	Containment integrity
CV	Chemical and Volume Control	Emergency cooling, containment integrity
DA	Diesel Starting Air	Diesel start
DG	Diesel Generator	Power supply
FM	Incore Flux Mapping	Reactor coolant system 74 integrity
FO	Fuel Oil	Power supply
FW	Feedwater (I&C only)	Non-safety related isolation
HV	Auxiliary Steam, Heating Steam & Condensate, Chilled & Hot Water	Containment integrity
IA	Instrument Air	Containment integrity
IST	Inservice Test Equipment (i.e. steam generator nozzle dams)	Reactor coolant system integrity
MRR	Metering, Relaying, & Regulation	Monitoring
MS	Main, Extraction, Gland Seal & Reheat Steam	Containment integrity, heat removal
NG	Nitrogen Gas	Monitoring
NI	Nuclear Instrumentation	Reactor protection
PACV	Post-Accident Vent, Drains, etc.	Containment integrity, containment hydrogen control
RC	Reactor Coolant	Reactor coolant system integrity, reactor protection, containment integrity
RDC	Rod Drive Control	Reactor coolant system integrity, reactor protection

Designator	System	Safety Related Functions
RH	Residual Heat Removal (LPSI)	Monitoring, Containment integrity, emergency cooling
RM	Radiation Monitoring	Monitoring, containment integrity
RP	Reactor Protection	Reactor protection, monitoring, non-safety-related isolation
RS	Radwaste Steam	Non-safety-related isolation
S	Structures	Safety-related equipment safety
SA	Service Air	Containment integrity
SC	Primary Sampling	Containment integrity
SI	Safety Injection (HPSI)	Emergency cooling, heat removal, containment integrity, iodine removal
SW	Service Water	Feedwater supply, heat removal, containment integrity
VNBI	PAB Battery & Inverter Room H&V	Heat removal, battery room hydrogen control
VNCC	Containment Accident Fans H&V	Heat removal
VNDG	Diesel Generator Room H&V	Diesel operation
VNPSE	Containment Purge Supply & Exhaust H&V	Containment integrity
VNRC	Reactor Cavity Cooling H&V	Containment integrity
WG	Waste Gas	Containment integrity
WL	Waste Liquid	Containment integrity
Y	Vital Instrument Bus 120 Vac	Non-safety-related isolation, power supply
4.16KV	4.16 kVac Electrical	Power supply
480V	480 Vac Electrical	Power supply
125V	125 Vdc Electrical	Power supply

Normally, fire protection is not in use. However, the system components are required to perform as designed in the event of a fire emergency. The National Fire Protection Association and the plant insurance carrier have specified periodic tests and inspections to demonstrate fire protection equipment operability.

This condition is entered when the Fire Brigade Chief reports a fire that affects two trains of safety systems.

Therefore, this initiating condition which is indicative of serious plant system conditions with adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a higher emergency class, if appropriate, will be based on system malfunction, fission product barrier degradation, abnormal rad levels, or emergency director judgment.

Source Documents/References/Calculations:

81, 102, 103, 109

CATEGORY 8
FIRE

Emergency Classification Level: **ALERT**

Initiating Condition: Fire Affecting One (1) Train of Safety Systems

Emergency Action Levels:

As reported by Fire Brigade Chief.

Plant Specific Information:

Safety systems as used here designates systems with safety related functions. Listed below are the systems with safety related functions.

Designator	System	Safety Related Functions
AF	Auxiliary Feedwater	Feedwater supply, monitoring
AMSAC	ATWS Mitigation System Actuation Circuitry	Non-safety related isolation
BS	Boron Recycle	Safety injection
CCW	Radwaste Systems Component Cooling Water	Non-safety related isolation
COMP	Computers	Monitoring
CONT	Containment Structures	Containment integrity
CP	Containment Penetrations	Containment integrity
CV	Chemical and Volume Control	Emergency cooling, containment integrity
DA	Diesel Starting Air	Diesel start
DG	Diesel Generator	Power supply
FM	Incore Flux Mapping	Reactor coolant system integrity
FO	Fuel Oil	Power supply
FW	Feedwater (I&C only)	Non-safety related isolation
HV	Auxiliary Steam, Heating Steam & Condensate, Chilled & Hot Water	Containment integrity
IA	Instrument Air	Containment integrity
IST	Inservice Test Equipment (i.e. steam generator nozzle dams)	Reactor coolant system integrity
MRR	Metering, Relaying, & Regulation	Monitoring
MS	Main, Extraction, Gland Seal & Reheat Steam	Containment integrity, heat removal
NG	Nitrogen Gas	Monitoring
NI	Nuclear Instrumentation	Reactor protection
PACV	Post-Accident Vent, Drains, etc.	Containment integrity, containment hydrogen control
RC	Reactor Coolant	Reactor coolant system integrity, reactor protection, containment integrity
RDC	Rod Drive Control	Reactor coolant system

Designator	System	Safety Related Functions
		integrity, reactor protection
RH	Residual Heat Removal (LPSI)	Monitoring, Containment integrity, emergency cooling
RM	Radiation Monitoring	Monitoring, containment integrity
RP	Reactor Protection	Reactor protection, monitoring, non-safety-related isolation
RS	Radwaste Steam	Non-safety-related isolation
S	Structures	Safety-related equipment safety
SA	Service Air	Containment integrity
SC	Primary Sampling	Containment integrity
SI	Safety Injection (HPSI)	Emergency cooling, heat removal, containment integrity, iodine removal
SW	Service Water	Feedwater supply, heat removal, containment integrity
VNBI	PAB Battery & Inverter Room H&V	Heat removal, battery room hydrogen control
VNCC	Containment Accident Fans H&V	Heat removal
VNDG	Diesel Generator Room H&V	Diesel operation
VNPSE	Containment Purge Supply & Exhaust H&V	Containment integrity
VNRC	Reactor Cavity Cooling H&V	Containment integrity
WG	Waste Gas	Containment integrity
WL	Waste Liquid	Containment integrity
Y	Vital Instrument Bus 120 Vac	Non-safety-related isolation, power supply
4.16KV	4.16 kVac Electrical	Power supply
480V	480 Vac Electrical	Power supply
125V	125 Vdc Electrical	Power supply

Normally, fire protection is not in use. However, the system components are required to perform as designed in the event of a fire emergency. The National Fire Protection Association and the plant insurance carrier have specified periodic tests and inspections to demonstrate fire protection equipment operability.

This condition is entered when the Fire Brigade Chief reports a fire that affects one train of safety systems.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a higher emergency class, if appropriate, will be based on system malfunction, fission product barrier degradation, abnormal rad levels, or emergency director judgment.

Source Documents/References/Calculations:

81, 103

CATEGORY 8
FIRE

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Fire In Vital Area or On the Controlled Side Of Plant Lasting >10 Minutes After Initial Use of Fire Extinguishing Equipment

Emergency Action Levels:

As reported by Fire Brigade Chief

Plant Specific Information:

The purpose of this initiating condition is to address the magnitude and extent of fires that may be potentially significant precursors to damage to safety systems. This excludes such items as fires within administration buildings, waste-basket fires, and other small fires of no safety consequence. This initiating condition applies to buildings or areas contiguous to plant vital areas or other significant buildings or areas. The intent of this initiating condition is not to include buildings (i.e., warehouses) or areas that are not contiguous or immediately adjacent to plant vital areas. Verification of the alarm in this context means those actions taken in the control room to determine that the control room alarm is not spurious.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This condition is entered when the Fire Brigade Chief reports a fire that has not responded to fire abatement measures and has lasted for more than ten minutes.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

Escalation to a higher emergency class is by Major Electrical Fires - Fire Affecting One Train of Safety Systems.

Source Documents/References/Calculations:

81, 103

CATEGORY 9
HAZARDS TO PLANT OPERATION

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Missile Impact Causing Damage to Two Trains of Safety Systems

Emergency Action Levels:

Visual observation by the Operations Supervisor

Plant Specific Information:

Safety systems as used here designates systems with safety related functions. Listed below are the systems with safety related functions.

Designator	System	Safety Related Functions
AF	Auxiliary Feedwater	Feedwater supply, monitoring
AMSAC	ATWS Mitigation System Actuation Circuitry	Non-safety related isolation
BS	Boron Recycle	Safety injection
CCW	Radwaste Systems Component Cooling Water	Non-safety related isolation
COMP	Computers	Monitoring
CONT	Containment Structures	Containment integrity
CP	Containment Penetrations	Containment integrity
CV	Chemical and Volume Control	Emergency cooling, containment integrity
DA	Diesel Starting Air	Diesel start
DG	Diesel Generator	Power supply
FM	Incore Flux Mapping	Reactor coolant system integrity
FO	Fuel Oil	Power supply
FW	Feedwater (I&C only)	Non-safety related isolation
HV	Auxiliary Steam, Heating Steam & Condensate, Chilled & Hot Water	Containment integrity
IA	Instrument Air	Containment integrity
IST	Inservice Test Equipment (i.e. steam generator nozzle dams)	Reactor coolant system integrity
MRR	Metering, Relaying, & Regulation	Monitoring
MS	Main, Extraction, Gland Seal & Reheat Steam	Containment integrity, heat removal
NG	Nitrogen Gas	Monitoring
NI	Nuclear Instrumentation	Reactor protection
PACV	Post-Accident Vent, Drains, etc.	Containment integrity, containment hydrogen control
RC	Reactor Coolant	Reactor coolant system integrity, reactor protection, containment integrity
RDC	Rod Drive Control	Reactor coolant system

Designator	System	Safety Related Functions
		integrity, reactor protection
RH	Residual Heat Removal (LPSI)	Monitoring, Containment integrity, emergency cooling
RM	Radiation Monitoring	Monitoring, containment integrity
RP	Reactor Protection	Reactor protection, monitoring, non-safety-related isolation
RS	Radwaste Steam	Non-safety-related isolation
S	Structures	Safety-related equipment safety
SA	Service Air	Containment integrity
SC	Primary Sampling	Containment integrity
SI	Safety Injection (HPSI)	Emergency cooling, heat removal, containment integrity, iodine removal
SW	Service Water	Feedwater supply, heat removal, containment integrity
VNBI	PAB Battery & Inverter Room H&V	Heat removal, battery room hydrogen control
VNCC	Containment Accident Fans H&V	Heat removal
VNDG	Diesel Generator Room H&V	Diesel operation
VNPSE	Containment Purge Supply & Exhaust H&V	Containment integrity
VNRC	Reactor Cavity Cooling H&V	Containment integrity
WG	Waste Gas	Containment integrity
WL	Waste Liquid	Containment integrity
Y	Vital Instrument Bus 120 Vac	Non-safety-related isolation, power supply
4.16KV	4.16 kVac Electrical	Power supply
480V	480 Vac Electrical	Power supply
125V	125 Vdc Electrical	Power supply

The inclusion of a "report of visible damage" should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this EAL to assess the actual magnitude of damage. The occurrence of the missile impact with reports of evidence of damage (e.g., deformation) is sufficient for declaration. The declaration of a Site Emergency and the activation of the TSC will provide the Emergency Director with the resources needed to perform these damage assessments.

This condition is entered when the Operations supervisor visually observes damage to two trains of safety systems by missile impact.

This initiating condition which is indicative of serious plant system conditions and adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a higher emergency class, if appropriate, will be based on system malfunction, fission product barrier degradation, abnormal rad levels, or emergency director judgment.

Source Documents/References/Calculations:

81

CATEGORY 9
HAZARDS TO PLANT OPERATION

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Toxic or Flammable Gases Entering Into Vital Areas (Control Room, Auxiliary Building, etc.) Excluding Normal Process Gases

Emergency Action Levels:

Visual observation by Operations Supervisor

Plant Specific Information:

This initiating condition is based on gases that have entered a plant structure affecting the safe operation of the plant. This initiating condition applies to buildings and structures contiguous to plant vital areas or other significant buildings or areas (i.e., Service Water Pumphouse). The intent of this initiation condition is not to include buildings or other areas that are not contiguous or immediately adjacent to plant vital areas. It is appropriate that increased monitoring be done to ascertain whether consequential damage has occurred.

Flammable Gases: In NFPA usage, any gas which will burn in the normal concentrations of oxygen in the air is considered a flammable gas. Flammable gases will burn in air the same way flammable liquid vapors burn in air, i.e., each gas will burn only within a certain range of gas-air mixture compositions (the flammable or combustible range) and will ignite only at or above a certain temperature (the ignition temperature). Flammable gases include acetylene and hydrogen.

Toxic Gases: Certain gases can present a serious life hazard if they are released into the atmosphere. These gases, which are poisonous or irritating when inhaled or contacted, include chlorine, hydrogen sulfide, sulfur dioxide, ammonia, and carbon monoxide, among others. The presence of these gases may complicate fire fighting efforts by exposing fire fighters to toxic hazard.

This condition is entered when the Operations supervisor visually observes toxic or flammable gases entering vital areas.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This initiating condition which is indicative of serious plant system conditions and adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a higher emergency class, if appropriate, will be based on system malfunction, fission product barrier degradation, abnormal rad levels, or emergency director judgment.

Source Documents/References/Calculations:

88

CATEGORY 9
HAZARDS TO PLANT OPERATION

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Evacuation of the Control Room >15 Minutes and No Control At Remote Shutdown Stations

Emergency Action Levels:

As required by the DSS

Plant Specific Information:

Expeditious transfer of safety systems has not occurred but fission product barrier damage may not yet be indicated. In cold shutdown and refueling modes, operator concern is directed toward maintaining core cooling such as is discussed in Generic Letter 88-17, "Loss of Decay Heat Removal." In power operation, hot standby and hot shutdown modes, operator concern is primarily directed toward maintaining critical safety functions and thereby assuring fission product barrier integrity.

Evacuation of the control room may be due to a fire or other contingency, with or without offsite power, which may cause a loss of control of safe shutdown equipment from the control room, spurious action of safe shutdown equipment, or a serious threat to the control of safe shutdown equipment from the control room.

This condition is entered as required by the DSS.

Therefore, this initiating condition which is indicative of serious plant system conditions and adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Escalation to a higher emergency class, if appropriate, will be based on system malfunction, fission product barrier degradation, abnormal rad levels, or emergency director judgment.

Source Documents/References/Calculations:

15, 16

CATEGORY 9
HAZARDS TO PLANT OPERATION

Emergency Classification Level: **ALERT**

Initiating Condition: Missile Impacts On Facility From Any Source.

Emergency Action Levels:

Visual observation by Operations supervisor.

Plant Specific Information:

This initiating condition addresses events that may have resulted in a plant vital area being subjected to missile impacts, and thus damage may be assumed to have occurred to plant safety systems.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This condition is entered when the Operations supervisor visually observes damage to the facility by missile impact.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a higher emergency classification, if appropriate, will be based on observed visual damage to safe shutdown equipment.

Source Documents/References/Calculations:

20, 85, 105

CATEGORY 9
HAZARDS TO PLANT OPERATION

Emergency Classification Level: **ALERT**

Initiating Condition: Aircraft Crash In Protected Area (Within the Fence)

Emergency Action Levels:

Visual observation by Operations supervisor.

Plant Specific Information:

This initiating condition addresses events that may have resulted in a plant vital area being subjected to missile impacts, and thus damage may be assumed to have occurred to plant safety systems.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This condition is entered when the Operations supervisor visually observes the event.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a higher emergency class will be based on confirmed damage to safe shutdown equipment.

Source Documents/Reference/Calculations:

98

CATEGORY 9
HAZARDS TO PLANT OPERATIONS

Emergency Classification Level: **ALERT**

Initiating Condition: Known Explosion Damage to Facility Affecting Plant Operation. Toxic or Flammable Gases In Facility Environment, Excluding Normal Process Gases.

Emergency Action Levels:

Visual observation by Operations supervisor.

Plant Specific Information:

This initiating condition addresses events that may have resulted in a plant vital area being subjected to missile impacts, and thus damage may be assumed to have occurred to plant safety systems.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

With regard to explosions, only those explosions of sufficient force to damage permanent structures or equipment required for safe operation within the identified plant area should be considered. As used here, an explosion is a rapid, violent, unconfined combustion, or catastrophic failure of pressurized equipment, that potentially imparts significant energy to nearby structures and materials. The inclusion of a "report of visible damage" should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this EAL to assess the actual magnitude of damage. The occurrence of the explosion with reports of evidence of damage (e.g., deformation) is sufficient for declaration. The declaration of a ALERT and the activation of the TSC will provide the Emergency Director with the resources needed to perform these damage assessments.

Toxic or flammable gases in the facility environment at levels which impact plant operation is also a condition sufficient for declaration.

This condition is entered when the Operations supervisor visually observes the event.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a higher emergency class, if appropriate, will be based on system malfunction, fission product barrier degradation, abnormal rad levels, or emergency director judgment.

Source Documents/References/Calculations:

17, 20, 88, 98

CATEGORY 9
HAZARDS TO PLANT OPERATION

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Near or Onsite Explosion or Flammable or Toxic Gas Release

Emergency Action Levels:

As reported to the DSS by plant personnel making visual observation.

Plant Specific Information:

This initiating condition is based upon the following:

a. The plant is within the evacuation area of an offsite event (i.e., tanker truck accident releasing toxic gases, etc.);

b. The release results in a concentration within the site boundary that will affect the health of plant personnel or affect the safe operation of the plant.

Flammable Gases: In NFPA usage, any gas which will burn in the normal concentrations of oxygen in the air is considered a flammable gas. Flammable gases will burn in air the same way flammable liquid vapors burn in air, i.e., each gas will burn only within a certain range of gas-air mixture compositions (the flammable or combustible range) and will ignite only at or above a certain temperature (the ignition temperature). Flammable gases include acetylene and hydrogen.

Toxic Gases: Certain gases can present a serious life hazard if they are released into the atmosphere. These gases, which are poisonous or irritating when inhaled or contacted, include chlorine, hydrogen sulfide, sulfur dioxide, ammonia, and carbon monoxide, among others. The presence of these gases may complicate fire fighting efforts by exposing fire fighters to toxic hazard.

The evacuation is as determined from the DOT Evacuation Tables for Selected Hazardous Materials, in the DOT Emergency Response Guide for Hazardous Materials.

This condition is entered when plant personnel report the event to the DSS.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

Source Documents/References/Calculations:

17, 20, 88, 98

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Wind With Damage

Emergency Action Level:

Structural damage to containment.

Plant Specific Information:

This initiating condition addresses conditions that have resulted in plant vital areas being subjected to forces beyond design limits, and damage may be assumed to have occurred to plant safety systems.

Winds in excess of the design limit of 100 mph may produce structural damage to plant vital areas.

This condition is entered when there is structural damage to plant vital areas.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

Therefore, this initiating condition which is indicative of serious plant system conditions with adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Emergency classifications under other initiating conditions may be appropriate due to offsite affects caused by high winds, particularly status of offsite power lines.

Source Documents/References/Calculations:

19

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Flooding In Vital Equipment Areas (i.e., caused by seiche > design levels)

Emergency Action Levels:

Any of the following:

1. >3' of water in both EDG G-01 and G-02 rooms

2. >2' of water in vital switchgear room

3. >2' of water in auxiliary feed pump room.

Plant Specific Information:

This initiating condition addresses conditions that has resulted in plant vital areas being subjected to forces beyond design limits, and damage may be assumed to have occurred to plant safety systems.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This condition is entered when there is greater than three feet of water in both EDG rooms, greater than two feet of water in the vital switchgear room, or greater than two feet of water in the auxiliary feedwater pump room.

Flooding in vital equipment areas was previously evaluated, specifically in the evaluation of SOER 85-5, "Internal Flooding of Power Plant Buildings." It was determined that Point Beach is able to withstand all postulated internal and external flooding events without losing redundant trains of safety related equipment. Several conditions that would require designation of an event are included in the Emergency Action Levels.

Water levels in excess of three feet in both Emergency Diesel Generator G-01 and G-02 rooms is a Site Area Emergency initiating condition. The diesel generator starting air compressor is located approximately one foot above the floor. The bottom end of the generator casing is approximately 18 inches above the floor and the rotor is approximately three feet above the floor.

Water levels in excess of two feet in the vital switchgear room is also a Site Area Emergency initiating condition. Several 125-volt DC station batteries are installed in the vital switchgear room. The bottom and top of these batteries are six and 36 inches above the floor, respectively. Numerous electrical cabinets containing electrical components for the safety injection pumps, the station service transformers, and the 4.16 kV electrical system are also located in the room.

Water levels in excess of two feet in the auxiliary feedwater pump room is a Site Area Emergency initiating condition. The turbine operated auxiliary feedwater pumps are located approximately 18 inches above the floor and the motor operated auxiliary feedwater pumps are located approximately two feet above the floor. Additionally, the Source Range Output Expansion Control Panel is approximately two feet above the floor.

Therefore, this initiating condition which is indicative of serious plant system conditions with adverse consequences on the public health and safety is classified as a SITE EMERGENCY.

Emergency classifications under other initiating conditions may be appropriate due to offsite affects caused by high winds, particularly status of offsite power lines.

Source Documents/References/Calculations:

18, 31, 86, 87, 107

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **ALERT**

Initiating Condition: Seiche Near Design Level

Emergency Action Levels:

>6" of water in turbine hall.

Plant Specific Information:

This initiating condition addresses an event that may result in a plant vital area being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This condition is entered when there is greater than six inches of water in the turbine hall.

A water level in excess of six inches in the turbine hall is an Alert initiating condition. The feedwater pumps each sit on a base that is eight inches above the floor. The turbine seal oil pumps are approximately ten inches above the floor.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Escalation to a higher emergency class, if appropriate, will be based on Flooding In Vital Equipment Areas.

Source Documents/References/Calculations:

18

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **ALERT**

Initiating Condition: Tornado Striking the Facility

Emergency Action Levels:

Visual observation by DSS or Operations supervisor.

Plant Specific Information:

This initiating condition addresses an event that may result in a plant vital area being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems. Escalation to a higher emergency class, if appropriate, will be based on Wind With Damage.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This condition is entered when a tornado is visually observed by the DSS or the Operations Supervisor striking the facility.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Source Documents/References/Calculations:

19, 106

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **ALERT**

Initiating Condition: Winds In Excess of Design Level

Emergency Action Levels:

Wind speed indicated >100 mph.

Plant Specific Information:

This initiating condition addresses an event that may result in a plant vital area being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems. Escalation to a higher emergency class, if appropriate, will be based on Wind With Damage.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This condition is entered when the measured windspeed is greater than 100 mph.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Source Documents/References/Calculations:

19, 106

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **ALERT**

Initiating Condition: Earthquake Greater Than Operating Basis Earthquake

Emergency Action Levels:

Earthquake with attendant structural damage of containment or spent fuel pool.

Plant Specific Information:

This initiating condition addresses an event that may result in a plant vital area being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems.

Plant vital area designations are contained in the Point Beach Nuclear Plant Security Plan.

This condition is entered when an earthquake occurs that causes structural damage of the containment building or the spent fuel pool.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Source Documents/References/Calculations:

FSAR A-1.0, Definition of Seismic Design Classifications

19

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Earthquake

Emergency Action Levels:

Activation of ≥2 seismic event indicators and verified by actual physical ground shaking or by contacting University of Wisconsin Milwaukee Seismic Center (phone numbers are found in EPIP-23).

SEI 6210 Warehouse 3
SEI 6211 El. 6.5'/U1 Facade
SEI 6212 El. 26'/PAB/Drumming Area
SEI 6213 El. 8'/AFW Pump Room/NE of tunnel

Plant Specific Information:

Damage may be caused to some portions of the site, but should not affect the ability of safety functions to operate. Method of detection can be based on instrumentation, validated by a reliable source, or operator assessment. As defined in the EPRI sponsored "Guidelines for Nuclear Plant Response to an Earthquake," dated October 1989, a "felt earthquake" is:

> An earthquake of sufficient intensity such that: (a) the vibratory ground motion is felt at the nuclear plant site and recognized as an earthquake based on a consensus of control room operators on duty at the time, and (b) for plants with operable seismic instrumentation, the seismic detectors of the plant are activated. For most plants with seismic instrumentation, the seismic switches are set at an acceleration of 0.01g.

This condition is entered when greater than two seismic indicators have been activated and the earthquake event has been verified by tremors at the site or by personnel at the University of Wisconsin - Milwaukee Seismic Center.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse consequences on the public health and safety is classified as an UNUSUAL EVENT.

Source Documents/References/Calculations:

FSAR A-1.0, Definition of seismic Design Classifications

19

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Tornado Visible From Site

Emergency Action Levels:

As judged by Operations supervisor.

Plant Specific Information:

This initiation condition is based on the assumption that a tornado striking within the protected area may potentially damage plant structures containing functions or systems required for safe shutdown of the plant. If damage is confirmed visually or by other plant indications, the event may be escalated to an Alert.

This condition is entered when a tornado, as judged by the Operations supervisor, is visible from the site.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse consequences on the public health and safety is classified as an UNUSUAL EVENT.

Source Documents/References/Calculations:

19, 106

CATEGORY 10
NATURAL EVENTS

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Low Lake Michigan Water Level

Emergency Action Levels:

1. With no CW pumps running, water level is 3.9' below 0' on surge chamber level and confirmed by measuring forebay level at 10.9' below pumphouse floor (7' level).

Plant Specific Information:

This initiating condition is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems.

This condition is entered when the water level on the surge chamber level is 3.9 feet below the zero level and the forebay level is measured at 10.9 feet below the pumphouse floor.

Water levels below these levels impairs the ability of the circulating water pumps to provide water to the unit condensers.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse consequences on the public health and safety is classified as an UNUSUAL EVENT.

CATEGORY 11
PLANT SHUTDOWN FUNCTION

Emergency Classification Level: **ALERT**

Initiating Condition: Failure of Reactor Protection System to Complete a Trip Which Brings the Reactor Subcritical

Emergency Action Levels:

All of the following:

1. Unplanned first-out annunciator on C-04 with confirmation from an associated indicator

2. Intermediate range detector output not decaying

3. RPI indicates fully withdrawn.

Plant Specific Information:

This condition indicates failure of the automatic protection system to scram the reactor. This condition is more than a potential degradation of a safety system in that a front line automatic protection system did not function in response to a plant transient and thus the plant safety has been compromised, and design limits of the fuel may have been exceeded. An ALERT is indicated because conditions exist that lead to potential loss of fuel clad or RCS barrier. Reactor protection system setpoint being exceeded (rather than limiting safety system setpoint being exceeded) is specified here because failure of the automatic protection system is the issue. A manual scram is any set of actions by the reactor operator at the reactor control console which causes control rods to be rapidly inserted into the core and brings the reactor subcritical (e.g., reactor trip button).

This condition is entered when more than one rod position indicator indicates fully withdrawn, the intermediate range detector is not decreasing, and the unplanned first-out annunciator alarms.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

Failure of the manual scram would escalate the event to a Site Emergency.

Source Documents/References/Calculations:

9, 21, 22, 30, 68

CATEGORY 11
PLANT SHUTDOWN FUNCTION

Emergency Classification Level: **ALERT**

Initiating Condition: Loss of All Alarms (Annunciators) >15 Minutes While Unit is Not In Cold Shutdown

Emergency Action Levels:

"Annunciator power failure" alarm on C-01, C-02, and 1(2)C-03, 1(2)C-04.

Plant Specific Information:

This initiation condition is intended to recognize the difficulty associated with monitoring changing plant conditions without the use of annunciation or indication equipment during a transient. Recognition of the availability of computer based indication equipment is considered.

"Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

"Significant transient" includes response to automatic or manually initiated functions such as scrams, runbacks involving greater than 25 percent thermal change, ECCS injections, or thermal power oscillations of ten percent or greater.

"Compensatory non-alarming indications" in this context includes computer based information. This should include all computer systems available for this use depending on specific plant design and subsequent retrofits. If both a major portion of the annunciation system and all computer monitoring are unavailable to the extent that the additional operating personnel are required to monitor indications, the Alert is required.

Due to the limited number of safety systems in operation during cold shutdown, refueling and defueled conditions, no initiating condition is indicated during these times.

This condition is entered when the "Annunciator Power Failure" alarm occurs on C-01, C-02, 1(2)C-03, and 1(2)C-04.

The "Annunciator Power Failure" alarm indicates a loss of DC power to the annunciators on the associated control panel. This alarm on the C-01, C-02, C-03, and C-04 panels indicates a loss of power to all the annunciators.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse consequences on the public health and safety is classified as an ALERT.

This initiation condition will be escalated to a SITE EMERGENCY if the operating crew can not monitor the transient in progress.

Source Documents/References/Calculations:

33, 45

CATEGORY 11
PLANT SHUTDOWN FUNCTION

Emergency Classification Level: **ALERT**

Initiating Condition: Loss of Functions Needed for Cold Shutdown For >4 Hours While Unit is in Cold Shutdown

Emergency Action Levels:

Loss of both trains of decay heat removal from RHR.

Plant Specific Information:

This initiating condition addresses complete loss of functions required for core cooling during refueling and cold shutdown modes. Escalation to Site Emergency or General Emergency would be via Abnormal Radiation Levels or Emergency Director judgment.

This initiation condition is based on concerns raised by Generic Letter 88-17, "Loss of Decay Heat Removal." A number of phenomena such as pressurization, vortexing, steam generator U-tube draining, RCS level differences when operating at a mid-loop condition, decay heat removal system design, and level instrumentation problems can lead to conditions where decay heat removal is lost and core uncovery can occur. NRC analyses show that sequences that can cause core uncovery in 15 to 20 minutes and severe core damage within an hour after decay heat removal is lost. Under these conditions, RCS integrity is lost and fuel clad integrity is lost or potentially lost, which is consistent with a Site Emergency.

"Uncontrolled" means that system temperature increase is not the result of planned actions by the plant staff. This guidance to uncontrolled temperature rise is necessary to preserve the anticipatory philosophy of NUREG-0654 for events starting from temperatures much lower than the cold shutdown temperature limit.

This condition is entered when there is a loss of both trains of decay heat removal from RHR.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse impact on the public health and safety is classified as an ALERT.

Source Documents/References/Calculations:

AOP-9C, Degraded RHR System Capability

33, 45

CATEGORY 11
PLANT SHUTDOWN FUNCTION

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Loss of Control Room Indications or Alarms to an Extent Requiring Plant Shutdown

Emergency Action Levels:

Both of the following:

1. "Annunciator power failure" on C-04

2. Failed indication as determined by DSS.

Plant Specific Information:

This initiation condition is intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment during a transient.

Recognition of the availability of computer based indication equipment is considered.

"Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

"Significant transient" includes response to automatic or manually initiated functions such as scrams, runbacks involving greater than 25 percent thermal change, ECCS injections, or thermal power oscillations of ten percent or greater.

"Compensatory non-alarming indications" in this context includes computer based information. This should include all computer systems available for this use depending on specific plant design and subsequent retrofits. If both a major portion of the annunciation system and all computer monitoring are unavailable to the extent that the additional operating personnel are required to monitor indications, the Alert is required.

Due to the limited number of safety systems in operation during cold shutdown, refueling and defueled conditions, no initiating condition is indicated during these times.

This condition is entered when there is an "Annunciator Power Failure" alarm on panel C-04 and the DSS has determined there is a failed indication.

The "Annunciator Power Failure" alarm indicates loss of DC power to the associated panel.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

This initiation condition will be escalated to a SITE EMERGENCY if the operating crew can not monitor the transient in progress.

Source Documents/References/Calculations:

45

CATEGORY 11
PLANT SHUTDOWN FUNCTION

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Turbine Mechanical Failure With Consequences

Emergency Action Levels:

Both of the following:

1. Visual confirmation of turbine housing penetration by a blade or disc.

2. Any of the following consequences:

   a. No direct loss of reactor coolant;

   b. Reasonable assurance that the plant can be maintained in a safe shutdown condition;

   c. Offsite exposure within 10 CFR 100 guidelines for missile damage resulting in activity release.

Plant Specific Information:

This initiation condition addresses the consequences of turbine failure and turbine missile effects.

Analyses documented in the FSAR on the consequences of turbine overspeed in the past indicated that there would be only a low energy missile generated external to the low pressure turbine casing in the event of a turbine overspeed.

Rupture of a low pressure turbine disk at or below design speed has been postulated for design purposes, even though this failure is shown to have a very low probability because of design conservatism and original quality control. The original turbine missile analysis determined that there is reasonable assurance that the plant can be kept in a safe shutdown condition following missile generation and ejection at design speed.

The criteria used to assess the plant' capability to withstand the postulated turbine missile are:

1. No direct loss of reactor coolant;

2. Reasonable assurance that the plant can be maintained in a safe shutdown condition;

3. Offsite exposure within 10 CFR 100 guidelines for missile damage resulting in activity release.

Direct loss of reactor coolant was evaluated by examining the reactor containment structure. This structure is more than sufficient to prevent a direct loss of reactor coolant since this structure can preclude local perforation.

Assurance that the plant can be maintained in a safe shutdown condition was based on two principles. First, all areas of critical plant equipment or components were reviewed with respect to the amount of protection afforded them by concrete ceilings or floors such that a falling missile would not hit the equipment and damage it. Second, those areas of the plant that did not have adequate protection to preclude damage from a missile were evaluated with respect to the capability for safe operation of the plant in the event that a missile should damage the equipment or components in these areas. The existing local protection and separation of the systems involved in safe shutdown are such that the plant can be safely shutdown and kept in a safe condition for an indefinite amount of time.

Missile damage resulting in activity release was determined to produce doses that are a small fraction of the 10 CFR 100 limits. Activity release was postulated to result from the rupture of a main steam line or missile damage to fuel assemblies in the spent fuel pool (maximum of 18).

The study determined that the following components are subject to the effects of a turbine missile: one main steam line, the condensate storage tanks, reactor makeup water storage tanks, the reactor makeup water storage tank pumps, the refueling water storage tank, diesel generator fuel oil line, and the service water pump electrical leads.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

Escalation to an ALERT under Hazards to Plant Operations - Missile Impacts On Facility From Any Source or under Fuel Handling Accident - Fuel Damage Accident With Release of Radioactivity to Auxiliary Building may be appropriate based on damage indications in the plant environs.

Source Documents/References/Calculations:

57, 108, 111

CATEGORY 11
PLANT SHUTDOWN FUNCTION

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Inability to Reach Technical Specification Required Shutdown within the Specified Time Limit

Emergency Action Levels:

When the Technical Specification time limit, as determined by the DSS and DCS, for reaching the required shutdown condition, is exceeded.

Plant Specific Information:

Exceeding Technical Specification limits for the period designated in the action statement is an analyzed condition of the plant and does not, by itself, represent an emergency. If plant conditions are outside of Technical Specification limits and those conditions do result in a degradation in the level of plant safety, other initiating conditions would trigger an appropriate classification within an acceptable time frame. When the plant cannot be brought to the required operating mode within the allowable action statement time, declaration of an Unusual Event would be warranted.

Source Documents/References/Calculations:

96

CATEGORY 12
FUEL HANDLING ACCIDENT

Emergency Classification Level: **ALERT**

Initiating Condition: Major Damage to Irradiated Fuel In Containment

Emergency Action Levels:

All of the following:

1. As reported to DSS by core loading supervisor

2. Alarm manipulator Victoreen

3. Any of the following:

   a. Alarm on 1(2)RE-211 "Containment air particulate" monitor

   b. Alarm on 1(2)RE-212 "Containment noble gas" monitor

Plant Specific Information:

This initial condition applies to spent fuel requiring water coverage and is not intended to address spent fuel which is licensed for dry storage.

NUREG-0818, "Emergency Action Levels for Light Water Reactors," forms the basis for this EAL.

There is time available to take corrective actions, and there is little potential for substantial fuel damage. In addition, NUREG/CR-4982, "Severe Accident In Spent Fuel Pools In Support of Generic Safety Issue 82," July 1987, indicates that even if corrective actions are not taken, no prompt fatalities are predicted, and that risk of injury is low. In addition, NRC Information Notice No. 90-08, "Kr-85 Hazards From Decayed Fuel," presents the following in its discussion:

> 'In the event of a serious accident involving decayed spent fuel, protective actions would be needed for personnel on site, while offsite doses (assuming an exclusion area radius of one mile from the plant site) would be well below the EPA's Protective Action Guides. Accordingly, it is important to be able to properly survey and monitor for Kr-85 in the event of an accident with decayed spent fuel.
>
> Licensees may wish to reevaluate whether Emergency Action Levels specified in the emergency plan and procedures governing decayed fuel handling activities appropriately focus concern for onsite workers and Kr-85 releases in areas where decayed spent fuel accidents could occur, for example, the spent fuel pool working floor. Furthermore, licensees may wish to determine if emergency plans and corresponding implementing procedures address the means for limiting radiological exposure of onsite personnel who are in other areas of the plant. Among other things, moving onsite personnel away from the plume and shutting off building air intakes downwind from the source may be appropriate.'

This condition is entered when it is reported to the DSS by the core loading supervisor, the manipulator monitor alarms, and one of the containment air monitors alarms.

Any one of the following alarms is an indication of a fuel handling accident. The containment air particulate monitor (RE-211) samples containment air for particulate radioactive material. The alarm setpoint for this monitor is 0.5 microcuries. The containment noble gas monitor samples containment air for noble gases. The alarm setpoint for this monitor is the Technical Specification limit. Monitoring equipment located on the spent fuel pool bridge and the drumming area vent stack are set to alarm at a level below the technical specification limit of 6.1E-03 microcuries per cubic centimeter.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse impact on the public health and safety is classified as an ALERT.

Escalation to a SITE EMERGENCY based on Abnormal Effluent may be appropriate if offsite rad levels are measured.

Source Documents/References/Calculations:

12, 99

CATEGORY 12
FUEL HANDLING ACCIDENT

Emergency Classification Level: **ALERT**

Initiating Condition: Major Damage to Irradiated Fuel in the Primary Auxiliary Building (FSAR 14.2.1)

Emergency Action Levels:

Both of the following:

1. As reported to DSS by the supervisor in charge of fuel handling;

2. Alarm on Victoreen on spent fuel pool bridge and drumming area vent [RE-221].

Plant Specific Information:

This initial condition applies to spent fuel requiring water coverage and is not intended to address spent fuel which is licensed for dry storage.

NUREG-0818, "Emergency Action Levels for Light Water Reactors," forms the basis for this EAL.

There is time available to take corrective actions, and there is little potential for substantial fuel damage. In addition, NUREG/CR-4982, "Severe Accident In Spent Fuel Pools In Support of Generic Safety Issue 82," July 1987, indicates that even if corrective actions are not taken, no prompt fatalities are predicted, and that risk of injury is low. In addition, NRC Information Notice No. 90-08, "Kr-85 Hazards From Decayed Fuel," presents the following in its discussion:

> 'In the event of a serious accident involving decayed spent fuel, protective actions would be needed for personnel on site, while offsite doses (assuming an exclusion area radius of one mile from the plant site) would be well below the EPA's Protective Action Guides. Accordingly, it is important to be able to properly survey and monitor for Kr-85 in the event of an accident with decayed spent fuel.
>
> Licensees may wish to reevaluate whether Emergency Action Levels specified in the emergency plan and procedures governing decayed fuel handling activities appropriately focus concern for onsite workers and Kr-85 releases in areas where decayed spent fuel accidents could occur, for example, the spent fuel pool working floor. Furthermore, licensees may wish to determine if emergency plans and corresponding implementing procedures address the means for limiting radiological exposure of onsite personnel who are in other areas of the plant. Among other things, moving onsite personnel away from the plume and shutting off building air intakes downwind from the source may be appropriate.'

This condition is entered when it is reported to the DSS by the supervisor in charge of fuel handling and the spent fuel pool bridge and spent fuel pool stack monitors alarm.

Monitoring equipment located on the spent fuel pool bridge and the drumming area vent stack are set to alarm at a level below the technical specification limit of 6.1E-03 microcuries per cubic centimeter.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse impact on the public health and safety is classified as an ALERT.

Source Documents/References/Calculations:

FSAR 9.5, Fuel Handling System

13, 14

CATEGORY 13
OTHER

Emergency Classification Level: **ALERT**

Initiating Condition: Condition That Warrants Establishment of Technical Support Center and Emergency Operations Facility

Emergency Action Levels:

DCS and DSS concurrence.

Plant Specific Information:

This initiating condition is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Alert emergency class.

This condition is entered upon the concurrence of the DCS and the DSS.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse impact on the public health and safety is classified as an ALERT.

Source Documents/References/Calculations:

8, 13, 14, 17

CATEGORY 13
OTHER

Emergency Classification Level: **ALERT**

Initiating Condition: Condition That Warrants Use of Monitoring Teams

Emergency Action Levels:

DCS and DSS concurrence.

Plant Specific Information:

This initiating condition is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Alert emergency class.

This condition is entered upon the concurrence of the DCS and the DSS.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse impact on the public health and safety is classified as an ALERT.

Source Documents/References/Calculations:

8, 13, 14, 17

CATEGORY 13
OTHER

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Condition That Warrants State and/or Local Official Awareness

Emergency Action Levels:

DCS and DSS concurrence.

Plant Specific Information:

This initiating condition is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Unusual Event emergency class.

This condition is entered upon the concurrence of the DCS and the DSS.

Therefore, this initiating condition which is indicative of abnormal plant system conditions with possible adverse impact on the public health and safety is classified as an ALERT.

In addition to the above generic information, incidents involving a loaded spent fuel storage cask may warrant declaration of an Unusual Event. Consideration should be given to declaring an emergency event related to spent fuel storage if any of the following indications occur:

1. Measured radiation levels ≥1 Rem/hr at 1' from a ventilated storage cask.

2. Measured radioactive contamination levels of 10^5DPM/100 cm^2 BETA-GAMMA or 10^3 DPM/100 cm^2 ALPHA around a ventilated storage cask.

3. Measured airborne radioactivity levels ≥10 times the effluent concentration limit from a ventilated storage cask.

4. Measurement of any of the above levels suspected to be caused by an operational event (cask drop, missile impact, etc.)

Source Documents/References/Calculations:

14, 17

CATEGORY 14
ABNORMAL COOLANT TEMPERATURE/PRESSURE

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Unexpected Decrease in Subcooling Margin

Emergency Action Levels:

Both of the following:

1. Alarm on SAS

   OR

   "RCS subcooling margin low alert" on 1(2)C-20

   OR

   "RCS subcooling margin low alarm" on 1(2)C-20

2. Confirmation by manual calculation.

Plant Specific Information:

This initiating condition addresses a condition that may indicate a potential degradation of the level of the safety of the plant. Reactor coolant is the core's heat sink and the subcooling margin is a measure of the amount of heat the reactor coolant can absorb before approaching the condition where the water in the core starts to boil.

This condition is entered when the condition is alarmed on the SAS or the RCS subcooling monitor alerts or alarms and the condition is confirmed by manual calculation.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

CATEGORY 15
REACTIVITY TRANSIENT

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Uncontrolled Rod Withdrawal (FSAR 14.1.1 and 14.1.2)

Emergency Action Levels:

DCS and DSS concurrence.

Plant Specific Information:

This initiating condition addresses a condition that may indicate a potential degradation of the level of the safety of the plant.

An uncontrolled rod withdrawal at power results in an increase in core heat flux. Since the heat extraction from the steam generator remains constant, there is a net increase in reactor coolant temperature. Unless terminated by manual or automatic action, this power mismatch and resultant coolant temperature rise would eventually result in DNB. Therefore, to prevent the possibility of damage to the coolant, the reactor protection system is designed to terminate any such transient with an adequate margin to DNB.

The automatic features of the reactor protection system which prevent core damage in a rod withdrawal accident are:

1. Nuclear power range instrumentation actuates a reactor trip if two out of four channels exceed the overpower setpoint;

2. Reactor trip is actuated if two out of four ΔT channels exceed their overtemperature ΔT setpoint;

3. Reactor trip is actuated if two out of four ΔT channels exceed their overpower ΔT setpoint;

4. Reactor trip is actuated if two out of three reactor coolant pressure channels exceed their setpoint.

5. Reactor trip is actuated if two out of three pressurizer high water level channels exceed their setpoint.

This accident was analyzed in the FSAR and determined that the core and the reactor coolant system are not adversely affected.

This condition is entered with the DSS and DCS concurrence.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

Source Documents/References/Calculations:

10, 51, 52, 61, 78

CATEGORY 15
REACTIVITY TRANSIENT

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: CVCS Malfunction (FSAR 14.1.4)

Emergency Action Levels:

DCS and DSS concurrence.

Plant Specific Information:

Positive reactivity can be added to the core with the chemical and volume control system by feeding reactor makeup water into the reactor coolant system by the reactor makeup control system. The normal dilution procedures call for a limit on the rate and magnitude for any individual dilution, under strict administrative controls. Boron dilution is a manual operation. The chemical and volume control system is designed to limit, even under various postulated failure modes, the potential rate of dilution to a value which, after indication through alarms and instrumentation, provides the operator sufficient time to correct the situation in a safe and orderly manner.

There is only a single, common source of reactor makeup water to the reactor coolant system from the reactor makeup water storage tank, and inadvertent dilution can be readily terminated by isolating this single source. The operation of the reactor makeup water pumps which take suction from this tank provides the only supply of makeup water to the reactor coolant system. In order for makeup water to be added to the reactor coolant system, the charging pumps must be running in addition to the reactor makeup water pumps.

The rate of addition of unborated water makeup to the reactor coolant system is limited to the capacity of the CVCS pumps. This limiting addition rate is 181.5 gpm. For totally unborated water to be delivered at this rate to the reactor coolant system at pressure, three charging pumps must be operated.

Because of the procedures involved in the dilution process, an erroneous dilution is not considered credible. Nevertheless, if an unintentional dilution of boron in the reactor coolant does occur, numerous alarms and indications are available to alert the operator to the condition. The maximum reactivity addition is slow enough to allow the operator to determine the cause of the addition and take corrective action before the required shutdown margin is lost.

This condition is entered with the DSS and DCS concurrence.

Therefore, this initiating condition which is indicative of degraded, but not failed, equipment barriers with no adverse impact on the public health and safety is classified as an UNUSUAL EVENT.

Source Documents/References/Calculations:

53

NUREG-0654 Initiating Conditions Not Included and The Reason Why:

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Fuel Damage Indication - High Offgas at BWR Air Ejector Monitor

Reason for Noninclusion: The Point Beach Nuclear Plant is a two unit PWR site. Therefore, this initiating condition does not apply.

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Failure of a Safety or Relief Valve In a Safety Related System to Close Following Reduction of Applicable Pressure

Reason for Noninclusion: If a pressurizer safety or relief valve were to lift and fail to reseat, the resultant flow rate would exceed 10 gpm. The technical specification for a primary leak rate is 10 gpm. Therefore, this initiating condition is covered by initiating condition - exceeding primary system leak rate technical specification.

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Natural Phenomenon Being Experienced Or Projected Beyond Usual Levels - Tsunami, Hurricane Surge, Any Hurricane

Reason for Noninclusion: The Point Beach Nuclear Plant is located on Lake Michigan which is an inland lake and thus is not susceptible to hurricanes or tsunamis whose effects are confined to coastal sites.

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Aircraft Crash Onsite or Unusual Aircraft Activity Over Facility

Reason for Noninclusion: Any aircraft crash is classified as an Alert in the event classification table. If significant damage occurs as a result of the crash, the event classification may be escalated to a higher classification.

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Train Derailment Onsite

Reason for Noninclusion: The occurrence of a train derailment onsite is not discussed because there are no train tracks onsite.

Emergency Classification Level: **UNUSUAL EVENT**

Initiating Condition: Rapid Depressurization of PWR Secondary Side

Reason for Noninclusion: Rapid depressurization of the secondary side will initiate the ECCS. The unplanned initiation of the ECCS with injection to the primary system is included in the event classification table. This initiation condition is addressed.

Emergency Classification Level: **ALERT**

Initiating Condition: Severe Loss of Fuel Cladding - High Offgas at BWR Air Ejector Monitor

Reason for Noninclusion: Not applicable to the Point Beach Nuclear Plant.

Emergency Classification Level: **ALERT**

Initiating Condition: Radiation Levels or Airborne Contamination Which Indicate a Severe Degradation in the Control of Radioactive Materials

Reason for Noninclusion: This initiating condition is not discussed in the Event Classification table. This initiating condition addresses conditions that warrant the establishment of the Technical Support Center (TSC) and the Emergency Operations Facility (EOF) or the use of monitoring teams. The establishment of the TSC and the EOF or the use of monitoring teams are addressed by initiating conditions in the table. This was deemed sufficient to meet the intent of the NUREG.

Emergency Classification Level: **ALERT**

Initiating Condition: Loss of All Onsite DC Power

Reason for Noninclusion: This initiating condition is not discussed, however, a loss of all DC power for greater than 15 minutes is discussed which requires the declaration of a General Emergency. It was determined that it would take at least 15 minutes to classify this event and make the proper notifications. Therefore, it was decided to not include this shorter duration initiating condition in the event classification table.

Emergency Classification Level: **ALERT**

Initiating Condition: Coolant Pump Seizure Leading to Fuel Failure

Reason for Noninclusion: This initiating condition is not discussed in the event classification table because initiating conditions for different levels of core fuel damage are included in the table. It was determined that including initiating conditions for different levels of fuel damage is sufficient to meet the intent of the NUREG due to the reason that the effect of the failure is not as important as the failure itself.

Emergency Classification Level: **ALERT**

Initiating Condition: Turbine Failure Causing Casing Penetration

Reason for Noninclusion: This initiating condition is not discussed in the event classification table, however, turbine mechanical failure with consequences is classified as an Unusual Event in the table. The event classification is escalated when damage to the facility is observed. Since turbine failure is already addressed in the table and event escalation is taken as required, it was decided that including this initiating condition in a further refined state in the event classification table was not needed.

Emergency Classification Level: **ALERT**

Initiating Condition: Evacuation of Control Room Anticipated or Required With Control of Shutdown Systems Established From Local Stations

Reason for Noninclusion: Since controlling plant shutdown systems from local stations rather than from the control room it is not detrimental to safe plant operation, it was determined that this initiating condition could be excluded from the event classification table without detrimental effects.

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: BWR Steam Line Break Outside Containment Without isolation

Reason for Noninclusion: Not applicable to the Point Beach Nuclear Plant.

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Complete Loss of Any Function Needed for Plant Hot Shutdown

Reason for Noninclusion: This initiating condition is not discussed in the Event Classification table. However, failure of the reactor protection system to complete a trip which brings the reactor subcritical is. Since escalation of the event classification is done as warranted, it was decided that this initiating condition could be excluded from the table without detrimental effect.

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Transient Requiring Operation of Shutdown Systems With Failure to Scram

Reason for Noninclusion: This initiating condition is not discussed in the Event Classification table. However, failure of the reactor protection system to complete a trip which brings the reactor subcritical is. Since escalation of the event classification is done as warranted, it was decided that this initiating condition could be excluded from the table without detrimental effect.

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Major Damage to Spent Fuel In Containment or Fuel Handling Building

Reason for Noninclusion: This initiating condition is addressed in the event classification table under Fuel Handling Accident - Alert classification. it was determined that it was not necessary to further escalate this initiating condition based on the extent of fuel damage. Accident analyses calculations performed for this accident has calculated that the dose to the public from this accident is a small fraction of 10 CFR 100 and that onsite personnel is the group that is at risk.

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Most or All Alarms Lost and Plant Transient Initiated or In Progress

Reason for Noninclusion: This initiating condition is not discussed in the Event Classification table. However, loss of DC which is a causative factor for this initiating condition is discussed. Therefore, it was determined that this initiating condition could be excluded from the table without detrimental effects.

Emergency Classification Level: **SITE EMERGENCY**

Initiating Condition: Severe Natural Phenomena Being Experienced or Projected With Plant Not In Cold Shutdown - Earthquake Greater Than SSE Levels

Reason for Noninclusion: This initiating condition is not discussed in the Event Classification table, however, earthquake greater than operating basis earthquake is classified as an Alert in the table. The event classification is escalated when plant conditions warrant the need. It was decided that including this initiating condition in a further refined state in the table was not needed.

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Transient Requiring Operation of Shutdown Systems With Failure to Scram Which Results In Core Damage or Additional Failure of Core Cooling and Makeup Systems

Reason for Noninclusion: This initiating condition is not discussed in the Event Classification table. However, failure of the reactor protection system to complete a trip which brings a reactor subcritical is. Since the operation of the shutdown system with failure to scram is discussed in the table and escalation of the event classification is taken as needed, it was decided that this initiating condition could be excluded from the table without detrimental effect.

Emergency Classification Level: **GENERAL EMERGENCY**

Initiating Condition: Small LOCA and Initially Successful ECCS

Reason for Noninclusion: This initiating condition is not discussed in the Event Classification table. However, small LOCA events are. Since LOCA events are discussed in the table and escalation of the event classification is taken as needed, it was decided that this initiating condition could be excluded from the table without detrimental effect.

Ref #	Reference	Subject
1	AABD Modules 6 and 11	Accident Analysis Base Document (DBD-T-35)
2	AOP 0.0	Vital DC System Malfunction
3	AOP 0.1	Declining Frequency on 345 kV Distribution System
4	AOP 1A	Reactor Coolant Leak
5	AOP 2A	Secondary Coolant Leak
6	AOP 2B	Loss of Feedwater or Feedwater System Failure
7	AOP 2C	Auxiliary Feed Pump Steam Binding or Overheating
8	AOP 4A	High Effluent Activity
9	AOP 6B	Stuck Rod or Malfunctioning Position Indication
10	AOP 6C	Uncontrolled Withdrawal of RCCA(s)
11	AOP 8A	High Reactor Coolant Activity
12	AOP 8B	Irradiated Fuel Handling Accident in Containment
13	AOP 8C	Irradiated Fuel Handling Accident in the Spent Fuel Pool
14	AOP 8D	Spent Fuel Shipping Cask Drop
15	AOP 10A	Safe Shutdown - Local Control
16	AOP 10B	Safe to Cold Shutdown in Local Control
17	AOP 12A	Oil, Hazardous Material, Radioactive Materials Spill
18	AOP 13B	High Lake Water Level
19	AOP 13C	Severe Weather Conditions
20	AOP 15A	Land Vehicle Bomb Alert or Explosion
21	CSP S.1	Response to Nuclear Power Generation/ATWS
22	CSP S.2	Response to Loss of Core Shutdown
23	CSP C.1	Response to Inadequate Core Cooling
24	CSP C.2	Response to Degraded Core Cooling
25	CSP H.1	Response to Loss of Secondary Heat Sink
26	CSP P.1	Response to Imminent Pressurized Thermal Shock Condition
27	CSP Z.1	Response to High Containment Pressure
28	CSP Z.2	Response to Containment Flooding
29	CSP Z.3	Response to High Containment Radiation Level
30	CSPBG S.1	Background document for CSP-S.1, Response to Nuclear power Generation/ATWS
31	DCS 3.1.2	Service Water System Leakage Inside Containment
32	DCS 3.1.3	Auxiliary Feedwater Flow Rate
33	DCS 3.1.6	Intent of the Definition of cold Shutdown in Technical Specification 15.1.G.2
34	DCS 3.1.20	345 kV Transmission System Operability
35	ECA 0.0	Loss of All AC Power
36	ECA 0.1	Loss of All AC Power Recovery without SI Required
37	ECA 0.2	Loss of All AC Power Recovery with SI Required
38	ECA 1.2	LOCA Outside Containment
39	ECA 2.1	Uncontrolled Depressurization of Both Steam Generators
40	ECA 3.1	SGTR with Loss of Reactor Coolant - Subcooled Recovery Desired
41	ECA 3.2	SGTR with Loss of Reactor Coolant - Saturated Recovery Desired
42	ECA 3.3	SGTR without Pressurizer Pressure Control
43	EOP 1	Loss of Reactor or Secondary Coolant
44	EOP 1.3	Transfer to Containment Sump Recirculation
45	FSAR 2.4	Land Use
46	FSAR 4.1	Design Bases
47	FSAR 5.1	Containment System Structure
48	FSAR 5.2	Containment Isolation System
49	FSAR 9.0	Auxiliary and Emergency System
50	FSAR 9.3	Auxiliary Coolant System
51	FSAR 14.1.1	Uncontrolled RCCA Withdrawal from A Sub Critical Condition
52	FSAR 14.1.2	Uncontrolled RCCA Withdrawal at Power

Ref #	Reference	Subject
53	FSAR 14.1.4	Chemical and Volume Control System Malfunction
54	FSAR 14.1.6	Reduction in Feedwater Enthalpy Incident
55	FSAR 14.1.10	Loss of Normal Feedwater
56	FSAR 14.1.11	Loss of All AC Power to the Auxiliaries
57	FSAR 14.1.12	Likelihood of Turbine-Generator Unit Overspeed
58	FSAR 14.2.3	Accidental Release - Waste Gas
59	FSAR 14.2.4	Steam Generator Tube Rupture
60	FSAR 14.2.5	Rupture of a Steam Pipe
61	FSAR 14.2.6	Rupture of a Control Rod Mechanism Housing
62	FSAR 14.3.1	Loss of Reactor Coolant from Small Ruptured Pipes or from Cracks Large Pipes with Actuates Emergency Core Cooling System
63	FSAR 14.3.2	Major Reactor Coolant System Pipe Ruptures (Loss of Coolant Accident)
64	FSAR 14.3.4	Containment Integrity Evaluation
65	FSAR 14.3.5	Environmental Consequences of Loss of Coolant Accident
66	OM 3.19	Reactor Coolant System Leakage Determination
67	RAM 2.1	Radioactive Liquid Effluent Releases
68	ST 1	Subcriticality
69	ST 2	Core Cooling
70	ST 3	Heat Sink
71	ST 4	Integrity
72	ST 5	Containment
73	Tech Spec 15.2.1	Safety Limit, Reactor Core
74	Tech Spec 15.3.1	Reactor Coolant System
75	Tech Spec 15.3.4	Steam and Power Conversion System
76	Tech Spec 15.3.7	Auxiliary Electrical Systems
77	Tech Spec 15.3.9	Effluent Release
78	Tech Spec 15.3.10	Control [illegible] and Power Distribution Limits
79	Tech Spec 15.4.6	Emergency Power System Periodic Tests
80	Tech Spec 15.4.8	Auxiliary Feedwater System
81	Tech Spec 15.4.15	Fire Protection System
82	Tech Spec 15.7.1	Radiological Effluent Technical Specifications (RETS)
83	Tech Spec 15.7.5	Radioactive Effluent Release Limits
84	10 CFR 50.54	
85	Calc 6704.001-C-017	Effect of Tornado Generated Missiles on the Diesel Generator
86	DG-C02	Internal Flooding
87	Eval SOER 85-5 Dated 04/16/87	Internal Flooding of Power Plant Buildings
88	Fire Protection Handbook	
89	N-90-015	
90	N-90-060	RETRAN Analysis of a Loss of Main Feedwater for Point Beach
91	N-90-075	
92	N-91-008	RETRAN Analysis of an Unisolable Main Feedwater Line Rupture
93	N-91-058	
94	N-94-114	Thyroid Dose from Main Steam Line Break Accident
95	NEPB 86-515	Correlation of Reactor Coolant iodine Concentrations and Failed Fuel Monitor Readings to Emergency Action Levels, Point Beach Nuclear Plant.
96	NRC Branch Position Paper	Acceptable Deviations from Appendix 1 to NUREG-0654 Based Upon the Regulatory Analysis of NUMARC/NESP-007, Methodology for Development of Emergency Action Levels
97	NUMARC/NESP-007	Methodology for Development of Emergency Action Levels
98	NUREG -0654	Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants

Ref #	Reference	Subject
99	NUREG 0818	Emergency Action Levels for Light Water Reactors
100	NUREG 0909	
101	NUREG 1154	Loss of Main and Auxiliary Feedwater at the Davis-Besse Plant on June 9, 1985
102	NUREG 4310	Investigation of Potential Fire-Related Damage to Safety
103	PBNP FPER	
104	Resp Time 1" BRK	
105	Reg Guide 1.70.35	Information for SARs - International Generated Missiles
106	Reg Guide 1.76	Design Basis Tornado for Nuclear Power Plants
107	Reg Guide 1.102	
108	Reg Guide 1.115	Protection Against Low-Projectory Turbine Missiles
109	Reg Guide 1.120	
110	Retran Anal	
111	WCAP 7525-L	Likelihood and Consequences of Turbine Overspeed at the Point Beach Nuclear Plant
112	WCAP 9744	Loss of Feedwater Induced Loss of Coolant Accident Analysis
113	WCAP 10405	Feedwater Related Plant Trips
114	WCAP 11125	Evaluation/Categorization of Feedwater Related Trips
115	WE Memo from KAJ to JJZ Dated 08/03/84	Methodology to Correlate Containment High Range Monitors to Emergency Action Levels - Point Beach Nuclear Plant