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DUKE POWER

August 29, 1996

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U S Nuclear Regulatory Commission
Washington, DC 20555

Subject: Catawba Nuclear Site, Docket Nos. 50-413/50-414
Submission of Section D, Catawba Nuclear Site Emergency
Plan - Adoption of NUMARC/NESP-007, Rev. 2
Classification Scheme

Duke Power Company is submitting the classification scheme provided in NUMARC/NESP-007, Rev. 2, for Catawba Nuclear Site. Approval of the submittal is requested prior to final implementation. A table showing the disposition of NUMARC/NESP-007, Rev. 2 Initiating Conditions and Emergency Action Levels (EAL) in the Catawba EAL submittal is enclosed. A BASIS document is provided which cross-references the initiating conditions described in the NUMARC document. A copy of the classification procedure is also enclosed. This procedure has been reviewed by the state and local governments within the plume exposure EPZ. Their concurrence letters are enclosed. If there are any questions regarding the submittal, please contact Gary L. Mitchell at (803) 831-3235.

Yours truly,

W.R. McCollum, Jr.
Vice President

- Encl.: 1) Disposition of NUMARC/NESP-007, Rev. 2 Initiating Conditions and Emergency Action Levels (EAL) in the Catawba EAL submittal
2) Catawba Emergency Plan Section D
3) Catawba Procedure RP/0/A/5000/01
4) State and County concurrence letters

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ENCLOSURE 1

**Disposition of NUMARC/NESP-007, Rev. 2
Initiating Conditions and Emergency Action Levels (EAL)
in Catawba EAL submittal**

Disposition of NUMARC/NESP-007, Rev. 2 IC/EAL in Catawba EAL Submittal

NUMARC IC/EAL	Catawba EAL Recognition Category and EAL Number
<i>Recognition Category A</i>	
AU1/1	Abnormal Rad Levels/Radiological Effluent 4.3.U.1-1 and -2
AU1/2	Abnormal Rad Levels/Radiological Effluent 4.3.U.1-3 and -4
AU1/3	Deleted -- Catawba does not have perimeter monitors
AU1/4	Deleted -- Catawba does not have real time dose assessment
AU2/1	Abnormal Rad Levels/Radiological Effluent 4.3.U.2-1
AU2/2	Abnormal Rad Levels/Radiological Effluent 4.3.U.2-2
AU2/3	Deleted -- Catawba does not have dry fuel storage
AU2/4	Abnormal Rad Levels/Radiological Effluent 4.3.U.2-3
AA1/1	Abnormal Rad Levels/Radiological Effluent 4.3.A.1-1 and -2
AA1/2	Abnormal Rad Levels/Radiological Effluent 4.3.A.1-3 and -4
AA1/3	Deleted -- Catawba does not have perimeter monitors
AA1/4	Deleted -- Catawba does not have real time dose assessment
AA2/1	Abnormal Rad Levels/Radiological Effluent 4.3.A.2-1
AA2/2	Abnormal Rad Levels/Radiological Effluent 4.3.A.2-2
AA2/3	Abnormal Rad Levels/Radiological Effluent 4.3.A.2-3
AA2/4	Abnormal Rad Levels/Radiological Effluent 4.3.A.2-2
AA3/1	Abnormal Rad Levels/Radiological Effluent 4.3.A.3-1
AA3/2	Abnormal Rad Levels/Radiological Effluent 4.3.A.3-2
AS1/1	Abnormal Rad Levels/Radiological Effluent 4.3.S.1-1
AS1/2	Deleted -- Catawba does not have perimeter monitors
AS1/3	Abnormal Rad Levels/Radiological Effluent 4.3.S.1-2
AS1/4	Abnormal Rad Levels/Radiological Effluent 4.3.S.1-3
AG1/1	Abnormal Rad Levels/Radiological Effluent 4.3.G.1-1
AG1/2	Deleted -- Catawba does not have perimeter monitors
AG1/3	Abnormal Rad Levels/Radiological Effluent 4.3.G.1-2
AG1/4	Abnormal Rad Levels/Radiological Effluent 4.3.G.1-3

Disposition of NUMARC/NESP-007, Rev. 2 IC/EAL in Catawba EAL Submittal

NUMARC IC/EAL	Catawba EAL Recognition Category and EAL Number
<i>Recognition Category F</i>	
FPB Fuel/1	Fission Product Barrier 4.1.F.1
FPB Fuel/2	Fission Product Barrier 4.1.F.2
FPB Fuel/3	Deleted -- Core exit thermocouples are monitored as part of Critical Safety Function (CSF) status. If the OAC is not available, manual monitoring is done per F/0, "Critical Safety Function Status" and will be used to classify.
FPB Fuel/4	Deleted -- Reactor Vessel level is monitored as part of CSF status. If the OAC is not available, manual monitoring is done per F/0, "Critical Safety Function Status" and will be used to classify.
FPB Fuel/5	Fission Product Barrier 4.1.F.3
FPB Fuel/6	Deleted -- Catawba does not believe additional indications are needed to determine Fuel Clad Barrier status. Air sampling (PAGS) results are not used, as containment monitors can be used to determine Fuel Clad status.
FPB Fuel/7	Fission Product Barrier 4.1.F.4
FPB RCS/1	Fission Product Barrier 4.1.N.1
FPB RCS/2	Fission Product Barrier 4.1.N.2
FPB RCS/3	Fission Product Barrier 4.1.N.3 Note: The classification procedure does not provide site specific criteria that a steam generator is ruptured. Duke Power's philosophy is that diagnostic information of this type belongs in the Emergency Operating Procedures. Once the Emergency Coordinator/EOF Director determines that a steam generator is ruptured, the classification procedure can be used to determine the correct classification.
FPB RCS/4	Fission Product Barrier 4.1.N.4
FPB RCS/5	Deleted -- Catawba does not believe additional indications are needed to determine Reactor Coolant System Barrier status. Air sampling (PAGS) results are not used, as containment monitors can be used to determine Reactor Coolant System Barrier status.
FPB RCS/6	Fission Product Barrier 4.1.N.5
FPB Containment/1	Fission Product Barrier 4.1.C.1
FPB Containment/2	Fission Product Barrier 4.1.C.2
FPB Containment/3	Fission Product Barrier 4.1.C.3
FPB Containment/4	Fission Product Barrier 4.1.C.4
FPB Containment/5	Fission Product Barrier 4.1.C.5
FPB Containment/6	Fission Product Barrier 4.1.C.6 Core exit thermocouples are monitored as part of CSF status. If the OAC is not available, manual monitoring is done per F/0, "Critical Safety Function Status" and will be used to classify.
FPB Containment/7	Deleted -- no additional indications needed
FPB Containment/8	Fission Product Barrier 4.1.C.7

Disposition of NUMARC/NESP-007, Rev. 2 IC/EAL in Catawba EAL Submittal

NUMARC IC/EAL	Catawba EAL Recognition Category and EAL Number
<i>Recognition Category H</i>	
HU1/1	Natural Disasters, Hazards, etc. 4.7.U.1-1 and -2
HU1/2	Natural Disasters, Hazards, etc. 4.7.U.1-3
HU1/3	Deleted -- Catawba considers this redundant to Emergency Director Judgement
HU1/4	Natural Disasters, Hazards, etc. 4.7.U.1-4
HU1/5	Fire and Security 4.6.U.1-2
HU1/6	Natural Disasters, Hazards, etc. 4.7.U.1-5
HU1/7	Deleted -- Catawba believes no additional items are needed based on current EAL experience
HU2/1	Fire and Security 4.6.U.1-1
HU3/1	Natural Disasters, Hazards, etc. 4.7.U.2-1
HU3/2	Natural Disasters, Hazards, etc. 4.7.U.2-2
HU4/1	Fire and Security 4.6.U.2-1
HU4/2	Fire and Security 4.6.U.1-2 and -3
HU5/1	Natural Disasters, Hazards, etc. 4.7.U.3-1
HA1/1	Natural Disasters, Hazards, etc. 4.7.A.1-1
HA1/2	Natural Disasters, Hazards, etc. 4.7.A.1-2
HA1/3	Natural Disasters, Hazards, etc. 4.7.A.1-3
HA1/4	Natural Disasters, Hazards, etc. 4.7.A.1-3
HA1/5	Natural Disasters, Hazards, etc. 4.7.A.1-3
HA1/6	Natural Disasters, Hazards, etc. 4.7.A.1-3
HA1/7	Natural Disasters, Hazards, etc. 4.7.A.1-3
HA2/1	Fire and Security 4.6.A.1-1
HA3/1	Natural Disasters, Hazards, etc. 4.7.A.2-1
HA3/2	Natural Disasters, Hazards, etc. 4.7.A.2-2
HA4/1	Fire and Security 4.6.A.2-1
HA4/2	Deleted -- Catawba believes no others Security Event EALs necessary based on current EAL experience
HA5/1	Natural Disasters, Hazards, etc. 4.7.A.3-1
HA6/1	Natural Disasters, Hazards, etc. 4.7.A.4-1
HS1/1	Fire and Security 4.6.S.1-1
HS1/2	Fire and Security 4.6.S.1-2 and -3
HS2/1	Natural Disasters, Hazards, etc. 4.7.S.1-1
HS3/1	Natural Disasters, Hazards, etc. 4.7.S.2-1
HG1/1	Fire and Security 4.6.G.1-1
HG1/2	Fire and Security 4.6.G.1-2
HG2/1	Natural Disasters, Hazards, etc. 4.7.G.1-1

Disposition of NUMARC/NESP-007, Rev. 2 IC/EAL in Catawba EAL Submittal

NUMARC IC/EAL	Catawba EAL Recognition Category and EAL Number
<i>Recognition Category S</i>	
SU1/1	Loss of Power 4.5.U.1-1
SU2/1	System Malfunction 4.2.U.1-1
SU3/1	System Malfunction 4.2.U.2-1
SU4/1	Deleted -- Catawba has no failed fuel monitor. Reactor coolant sampling is used to determine fuel clad degradation.
SU4/2	System Malfunction 4.2.U.3-1
SU5/1	System Malfunction 4.2.U.4-1, -2, and -3
SU6/1	System Malfunction 4.2.U.5-1 and -2
SU7/1	Loss of Power 4.5.U.2-1
SA1/1	Loss of Power 4.5.A.1-1
SA2/1	Loss of Shutdown Function 4.4.A.1-1
SA3/1	Loss of Shutdown Function 4.4.A.2-1 and -2
SA4/1	System Malfunction 4.2.A.1-1
SA5/1	Loss of Power 4.5.A.2-1
SS1/1	Loss of Power 4.5.S.1-1
SS2/1	Loss of Shutdown Function 4.4.S.1-1
SS3/1	Loss of Power 4.5.S.2-1
SS4/1	Loss of Shutdown Function 4.4.S.2-1, -2, and -3
SS5/1	Loss of Shutdown Function 4.4.S.3-1, -2, and -3
SS6/1	System Malfunction 4.2.S.1-1
SG1/1	Loss of Power 4.5.G.1-1
SG2/1 and 2	Loss of Shutdown Function 4.4.G.1-1

ENCLOSURE 4. 1 FISSION PRODUCT BARRIER MATRIX

Catawba Nuclear Site

Use EALs to determine Fission Product Barrier status (Intact, Potential Loss, or Loss). Add points for all 3 barriers. Classify according to the table below.

Note 1: This table is only applicable in Modes 1-4.

Note 2: Also, an event (or multiple events) could occur which results in the conclusion that exceeding the Loss or Potential Loss thresholds is **IMMINENT** (i.e., within 1-3 hours). In this **IMMINENT** loss situation, use judgement and classify as if the thresholds are exceeded.

<u>Unusual Event (1 - 3 Points)</u>		<u>Alert (4 - 6 Points)</u>	<u>Site Area Emergency (7 - 10 Points)</u>	<u>General Emergency (11 - 13 Points)</u>
• Any Potential Loss of Containment	• Any Potential Loss or Loss of the NCS	• Loss of both NCS and Fuel Clad	• Loss of any three barriers	
• Any Loss of Containment	• Any Potential Loss or Loss of Fuel Clad	• Potential Loss of both NCS and Fuel Clad	• Loss of any two barriers and the Potential Loss of the third barrier	
		• Potential Loss of either the NCS or Fuel Clad and Loss of any additional barrier		

CONTAINMENT BARRIER		NCS BARRIER		FUEL CLAD BARRIER	
POTENTIAL LOSS - (1 Point(s))	LOSS - (3 Point(s))	POTENTIAL LOSS - (4 Point(s))	LOSS - (5 Point(s))	POTENTIAL LOSS - (4 Point(s))	LOSS - (5 Point(s))
<u>1. Critical Safety Function Status</u>		<u>1. Critical Safety Function Status</u>		<u>1. Critical Safety Function Status</u>	
• Containment-RED	• Not applicable	• NCS Integrity-Red	• Not applicable	• Core Cooling-Orange	• Core Cooling-Red
		• Heat Sink-Red		• Heat Sink-Red	
<u>2. Containment Conditions</u>		<u>2. NCS Leak Rate</u>		<u>2. Primary Coolant Activity Level</u>	
• Containment Pressure > 15 PSIG	• Rapid unexplained decrease in containment pressure following initial increase	• Unisolable leak exceeding the capacity of one charging pump in the normal charging mode with letdown isolated.	• GREATER THAN available makeup capacity as indicated by a loss of NCS subcooling.	• Not applicable	• Coolant Activity GREATER THAN 300 µCi/cc Dose Equivalent Iodine (DEI) I-131
• H2 concentration > 9%					
• Containment pressure greater than 3 psig with less than one full train of NS and a VX-CARF operating.	• Containment pressure or sump level response not consistent with LOCA conditions.				

**ENCLOSURE 4.1
FISSION PRODUCT BARRIER MATRIX**

Catawba Nuclear Site

CONTAINMENT BARRIER		NCS BARRIER		FUEL CLAD BARRIER	
POTENTIAL LOSS - (1 Point(s))	LOSS - (3 Point(s))	POTENTIAL LOSS - (4 Point(s))	LOSS - (5 Point(s))	POTENTIAL LOSS - (4 Point(s))	LOSS - (5 Point(s))
3. Containment Isolation Valves Status After Containment Isolation Actuation <ul style="list-style-type: none"> Not applicable Containment isolation is incomplete and a release path from containment exists 		3. SG Tube Rupture <ul style="list-style-type: none"> Primary-to-Secondary leak rate exceeds the capacity of one charging pump in the normal charging mode with letdown isolated. Indication that a SG is ruptured and has a Non-Isolable secondary line fault Indication that a SG is ruptured and a prolonged release of contaminated secondary coolant is occurring from the affected SG to the environment 		3. Containment Radiation Monitoring <ul style="list-style-type: none"> Containment radiation monitor 53 A or 53 B reading >117 R/hr 	
4. SG Secondary Side Release With Primary-to-Secondary Leakage <ul style="list-style-type: none"> Not applicable Release of secondary side to atmosphere with primary to secondary leakage GREATER THAN Tech Spec allowable 		4. Containment Radiation Monitoring <ul style="list-style-type: none"> Not applicable Unplanned Valid Trip II alarm on EMFs 38, 39, or 40 		4. Emergency Coordinator/EOF Director Judgement <ul style="list-style-type: none"> Any condition, including inability to monitor the barrier, that in the opinion of the Emergency Coordinator/EOF Director indicates LOSS or POTENTIAL LOSS of the fuel clad barrier. 	
5. Significant Radioactive Inventory in Containment <ul style="list-style-type: none"> Containment Rad. Monitor EMF53A or 53B Reading @ time since shutdown: > 470 R/hr @ 0 - 0.5 hr > 170 R/hr @ 0.5 - 2 hr > 125 R/hr @ 2 - 4 hr > 90 R/hr @ 4 - 8 hr > 53 R/hr @ > 8 hr Not applicable 		5. Emergency Coordinator/EOF Director Judgement <ul style="list-style-type: none"> Any condition, including inability to monitor the barrier, that in the opinion of the Emergency Coordinator /EOF Director indicates LOSS or POTENTIAL LOSS of the NCS barrier. 			
6. Core Cooling <ul style="list-style-type: none"> Core cooling - RED path is indicated for > 15 min. Not applicable 					
7. Emergency Coordinator /EOF Director Judgement <ul style="list-style-type: none"> Any condition, including inability to monitor the barrier, that in the opinion of the Emergency Coordinator/EOF Director indicates LOSS or POTENTIAL LOSS of the containment barrier. 					

ENCLOSURE 4.2

SYSTEM MALFUNCTION

UNUSUAL EVENT

4.2.U.1 Inability to Reach Required Shutdown Within Technical Specification Limits

4.2.U.2 Unplanned Loss of Most or All Safety System Annunciation or Indication in the Control Room for Greater Than 15 Minutes

4.2.U.3 Fuel Clad Degradation

4.2.U.4 Reactor Coolant (NCS) System Leakage

4.2.U.5 Unplanned Loss of All Onsite or Offsite Communications

ALERT

4.2.A.1 Unplanned Loss of Most or All Safety System Annunciation or Indication in Control Room With Either:
(1) a Significant Transient in Progress, or
(2) Compensatory Non-Alarming Indicators Unavailable

SITE AREA EMERGENCY

4.2.S.1 Inability to Monitor a Significant Transient in Progress

GENERAL EMERGENCY

ENCLOSURE 4.3

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
4.3.U.1 Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the SLC Limits for 60 Minutes or Longer	4.3.A.1 Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the SLC Limits for 15 Minutes or Longer	4.3.S.1 Boundary Dose Resulting from an Actual or Imminent Release of Radioactivity Exceeds 100 mRem TEDE or 500 mRem CDE Adult Thyroid for the Actual or Projected Duration of the Release	4.3.G.1 Boundary Dose Resulting from an Actual or Imminent Release of Radioactivity that Exceeds 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid for the Actual or Projected Duration of the Release
4.3.U.2 Unexpected Increase in Plant Radiation or Airborne Concentration	4.3.A.2 Major Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel		
	4.3.A.3 Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown		

ENCLOSURE 4.4

LOSS OF SHUTDOWN FUNCTION

UNUSUAL EVENT**ALERT****SITE AREA EMERGENCY****GENERAL EMERGENCY**

4.4.A.1 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip Was Successful

4.4.A.2 Inability to Maintain Plant in Cold Shutdown

4.4.S.1 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip Was NOT Successful

4.4.S.2 Complete Loss of Function Needed to Achieve or Maintain Hot Shutdown

4.4.S.3 Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel

4.4.G.1 Failure of the Reactor Protection System to Complete an Automatic Trip and Manual Trip was NOT Successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core

ENCLOSURE 4.5

LOSS OF POWER

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
4.5.U.1 Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes	4.5.A.1 Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses During Cold Shutdown Or Refueling Mode	4.5.S.1 Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses	4.5.G.1 Prolonged Loss of All (Offsite and Onsite) AC Power
4.5.U.2 Unplanned Loss of Required DC Power During Cold Shutdown or Refueling Mode for Greater than 15 Minutes	4.5.A.2 AC power to essential busses reduced to a single power source for greater than 15 minutes such that an additional single failure could result in station blackout	4.5.S.2 Loss of All Vital DC Power	

ENCLOSURE 4.6
FIRE/EXPLOSION AND SECURITY EVENTS

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
4.6.U.1 Fire or Explosion Within Protected Area Boundary Not Extinguished Within 15 Minutes of Detection	4.6.A.1 Fire or Explosion Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown	4.6.S.1 Security Event in a Plant Vital Area	4.6.G.1 Security Event Resulting in Loss Of Ability to Reach and Maintain Cold Shutdown
4.6.U.2 Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant	4.6.A.2 Fire or Explosion Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown		
	4.6.A.3 Security Event in a Plant Protected Area		

ENCLOSURE 4.7

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
4.7.U.1 Natural and Destructive Phenomena Affecting the Protected Area	4.7.A.1 Natural and Destructive Phenomena Affecting the Plant Vital Area	4.7.S.1 Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established	4.7.G.1 Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of General Emergency
4.7.U.2 Release of Toxic or Flammable Gases Deemed Detrimental to Safe Operation of the Plant	4.7.A.2 Release of Toxic or Flammable Gases Within a Facility Structure Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown	4.7.S.2 Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of Site Area Emergency	
4.7.U.3 Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of an Unusual Event	4.7.A.3 Control Room Evacuation Has Been Initiated		
	4.7.A.4 Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of an Alert		

ENCLOSURE 2

Catawba Emergency Plan Section D

D. EMERGENCY CLASSIFICATION SYSTEM

Regulatory Guide 1.101, Rev. 3, August 1992, approved the guidance provided by NUMARC/NESP-007, Revision 2, as an alternative methodology for the development of Emergency Action Levels. Catawba Nuclear Site will use the NUMARC guidance for the development of initiating conditions and emergency action levels.

The emergency classification system utilizes four categories for classification of emergency events.

D.1.a UNUSUAL EVENT

Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

The purpose of this class is to provide notification of the emergency to the station staff, State and Local Government representatives, and the NRC.

Specific initiating conditions and their corresponding emergency action levels are provided in the Basis Document beginning on page D-4.

D.1.b ALERT

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

The purpose of this class is to assure that emergency personnel are readily available to:

1. Activate the onsite response centers
2. Respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required
3. Provide offsite authorities current status information

Specific initiating conditions and their corresponding emergency action levels are provided in the Basis Document beginning on page D-4.

D.1.c. SITE AREA EMERGENCY

Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels except near the site boundary.

The purpose of the Site Area Emergency is to:

1. Activate the offsite response centers
2. Assure that monitoring teams are mobilized
3. Assure that personnel required for taking protective actions of near site areas are at duty stations should the situation become more serious.
4. Provide current information to the public and be available for consultation with offsite authorities

Specific initiating conditions and their corresponding emergency action levels are provided in the Basis Document beginning on page D-4.

D.1.d. GENERAL EMERGENCY

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

The purpose of the General Emergency is to:

1. Initiate predetermined protective actions for the public
2. Provide continuous assessment of information from onsite and offsite measurements
3. Initiate additional measures as indicated by event releases or potential releases
4. Provide current information to the public and be available for consultation with offsite authorities

Specific initiating conditions and their corresponding emergency action levels are provided in the Basis Document beginning on page D-4.

D.2. INITIATING CONDITIONS

The initiating conditions and their corresponding emergency actions levels are contained in the BASIS document beginning on page D-4. A classification procedure (RP/0/A/5000/01) will be used to classify events as they occur. Specific response procedures are in place which delineate the required response during the appropriate classification.

**ENCLOSURE 4.1
BASIS INFORMATION FOR
FISSION PRODUCT BARRIER REFERENCE TABLE**

CONTAINMENT BARRIER EALs: (C. 1 or C. 2 or C. 3 or C. 4 or C. 5 or C. 6 or C. 7)

The Containment Barrier includes the containment building, its connections up to and including the outermost containment isolation valves. This barrier also includes the main steam, feedwater, and blowdown line extensions outside the containment building up to and including the outermost secondary side isolation valve.

Critical Safety Function (CSF) indications are not meant to include transient alarm conditions which may appear during the start-up of engineered safeguards equipment. A CSF condition is satisfied when the alarmed state is valid and sustained.

4.1.C.1 Critical Safety Function Status

Containment - RED indicates containment conditions which may challenge the containment integrity. Therefore, this condition represents a potential loss of the containment barrier.

There is no "Loss" EAL associated with this item.

4.1.C.2 Containment Conditions

Containment pressure above 15 psig (the design pressure) indicates that the containment or its heat removal systems are not functioning as intended. This degradation of containment pressure control represents a potential loss of containment integrity.

A containment hydrogen concentration of 9 volume percent is sufficient to expect that any ignition would result in complete combustion of the hydrogen in containment and a significant pressure rise. At some initial containment pressures, this pressure rise may exceed the capacity of the containment. Therefore, this level of hydrogen in the containment represents a potential loss of containment integrity.

Containment heat removal systems are actuated at the high-high containment pressure setpoint of 3 psig. At least one train of Containment Spray (NS) and one Containment Air (VX) Return Fan (CARF) should be actuated at that time (the CARF with a 10 minute delay). A failure to actuate the design basis heat removal capability or assure proper containment mixing represents a degradation in the control of the

containment conditions. Therefore, this situation represents a potential loss of containment integrity.

Rapid unexplained loss of pressure (i.e., not attributable to containment spray or condensation effects) following an initial pressure increase indicates a loss of containment integrity.

Containment pressure and sump levels should increase as a result of the mass and energy release into containment from a Loss of Coolant Accident (LOCA). Thus, sump level or containment pressure not increasing indicates an interfacing systems LOCA which is a containment bypass and a loss of containment integrity, or some other containment pressure boundary failure.

4.1.C.3 Containment Isolation Valve Status After Containment Isolation Actuation

Failure to isolate those containment pathways which would allow containment atmosphere to be released from containment is a loss of the containment barrier.

There is no "Potential Loss" EAL associated with this item.

4.1.C.4 Steam Generator (SG) Secondary Side Release With Primary To Secondary Leakage

Secondary side releases to atmosphere include those from the condenser air ejector, SG Power Operated Relief Valves (PORVs), atmospheric dump valves, faulted steam lines, and main steam safety valves. Steam releases, in combination with primary to secondary leakage, constitute a bypass of the containment and, therefore, a loss of the containment barrier.

The appropriate classification can be determined in combination with the SG Tube Rupture EAL under the Reactor Coolant System (NCS) barrier.

There is no "Potential Loss" EAL associated with this item.

4.1.C.5 Significant Radioactive Inventory in Containment

These values indicate significant fuel damage well in excess of the EALs associated with both loss of Fuel Clad and loss of NCS Barriers. 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%. 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.

By treating the radioactive inventory in containment as a potential loss, a General Emergency will be declared when the conditions of the fuel clad and NCS barriers are included in the evaluation. This will allow the appropriate protective actions to be recommended.

There is no "Loss" EAL associated with this item.

NOTE: If EMF-53A and EMF-53B are unavailable, readings can be calculated from procedure HP/O/B/1009/06, "Alternative Method for Determining Dose Rates within the Reactor Building."

4.1.C.6 Core Cooling

Core Cooling - RED for greater than 15 minutes in this potential loss EAL represents imminent core damage that, if not terminated, could lead to reactor vessel failure and an increased potential for containment failure. The potential for containment challenge as a result of events at reactor vessel failure makes it prudent to consider an unmitigated core damage condition as a potential loss of the containment barrier.

Severe accident analyses (e.g., NUREG-1150) have concluded that function restoration procedures can arrest core degradation within the reactor vessel in a significant fraction of the core damage scenarios, and that the likelihood of containment failure is very small in these events. Given this, it is appropriate to provide a reasonable period to allow function restoration procedures to arrest the core melt sequence. Whether or not the procedures will be effective should be apparent within 15 minutes. The Emergency Coordinator/EOF Director should make the declaration as soon as it is determined that the procedures have been, or will be, ineffective.

There is no "Loss" EAL associated with this item.

4.1.C.7 Emergency Coordinator/EOF Director Judgement

This EAL addresses any other factors that are to be used by the Emergency Coordinator/EOF Director in determining whether the containment barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Coordinator/EOF Director judgement that the barrier may be considered lost or potentially lost.

REACTOR COOLANT SYSTEM (NCS) BARRIER EALs: (N.1 or N. 2 or N. 3 or N.4 or N.5)

The NCS Barrier includes the NCS primary side and its connections up to and including the pressurizer safety and relief valves, and other connections up to and including the primary isolation valves.

4.1.N.1 Critical Safety Function Status

NCS Integrity - RED indicates NCS pressure and temperature conditions which may challenge the Reactor Vessel integrity. Heat Sink - RED indicates the ultimate heat sink function is under extreme challenge. Either of these conditions indicate a potential loss of the NCS Barrier.

There is no "Loss" EAL associated with this item.

4.1.N.2 NCS Leak Rate

Small leaks may result in the inability to maintain normal liquid inventory within the NCS by operation of the Chemical and Volume Control System, which is considered as one centrifugal charging pump discharging to the charging header with the letdown line isolated. If letdown cannot be isolated, and a second charging pump is required, this is still considered a potential loss of the NCS barrier. The need for compensatory action to maintain normal liquid inventory is an indication of a degraded NCS barrier and is considered to be a potential loss of the barrier.

The loss of subcooling is the fundamental indication that the inventory loss from the primary system exceeds the capacity of the inventory control systems. If the loss of subcooling is indicated, the NCS barrier is considered lost.

4.1.N.3 SG Tube Rupture

Small Steam Generator tube leaks may result in the inability to maintain normal liquid inventory within the Reactor Coolant System (NCS) by operation of the Chemical and Volume Control System, which is considered as one centrifugal charging pump discharging to the charging header with the letdown line isolated. If letdown cannot be isolated, and a second charging pump is required, this is still considered a potential loss of the NCS barrier. The need for compensatory action to maintain normal liquid inventory is an indication of a degraded NCS barrier and is considered to be a potential loss of the barrier.

A tube rupture with an unisolable secondary line fault is generally indicated by a reduction in primary coolant inventory, increased secondary radiation levels, and an uncontrolled or complete depressurization of the ruptured SG. This set of conditions represents a loss of the NCS and containment fission product barriers. In conjunction with containment barrier loss #4, this condition will result in the declaration of a Site Area Emergency. Escalation to a General Emergency would be indicated by at least a potential loss of the fuel clad barrier.

Secondary radiation increases should be observed via radiation monitoring of Condenser Air Ejector Discharge, SG Blowdown, Main Steam, and/or SG Sampling System. Determination of the "uncontrolled" depressurization of the ruptured SG 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 an EOP induced cooldown of the NCS that does not involve the prolonged release of contaminated secondary coolant from the affected SG to the environment. This EAL should encompass steam breaks, feed breaks, and stuck open safety or relief valves. These conditions represents a loss of the NCS and containment fission product barriers.

4.1.N.4 Containment Radiation Monitoring

An unplanned valid Trip II alarm on EMFs 38, 39, or 40 indicates the release of reactor coolant to the containment. This reading is not valid without a corresponding decrease in NCS inventory and increased makeup rate to the NCS. The Trip II setpoint is selected to ensure compliance with Selected Licensee Commitment 16.11-6. The indicated loss of reactor coolant is identification of a loss of the NCS barrier. This reading will be less than that specified for Fuel Clad Barrier EAL #3. Thus, this EAL would be indicative of a NCS leak only. If the radiation monitor reading increased to that specified by Fuel Clad Barrier EAL #3 fuel damage would also be indicated.

There is no "Potential Loss" EAL associated with this item.

4.1.N.5 Emergency Coordinator/EOF Director Judgement

This EAL addresses any other factors that are to be used by the Emergency Coordinator/EOF Director in determining whether the NCS barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Coordinator/EOF Director judgement that the barrier may be considered lost or potentially lost.

FUEL CLAD BARRIER EALs: (F.1 or F. 2 or F. 3 or F. 4)

The Fuel Clad Barrier is the zircalloy tubes that contain the fuel pellets.

4.1.F.1 Critical Safety Function Status

Core Cooling - ORANGE indicates subcooling has been lost and that some clad damage may occur. Heat Sink - RED indicates the ultimate heat sink function is under extreme challenge. Either of these conditions indicate a potential loss of the Fuel Clad Barrier.

Core Cooling - RED indicates significant reactor coolant superheating and core uncover. Clad damage under these conditions is likely; therefore, this is indication of loss of the Fuel Clad Barrier.

4.1.F.2 Primary Coolant Activity Level

The value of 300 $\mu\text{Ci/cc}$ I_{131} equivalent coolant activity is well above that expected for iodine spikes and corresponds to about 2% to 5% fuel clad damage. This amount of clad damage indicates significant clad damage and thus the Fuel Clad Barrier is considered lost.

There is no equivalent "Potential Loss" EAL for this item.

4.1.F.3 Containment Radiation Monitoring

A reading of 117 R/hr on EMF-53A or B is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the containment. Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage (approximately 5% clad failure depending on core inventory and NCS volume). This value is higher than that specified for NCS barrier Loss EAL #4. Thus, this EAL indicates a loss of both the fuel clad barrier and a loss of NCS barrier.

There is no "Potential Loss" EAL associated with this item.

NOTE: If EMF-53A and EMF-53B are unavailable, readings can be calculated from procedure HP/0/B/1009/06, "Alternative Method for determining Dose Rates within the Reactor Building."

4.1.F.4 Emergency Coordinator/EOF Director Judgement

This EAL addresses any other factors that are to be used by the Emergency Coordinator/EOF Director in determining whether the Fuel Clad barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Coordinator/EOF Director judgement that the barrier may be considered lost or potentially lost.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, BASIS INFORMATION FOR TABLE 4

ENCLOSURE 4.2
SYSTEM MALFUNCTION

UNUSUAL EVENT

4.2.U.1 Inability to Reach Required Shutdown Within Technical Specification Limits.

OPERATING MODE APPLICABILITY: **Mode 1 (Power Operation)**
 Mode 2 (Startup)
 Mode 3 (Hot Standby)
 Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

4.2.U.1-1 Plant is not brought to required operating mode within Technical Specifications LCO Action Statement Time.

BASIS:

Limiting Conditions of Operation (LCOs) require the plant to be brought to a required shutdown mode when the Technical Specification required configuration cannot be restored. Depending on the circumstances, this may or may not be an emergency or precursor to a more severe condition. In any case, the initiation of plant shutdown required by the site Technical Specifications requires a one hour report under 10 CFR 50.72 (b) Non-emergency events. The plant is within its safety envelope when being shut down within the allowable action statement time in the Technical Specifications. An immediate Notification of an Unusual Event is required when the plant is not brought to the required operating mode within the allowable action statement time in the Technical Specifications. **Declaration of an Unusual Event is based on the time at which the LCO-specified action statement time period elapses under the site Technical Specifications and is not related to how long a condition may have existed.** Other required Technical Specification shutdowns that involve precursors to more serious events are addressed by other System Malfunction, Hazards, or Fission Product Barrier Degradation ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SU2

SYSTEM MALFUNCTION

UNUSUAL EVENT

4.2.U.2 Unplanned Loss of Most or All Safety System Annunciation or Indication in the Control Room for Greater Than 15 Minutes.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)

Mode 2 (Startup)

Mode 3 (Hot Standby)

Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

4.2.U.2-1 The following conditions exist:

- a. Unplanned loss of most (>50%) annunciators associated with safety systems for greater than 15 minutes.

AND

- b. In the opinion of the Operations Shift Manager/Emergency Coordinator/EOF Director, the loss of the annunciators or indicators requires additional personnel (beyond normal shift compliment) to safely operate the unit.

BASIS:

This Initiating Condition (IC) and its associated EAL are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment. "Unplanned" loss of annunciators or indicator excludes scheduled maintenance and testing activities. Quantification of "most" is arbitrary; however, this judgement is supported by the specific opinion of the Operations Shift Manager/Emergency Coordinator/EOF Director that additional operating personnel will be required to provide increased monitoring of system operation to safely operate the unit. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This Unusual Event will be escalated to an Alert if a transient is in progress during the loss of annunciation or indication.

Due to the limited number of safety systems in operation during cold shutdown, refueling, and defueled modes, no IC is indicated during these modes of operation.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SU3

SYSTEM MALFUNCTION

UNUSUAL EVENT

4.2.U.3 Fuel Clad Degradation.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

4.2.U.3-1 Dose Equivalent I-131 greater than the Technical Specification allowable limit.

BASIS:

This IC is included as an Unusual Event because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems. The EAL addresses coolant samples exceeding coolant technical specifications for iodine spike. Escalation of this IC to the Alert level is via the Fission Product Barrier Degradation Monitoring ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SU4

SYSTEM MALFUNCTION

UNUSUAL EVENT

4.2.U.4 Reactor Coolant System (NCS) Leakage.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)

Mode 2 (Startup)

Mode 3 (Hot Standby)

Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVELS:

4.2.U.4-1 Unidentified leakage ≥ 10 gpm

4.2.U.4-2 Pressure boundary leakage ≥ 10 gpm

4.2.U.4-3 Identified leakage ≥ 25 gpm

BASIS:

This IC is included as an Unusual Event because it may be a precursor of more serious conditions and, as a result, is considered to be a potential degradation of the level of safety of the plant. The 10 gpm value for the unidentified and pressure boundary leakage was selected as it is observable with normal control room indications. Lesser values must generally be determined through time-consuming surveillance tests (e.g., mass balances). The EAL for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage. In either case, escalation of this IC to the Alert level is via Fission Product Barrier Degradation ICs or IC, "Inability to Maintain Plant in Cold Shutdown."

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SU5

SYSTEM MALFUNCTION

UNUSUAL EVENT

4.2.U.5 Unplanned Loss of All Onsite or Offsite Communications.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

4.2.U.5-1 Loss of all onsite communications capability (internal phone system, PA system, onsite radio system) affecting the ability to perform routine operations.

4.2.U.5-2 Loss of all offsite communications capability (Selective Signaling, NRC FTS lines, offsite radio system, commercial phone system) affecting the ability to communicate with offsite authorities.

BASIS:

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities. The loss of offsite communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

This EAL is intended to be used only when extraordinary means are being utilized to make communications possible (relaying of information from radio transmissions, individuals being sent to offsite locations, etc.).

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SU6

SYSTEM MALFUNCTION

ALERT

- 4.2.A.1** **Unplanned Loss of Most or All Safety System Annunciation or Indication in Control Room With Either (1) a Significant Transient in Progress, or (2) Compensatory Non-Alarming Indicators Unavailable.**

OPERATING MODE APPLICABILITY: **Mode 1 (Power Operation)**
 Mode 2 (Startup)
 Mode 3 (Hot Standby)
 Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

- 4.2.A.1-1** The following conditions exist:

- a. Unplanned loss of most (>50%) annunciators associated with safety systems for greater than 15 minutes.

AND

- b. In the opinion of the Operations Shift Manager/Emergency Coordinator/EOF Director, the loss of the annunciators or indicators requires additional personnel (beyond normal shift compliment) to safely operate the unit.

AND

- c. Either of the following:
- A significant plant transient is in progress.
 - Loss of the Operator Aid Computer (OAC).

BASIS:

This IC and its associated EAL are 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. Quantification of "Most" is arbitrary; however, this judgement is supported by the specific opinion of the Operations Shift Manager/Emergency Coordinator/EOF Director that additional operating personnel will be required to provide increased monitoring of system operation to safely operate the unit. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Refer to Operations Procedure OP/1(2)/A/6700/03, "Operating with OAC Out of Service."

"Significant Transient" includes response to automatic or manually initiated functions such as reactor trips, runbacks involving greater than 25% thermal power change, ECCS injections, or thermal power oscillations of 10% or greater.

Significant indication is available from the OAC. Loss of the OAC in conjunction with the loss of other indications would further impair the ability to monitor plant parameters.

Due to the limited number of safety systems in operation during cold shutdown, refueling and defueled modes, no IC is indicated during these modes of operation.

This Alert will be escalated to a Site Area Emergency if the operating crew cannot monitor the transient in progress.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SA4

SYSTEM MALFUNCTION

SITE AREA EMERGENCY

4.2.S.1 Inability to Monitor a Significant Transient in Progress.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)
Mode 2 (Startup)
Mode 3 (Hot Standby)
Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

4.2.S.1-1 The following conditions exist:

- a. Unplanned loss of most (>50%) annunciators associated with safety systems for greater than 15 minutes.

AND

- b. A significant plant transient is in progress.

AND

- c. Loss of the OAC.

AND

- d. Inability to provide manual monitoring, independent of the OAC Critical Safety Function Status Tree program, of any one of the following Critical Safety Functions:
 - subcriticality
 - core cooling
 - heat sink
 - containment

BASIS:

This IC and its associated EAL are intended to recognize the inability of the control room staff to monitor the plant response to a transient. A Site Area Emergency is considered to exist if the control room staff cannot monitor safety functions needed for protection of the public.

"Significant Transient" includes response to automatic or manually initiated functions such as trips, runbacks involving greater than 25% thermal power change, ECCS injections, or thermal power oscillations of 10% or greater.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SS6

ENCLOSURE 4.3
ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

UNUSUAL EVENT

4.3.U.1 Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the SLC Limits for 60 Minutes or Longer.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

4.3.U.1-1 a. A valid TRIP 2 alarm on radiation monitor EMF-49L or EMF-57

AND

b. Failure of the release path to automatically isolate

AND

c. The liquid radioactive release to the environment exceeds two times the SLC limit for 60 minutes or longer.

4.3.U.1-2 A valid indication on radiation monitor EMF-36L of $\geq 1.08 \text{ E}+04$ cpm for ≥ 60 minutes.

4.3.U.1-3 Gaseous effluent being released exceeds two times SLC 16.11-1 for ≥ 60 minutes as determined by Radiation Protection (RP) procedure.

4.3.U.1-4 Liquid effluent being released exceeds two times SLC 16.11-6 for ≥ 60 minutes as determined by RP procedure.

NOTE: If monitor reading is sustained for the time period indicated in the EAL **and** the required assessments (procedure calculations) cannot be completed within this period, declaration must be made based on the valid radiation monitor reading.

BASIS:

The term "Unplanned", as used in this context, includes any release for which a liquid waste release (LWR) or gaseous waste release (GWR) package was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm set points, etc.) on the applicable package.

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

Unplanned releases in excess of two times the site Selected Licensee Commitments (SLC) that continue for 60 minutes or longer represent an uncontrolled situation and hence, a potential degradation in the level of safety. It is not intended that the release be averaged over 60 minutes. The event should be declared as soon as it is determined that the release duration has or will likely exceed 60 minutes.

The gaseous release rate SLC are based on limiting gaseous release rates to the SITE BOUNDARY to 500 mr/year total body.

The liquid release rate SLC are based on limiting liquid release rates to the UNRESTRICTED AREA to 10 times the Effluent Concentration (EC) values given in 10CFR20.1001-20.2401, Appendix B, Table 2, Column 2.

Monitor indications are based on the methodology of the site Offsite Dose Calculation Manual (ODCM) using most restrictive dispersion coefficient $3.51\text{E-}5 \text{ sec/m}^3$. Worst case annual average meteorology has been used. Radiation Protection will use HP/O/B/1009/23, "Investigation of Unusual Radiological Occurrences" to quantify a release.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, AU1

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

UNUSUAL EVENT

4.3.U.2 Unexpected Increase in Plant Radiation or Airborne Concentration.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.3.U.2-1** Indication of uncontrolled water level decrease of greater than 6 inches in the reactor refueling cavity with all irradiated fuel assemblies remaining covered by water.
- 4.3.U.2-2** Uncontrolled water level decrease of greater than 6 inches in the spent fuel pool and fuel transfer canal with all irradiated fuel assemblies remaining covered by water.
- 4.3.U.2-3** Unplanned **valid** area radiation monitor (EMF) reading increases by a factor of 1000 over normal levels.

BASIS:

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

All of the above events tend to have long lead times relative to potential for radiological release outside the site boundary; thus, impact to public health and safety is very low.

In light of reactor cavity seal failure incidents, explicit coverage of these types of events via EALs 1 and 2 is appropriate given their potential for increased doses to plant staff. A threshold value of 6 inches is used to allow time for mitigating actions to successfully terminate the inventory loss. Credit should not be taken for inventory additions to maintain level above the 6 inch threshold. Classification as an Unusual Event is warranted as a precursor to a more serious event.

EAL 3 addresses unplanned increases in in-plant radiation levels that represent a degradation in the control of radioactive material, and represent a potential degradation in the level of safety of the plant. This EAL escalates to an Alert if the increases impair safe operation.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, AU2

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

ALERT

- 4.3.A.1 Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the SLC limits for 15 Minutes or Longer.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.3.A.1-1** a. A valid TRIP 2 alarm on radiation monitor EMF-49L or EMF-57

AND

- b. Failure of the release path to automatically isolate

AND

- c. The liquid radioactive release to the environment exceeds 200 times the SLC limit for 15 minutes or longer.

- 4.3.A.1-2** A valid indication on radiation monitor EMF-36L of $\geq 1.08 \text{ E}+06$ cpm for ≥ 15 minutes.

- 4.3.A.1-3** Gaseous effluent being released exceeds 200 times the level of SLC 16.11-1 for ≥ 15 minutes as determined by RP procedure.

- 4.3.A.1-4** Liquid effluent being released exceeds 200 times the level of SLC 16.11-6 for ≥ 15 minutes as determined by RP procedure.

NOTE: If monitor reading is sustained for the time period indicated in the EAL and the required assessments (procedure calculations) cannot be completed within this period, declaration must be made based on the valid radiation monitor reading.

BASIS:

The term "Unplanned", as used in this context, includes any release for which a liquid waste release (LWR) or gaseous waste release (GWR) package was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm set points, etc.) on the applicable package.

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

This event escalates from the Unusual Event by escalating the magnitude of the release by a factor of 100.

It is not intended that the release be averaged over 15 minutes. The event should be declared as soon as it is determined that the release duration has or will likely exceed 15 minutes.

The gaseous release rate SLC are based on limiting gaseous release rates to the SITE BOUNDARY to 500 mr/year total body.

The liquid release rate SLC are based on limiting liquid release rates to the UNRESTRICTED AREA to 10 times the Effluent Concentration (EC) values given in 10CFR20.1001-20.2401, Appendix B, Table 2, Column 2.

Monitor indications are based on the methodology of the site Offsite Dose Calculation Manual (ODCM) using most restrictive dispersion coefficient $3.51\text{E-}5 \text{ sec/m}^3$. Worst case annual average meteorology has been used. Radiation Protection will use HP/O/B/1009/23, "Investigation of Unusual Radiological Occurrences" to quantify a release.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, AA1

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

ALERT

- 4.3.A.2 Major Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.3.A.2-1** An unplanned valid trip II alarm on any of the following radiation monitors:

- a. Spent Fuel Building Refueling Bridge

1EMF-15

2EMF-4

- b. Spent Fuel Pool Ventilation

1EMF-42

2EMF-42

- c. Reactor Building Refueling Bridge

1EMF-17

2EMF-2

- d. Containment Noble Gas Monitors

1EMF-39

2EMF-39

- 4.3.A.2-2** Plant personnel report that water level drop in reactor refueling cavity, spent fuel pool, or fuel transfer canal has or will exceed makeup capacity such that irradiated fuel will become uncovered.

- 4.3.A.2-3** NC system wide range level < 95 % after initiation of NC system make-up

AND

Any irradiated fuel assembly not capable of being lowered into spent fuel pool or reactor vessel

AND

KF-122 cannot be closed.

BASIS:

This IC applies to spent fuel requiring water coverage. There is time available to take corrective actions, and there is little potential for substantial fuel damage. Thus, an Alert Classification for this event is appropriate. Escalation, if appropriate, would occur via Abnormal Rad Level/Radiological Effluent or Emergency Coordinator/EOF Director Judgement.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, AA2

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

ALERT

- 4.3.A.3 Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.3.A.3-1** Valid radiation monitor reading indicating greater than 15 mR/hr in the control room or PAP.
- 4.3.A.3-2** Valid radiation monitor reading of >5 R/hr in a plant vital area.

BASIS:

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

This initiating condition (IC) addresses increased radiation levels that impede necessary access to operating stations, or other areas containing equipment that must be operated manually, in order to maintain safe operation or perform a safe shutdown. It is this impaired ability to operate the plant that results in the actual or potential substantial degradation of the level of safety of the plant.

This IC is not intended to apply to anticipated temporary increases due to planned events (e.g., incore detector movement, radwaste container movement, depleted resin transfers, etc.)

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, AA3

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

SITE AREA EMERGENCY

- 4.3.S.1 Boundary Dose Resulting from an Actual or Imminent Release of Radioactivity Exceeds 100 mRem TEDE or 500 mRem CDE Adult Thyroid for the Actual or Projected Duration of the Release.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.3.S.1-1** A valid indication on radiation monitor EMF-36L $\geq 1.08 \text{ E } +07$ cpm.
- 4.3.S.1-2** Dose assessment team calculations indicate dose consequences greater than 100 mRem TEDE or 500 mRem CDE Adult Thyroid at the site boundary.
- 4.3.S.1-3** Analysis of field survey results or field survey samples indicates dose consequences greater than 100 mRem TEDE or 500 mRem CDE Adult Thyroid at the site boundary.

NOTE 1: These EMF readings are calculated based on worst case average annual meteorology, a sixty minute release duration, and design unit vent flow rate. Calculations by the dose assessment team use actual meteorology, duration, and unit vent flow rate. Therefore, these EMF readings should not be used if dose assessment team calculations are available.

NOTE 2: If dose assessment team calculations cannot be completed in 15 minutes, then valid monitor readings should be used for emergency classification.

BASIS:

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

The 100 mRem integrated dose in this initiating condition is based on 10 CFR 20 annual average population exposure. This value also provides a desirable gradient (one order of magnitude) between the Alert, Site Area Emergency, and General Emergency classes. These values are 10% of the EPA Protective Action Guide (PAG) values given in EPA-400-R-92-001.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, ASI

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

GENERAL EMERGENCY

- 4.3.G.1 Boundary Dose Resulting from an Actual or Imminent Release of Radioactivity that Exceeds 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid for the Actual or Projected Duration of the Release.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.3.G.1-1** A valid indication on radiation monitor EMF-36H $\geq 1.72 \text{ E } +04$ cpm.
- 4.3.G.1-2** Dose assessment team calculations indicate dose consequences greater than 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid at the site boundary.
- 4.3.G.1-3** Analysis of field survey results or field survey samples indicates dose consequences greater than 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid at the site boundary.

NOTE 1: These EMF readings are calculated based on worst case average annual meteorology, a sixty minute release duration, and design unit vent flow rate. Calculations by the dose assessment team use actual meteorology, duration, and unit vent flow rate. Therefore, these EMF readings should not be used if dose assessment team calculations are available.

NOTE 2: If dose assessment team calculations cannot be completed in 15 minutes, then valid monitor readings should be used for emergency classification.

BASIS:

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

The 1000 mRem TEDE and 5000 mRem CDE thyroid integrated doses are based on the EPA PAG values given in EPA-400-R-92-001, which indicates that public protective actions are indicated if doses exceed these values. This is consistent with the emergency class description of a general emergency.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, AGI

ENCLOSURE 4.4
LOSS OF SHUTDOWN FUNCTIONS

ALERT

- 4.4.A.1 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip Was Successful.**

OPERATING MODE APPLICABILITY: **Mode 1 (Power Operation)**
 Mode 2 (Startup)
 Mode 3 (Hot Standby)

EMERGENCY ACTION LEVEL:

- 4.4.A.1-1** The following conditions exist:

- a. Valid reactor trip signal received or required.

AND

- b. Manual reactor trip from the control room is successful and reactor power is less than 5% and decreasing.

BASIS:

This condition indicates failure of the automatic protection system to trip 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 NCS. 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 trip is any set of actions by the reactor operator(s) at the reactor control console which causes control rods to be RAPIDLY inserted into the core and brings the reactor subcritical. Operator action to drive rods does NOT constitute a reactor trip, i.e. does not meet the rapid insertion criterion.

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

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SA2

LOSS OF SHUTDOWN FUNCTIONS

SITE AREA EMERGENCY

4.4.S.1 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip WAS NOT Successful.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)

EMERGENCY ACTION LEVEL:

4.4.S.1-1 The following conditions exist:

- a. Valid reactor trip signal received or required.

AND

- b. Manual reactor trip from the control room was not successful in reducing reactor power to less than 5% and decreasing.

BASIS:

Automatic and manual trip are not considered successful if action away from the reactor control console is required to trip the reactor. This EAL is equivalent to the Subcriticality CSF-RED.

Under these conditions, the reactor is producing more heat than the maximum decay heat load for which the safety systems are designed. A Site Area Emergency is indicated because conditions exist that lead to imminent loss or potential loss of both fuel clad and NCS. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response. Escalation of this event to a General Emergency would be via Fission Product Barrier Degradation or Emergency Coordinator/EOF Director Judgement ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SS2

LOSS OF SHUTDOWN FUNCTIONS

SITE AREA EMERGENCY

4.4.S.2 Complete Loss of Function Needed to Achieve or Maintain Hot Shutdown.

OPERATING MODE APPLICABILITY: **Mode 1 (Power Operation)**
 Mode 2 (Startup)
 Mode 3 (Hot Standby)
 Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVELS:

4.4.S.2-1 Core Cooling CSF-RED

4.4.S.2-2 Heat Sink CSF-RED

4.4.S.2-3 Subcriticality CSF-RED

BASIS:

This EAL addresses complete loss of functions, including ultimate heat sink and reactivity control, required for hot shutdown with the reactor at pressure and temperature. Under these conditions, there is an actual major failure of a system intended for protection of the public. Thus, declaration of a Site Area Emergency is warranted. Escalation to General Emergency would be via Abnormal Rad Levels/Radiological Effluent, Emergency Coordinator/EOF Director Judgement, or Fission Product Barrier Degradation ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SS4

LOSS OF SHUTDOWN FUNCTIONS

SITE AREA EMERGENCY

4.4.S.3 Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel.

OPERATING MODE APPLICABILITY: **Mode 5 (Cold Shutdown)**
 Mode 6 (Refueling)

EMERGENCY ACTION LEVELS:

4.4.S.3-1 a. Failure of heat sink causes loss of cold shutdown conditions.

AND

b. Lower range Reactor Vessel Level Indication System (RVLIS) decreasing after initiation of NC system makeup.

4.4.S.3-2 a. Failure of heat sink causes loss of cold shutdown conditions.

AND

b. Reactor Coolant (NC) system narrow range level less than 11% and decreasing after initiation of NC system makeup.

4.4.S.3-3 a. Failure of heat sink causes loss of cold shutdown conditions.

AND

b. Either train ultrasonic level indication less than 7.25% and decreasing after initiation of NC system makeup.

BASIS:

Under the conditions specified by this IC, severe core damage may be imminent due to prolonged boiling following loss of decay heat removal.

Thus, declaration of a Site Area Emergency is warranted under the conditions specified by the IC. Escalation to a General Emergency is via radiological effluent IC.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SS5

LOSS OF SHUTDOWN FUNCTIONS

GENERAL EMERGENCY

4.4.G.1 Failure of the Reactor Protection System to Complete an Automatic Trip and Manual Trip was NOT Successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)

EMERGENCY ACTION LEVEL:

4.4.G.1-1 The following conditions exist:

- a. Valid reactor trip signal received or required.

AND

- b. Manual reactor trip from the control room was not successful in reducing reactor power to less than 5% and decreasing.

AND

- c. Either of the following conditions exist:
 - Core Cooling CSF-RED
 - Heat Sink CSF-RED

BASIS

Automatic and manual trip are not considered successful if action away from the reactor control console is required to trip the reactor.

Under the conditions of this IC and its associated EALs, the efforts to bring the reactor subcritical have been unsuccessful and, as a result, the reactor is producing more heat than the maximum decay heat load for which the safety systems were designed.

The extreme challenge to the ability to cool the core is intended to mean that the core exit temperatures are at or approaching 1200°F or that the reactor vessel water level is below the top of active fuel. This equates to a Core Cooling-RED condition.

Another consideration is the inability to initially remove heat during the early stages of this sequence. If emergency feedwater flow is insufficient to remove the amount of heat required by

design from at least one steam generator, an extreme challenge should be considered to exist. This equates to a Heat Sink-RED condition.

In the event either of these challenges occurs during or following a time that the reactor has not been brought below the power associated with the safety system design, core damage may be imminent. For this reason, the General Emergency declaration is intended to be anticipatory of the fission product barrier matrix declaration to permit maximum offsite intervention time.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SG2

ENCLOSURE 4.5
LOSS OF POWER

UNUSUAL EVENT

4.5.U.1 Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

4.5.U.1-1 The following conditions exist:

- a. Loss of offsite power to essential buses ETA and ETB for greater than 15 minutes.

AND

- b. Each emergency diesel generator is supplying power to its respective essential bus.

BASIS:

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.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SU1

LOSS OF POWER

UNUSUAL EVENT

4.5.U.2 Unplanned Loss of Required DC Power During Cold Shutdown or Refueling Mode for Greater than 15 Minutes.

OPERATING MODE APPLICABILITY: Mode 5 (Cold Shutdown)
Mode 6 (Refueling)

EMERGENCY ACTION LEVEL:

4.5.U.2-1 The following conditions exist:

- a. Unplanned loss of both unit related busses: EBA and EBD both < 112 VDC, and EBB and EBC both < 109 VDC.

AND

- b. Failure to restore power to at least one required DC bus within 15 minutes from the time of loss.

BASIS:

The purpose of this IC and its associated EALs is to recognize a loss of DC power compromising the ability to monitor and control the removal of decay heat during Cold Shutdown or Refueling operations. This EAL is intended to be anticipatory in as much as the operating crew may not have necessary indication and control of equipment needed to respond to the loss.

"Unplanned" is included in this IC and EAL to preclude the declaration of an emergency as a result of planned maintenance activities.

If this loss results in the inability to maintain cold shutdown, the escalation to an Alert is via "Inability to Maintain Plant in Cold Shutdown."

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SU7

LOSS OF POWER

ALERT

4.5.A.1 Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses During Cold Shutdown Or Refueling Mode.

OPERATING MODE APPLICABILITY: Mode 5 (Cold Shutdown)
Mode 6 (Refueling)
No Mode (Defueled)

EMERGENCY ACTION LEVEL:

4.5.A.1-1 Loss of all offsite and onsite AC power as indicated by:

- a. Loss of power on essential buses ETA and ETB.

AND

- b. Failure to restore power to at least one essential bus within 15 minutes.

BASIS:

Loss of all AC power compromises all plant safety systems requiring electric power including Residual Heat Removal (RHR), Emergency Core Cooling Systems (ECCS), Containment Heat Removal, Spent Fuel Heat Removal and the Ultimate Heat Sink. When in cold shutdown, refueling, or defueled mode the event can be classified as an Alert, because of the significantly reduced decay heat, lower temperature and pressure, increasing the time to restore one of the essential busses, relative to that specified for the Site Area Emergency EAL. Escalating to Site Area Emergency, if appropriate, is by Abnormal Rad Levels/Radiological Effluent, or Emergency Coordinator/EOF Director Judgement ICs. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SAI

LOSS OF POWER**ALERT**

- 4.5.A.2** AC power to essential busses reduced to a single power source for greater than 15 minutes such that an additional single failure could result in station blackout.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)
 Mode 2 (Startup)
 Mode 3 (Hot Standby)
 Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

- 4.5.A.2-1** The following condition exists:

AC power capability has been degraded to one essential bus powered from a single power source for > 15 min. due to the loss of all but one of:

SATA
SATB
ATC
ATD
D/G A
D/G B

BASIS:

This IC and the associated EAL is intended to provide an escalation from IC, "Loss of All Offsite Power To Essential Busses for Greater Than 15 Minutes." The condition indicated by this IC is the degradation of the offsite and onsite power systems such that an additional single failure could result in a station blackout. This condition could occur due to a loss of offsite power with a concurrent failure of one emergency generator to supply power to its essential busses. Another related condition could be the loss of all offsite power and loss of onsite emergency diesels with only one train of essential busses being back fed from the unit main generator, or the loss of onsite emergency diesels with only one train of essential busses being back fed from offsite power. The subsequent loss of this single power source would escalate the event to a Site Area Emergency in accordance with IC, "Loss of All Offsite and Loss of All Onsite AC Power to Essential Busses."

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SA5

LOSS OF POWER

SITE AREA EMERGENCY

4.5.S.1 Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)
 Mode 2 (Startup)
 Mode 3 (Hot Standby)
 Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

4.5.S.1-1 Loss of all offsite and onsite AC power as indicated by:

- a. Loss of power on essential buses ETA and ETB.

AND

- b. Failure to restore power to at least one essential bus within 15 minutes.

BASIS:

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.

Escalation to General Emergency is via Fission Product Barrier Degradation or IC, "Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power."

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SS1

LOSS OF POWER

SITE AREA EMERGENCY

4.5.S.2 Loss of All Vital DC Power.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)
Mode 2 (Startup)
Mode 3 (Hot Standby)
Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

4.5.S.2-1 The following conditions exist:

- a. Unplanned loss of both unit related busses: EBA and EBD both < 112 VDC, and EBB and EBC both < 109 VDC.

AND

- b. Failure to restore power to at least one required DC bus within 15 minutes from the time of loss.

BASIS:

Loss of all DC power compromises 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 system. Escalation to a General Emergency would occur by Abnormal Rad Levels/Radiological Effluent, Fission Product Barrier Degradation, or Emergency Coordinator/EOF Director Judgement ICs. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SS3

LOSS OF POWER

GENERAL EMERGENCY

4.5.G.1 Prolonged Loss of All (Offsite and Onsite) AC Power.

OPERATING MODE APPLICABILITY: **Mode 1 (Power Operation)**
 Mode 2 (Startup)
 Mode 3 (Hot Standby)
 Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

4.5.G.1-1 Prolonged loss of all offsite and onsite AC power as indicated by:

- a. Loss of power on essential buses ETA and ETB for greater than 15 minutes.

AND

- b. Standby Shutdown Facility (SSF) fails to maintain hot standby

AND

- c. At least one of the following conditions exist:

- Restoration of at least one essential bus within 4 hours is *NOT* likely.
- Indication of continuing degradation of core cooling based on Fission Product Barrier monitoring.

BASIS:

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 those functions necessary to maintain hot shutdown will lead to loss of fuel clad, NCS, and containment.

The SSF is capable of providing the necessary functions to maintain a hot shutdown condition for up to 72 hours. No fission product barrier degradation would be expected if the SSF is functioning as intended.

Analysis in support of the station blackout coping study indicates that the plant can cope with a station blackout for 4 hours without core damage.

The likelihood of restoring at least one essential 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 Coordinator/EOF Director a reasonable idea of how quickly (s)he 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 the 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 Coordinator/EOF Director judgement as it relates to IMMINENT Loss or Potential Loss of fission product barriers and degraded ability to monitor fission product barriers.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, SG1

ENCLOSURE 4.6
FIRE/EXPLOSION AND SECURITY EVENTS

UNUSUAL EVENT

4.6.U.1 Fire or Explosion Within Protected Area Boundary Not Extinguished Within 15 Minutes of Detection.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

4.6.U.1-1 Fire in any of the following areas not extinguished within 15 minutes of control room notification or verification of a control room fire alarm.

- Reactor Building
- Auxiliary Building
- Diesel Generator Rooms
- Control Room
- RN Pumphouse
- Standby Shutdown Facility (SSF)
- Central Alarm Station (CAS)
- Doghouses
- Refueling Water Storage Tank (FWST)
- Turbine Building
- Service Building
- Interim Radwaste Building

4.6.U.1-2 Report by plant personnel of an unanticipated explosion within protected area boundary resulting in visible damage to permanent structure or equipment.

BASIS:

EAL 1: The purpose of this EAL is to address the magnitude and extent of fires that may be potentially significant precursors to damage to safety systems. Fire is combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute fires. Observation of flames is preferred but is NOT required if large quantities of smoke and heat are observed. This excludes such items as fires within administration buildings outside the protected area. Waste-basket fires, and other small fires of no safety consequence should easily be extinguished within 15 minutes of detection. This IC applies to buildings and areas contiguous to plant vital areas or other significant buildings or 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.

EAL 2: Only those explosions of sufficient force to damage permanent structures or equipment within the protected area should be considered. As used here, an explosion is a rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment, that potentially imparts significant energy to near-by structures and materials. No attempt is made in this EAL to assess the actual magnitude of the damage. The occurrence of the explosion with reports of evidence of damage (e.g., deformation, scorching) is sufficient for declaration. The Emergency Coordinator/EOF Director also needs to consider any security aspects of the explosion, if applicable.

Escalation to a higher emergency class is by, "Fire Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown".

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HU2

FIRE/EXPLOSION AND SECURITY EVENTS

UNUSUAL EVENT

4.6.U.2 Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

4.6.U.2-1 Security confirmed bomb device discovered within plant Protected Area and outside Vital Areas.

4.6.U.2-2 Hostage situation/extortion

4.6.U.2-3 A violent civil disturbance within the owner controlled area.

BASIS:

The above situations represent a potential degradation in the level of safety of the plant.

A civil disturbance is to be considered violent when force has been used in an attempt to injure site personnel or damage plant property.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HU4

FIRE/EXPLOSION AND SECURITY EVENTS

ALERT

4.6.A.1 Fire or Explosion Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.

OPERATING MODE APPLICABILITY: Mode 1 (Power Operation)
 Mode 2 (Startup)
 Mode 3 (Hot Standby)
 Mode 4 (Hot Shutdown)

EMERGENCY ACTION LEVEL:

4.6.A.1-1 The following conditions exist:

- a. Fire or explosion in any of the following areas:
 - Reactor Building
 - Auxiliary Building
 - Diesel Generator Rooms
 - Control Room
 - RN Pumphouse
 - SSF
 - CAS
 - Doghouses
 - FWST

AND

- b. One of the following:
 - Affected safety system parameter indications show degraded performance
 - Plant personnel report visible damage to permanent structures or equipment within the specified area.

Note: Only one train of a system needs to be affected or damaged in order to satisfy this condition.

BASIS:

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 a catastrophic failure of pressurized equipment, that potentially imparts significant energy to nearby structures and materials. Fire is combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute fires. Observation of flames is preferred but is NOT required if large quantities of smoke and heat are observed. The inclusion of a "report of visible damage" should not be interpreted as mandating a lengthy damage assessment prior to classification.

The key to classifying fires/explosions as an Alert is the damage as a result of the incident. The fact that safety-related equipment required for safe shutdown of the unit has been affected or damaged as a result of the fire/explosion is the driving force for declaring the Alert. **It is important to note that this EAL addresses a fire/explosion and not just the degradation of a safety system. The reference to damage of the systems is used to identify the magnitude of the fire/explosion and to discriminate against minor fires/explosions.**

Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels/Radiological Effluent, or Emergency Coordinator/EOF Director Judgement ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HA2

FIRE/EXPLOSION AND SECURITY EVENTS

ALERT

4.6.A.2 Fire or Explosion Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.

OPERATING MODE APPLICABILITY: **Mode 5 (Cold Shutdown)**
 Mode 6 (Refueling)

EMERGENCY ACTION LEVEL:

4.6.A.2-1 The following conditions exist:

a. Fire or explosion in any of the following areas:

- Reactor Building
- Auxiliary Building
- Diesel Generator Rooms
- Control Room
- RN Pumphouse
- SSF
- CAS
- FWST

AND

b. One of the following:

- Affected safety system parameter indications show degraded performance
- Plant personnel report visible damage to permanent structures or equipment within the specified area.

Note: Only one train of a system needs to be affected or damaged in order to satisfy this condition.

BASIS:

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 a catastrophic failure of pressurized equipment, that potentially imparts significant energy to nearby structures and materials. Fire is combustion characterized by heat and light. Sources of

smoke such as slipping drive belts or overheated electrical equipment do not constitute fires. Observation of flames is preferred but is NOT required if large quantities of smoke and heat are observed. The inclusion of a "report of visible damage" should not be interpreted as mandating a lengthy damage assessment prior to classification.

The key to classifying fires/explosions as an Alert is the damage as a result of the incident. The fact that safety-related equipment required for safe shutdown of the unit has been affected or damaged as a result of the fire/explosion is the driving force for declaring the Alert. **It is important to note that this EAL addresses a fire/explosion and not just the degradation of a safety system. The reference to damage of the systems is used to identify the magnitude of the fire/explosion and to discriminate against minor fires/explosions.**

Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels/Radiological Effluent, or Emergency Coordinator/EOF Director Judgement ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HA2

FIRE/EXPLOSION AND SECURITY EVENTS

ALERT

4.6.A.3 Security Event in a Plant Protected Area.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

4.6.A.3-1 Intrusion into plant protected area by a hostile force.

BASIS:

This class of security events represents an escalated threat to plant safety above that contained in the Unusual Event. 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 Area Emergency.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HA4

FIRE/EXPLOSION AND SECURITY EVENTS

SITE AREA EMERGENCY

4.6.S.1 Security Event in a Plant Vital Area.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

4.6.S.1-1 Intrusion into any of the following plant areas by a hostile force:

- Reactor Building
- Auxiliary Building
- Diesel Generator Rooms
- Control Room
- RN Pumphouse
- SSF
- Doghouses
- CAS

4.6.S.1-2 Security confirmed bomb discovered/exploded in a vital area.

4.6.S.1-3 Security confirmed sabotage in a plant vital area.

BASIS:

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

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HSI

FIRE/EXPLOSION AND SECURITY EVENTS

GENERAL EMERGENCY

- 4.6.G.1 Security Event Resulting in Loss Of Ability to Reach and Maintain Cold Shutdown.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.6.G.1-1** Loss of physical control of the control room due to security event.
- 4.6.G.1-2** Loss of physical control of the SSF and Auxiliary Shutdown Panel (ASP) due to security event.

BASIS:

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

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HG1

ENCLOSURE 4.7
NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

UNUSUAL EVENT

4.7.U.1 Natural and Destructive Phenomena Affecting the Protected Area.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.7.U.1-1** Tremor felt and valid alarm on the "strong motion accelerograph".
- 4.7.U.1-2** Tremor felt and valid alarm on the "Peak shock annunciator".
- 4.7.U.1-3** Report by plant personnel of tornado striking within protected area boundary.
- 4.7.U.1-4** Vehicle crash into plant structures or systems within protected area boundary.
- 4.7.U.1-5** Report of turbine failure resulting in casing penetration or damage to turbine or generator seals.

BASIS:

The protected area boundary is typically that part within the security isolation zone and is defined in the site security plan.

EALs 1&2: Damage may be caused to some portions of the site, but should not affect 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, and (b) valid alarm on seismic instrumentation occurs.

EAL 3: A tornado striking (touching down) within the protected boundary may have potentially damaged plant structures containing functions or systems required for safe shutdown of the plant. If such damage is confirmed visually or by other in-plant indications, the event may be escalated to Alert.

EAL 4: Addresses such items as a car, truck, plane, helicopter, or train crash that may potentially damage plant structures containing functions and systems required for safe shutdown of the plant. If the crash is confirmed to affect a plant vital area, the event may be escalated to Alert.

EAL 5: Addresses main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the turbine generator. Of major concern is the potential for leakage of combustible fluids (lubricating oils) and gases (hydrogen cooling) to the plant environs. Actual fires and flammable gas build up are appropriately classified via other EALs. This EAL is consistent with the definition of an Unusual Event while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment. Escalation of the emergency classification is based on potential damage done by the missiles generated by the failure or by the radiological releases in conjunction with a steam generator tube rupture. These latter events would be classified by the Radiological ICs or Fission Product Barrier ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HU1

NOTE: NUMARC EAL #5 moved to Fire/Security Recognition Category

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

UNUSUAL EVENT

4.7.U.2 Release of Toxic or Flammable Gases Deemed Detrimental to Safe Operation of the Plant.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

4.7.U.2-1 Report or detection of toxic or flammable gases that could enter within the site area boundary in amounts that can affect safe operation of the plant.

4.7.U.2-2 Report by Local, County or State Officials for potential evacuation of site personnel based on offsite event.

BASIS:

This IC is based on releases in concentrations within the site boundary that will affect the health of plant personnel or the safe operation of the plant with the plant being within the evacuation area of an offsite event (i.e., tanker truck accident releasing toxic gases, etc.).

Gases within the owner controlled area that are below life threatening or flammable concentrations do not meet this EAL.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HU3

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

UNUSUAL EVENT

- 4.7.U.3 Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of an Unusual Event.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

- 4.7.U.3-1** Other conditions exist which in the judgement of the Emergency Coordinator/EOF Director indicate a potential degradation of the level of safety of the plant.

BASIS:

This EAL 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 Coordinator/EOF Director to fall under the Unusual Event emergency class.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HU5

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

ALERT

4.7.A.1 Natural and Destructive Phenomena Affecting the Plant Vital Area.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

4.7.A.1-1 Valid seismic accelerations greater than the operating basis earthquake (OBE):

0.08 g horizontal

OR

0.053 g vertical.

4.7.A.1-2 Tornado or high winds:

Tornado striking plant structures within the vital area

OR

sustained winds ≥ 74 mph for > 15 minutes.

4.7.A.1-3 Turbine failure generated missiles, vehicle crashes or other catastrophic events causing visible structural damage on any of the following plant structures:

- Reactor Building
- Auxiliary Building
- Refueling Water Storage Tank (FWST)
- Diesel Generator Rooms
- Control Room
- RN Pumphouse
- Standby Shutdown Facility (SSF)
- Doghouses
- Central Alarm Station (CAS)

BASIS:

EAL 1: Based on the FSAR design basis. Seismic events of this magnitude ($> OBE$) can cause damage to safety functions.

EAL 2: Based on the available instrumentation (90 mph maximum range) and the FSAR design basis, which is 95 mph. Wind loads of this magnitude (74 mph hurricane force winds) are approaching speeds that could cause damage to safety functions.

EAL 3: This EAL is intended to address the threat to safety related structures or equipment from uncontrollable and possibly catastrophic events. This list of areas includes areas containing safety-related equipment, their controls, and their power supplies. This EAL is, therefore, consistent with the definition of an ALERT in that if events have damaged areas containing safety-related equipment the potential exists for substantial degradation of the level of safety of the plant.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HA1

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

ALERT

- 4.7.A.2 Release of Toxic or Flammable Gases Within a Facility Structure Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVELS:

- 4.7.A.2-1** Report or detection of toxic gases within a Facility Structure in concentrations that will be life threatening to plant personnel.
- 4.7.A.2-2** Report or detection of flammable gases within a Facility Structure in concentrations that will affect the safe operation of the plant.

Structures for above EALs:

- Reactor Building
- Auxiliary Building
- Diesel Generator Rooms
- RN Pumphouse
- Control Room
- SSF
- Doghouses
- CAS

BASIS:

This IC is based on gases that have entered a plant structure affecting the safe operation of the plant. Safe operations are affected when the area can not be accessed by plant personnel to ensure continued operability or availability of safety systems/components. This IC applies to buildings and areas contiguous to plant Vital Areas or other significant buildings or areas. The intent of this IC is not to include buildings (i.e., warehouses) 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. Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels/Radioactive Effluent, or Emergency Coordinator/EOF Director Judgement ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HA3

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

ALERT

4.7.A.3 Control Room Evacuation Has Been Initiated.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

4.7.A.3-1 Evacuation of the control room and control is, or is in the process of being, established from the Auxiliary Shutdown Panel (ASP) or the SSF.

BASIS:

With the control room evacuated, additional support, monitoring and direction through the Technical Support Center and/or Emergency Operations Facility is necessary. Inability to establish plant control from outside the control room, as evidenced by the inability to maintain NCS or SG inventories, will escalate this event to a Site Area Emergency.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HA5

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

ALERT

- 4.7.A.4 Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of an Alert.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

- 4.7.A.4-1** Other conditions exist which in the Judgement of the Emergency Coordinator/EOF Director indicate that plant safety systems may be degraded and that increased monitoring of plant functions is warranted.

BASIS:

This EAL 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 Coordinator/EOF Director to fall under the Alert emergency class.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HA6

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

SITE AREA EMERGENCY

4.7.S.1 Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

4.7.S.1-1 The following conditions exist:

- a. Control room evacuation has been initiated.

AND

- b. Control of the plant cannot be established from the ASP or the SSF within 15 minutes.

BASIS:

The timely transfer of control to alternate control areas has not been accomplished. This failure to transfer control would be evidenced by deteriorating reactor coolant system or steam generator parameters. For purposes of classification, the 15 minutes begins at the time that the determination to staff the alternate location is made. For most conditions, Reactor Coolant Pump seal LOCAs or steam generator dryout would be indications of failure to accomplish the transfer in the necessary time.

Escalation of this event, if appropriate, would be by Fission Product Barrier Degradation, Abnormal Rad Levels/Radiological Effluent, or Emergency Coordinator/EOF Director Judgement ICs.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HS2

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

SITE AREA EMERGENCY

- 4.7.S.2 Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of Site Area Emergency.**

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

- 4.7.S.2-1** Other conditions exist which in the Judgement of the Emergency Coordinator/EOF Director indicate actual or likely major failures of plant functions needed for protection of the public.

BASIS:

This EAL 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 Coordinator/EOF Director to fall under the emergency class description for Site Area Emergency.

REFERENCE: NUMARC/NESP-007, REV. 2, 01/92, HS3

NATURAL DISASTERS, HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

GENERAL EMERGENCY

4.7.G.1 Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of General Emergency.

OPERATING MODE APPLICABILITY: All

EMERGENCY ACTION LEVEL:

4.7.G.1-1 Other conditions exist which in the Judgement of the Emergency Coordinator/EOF Director indicate:

- actual or imminent substantial core degradation with potential for loss of containment

OR

- potential for uncontrolled radionuclide releases

These releases can reasonably be expected to exceed Environmental Protection Agency Protective Action Guideline levels outside the site boundary.

BASIS:

This EAL 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 Coordinator/EOF Director to fall under the General Emergency class.

REFERENCE: NUMAFC/NESP-007, REV. 2, 01/92, HG2

ENCLOSURE 3

**Catawba Procedure RP/0/A/5000/01,
“Classification of Emergency”**

DUKE POWER COMPANY
CATAWBA NUCLEAR SITE
CLASSIFICATION OF EMERGENCY

1.0 SYMPTOMS

1.1 Notification of Unusual Event

- 1.1.1 Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant.
- 1.1.2 No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

1.2 Alert

- 1.2.1 Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant.
- 1.2.2 Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

1.3 Site Area Emergency

- 1.3.1 Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public.
- 1.3.2 Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels except near the **site boundary**.

1.4 General Emergency

- 1.4.1 Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity.
- 1.4.2 Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

2.0 IMMEDIATE ACTIONS

- 2.1 Determine operating mode that existed at the time the event occurred prior to any protection system or operator action initiated in response of the event.
- 2.2 If the plant was in Mode 1-4 and a **valid** condition affects fission product barriers, then proceed to Enclosure 4.1.
- 2.3 If the condition does not affect fission product barriers, then review the listing of enclosures to determine if the event is applicable to one of the categories shown.
- 2.4 Compare actual plant conditions to the Emergency Action Levels listed, then declare the appropriate Emergency Class as indicated.
- 2.5 Implement the applicable Emergency Response Procedure (RP) for that classification and continue with subsequent steps of this procedure.

Notification of Unusual Event	RP/0/A/5000/02
Alert	RP/0/A/5000/03
Site Area Emergency	RP/0/A/5000/04
General Emergency	RP/0/A/5000/05

3.0 SUBSEQUENT ACTIONS

- 3.1 To escalate, de-escalate, or terminate the Emergency, compare plant conditions to the Initiating Conditions of Enclosures 4.1 through 4.7.
- 3.2 Refer to enclosure 4.9, Emergency Declaration Guidelines, as needed.

4.0 ENCLOSURES

- 4.1 Fission Product Barrier Matrix
- 4.2 Systems Malfunctions
- 4.3 Abnormal Rad Levels/Radiological Effluent
- 4.4 Loss of Shutdown Functions
- 4.5 Loss of Power
- 4.6 Fires/ Explosions and Security Events
- 4.7 Natural Disasters, Hazards and Other Conditions Affecting Plant Safety
- 4.8 Definitions/Acronyms
- 4.9 Emergency Declaration Guidelines

CATAWBA NUCLEAR SITE EMERGENCY ACTION LEVELS FISSION PRODUCT BARRIER MATRIX

Use EALs to determine Fission Product Barrier status (Intact, Potential Loss, or Loss). Add points for all 3 barriers. Classify according to the table below.

Note 1: This table is only applicable in Modes 1-4.

Note 2: Also, an event (or multiple events) could occur which results in the conclusion that exceeding the Loss or Potential Loss thresholds is IMMEDIATE (i.e., within 1-3 hours). In this IMMEDIATE Loss Situation, use judgement and classify as if the thresholds are exceeded.

Unusual Event (1 - 3 Points)	Alert (4 - 6 Points)	Site Area Emergency (7 - 10 Points)	General Emergency (11 - 13 Points)
<ul style="list-style-type: none"> Any Potential Loss of Containment Any Loss of Containment 	<ul style="list-style-type: none"> Any Potential Loss or Loss of the NCS Any Potential Loss or Loss of Fuel Clad 	<ul style="list-style-type: none"> Loss of both NCS and Fuel Clad Potential Loss of both NCS and Fuel Clad Potential Loss of either the NCS or Fuel Clad and Loss of any additional barrier 	<ul style="list-style-type: none"> Loss of any three barriers Loss of any two barriers and the Potential Loss of the third barrier

NOTE: Take highest points for each barrier and add together in chart below. Do not take more than one number for each barrier. "Not applicable" are included in this table as place holders only, and no points are assigned.

Containment	_____	<u>TOTAL POINTS</u>
NCS	_____	1-3 Unusual Event
Fuel Clad	_____	4-6 Alert
Total Points	_____	7-10 Site Area Emergency
		11-13 General Emergency

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
FISSION PRODUCT BARRIER MATRIX**

CONTAINMENT BARRIER		NCS BARRIER		FUEL CLAD BARRIER	
POTENTIAL LOSS - (1 Point)	LOSS - (3 Points)	POTENTIAL LOSS - (4 Points)	LOSS - (5 Points)	POTENTIAL LOSS - (4 Points)	LOSS - (5 Points)
1. Critical Safety Function Status		1. Critical Safety Function Status		1. Critical Safety Function Status	
• Containment-RED	• Not applicable	• NCS Integrity-Red	• Not applicable	• Core Cooling-Orange	• Core Cooling-Red
		• Heat Sink-Red		• Heat Sink-Red	
2. Containment Conditions		2. NCS Leak Rate		2. Primary Coolant Activity Level	
• Containment Pressure > 15 PSIG	• Rapid unexplained decrease in containment pressure following initial increase	• Unisolable leak exceeding the capacity of one charging pump in the normal charging mode with letdown isolated.	• GREATER THAN available makeup capacity as indicated by a loss of NCS subcooling.	• Not applicable	• Coolant Activity GREATER THAN 30C μ Ci/cc Dose Equivalent Iodine (DEI) I-131
• H ₂ concentration > 9%					
• Containment pressure greater than 3 psig with less than one full train of NS and a VX-CARF operating.	• Containment pressure or sump level response not consistent with LOCA conditions.				
3. Containment Isolation Valves Status After Containment Isolation Actuation		3. SG Tube Rupture		3. Containment Radiation Monitoring	
• Not applicable	• Containment isolation is incomplete and a release path from containment exists	• Primary-to-Secondary leak rate exceeds the capacity of one charging pump in the normal charging mode with letdown isolated.	• Indication that a SG is Ruptured and has a Non-Isolable secondary line fault	• Not applicable	• Containment radiation monitor 53A or 53B reading >117 R/hr
			• Indication that a SG is Ruptured and a prolonged release of contaminated secondary coolant is occurring from the affected SG to the environment		
4. SG Secondary Side Release With Primary-to-Secondary Leakage		4. Containment Radiation Monitoring		4. Emergency Coordinator/EOF Director Judgement	
• Not applicable	• Release of secondary side to atmosphere with primary to secondary leakage GREATER THAN Tech Spec allowable	• Not applicable	• Unplanned Valid Trip II alarm on EMFs 38, 39, or 40	• Any condition including inability to monitor the barrier, that in the opinion of the Emergency Coordinator/EOF Director incites LOSS or POTENTIAL LOSS of the Fuel Clad barrier	

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
FISSION PRODUCT BARRIER MATRIX**

CONTAINMENT BARRIER		NCS BARRIER		FUEL CLAD BARRIER	
POTENTIAL LOSS - (1 Point)	LOSS - (3 Points)	POTENTIAL LOSS - (4 Points)	LOSS - (5 Points)	POTENTIAL LOSS - (4 Points)	LOSS - (5 Points)

5. Significant Radioactive Inventory In Containment

- Containment Rad. Monitor EMF53A or 53B
Reading @ time since shutdown:
>470 R/hr @ 0 - 0.5 hr
>170 R/hr @ 0.5 - 2 hr
>125 R/hr @ 2 - 4 hr
> 90 R/hr @ 4 - 8 hr
> 53 R/hr @ > 8 hr
- Not applicable

6. Core Cooling

- Core cooling -RED path is indicated for > 15 min.
- Not applicable

7. Emergency Coordinator /EOF Director Judgement

- Any condition, including inability to monitor the barrier, that in the opinion of the Emergency Coordinator/EOF Director indicates a LOSS or POTENTIAL LOSS of the Containment barrier.

END

5. Emergency Coordinator/EOF Director Judgement

Any condition, including inability to monitor the barrier, that in the opinion of the Emergency Coordinator/EOF Director indicates LOSS or POTENTIAL LOSS of the NCS barrier.

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
SYSTEM MALFUNCTION**

RP/0/A/5000/01
Enclosure 4.2
Page 1 of 2

UNUSUAL EVENT

ALERT

SITE AREA EMERGENCY

GENERAL EMERGENCY

END

1. Inability to Reach Required Shutdown Within Technical Specification Limits.

OPERATING MODE: 1, 2, 3, 4

- Plant is not brought to required operating mode within Technical Specifications LCO Action Statement Time.

2. Unplanned Loss of Most or All Safety System Annunciation or Indication in the Control Room for Greater Than 15 Minutes.

OPERATING MODE: 1, 2, 3, 4

- The following conditions exist:

Unplanned loss of most (>50%) annunciators associated with safety systems for greater than 15 minutes.

AND

In the opinion of the Operations Shift Manager/Emergency Coordinator/EOF Director, the loss of the annunciators or indicators requires additional personnel (beyond normal shift compliment) to safely operate the unit.

3. Fuel Clad Degradation.

OPERATING MODE: ALL

- Dose Equivalent I-131 greater than the Technical Specification allowable limit.

1. Unplanned Loss of Most or All Safety System Annunciation or Indication in Control Room With Either:
(1) a Significant Transient in Progress, or
(2) Compensatory Non-Alarming Indicators Unavailable.

OPERATING MODE: 1, 2, 3, 4

- The following conditions exist:

Unplanned loss of most (>50%) annunciators associated with safety systems for greater than 15 minutes.

AND

In the opinion of the Operations Shift Manager/Emergency Coordinator/EOF Director, the loss of the annunciators or indicators requires additional personnel (beyond normal shift compliment) to safely operate the unit.

AND

EITHER of the following:

- A significant plant transient is in progress.
- Loss of the OAC.

END

1. Inability to Monitor a Significant Transient in Progress.

OPERATING MODE: 1, 2, 3, 4

- The following conditions exist:

Unplanned loss of most (>50%) annunciators associated with safety systems for greater than 15 minutes.

AND

A significant plant transient is in progress.

AND

Loss of the OAC.

AND

Inability to provide manual monitoring, independent of the OAC Critical Safety Function Status Tree program, of any one of the following Critical Safety Functions:

- subcriticality
- core cooling
- heat sink
- containment

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
SYSTEM MALFUNCTION**

RP/0/A/5000/01
Enclosure 4.2
Page 2 of 2

UNUSUAL EVENT

ALERT

SITE AREA EMERGENCY

GENERAL EMERGENCY

4. Reactor Coolant System (NCS)
Leakage.

OPERATING MODE: 1, 2, 3, 4

- Unidentified leakage \geq 10 gpm
- Pressure boundary leakage \geq 10 gpm
- Identified leakage \geq 25 gpm

5. Unplanned Loss of All Onsite or Offsite
Communications.

OPERATING MODE: ALL

- Loss of all onsite communications capability (internal phone system, PA system, onsite radio system) affecting the ability to perform routine operations.
- Loss of all offsite communications capability (Selective Signaling, NRC FTS lines, offsite radio system, commercial phone system) affecting the ability to communicate with offsite authorities.

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT**

RP/0/A/5000/01
Enclosure 4.3
Page 1 of 3

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
<p>1. Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the SLC Limits for 60 Minutes or Longer.</p>	<p>1. Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the SLC limits for 15 Minutes or Longer.</p>	<p>1. Boundary Dose Resulting from an Actual or Imminent Release of Radioactivity Exceeds 100 mRem TEDE or 500 mRem CDE Adult Thyroid for the Actual or Projected Duration of the Release.</p>	<p>1. Boundary Dose Resulting from an Actual or Imminent Release of Radioactivity that Exceeds 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid for the Actual or Projected Duration of the Release.</p>
<p>OPERATING MODE: ALL</p>	<p>OPERATING MODE: ALL</p>	<p>OPERATING MODE: ALL</p>	<p>OPERATING MODE: ALL</p>
<ul style="list-style-type: none"> a. A valid TRIP 2 alarm on radiation monitor EMF- 49L or EMF-57 	<ul style="list-style-type: none"> a. A valid TRIP 2 alarm on radiation monitor EMF- 49L or EMF-57 	<ul style="list-style-type: none"> A valid indication on radiation monitor EMF-36L of $\geq 1.08 \text{ E}+07$ cpm 	<ul style="list-style-type: none"> A valid indication on radiation monitor EMF-36H of $\geq 1.72 \text{ E} + 04$ cpm
<p>AND</p>	<p>AND</p>		
<ul style="list-style-type: none"> b. Failure of the release path to automatically isolate 	<ul style="list-style-type: none"> b. Failure of the release path to automatically isolate 	<ul style="list-style-type: none"> Dose assessment team calculations indicate dose consequences greater than 100 mRem TEDE or 500 mRem CDE Adult Thyroid at the site boundary. 	<ul style="list-style-type: none"> Dose assessment team calculations indicate dose consequences greater than 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid at the site boundary.
<p>AND</p>	<p>AND</p>		
<ul style="list-style-type: none"> c. The liquid radioactive release to the environment exceeds two times the SLC limit for 60 minutes or longer. 	<ul style="list-style-type: none"> c. The liquid radioactive release to the environment exceeds 200 times the SLC limit for 15 minutes or longer. 	<ul style="list-style-type: none"> Analysis of field survey results or field survey samples indicates dose consequences greater than 100 mRem TEDE or 500 mRem CDE Adult Thyroid at the site boundary. 	<ul style="list-style-type: none"> Analysis of field survey results or field survey samples indicates dose consequences greater than 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid at the site boundary.
<ul style="list-style-type: none"> A valid indication on radiation monitor EMF- 36L of $\geq 1.08 \text{ E}+04$ cpm for ≥ 60 minutes. 	<ul style="list-style-type: none"> A valid indication on radiation monitor EMF- 36L of $\geq 1.08 \text{ E}+06$ cpm for ≥ 15 minutes. 		
<ul style="list-style-type: none"> Gaseous effluent being released exceeds two times SLC 16.11-1 for ≥ 60 minutes as determined by Radiation Protection (RP) procedure. 	<ul style="list-style-type: none"> Gaseous effluent being released exceeds 200 times the level of SLC 16.11-1 for ≥ 15 minutes as determined by RP procedure. 	<p>Note 1: These EMF readings are calculated based on worst case average annual meteorology, a sixty minute release duration, and design unit vent flow rate. <u>Calculations</u> by the dose assessment team <u>use actual</u> meteorology, duration, and unit vent flow rate. Therefore, these EMF readings should not be used if dose assessment team calculations are available.</p>	<p>Note 1: These EMF readings are calculated based on worst case average annual meteorology, a sixty minute release duration, and design unit vent flow rate. <u>Calculations</u> by the dose assessment team <u>use actual</u> meteorology, duration, and unit vent flow rate. Therefore, these EMF readings should not be used if dose assessment team calculations are available.</p>
<ul style="list-style-type: none"> Liquid effluent being released exceeds two times SLC 16.11-6 for ≥ 60 minutes as determined by RP procedure. 	<ul style="list-style-type: none"> Liquid effluent being released exceeds 200 times the level of SLC 16.11-6 for ≥ 15 minutes as determined by RP procedure. 		

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT**

RP/0/A/5000/01
Enclosure 4.3
Page 2 of 3

UNUSUAL EVENT

Note:

If the monitor reading is sustained for the time period indicated in the EAL and the required assessments (procedure calculations) cannot be completed within this time period, declaration must be made based on the **valid** radiation monitor reading.

2. Unexpected Increase in Plant Radiation or Airborne Concentration.

OPERATING MODE: ALL

- Indication of **uncontrolled** water level decrease of greater than 6 inches in the reactor refueling cavity with all irradiated fuel assemblies remaining covered by water.
- **Uncontrolled** water level decrease of greater than 6 inches in the spent fuel pool and fuel transfer canal with all irradiated fuel assemblies remaining covered by water.
- **Unplanned valid** area EMF reading increases by a factor of 1000 over normal levels.

END

ALERT

Note:

If the monitor reading is sustained for the time period indicated in the EAL and the required assessments (procedure calculations) cannot be completed within this time period, declaration must be made based on the **valid** radiation monitor reading.

2. Major Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.

OPERATING MODE: ALL

- An **unplanned valid** trip II alarm on any of the following radiation monitors:

Spent Fuel Building Refueling Bridge

1EMF-15

2EMF-4

Spent Fuel Pool Ventilation

1EMF-42

2EMF-42

Reactor Building Refueling Bridge

1EMF-17

2EMF-2

Containment Noble Gas Monitor

1EMF-39

2EMF-39

SITE AREA EMERGENCY

Note 2:

If dose assessment team calculations cannot be completed in 15 minutes, then **valid** monitor reading should be used for emergency classification.

END

GENERAL EMERGENCY

Note 2:

If dose assessment team calculations cannot be completed in 15 minutes, then **valid** monitor reading should be used for emergency classification.

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT**

RP/0/A/5000/01
Enclosure 4.3
Page 3 of 3

UNUSUAL EVENT

ALERT

SITE AREA EMERGENCY

GENERAL EMERGENCY

- Plant personnel report that water level drop in reactor refueling cavity, spent fuel pool, or fuel transfer canal has or will exceed makeup capacity such that irradiated fuel will become uncovered.
- NC system wide range level <95 % after initiation of NC system make-up

AND

Any irradiated fuel assembly not capable of being lowered into spent fuel pool or reactor vessel

AND

KF-122 cannot be closed.

3. **Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown.**

OPERATING MODE: ALL

- **Valid** radiation monitor reading indicating greater than 15 mR/hr in the control room or PAP.
- **Valid** radiation monitor reading of >5 R/hr in a plant vital area.

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
LOSS OF SHUTDOWN FUNCTIONS**

RP/0/A/5000/01
Enclosure 4.4
Page 1 of 2

UNUSUAL EVENT

END

ALERT

1. Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip WAS Successful.

OPERATING MODE: 1, 2, 3

- The following conditions exist:

Valid reactor trip signal received or required.

AND

Manual reactor trip from the control room is successful and reactor power is less than 5% and decreasing.

2. Inability to Maintain Plant in Cold Shutdown.

OPERATING MODE: 5, 6

- Total loss of ND and/or RN and/or KC

AND

Inability to maintain reactor coolant temperature below 200 °F.

END

SITE AREA EMERGENCY

1. Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip WAS NOT Successful.

OPERATING MODE: 1

- The following conditions exist:

Valid reactor trip signal received or required.

AND

Manual reactor trip from the control room was not successful in reducing reactor power to less than 5% and decreasing.

2. Complete Loss of Function Needed to Achieve or Maintain Hot Shutdown.

OPERATING MODE: 1, 2, 3, 4

- Core Cooling CSF-RED
- Heat Sink CSF-RED
- Subcriticality CSF-RED

GENERAL EMERGENCY

1. Failure of the Reactor Protection System to Complete an Automatic Trip and Manual Trip was NOT Successful and There is indication of an Extreme Challenge to the Ability to Cool the Core.

OPERATING MODE: 1

- The following conditions exist:

Valid reactor trip signal received or required.

AND

Manual reactor trip from the control room was not successful in reducing reactor power to less than 5% and decreasing.

AND

EITHER of the following conditions exist:

- Core Cooling CSF-RED
- Heat Sink CSF-RED

END

CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
LOSS OF SHUTDOWN FUNCTIONS

RP/0/A/5000/01
Enclosure 4.4
Page 2 of 2

UNUSUAL EVENT

ALERT

SITE AREA EMERGENCY

GENERAL EMERGENCY

3. Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel.

OPERATING MODE: 5, 6

- Failure of heat sink causes loss of cold shutdown conditions.

AND

Lower range Reactor Vessel Level Indication System (RVLIS) decreasing after initiation of NC system makeup.

- Failure of heat sink causes loss of cold shutdown conditions.

AND

Reactor Coolant (NC) system narrow range level less than 11% and decreasing after initiation of NC system makeup.

- Failure of heat sink causes loss of cold shutdown conditions.

AND

Either train ultrasonic level indication less than 7.25% and decreasing after initiation of NC system makeup.

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
LOSS OF POWER**

RP/0/A/5000/01
Enclosure 4.5
Page 1 of 1

USUAL EVENT

1. Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes.

OPERATING MODE: ALL

- The following conditions exist:

Loss of offsite power to essential buses ETA and ETB for greater than 15 minutes.

AND

Each emergency diesel generator is supplying power to its respective essential bus.

2. Unplanned Loss of Required DC Power During Cold Shutdown or Refueling Mode for Greater than 15 Minutes.

OPERATING MODE: 5, 6

- The following conditions exist:

Unplanned loss of both unit related busses: EBA and EBD both <112 VDC, and EBB and EBC both <109 VDC.

AND

Failure to restore power to at least one required DC bus within 15 minutes from the time of loss.

END

ALERT

1. Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses During Cold Shutdown Or Refueling Mode.

OPERATING MODE: 5, 6, No Mode

- Loss of all offsite and onsite AC power as indicated by:

Loss of power on essential buses ETA and ETB.

AND

Failure to restore power to at least one essential bus within 15 minutes.

2. AC power to essential busses reduced to a single power source for greater than 15 minutes such that an additional single failure could result in station blackout.

OPERATING MODE: 1, 2, 3, 4

- The following condition exists:

AC power capability has been degraded to one essential bus powered from a single power source for > 15 min. due to the loss of all but one of:

SATA SATB
ATC ATD
D/G A D/G B

END

SITE AREA EMERGENCY

1. Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses.

OPERATING MODE: 1, 2, 3, 4

- Loss of all offsite and onsite AC power as indicated by:

Loss of power on essential buses ETA and ETB.

AND

Failure to restore power to at least one essential bus within 15 minutes.

2. Loss of All Vital DC Power.

OPERATING MODE: 1, 2, 3, 4

- The following conditions exist:

Unplanned loss of both unit related busses: EBA and EBD both <112 VDC, and EBB and EBC both <109 VDC.

AND

Failure to restore power to at least one required DC bus within 15 minutes from the time of loss.

END

GENERAL EMERGENCY

1. Prolonged Loss of All (Offsite and Onsite) AC Power.

OPERATING MODE: 1, 2, 3, 4

- Prolonged loss of all offsite and onsite AC power as indicated by:

Loss of power on essential buses ETA and ETB for greater than 15 minutes.

AND

Standby Shutdown Facility (SSF) fails to maintain hot standby.

AND

At least one of the following conditions exist:

- Restoration of at least one essential bus within 4 hours is **NOT** likely.
- Indication of continuing degradation of core cooling based on Fission Product Barrier monitoring.

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
FIRE/EXPLOSION AND SECURITY EVENTS**

RP/0/A/5000/01
Enclosure 4.6
Page 1 of 2

UNUSUAL EVENT

ALERT

SITE AREA EMERGENCY

GENERAL EMERGENCY

1. Fire or Explosion Within Protected Area Boundary Not Extinguished Within 15 Minutes of Detection.

OPERATING MODE: ALL

- Fire in any of the following areas not extinguished within 15 minutes of control room notification or verification of a control room fire alarm.

- Reactor Building
- Auxiliary Building
- Diesel Generator Rooms
- Control Room
- RN Pump House
- SSF
- CAS
- Doghouses
- FWST
- Turbine Building
- Service Bldg.
- Interim Radwaste Bldg.

- Report by plant personnel of an unanticipated **explosion** within protected area boundary resulting in **visible damage** to permanent structure or equipment.

1. Fire or Explosion Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.

OPERATING MODE: 1, 2, 3, 4

- The following conditions exist:

Fire or explosion in any of the following areas:

- Reactor Building
- Auxiliary Building
- Diesel Generator Rooms
- Control Room
- RN Pump House
- SSF
- CAS
- Doghouses
- FWST

AND

One of the following:

- Affected safety system parameter indications show degraded performance
- Plant personnel report **visible damage** to permanent structures or equipment within the specified area.

Note applies to Mode 1, 2, 3, 4, 5, 6.

Note: Only one train of a system needs to be affected or damaged in order to satisfy this condition.

1. Security Event in a Plant Vital Area.

OPERATING MODE: ALL

- Intrusion into any of the following plant areas by a hostile force:

- Reactor Building
- Auxiliary Building
- Diesel Generator Rooms
- Control Room
- RN Pump House
- SSF
- Doghouses
- CAS

- Security confirmed **bomb** discovered/explored in a vital area.
- Security confirmed **sabotage** in a plant vital area.

END

1. Security Event Resulting in Loss Of Ability to Reach and Maintain Cold Shutdown.

OPERATING MODE: ALL

- Loss of physical control of the control room due to security event.
- Loss of physical control of the SSF and ASP due to security event.

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
FIRE/EXPLOSION AND SECURITY EVENTS**

RP/0/A/5000/01
Enclosure 4.6
Page 2 of 2

UNUSUAL EVENT

2. Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant.

OPERATING MODE: All

- Security confirmed **bomb** device discovered within plant **Protected Area** and outside Vital Areas.
- **Hostage** situation/extortion
- A **violent civil disturbance** within the owner controlled area.

END

ALERT

2. Fire or Explosion Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.

OPERATING MODE: 5, 6

- The following conditions exist:
Fire or explosion in any of the following areas:
 - Reactor Building
 - Auxiliary Building
 - Diesel Generator Rooms
 - Control Room
 - RN Pump House
 - SSF
 - CAS
 - FWST

AND

One of the following:

- Affected safety system parameter indications show degraded performance
- Plant personnel report **visible damage** to permanent structures or equipment within the specified area.

3. Security Event in a Plant Protected Area.

OPERATING MODE: ALL

- **Area by intrusion** into plant **Protected** a hostile force.

END

SITE AREA EMERGENCY

GENERAL EMERGENCY

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
NATURAL DISASTERS, HAZARDS, AND OTHER CONDITIONS
AFFECTING PLANT SAFETY**

RP/0/A/5000/01
Enclosure 4.7
Page 1 of 3

UNUSUAL EVENT

ALERT

SITE AREA EMERGENCY

GENERAL EMERGENCY

1. Natural and Destructive Phenomena Affecting the Protected Area.

1. Natural and Destructive Phenomena Affecting the Plant Vital Area.

1. Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established.

1. Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of General Emergency.

OPERATING MODE: ALL

OPERATING MODE: ALL

OPERATING MODE: ALL

OPERATING MODE: ALL

- Tremor felt and valid alarm on the "strong motion accelerograph".
- Tremor felt and valid alarm on the "Peak shock annunciator".
- Report by plant personnel of tornado striking within protected area boundary.
- Vehicle crash into plant structures or systems within protected area boundary.
- Report of turbine failure resulting in casing penetration or damage to turbine or generator seals.

- Valid seismic accelerations greater than the operating basis earthquake (OBE):

0.08 g horizontal
OR
0.053 g vertical.
- Tornado or high winds:

Tornado striking plant structures within the vital area
OR
sustained winds ≥ 74 mph for > 15 minutes.
- Turbine failure generated missiles, vehicle crashes or other catastrophic events causing visible structural damage on any of the following plant structures:

- The following conditions exist:

Control room evacuation has been initiated.

AND

Control of the plant cannot be established from the ASP or the SSF within 15 minutes.
- 2. Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of Site Area Emergency.

- Other conditions exist which in the Judgement of the Emergency Coordinator/EOF Director indicate:

(1) actual or imminent substantial core degradation with potential for loss of containment,

OR

(2) potential for uncontrolled radionuclide releases. These releases can reasonably be expected to exceed Environmental Protection Agency Protective Action Guideline levels outside the site boundary.

2. Release of Toxic or Flammable Gases Deemed Detrimental to Safe Operation of the Plant.

OPERATING MODE: ALL

END

OPERATING MODE: ALL

- Report or detection of **toxic** or flammable **gases** that could enter within the site area boundary in amounts that can affect safe operation of the plant.

- Reactor Building
- Auxiliary Building
- FWST
- Diesel Generator Rooms
- Control Room
- RN Pump House
- SSF
- Doghouses
- CAS

END

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
NATURAL DISASTERS, HAZARDS, AND OTHER CONDITIONS
AFFECTING PLANT SAFETY**

RP/0/A/5000/01
Enclosure 4.7
Page 2 of 3

UNUSUAL EVENT

- Report by Local, County or State Officials for potential evacuation of site personnel based on offsite event.
- 3. Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of an Unusual Event.

OPERATING MODE: ALL

- Other conditions exist which in the judgement of the Emergency Coordinator/EOF Director indicate a potential degradation of the level of safety of the plant.

END

ALERT

- 2. Release of Toxic or Flammable Gases Within a Facility Structure Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown.

OPERATING MODE: ALL

- Report or detection of **toxic gases** within a Facility Structure in concentrations that will be life threatening to plant personnel.
- Report or detection of flammable gases within a Facility Structure in concentrations where lack of access to the following plant structures will affect the safe operation of the plant:

- Reactor Building
- Auxiliary Building
- Diesel Generator Rooms
- Control Room
- RN Pump House
- SSF
- Doghouses
- CAS

SITE AREA EMERGENCY

GENERAL EMERGENCY

**CATAWBA NUCLEAR SITE
EMERGENCY ACTION LEVELS
NATURAL DISASTERS, HAZARDS, AND OTHER CONDITIONS
AFFECTING PLANT SAFETY**

RP/0/A/5000/01
Enclosure 4.7
Page 3 of 3

UNUSUAL EVENT

ALERT

SITE AREA EMERGENCY

GENERAL EMERGENCY

3. Control Room Evacuation Has Been Initiated.

OPERATING MODE: ALL

- Evacuation of the control room and control is, or is in the process of being, established from the ASP or the SSF.
4. Other Conditions Existing Which in the Judgement of the Emergency Coordinator/EOF Director Warrant Declaration of an Alert.

OPERATING MODE: ALL

- Other conditions exist which in the Judgement of the Emergency Coordinator/EOF Director indicate that plant safety systems may be degraded and that increased monitoring of plant functions is warranted.

END

DEFINITIONS/ACRONYMS

ALERT- Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA protective action guideline exposure levels.

BOMB- A fused explosive device

CARF - Containment Air Return Fan

CIVIL DISTURBANCE - A group of people violently protesting station operations or activities at the site. A civil disturbance is considered to be violent when force has been used in an attempt to injure site personnel or damage plant property.

EPA PAG - Environmental Protection Agency Protective Action Guidelines for exposure to a release of radioactive material.

EXPLOSION - A rapid, violent unconfined combustion, or a catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems or components.

EXTORTION - An attempt to cause an action at the site by threat of force.

FIRE - Combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute fires. Observation of flames is preferred but is NOT required if large quantities of smoke and heat are observed.

FUNCTIONAL - A component is fully capable of meeting its design function. It would be declared **INOPERABLE** if unable to meet Technical Specifications.

GENERAL EMERGENCY- Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA protective action guideline exposure levels outside the Site Boundary.

HOSTAGE - A person or object held as leverage against the site to ensure demands will be met by the site.

HOSTILE FORCE - One or more individuals present in a **PROTECTED AREA** without authorization that may have or have threatened to use force in an attempt to injure site personnel or damage plant property.

IMMINENT - Expected to occur within 1-3 hours.

INABILITY TO DIRECTLY MONITOR - Operational Aid Computer data points are unavailable or gauges/panel indications are not readily available to the operator.

INOPERABLE - A component does not meet Technical Specifications. The component may be functional, capable of meeting its design.

INTRUSION/INTRUDER - Suspected hostile individual present in a PROTECTED AREA without authorization.

LOSS - A component is INOPERABLE and not FUNCTIONAL.

PROLONGED - A duration beyond normal limits, defined as "greater than 15 minutes" or as determined by the judgement of the Emergency Coordinator.

PROTECTED AREA - Encompasses all owner controlled areas within the security perimeter fence.

RUPTURED (As relates to Steam Generator) - Existence of primary to secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection.

SABOTAGE - Deliberate damage, misalignment, or misoperation of plant equipment with the intent to render the equipment unavailable.

SIGNIFICANT TRANSIENT- An unplanned event involving one or more of the following: (1) Automatic turbine runback >25% thermal reactor power, (2) Electrical load rejection >25% full electrical load; (3) Reactor Trip, (4) Safety Injection

SITE AREA EMERGENCY - Events are in process or have occurred which involve actual or likely major failures of plant functions needed for the protection of the public. Any releases are NOT expected to result in exposure levels which exceed EPA protective action guideline exposure levels outside the Site Boundary.

SITE BOUNDARY - That area, including the protected area, in which Duke Power Company has the authority to control all activities, including exclusion or removal of personnel and property.

SLC - Selected Licensee Commitments

SECURITY EVENT - A security related emergency situation for which prompt response by the Security Force, immediate action by plant personnel, and/or assistance from offsite agencies may be required to apprehend intruders and mitigate the effects of or prevent radiological sabotage.

SUSTAINED - A duration of time long enough to confirm that the CSF is valid (not momentary).

TERMINATION - Exiting the emergency condition.

TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE) - The sum of external dose exposure to radioactive plume, to radionuclides deposited on the ground by the plume, and the internal exposure inhaled radionuclides deposited in the body.

TOXIC GAS - A gas that is dangerous to life or health by reason of inhalation or skin contact (e.g. chlorine).

UNCONTROLLED - Event is not the result of planned actions by the plant staff.

UNPLANNED - An event or action is **UNPLANNED** if it is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are **UNPLANNED**.

UNUSUAL EVENT- Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

VALID - An indication or report or condition is considered to be **VALID** when it is conclusively verified by: (1) an instrument channel check, or (2) indications on related or redundant instrumentation, or (3) by direct observation by plant personnel such that doubt related to the instrument's operability, the condition's existence or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

VIOLENT - Force has been used in an attempt to injure site personnel or damage plant property.

VISIBLE DAMAGE - Damage to equipment or structure that is readily observable without measurements, testing, or analyses. Damage is sufficient to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering.

VITAL AREA - Areas within the **PROTECTED AREA** that house equipment important for nuclear safety. Access to a **VITAL AREA** is allowed only if an individual has been authorized to be in that area.

EMERGENCY DECLARATION GUIDELINES

THE FOLLOWING GUIDANCE IS TO BE USED BY THE EMERGENCY COORDINATOR IN ASSESSING EMERGENCY CONDITIONS.

- The Emergency Coordinator shall review all applicable initiating events to ensure proper classification.
- The BASIS Document (located in Section D of the Catawba Nuclear Site Emergency Plan) is available for review if any questions arise over proper classification.
- If an event occurs on more than one unit concurrently, the event with the higher classification will be classified on the emergency notification form. Information relating to the problem on the other unit will be captured on the emergency notification form.
- If an event occurs, and a lower or higher plant operating mode is reached before the classification can be made, the classification shall be based on the mode that existed at the time the event occurred.
- The fission product barrier matrix is applicable only to those events that occur at (Mode 1-4) hot shutdown or higher. An event that is recognized at cold shutdown or lower (Mode 5 or 6) shall not be classified using the fission product barrier matrix. Reference would be made to the additional enclosures that provide emergency action levels for specific events (e.g. severe weather, fire, security).
- If a transient event should occur, the following guidance is provided.
 1. Some emergency action levels specify a specific duration. For these EALs, the classification is made when the Emergency Coordinator assessment concludes that the specified duration is exceeded or will be exceeded (i.e. condition cannot be reasonably corrected before the duration elapses), whichever is sooner.
 2. If a plant condition exceeding EAL criteria is corrected before the specified duration time is exceeded, the event is NOT classified by that EAL. Lower Severity EALs, if any, shall be reviewed for possible applicability in these cases.
 3. If a plant condition exceeding EAL criteria is not recognized at the time of occurrence, but is identified well after the condition has occurred (e.g. as a result of routine log or record review) and the condition no longer exists, an emergency shall NOT be declared. Reporting under 10CFR50.72 may be required. Such a condition could occur, for example, if a follow-up evaluation of an abnormal condition uncovers evidence that the condition was more severe than earlier believed.

4. If an emergency classification was warranted, but the plant condition has been corrected prior to declaration and notification, the Emergency Coordinator must consider the potential that the initiating condition (e.g. Failure of Reactor Protection System) may have caused plant damage that warrants augmenting the on-shift personnel via activation of the Emergency Response Organization. The following are applicable:
 - a. For UNUSUAL EVENTS, the condition shall be reported. The event may be terminated in the same notification or in a follow-up notification.
 - b. For ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY, the event shall be declared and the emergency response organization activated.

DETERMINATION OF "EVENT TIME" (TIME THE 15 MINUTE CLOCK STARTS)

1. If plant conditions require implementation of EP/1 or 2/A/5000/E0 (Reactor Trip or Safety Injection), increased emphasis shall be given to evaluation of plant conditions for determination of EAL(s) when "kickout" of the diagnostic procedure occurs. "Event Time" is the time at which the EAL(s) is determined.
2. If plant conditions do not require implementation of EP/1 or 2/A/5000/E0 (Reactor Trip or Safety Injection), and conditions of a specific EAL are met, the "Event Time" is the time at which the EAL(s) is determined.
3. The time the event is classified shall be entered on the initial emergency notification form.

MOMENTARY ENTRY INTO A HIGHER CLASSIFICATION

If, while in an emergency classification, the specified EALs of a higher classification are met momentarily, and in the judgment of the Emergency Coordinator are not likely to recur, the entry into the higher classification must be acknowledged. Acknowledgment is performed as follows:

If this condition occurs prior to the initial notification to the emergency response organization and off site agencies, the initial message should note that the site is currently in the lower classification, but had momentarily met the criteria for the higher classification. It should also be noted that plant conditions have improved and stabilized to the point that the criteria for the higher classification are not expected to be repeated.

ENCLOSURE 4

State and County Concurrence Letters



DUKE POWER

November 21, 1995

Mr. Billy Ray Cameron
NC Division of Emergency Management

Mr. Bob Phillips
Gaston County Emergency Management

Mr. Wayne Broome
Charlotte/Mecklenburg Emergency Mgmt.

Mr. Rick Spake
Lincoln County Emergency Management

Mr. Stan McKinney
SC Emergency Preparedness Division

Mr. Cotton Howell
York County Emergency Preparedness

Mr. Larry Dickerson
Iredell County Emergency Management

Mr. Charles Moody
Catawba County Emergency Management

Gentlemen:

Duke Power is required by 10CFR50, Appendix E, Part IV.B, Assessment Actions, to discuss and agree upon Emergency Action Levels (EALs) prior to implementation. Duke Power is proposing to convert to Emergency Action Levels based upon guidance contained in NUMARC/NESP-007, Revision 2, which was approved by the NRC in Reg. Guide 1.101 Revision 3 in August 1992 as an acceptable substitute to the EAL Guidelines contained in NUREG-0654, Appendix I. These EALs are used as criteria for determining the need for notification and participation of local and state agencies and for determining when and what type of protective measures should be considered outside the site boundary.

I have provided the procedure(s) containing the proposed NUMARC/NESP-007, Rev. 2, based Emergency Action Levels for McGuire and Catawba Nuclear Site (as appropriate for your agency), and ask that you review this document. Upon completion of your review, please sign and return the attached sheet indicating your concurrence with the EALs and providing any comments you may have. **Please provide your response by December 1, 1995.**

If you have any questions, please call me at (704) 382-3151 or Gary Mitchell at (803) 831-3235.

Yours truly,

A handwritten signature in cursive script, appearing to read 'Tina Kuhr', written in dark ink.

Tina Kuhr
Nuclear Emergency Planning Consultant

Attachment

The State of South Carolina
Military Department



OFFICE OF THE ADJUTANT GENERAL

STANHOPE S. SPEARS
MAJOR GENERAL
THE ADJUTANT GENERAL

December 11, 1995

Mr. Gary Mitchell
Emergency Planning Manager
Catawba Nuclear Station
4800 Concord Road
York, SC 29745

SUBJECT: 1995 Catawba Nuclear Station EAL Review.

Gary
Dear Mr. Mitchell:

Enclosed is this agency's review and signature document for the subject EALs. Thank you for the opportunity to comment.

Have a wonderful Christmas holiday.

Sincerely,

A handwritten signature in cursive script, appearing to read "Tim".

Tim Murphy
Area 2, Coordinator

SMM:TM:tm
C:\TEXT\CNS\MEMO\CNSEAL.LTR

Emergency Preparedness Division
Rutledge Building 1429 Senate Street
Columbia, South Carolina 29201 (803) 734-8020
Fax (803) 734-8062

Review of Proposed Emergency Action Levels (EALs)
based upon NUMARC/NESP-007 Rev. 2

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations.

for [Signature] Asst Dir
Name: Stan M. McKinney, Director

Agency: S C Emergency Preparedness Division

Date: December 18, 1995

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations except for the following comments:

COMMENTS: _____

Name: _____

Agency: _____

Date: _____

Review of Proposed Emergency Action Levels (EALs)
based upon NUMARC/NESP-007 Rev. 2

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations.

Name: Billy R. Cernoni

Agency: N.C. Div. of Emergency Mgt.

Date: 12/18/95

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations except for the following comments:

COMMENTS _____

Name: _____

Agency: _____

Date: _____

Review of Proposed Emergency Action Levels (EALs)
based upon NUMARC/NESP-007 Rev. 2

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations.

Name: Bob Phillips
Agency: Gaston Co. Em. Mgmt
Date: Dec. 13, 1995

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations except for the following comments:

COMMENTS: _____

Name: _____
Agency: _____
Date: _____

Review of Proposed Emergency Action Levels (EALs)
based upon NUMARC/NESP-007 Rev. 2

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations.

Name: _____

Agency: _____

Date: _____

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations except for the following comments:

COMMENTS: _____

Name: _____

Agency: _____

Date: _____

Review of Proposed Emergency Action Levels (EALs)
based upon NUMARC/NESP-007 Rev. 2

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations.

Name: Louis W. Barrow
Agency: Charlotte-Mecklenburg EMO
Date: 11-21-1995

I have reviewed the proposed Emergency Action Levels for McGuire/Catawba Nuclear Site and agree that they are adequate for event classification and protective action recommendations except for the following comments:

COMMENTS: _____

Name: _____
Agency: _____
Date: _____