

5.0 EMERGENCY CLASSIFICATION SYSTEM

Seabrook Station uses NEI 99-01, Revision 4, as the basis for the emergency classification system. The information in this chapter is derived from generic basis discussion presented in NEI 99-01, Revision 4.

5.1 Regulatory Context

Title 10, Code of Federal Regulations, Part 50 provides the regulations that govern emergency preparedness at nuclear power plants. Nuclear power reactor licensees are required to have NRC-approved "emergency response plans" for dealing with "radiological emergencies." The requirements call for both onsite and offsite emergency response plans, with the offsite plans being those approved by FEMA and used by the State and local authorities. This section deals with the utilities' approved onsite plans and procedures for response to radiological emergencies at nuclear power plants, and the links they provide to the offsite plans.

Section 50.47 of Title 10 of the Code of Federal Regulations (10 CFR 50.47), entitled "Emergency Plans," states the requirement for such plans. Part (a)(1) of this regulation states that "no operating license will be issued unless a finding is made by NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency."

The major portion of 10 CFR 50.47 lists "standards" that emergency response plans must meet. The standards constitute a detailed list of items to be addressed in the plans. Of particular importance to this project is the fourth standard, which addresses "emergency classification" and "action levels." These terms, however, are not defined in the regulation.

10 CFR 50.54, "Conditions of licenses," emphasizes that power reactor licensees must "follow, and maintain in effect, emergency plans which meet the standards in Part 50.47(b) and the requirements in Appendix E to this part." The remainder of this part deals primarily with required implementation dates.

10 CFR 50.54(q) allows licensees to make changes to emergency plans without prior Commission approval only if: (a) the changes do not decrease the effectiveness of the plans and (b) the plans, as changed, continue to meet 10 CFR 50.47(b) standards and 10 CFR 50 Appendix E requirements. The licensee must keep a record of any such changes. Proposed changes that decrease the effectiveness of the approved emergency plans may not be implemented without application to and approval by the Commission.

10 CFR 50.72 deals with "Immediate notification requirements for operating nuclear power reactors." The "immediate" notification section actually includes three types of reports: (1) immediately after notification of State or local agencies (for emergency classification events); (2) one-hour reports; and, (3) four-hour reports.

Although 10 CFR 50.72 contains significant detail, it does not define either "Emergency Class" or "Emergency Action Level." But one-hour and four-hour reports are listed as "non-emergency events," namely, those which are "not reported as a declaration of an Emergency Class." Certain 10 CFR 50.72 events can also meet the Unusual event emergency classification if they are precursors of more serious events. These situations also warrant anticipatory notification of state and local officials: (See Section 3.7, "Emergency Class Descriptions".)

By footnote, the reader is directed from 10 CFR 50.72 to 10 CFR 50 Appendix E, for information concerning "Emergency Classes."

10 CFR 50.73 describes the "Licensee event report system," which requires submittal of follow-up written reports within sixty days of required notification of NRC.

10 CFR 50 Appendix E, Section B, "Assessment Actions," mandates that emergency plans must contain "emergency action levels." EALs are to be described for: (1) determining the need for notification and participation of various agencies, and (2) determining when and what type of protective measures should be considered. Appendix E continues by stating that the EALs are to be based on: (1) in-plant conditions; (2) in-plant instrumentation; (3) onsite monitoring; and (4) offsite monitoring.

10 CFR 50 Appendix E, Section C, "Activation of Emergency Organization," also addresses "emergency classes" and "emergency action levels." This section states that EALs are to be based on: (1) onsite radiation monitoring information; (2) offsite radiation monitoring information; and, (3) readings from a number of plant sensors that indicate a potential emergency, such as containment pressure and the response of the Emergency Core Cooling System. This section also states that "emergency classes" shall include: (1) Unusual events (UNUSUAL EVENTS), (2) Alert, (3) Site Area Emergency, and (4) General Emergency.

These regulations are supplemented by various regulatory guidance documents. A significant document that has dealt specifically with EALs is NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," October 1980.

5.2 Definitions Used in Developing EAL Methodology

The following definitions apply to the Seabrook Station EAL methodology:

EMERGENCY CLASS: One of a minimum set of names or titles, established by the Nuclear Regulatory Commission (NRC), for grouping off-normal nuclear power plant conditions according to (1) their relative radiological seriousness, and (2) the time-sensitive onsite and off-site radiological emergency preparedness actions necessary to respond to such conditions. The existing radiological emergency classes, in ascending order of seriousness, are called:

- Unusual event
- Alert
- Site Area Emergency
- General Emergency

INITIATING CONDITION (IC): One of a predetermined subset of nuclear power plant conditions where either the potential exists for a radiological emergency, or such an emergency has occurred.

Discussion:

In NUREG-0654, the NRC introduced, but does not define, the term "initiating condition." Since the term is commonly used in nuclear power plant emergency planning, the definition above has been developed and combines both regulatory intent and the greatest degree of common usage among utilities.

Defined in this manner, an IC is an emergency condition which sets it apart from the broad class of conditions that may or may not have the potential to escalate into a radiological emergency. It can be a continuous, measurable function that is outside technical specifications, such as elevated RCS temperature or falling reactor coolant level (asymptom). It also encompasses occurrences such as FIRE (an event) or reactor coolant pipe failure (an event or a barrier breach).

EMERGENCY ACTION LEVEL (EAL): A pre-determined, site-specific, observable threshold for a plant Initiating Condition that places the plant in a given emergency class. An EAL can be: an instrument reading; an equipment status indicator; a measurable parameter (onsite or offsite); a discrete, observable event; results of analyses; entry into specific emergency operating procedures; or another phenomenon which, if it occurs, indicates entry into a particular emergency class.

Discussion:

The term "emergency action level" has been defined by example in the regulations, as noted in the above discussion concerning regulatory background. The term had not, however, been defined operationally in a manner to address all contingencies. There are times when an EAL will be a threshold point on a measurable continuous function, such as a primary system coolant leak that has exceeded technical specifications for a specific plant.

At other times, the EAL and the IC will coincide, both identified by a discrete event that places the plant in a particular emergency class. For example, "Train Derailment Onsite" is an example of an "Unusual Event" IC in NUREG-0654 that also can be an event-based EAL.

5.3 Recognition Categories

ICs and EALs can be grouped in one of several schemes. This generic classification scheme incorporates symptom-based, event-based, and barrier-based ICs and EALs.

The symptom-based category for ICs and EALs refers to those indicators that are measurable over some continuous spectrum, such as core temperature, coolant levels, containment pressure, etc. When one or more of these indicators begin to show off-normal readings, reactor operators are trained to identify the probable causes and potential consequences of these "symptoms" and take corrective action. The level of seriousness indicated by these symptoms depends on the degree to which they have exceeded technical specifications, the other symptoms or events that are occurring contemporaneously, and the capability of the licensed operators to gain control and bring the indicator back to safe levels.

Event-based EALs and ICs refer to occurrences with potential safety significance, such as the failure of a high-pressure safety injection pump, a safety valve failure, or a loss of electric power to some part of the plant. The range of seriousness of these "events" is dependent on the location, number of contemporaneous events, remaining plant safety margin, etc.

Barrier-based EALs and ICs refer to the level of challenge to principal barriers used to assure containment of radioactive materials contained within a nuclear power plant. For radioactive materials that are contained within the reactor core, these barriers are: fuel cladding, reactor coolant system pressure boundary, and containment. The level of challenge to these barriers encompasses the extent of damage (loss or potential loss) and the number of barriers concurrently under challenge. In reality, barrier-based EALs are a subset of symptom-based EALs that deal with symptoms indicating fission product barrier challenges. These barrier-based EALs are primarily derived from Emergency Operating Procedure (EOP) Critical Safety Function (CSF) Status Tree Monitoring (or their equivalent). Challenge

to one or more barriers generally is initially identified through instrument readings and periodic sampling. Under present barrier-based EALs, deterioration of the reactor coolant system pressure boundary or the fuel clad barrier usually indicates an "Alert" condition, two barriers under challenge a Site Area Emergency, and loss of two barriers with the third barrier under challenge is a General Emergency. The fission product barrier matrix described in Category F is a hybrid approach that recognizes that some events may represent a challenge to more than one barrier, and that the containment barrier is weighted less than the reactor coolant system pressure boundary and the fuel clad barriers.

Symptom-based ICs and EALs are most easily identified when the plant is in a normal startup, operating or hot shutdown mode of operation, with all of the barriers in place and the plant's instrumentation and emergency safeguards features fully operational as required by technical specifications. It is under these circumstances that the operations staff has the most direct information of the plant's systems, displayed in the main control room. As the plant moves through the decay heat removal process toward cold shutdown and refueling, barriers to fission products are reduced (i.e., reactor coolant system pressure boundary may be open) and fewer of the safety systems required for power operation are required to be fully operational. Under these plant operating modes, the identification of an IC in the plant's operating and safety systems becomes more event-based, as the instrumentation to detect symptoms of a developing problem may not be fully effective; and engineered safeguards systems, such as the Emergency Core Cooling System (ECCS), are partially disabled as permitted by the plant's Technical Specifications.

Barrier-based ICs and EALs also are heavily dependent on the ability to monitor instruments that indicate the condition of plant operating and safety systems. Fuel cladding integrity and reactor coolant levels can be monitored through several indicators when the plant is in a normal operating mode, but this capability is much more limited when the plant is in a refueling mode, when many of these indicators are disconnected or off-scale. The need for this instrumentation is lessened, however, and alternate instrumentation is placed in service when the plant is shut down.

It is important to note that in some operating modes there may not be definitive and unambiguous indicators of containment integrity available to control room personnel. For this reason, barrier-based EALs should not place undue reliance on assessments of containment integrity in all operating modes. Generally, Technical Specifications relax maintaining containment integrity requirements in modes 5 and 6 in order to provide flexibility in performance of specific tasks during shutdown conditions. Containment pressure and temperature indications may not increase if there is a pre-existing breach of containment integrity. At most plants, a large portion of the containment's exterior cannot be monitored for leakage by radiation monitors.

Several categories of emergencies have no instrumentation to indicate a developing problem, or the event may be identified before any other indications are recognized. A reactor coolant pipe could break; FIRE alarms could sound; radioactive materials could be released; and any number of other events can occur that would place the plant in an emergency condition with little warning. For emergencies related to the reactor system and safety systems, the ICs shift to an event based scheme as the plant mode moves toward cold shutdown and refueling modes. For non-radiological events, such as FIRE, external floods, wind loads, etc., as described in NUREG-0654 Appendix 1, event-based ICs are the norm.

In many cases, a combination of symptom-, event- and barrier-based ICs will be present as an emergency develops. In a loss of coolant accident (LOCA), for example:

- Coolant level is dropping; (symptom)

- There is a leak of some magnitude in the system (pipe break, safety valve stuck open) that exceeds plant capabilities to make up the loss; (barrier breach or event)
- Core (coolant) temperature is rising; (symptom) and
- At some level, fuel failure begins with indicators such as high coolant activity samples, etc. (barrier breach or symptom)

5.4 Emergency Class Descriptions

There are three considerations related to emergency classes. These are:

- (1) The potential impact on radiological safety, either as now known or as can be reasonably projected;
- (2) How far the plant is beyond its predefined design, safety, and operating envelopes; and
- (3) Whether or not conditions that threaten health are expected to be confined to within the site boundary.

The ICs deal explicitly with radiological safety impact by escalating from levels corresponding to releases within regulatory limits to releases beyond EPA Protective Action Guideline (PAG) plume exposure levels. In addition, the "Discussion" sections below include offsite dose consequence considerations which were not included in NUREG-0654 Appendix 1.

UNUSUAL EVENT: Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Discussion:

Potential degradation of the level of safety of the plant is indicated primarily by exceeding plant technical specification Limiting Condition of Operation (LCO) allowable action statement time for achieving required mode change. Precursors of more serious events should also be included because precursors do represent a potential degradation in the level of safety of the plant. Minor releases of radioactive materials are included. In this emergency class, however, releases do not require monitoring or offsite response.

ALERT: Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

Discussion:

Rather than discussing the distinguishing features of "potential degradation" and "potential substantial degradation," a comparative approach would be to determine whether increased monitoring of plant functions is warranted at the Alert level as a result of safety system degradation. This addresses the operations staff's need for help, independent of whether an actual

decrease in plant safety is determined. This increased monitoring can then be used to better determine the actual plant safety state, whether escalation to a higher emergency class is warranted, or whether de-escalation or termination of the emergency class declaration is warranted. Dose consequences from these events are small fractions of the EPA PAG plume exposure levels, i.e., about 10 mrem to 100 mrem TEDE.

SITE AREA EMERGENCY: Events are in process or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment 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 beyond the site boundary.

Discussion:

The discriminator (threshold) between Site Area Emergency and General Emergency is whether or not the EPA PAG plume exposure levels are expected to be exceeded outside the site boundary. This threshold, in addition to dynamic dose assessment considerations discussed in the EAL guidelines, clearly addresses NRC and offsite emergency response agency concerns as to timely declaration of a General Emergency.

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 or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Discussion:

The bottom line for the General Emergency is whether evacuation or sheltering of the general public is indicated based on EPA PAGs, and therefore should be interpreted to include radionuclide release regardless of cause. To better assure timely notification, EALs in this category must primarily be expressed in terms of plant function status, with secondary reliance on dose projection. In terms of fission product barriers, loss of two barriers with loss or potential loss of the third barrier constitutes a General Emergency.

5.5 Emergency Class Thresholds

The most common bases for establishing these boundaries are the technical specifications and setpoints for each plant that have been developed in the design basis calculations and the Final Safety Analysis Report (FSAR).

For those conditions that are easily measurable and instrumented, the boundary is likely to be the EAL (observable by plant staff, instrument reading, alarm setpoint, etc.) that indicates entry into a particular emergency class. For example, the main steam line radiation monitor may detect high radiation that triggers an alarm. That radiation level also may be the setpoint that closes the main steam isolation valves (MSIV) and initiates the reactor trip. This same radiation level threshold, depending on plant-specific parameters, also may be the appropriate EAL for a direct entry into an emergency class.

In addition to the continuously measurable indicators, such as coolant temperature, coolant levels, leak rates, containment pressure, etc., the FSAR provides indications of the consequences associated with design basis events. Examples would include steam pipe breaks, MSIV malfunctions, and other anticipated events that, upon occurrence, place the plant immediately into an emergency class.

Another approach for defining these boundaries is the use of a plant-specific probabilistic safety assessment (PSA - also known as probabilistic risk assessment, PRA). A PSA has been completed for Seabrook Station. PSAs can be used as a good first approximation of the relevant ICs and risk associated with emergency conditions for existing plants. Generic insights from PSAs and related severe accident assessments which apply to EALs and emergency class determinations are:

1. Prolonged loss of all AC power events are extremely important. This would indicate that should this occur, and AC power is not restored within 15 minutes, entry into the emergency class at no lower than a Site Area Emergency, when the plant was initially at power, would be appropriate. This implies that precursors to loss of all AC power events should appropriately be included in the EAL structure.
2. For severe core damage events, uncertainties exist in phenomena important to accident progressions leading to containment failure. Because of these uncertainties, predicting containment integrity may be difficult in these conditions. This is why maintaining containment integrity alone following sequences leading to severe core damage may be an insufficient basis for not escalating to a General Emergency.
3. EAL methodology must be sufficiently rigorous to cover risk-significant sequences such as containment bypass, large LOCA with early containment failure, station blackout greater than 4 hours (e.g., LOCA consequences of Station Blackout), and reactor coolant pump seal failure.

Another critical element of the analysis to arrive at these threshold (boundary) conditions is the time that the plant might stay in that condition before moving to a higher emergency class. In particular, station blackout coping analyses performed in response to 10 CFR 50.63 and Regulatory Guide 1.155, "Station Blackout," is used to determine whether a Site Area Emergency or a General Emergency is indicated. The time dimension is critical to the EAL since the purpose of the emergency class for state and local officials is to notify them of the level of mobilization that may be necessary to handle the emergency. This is particularly true when a "Site Area Emergency" or "General Emergency" is imminent.

Regardless of whether or not containment integrity is challenged, it is possible for significant radioactive inventory within containment to result in EPA PAG plume exposure levels being exceeded even assuming containment is within technical specification allowable leakage rates. With or without containment challenge, however, a major release of radioactivity requiring offsite protection actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant. 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%.

5.6 Emergency Action Levels

With the emergency classes defined, the thresholds that must be met for each EAL to be placed under the emergency class can be determined. There are two basic approaches to determining these EALs. EALs and emergency class boundaries coincide for those continuously measurable, instrumented ICs, such as radioactivity, core temperature, coolant levels, etc. For these ICs, the EAL will be the threshold reading that most closely corresponds to the emergency class description using the best available information.

For discrete (discontinuous) events, the approach will have to be somewhat different. Typically, in this category are internal and external hazards such as FIRE or earthquake. The purpose for including hazards in EALs is to assure that station personnel and offsite emergency response organizations are prepared to deal with consequential damage these hazards may cause. If, indeed, hazards have caused damage to safety functions or fission product barriers, this should be confirmed by symptoms or by observation of such failures. Therefore, it may be appropriate to enter an Alert status for events approaching or exceeding design basis limits such as Operating Basis Earthquake, design basis wind loads, FIRE within VITAL AREAs, etc. This would give the operating staff additional support and improved ability to determine the extent of plant damage. If damage to barriers or challenges to Critical Safety Functions (CSFs) have occurred or are identified, then the additional support can be used to escalate or terminate the Emergency Class based on what has been found. Of course, security events must reflect potential for increasing security threat levels.

Plant emergency operating procedures (EOPs) are designed to maintain and/or restore a set of CSFs which are listed in the order of priority for restoration efforts during accident conditions. The Seabrook Station CSF set includes:

- Subcriticality
- Core cooling
- Heat sink
- Pressure-temperature-stress (RCS integrity)
- Containment
- RCS inventory
- Emergency Coolant Recirculation
- Radiation/RDMS Display

There are diverse and redundant plant systems to support each CSF. By monitoring the CSFs instead of the individual system component status, the impact of multiple events is inherently addressed, e.g., the number of operable components available to maintain the critical safety function.

The EOPs contain detailed instructions regarding the monitoring of these functions and provides a scheme for classifying the significance of the challenge to the functions. In providing EALs based on these schemes, the emergency classification can flow from the EOP assessment rather than being based on a separate EAL assessment. This is desirable as it reduces ambiguity and reduces the time necessary to classify the event.

As an example, consider that the Westinghouse Owner's Group (WOG) Emergency Response Guidelines (ERGs) classify challenges as YELLOW, ORANGE, and RED paths. If the core exit thermocouples exceed 1,100 degrees F or 725 degrees F with low reactor vessel water level, a RED path condition exists. The ERG considers a RED path as "... an extreme challenge to a plant function necessary for the protection of the public ..." This is almost identical to the present NRC NUREG-0654 description of a site area emergency "... actual or likely failures of plant functions needed for the protection of the public ..." It reasonably follows that if any CSF enters a RED path, a site area emergency exists. A general emergency could be considered to exist if core cooling CSF is in a RED path and the EOP function

restoration procedures have not been successful in restoring core cooling.

5.7 Treatment Of Multiple Events And Emergency Class Upgrading

The emergency class declared is based on the highest EAL reached. For example, two Alerts remain in the Alert category. Or, an Alert and a Site Area Emergency is a Site Area Emergency.

Although the majority of the EALs provide very specific thresholds, the STED/SED must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the STED/SED, an imminent situation is at hand, the classification should be made as if the threshold has been exceeded. While this is particularly prudent at the higher emergency classes (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all emergency classes.

5.8 Emergency Class Downgrading

Another important aspect of usable EAL guidance is the consideration of what to do when the risk posed by an emergency is clearly decreasing. Seabrook Station uses a combination approach involving recovery from General Emergencies and some Site Area Emergencies and termination from Unusual Events, Alerts, and certain Site Area Emergencies causing no long-term plant damage. Downgrading to lower emergency classes adds notifications but may have merit under certain circumstances.

5.9 Classifying Transient Events

For some events, the condition may be corrected before a declaration has been made. For example, an emergency classification is warranted when automatic and manual actions taken within the control room do not result in a required reactor trip. However, it is likely that actions taken outside of the control room will be successful, probably before the STED/SED classifies the event. The key consideration in this situation is to determine whether or not further plant damage occurred while the corrective actions were being taken. In some situations, this can be readily determined, in other situations, further analyses (e.g., coolant radiochemistry sampling, may be necessary).

If the emergency-related indications completely clear before a declaration of an emergency classification level has been made, then no emergency classification is required. The Shift Manager shall notify the Emergency News Manager within one hour of the termination of the emergency-related indications that emergency-related indications briefly existed, but cleared prior to the declaration of an emergency classification. The Emergency News Manager will initiate state notifications per good neighbor notification procedures. The event shall be reported to the NRC in accordance with 10 CFR 50.72 and 50.73 per the Regulatory Compliance Manual, and within 1 hour of the event.

If emergency-related indications are received and later cleared, and after the fact it is determined that an emergency classification was warranted but not made, then no emergency classification is required. The Shift Manager shall notify the Emergency News Manager within one hour of discovery that an emergency classification was warranted but not declared and that emergency-related indications no longer exist. The Emergency News Manager will initiate state notifications per good neighbor notification procedures. The event shall be reported to the NRC in accordance with 10 CFR 50.72 and 50.73 per the Regulatory Compliance Manual, and within 1 hour of the event.

If emergency-related indications are received and reduce in severity, such that the emergency classification went from an earlier higher level to a current lower level, the current lower level emergency should be declared.

Reporting requirements of 10 CFR 50.72 are applicable and the guidance of NUREG-1022, Rev. 1, Section 3 should be applied.

5.10 Cold Shutdown/Refueling IC/EALs

Generic Letter 88-17, Loss of Decay Heat Removal, SECY-91-283, Evaluation of Shutdown and Low Power Risk Issues, SECY-93-190, Regulatory Approach to Shutdown and Low-power Operation, NUREG-1449, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States, and NUMARC 91-06, Guidelines for Industry Actions to Assess Shutdown Management, all address nuclear power plant safety issues that are applicable to periods when the plant is shutdown. These evaluations identify a number of variables which significantly affect the probability and consequences of losing decay heat removal capability during shutdown periods. In addition, NUREG-1449 discusses that the need to respond appropriately, including emergency classification and notification, still exists during cold-shutdown and refueling conditions. Through use of NEI 99-01, Revision 4, the Seabrook Station emergency classification system addresses issues concerning shutdown effects on declaring emergencies discussed in SECY-93-190 and NUREG-1449.

Given the variability of plant configurations (e.g., systems out-of-service for maintenance, containment open, reduced AC power redundancy, time since shutdown) during these periods, the consequences of any given initiating event can vary greatly. For example, a loss of decay heat removal capability that occurs at the end of an extended outage has less significance than a similar loss occurring during the first week after shutdown. Compounding these events is the likelihood that instrumentation necessary for assessment may also be inoperable. The cold shutdown and refueling EALs are based on performance capability to the extent possible with consideration given to RCS integrity, containment closure, and fuel clad integrity for the applicable modes.

The initiating conditions and example emergency actions levels associated directly with Cold Shutdown or Refueling safety function are presented in Recognition Category C, Cold Shutdown/Refueling.

5.11 ISFSI IC/EALs

An Independent spent fuel storage installation (ISFSI) is a complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage. The Final Rule governing Emergency Planning Licensing Requirements for Independent Spent Fuel Storage Facilities (Federal Register Volume 60, Number 120 June 22, 1995, Pages 32430-32442) indicated that a significant amount of the radioactive material contained within a cask must escape its packaging and enter the biosphere for there to be a significant environmental impact resulting from an accident involving the dry storage of spent nuclear fuel. Formal offsite planning is not required because the postulated worst-case accident involving an ISFSI has insignificant consequences to the public health and safety.

Recognition Category E (Events Related to ISFSI) is applicable to licensees using their 10 CFR 50 emergency plan to fulfill the requirements of 10 CFR 72.32. The emergency classifications for Recognition Category E are those provided by NUREG 0654/FEMA Rep.1 in accordance with 10 CFR 50.47. The classification of an ISFSI event under provisions of a 10 CFR 50.47 emergency plan should be consistent with the definitions of the emergency classes as used by that plan.