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HOPE CREEK GENERATING STATION
EVENT CLASSIFICATION GUIDE TECHNICAL BASIS
December 18, 2001

CHANGE PAGES FOR
REVISION #14

The Table of Contents forms a general guide to the current revision of each section and attachment of the Hope Creek ECG Technical Basis. The changes that are made in this TOC Revision #14 are shown below.

1. Check that your revision packet is complete.
2. Add the revised documents.
3. Remove and recycle the outdated material listed below.

ADD			REMOVE		
Pages	Description	Rev.	Pages	Description	Rev.
ALL	TOC	14	All	TOC	13
All	Section 9.4	01	All	Section 9.4	00

HOPE CREEK ECG TECHNICAL BASIS
TABLE OF CONTENTS/SIGNATURE PAGE

HOPE CREEK ECG TECHNICAL BASIS
TABLE OF CONTENTS/SIGNATURE PAGE

REVISION SUMMARY Biennial Review Performed: Yes ____ No X

TOC has Revision Summary added.

9.4.1.a,b&c Added "*Salem County Office of Emergency Management will notify the fire departments of offsite release concerns from both sides of the river*" to explain who will notify local fire departments. This was a result of recommended actions from NRC Security Advisory.

9.4.1.b&c Added clarifying information concerning small or incidental releases not requiring classification and better definition of access restrictions and personnel injuries related to toxic gas releases. The clarifying information bring the use of this EAL in better alignment with NEI EAL guidance 99-01. This revision was determined not to constitute a decrease in effectiveness of the emergency plan. Specific new basis information included in this revision follows:

"Classification under this EAL is not warranted for small or incidental releases. This EAL assumes an uncontrolled process that has the potential to affect plant operations or personnel safety."

*A Uncontrolled **Toxic Gas** release is considered to be IMPEDING normal plant operations if the release results in **Access Restrictions** or **Personnel Injuries**.*

***Access Restrictions** are those actions that are put-in-place or left-in-place (evacuation of an area, no entry into an area, SCBA required for entry into an area), **after an initial assessment** of the release conditions is performed by the fire department. Access restrictions do not include short-term precautionary actions put in place prior to or during the initial assessment by the fire department.*

- *If the fire department's initial assessment results in implementation of or continuation of access restrictions, then the UE should be declared.*
- *If the fire department's initial assessment results in no access restrictions then the event does not warrant UE declaration.*

This EAL does not require a detailed assessment or quantification. If the initial assessment is delayed, cannot be completed or is inconclusive, and access restrictions are in place then classification of this event should be promptly made.

***Personnel Injuries** are considered any conditions that resulted for the uncontrolled toxic gas release that require transport of an individual(s) to the hospital for further evaluation or treatment. Injury to an individual for a small or incidental gas release (not an uncontrolled toxic gas release) is not included under this EAL. For example, an inhalation injury from a small or incidental release (small amount of localized fuming when a system is opened for maintenance) does not warrant classification under this EAL, however, an injury sustained when a leaking chemical pipe fills an area with hazardous fumes and a worker(s) is overcome and requires hospital evaluation/treatment, would warrant classification under this EAL."*

SIGNATURE PAGE

Prepared By: Craig Banner — 12/12/01
(If Editorial Revisions Only, Last Approved Revision) — Date

Section/Attachments Revised: Section 9.4 — 12/12/01
(List Non-Editorial Only - Section/Attachments) — Date

Reviewed By: Raymond Reece (R. Reece) — 12/04/2001
Station Qualified Reviewer — Date

Reviewed By: _____ — 12/12/01
Department Manager — Date

Reviewed By: N/A — _____
Manager – Licensing — Date
(Reportable Action Level (Section 11) and associated Attachments marked by "L")

Reviewed By: _____ — 12/12/01
Emergency Preparedness Manager — Date

Reviewed By: N/A — _____
Manager – Quality Assessment - NBU — Date
(If Applicable)

SORC Review and Station Approvals

N/A — N/A
Mtg. No. Hope Creek Chairman — Vice President - Nuclear Operations

_____ — _____
Date — Date

Effective Date of this Revision: 12/18/01
Date

9.0 Hazards - Internal/External

9.4 Toxic/Flammable Gases

UNUSUAL EVENT - 9.4.1.a

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

EAL

Notification by Local, County, or State Officials for the potential need to EVACUATE non-essential personnel due to an Offsite **Toxic Gas** release **AND** SNSS deems evacuation of non-essential personnel is required

OPERATIONAL CONDITION - All

BASIS

Notification by Local, County, or State Officials for the potential need to EVACUATE non-essential personnel due to an Offsite Toxic Gas release, along with OS concurrence that such action is appropriate warrants declaration of an Unusual Event, since a release that has occurred offsite, may have an impact on routine plant operations.

An offsite event (such as a tanker accident or a barge accident) may place the Protected Area within the evacuation area. The evacuation is determined from the DOT Evacuation Tables for Selected Hazardous Materials in the DOT Emergency Response Guide for Hazardous Materials. Salem County Office of Emergency Management will notify the fire department of offsite release concerns from both sides of the river.

A **Toxic Gas** is considered to be any substance that is dangerous to life or limb by reason of inhalation or skin contact. A **Toxic Gas** release is considered to be a threat to plant personnel if concentrations are high enough to endanger the health of those personnel.

Barrier Analysis

N/A

ESCALATION CRITERIA

Emergency Classification will escalate to an Alert if the Toxic Gas enters either a Plant Vital Area or an area contiguous to a Plant Vital Area.

DISCUSSION

None

DEVIATION

None

REFERENCES

NUMARC NESP-007, HU3.1 and HU3.2
HC.OP-AB.ZZ-0129 (Q), High Radiation, Smoke, or Toxic Gases in the Control Room Air Supply
HCGS Technical Specifications Section 3/4 7-6, Control Room Emergency Filtration System

9.0 Hazards - Internal/External

9.4 Toxic/Flammable Gases

UNUSUAL EVENT - 9.4.1.b

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

EAL

Uncontrolled Toxic Gas release within the Protected Area in ANY area which does not normally require an atmospheric survey or Respiratory Protection for entry

AND

Routine Plant Operations are IMPEDED based on EITHER one of the following:

- **Access restrictions** caused by the **uncontrolled** release
- **Personnel injuries** have occurred as a result of the release

OPERATIONAL CONDITION - All

BASIS

An **uncontrolled Toxic Gas** release within the Protected Area, in high enough concentrations, will adversely affect the health and safety of plant personnel, along with the safe operation of the plant. This EAL specifically addresses those areas within the Protected Area that do not normally require an atmospheric survey or Respiratory Protection for entry, since the atmosphere in an area that does require an atmospheric survey or Respiratory Protection does not meet the intent of this EAL.

Releases classified under this EAL include those that originate both onsite and offsite. Classification under this EAL is **not warranted** for small or incidental releases. This EAL assumes an uncontrolled process that has the potential to affect plant operations or personnel safety.

A **Toxic Gas** is considered to be any substance that is dangerous to life or limb by reason of inhalation or skin contact. **Uncontrolled Toxic Gas** releases are considered to be those releases that cannot be isolated / confined to a single compartment or area, or are not as the result of a designed plant safety feature.

For example, an **uncontrolled release** of chlorine/ammonia into the Turbine Building that requires evacuation warrants declaration of an Unusual Event. A Cardox discharge inside any area that contains this safety feature (i.e. Diesel Bays) does not warrant Unusual Event declaration, unless personnel injuries have occurred as a direct result of the discharge. An inhalation injury from a small or incidental release (small amount of localized fuming when a system is opened for maintenance) does not warrant classification under this EAL

A Uncontrolled **Toxic Gas** release is considered to be IMPEDING normal plant operations if the release results in **Access Restrictions** or **Personnel Injuries**.

Access Restrictions are those actions that are put-in-place or left-in-place (evacuation of an area, no entry into an area, SCBA required for entry into an area), **after an initial assessment** of the release conditions is performed by the fire department. Access restrictions do not include short-term precautionary actions put in place prior to or during the initial assessment by the fire department.

- If the fire department's initial assessement results in implementation of or continuation of access restrictions, then the UE should be declared.
- If the fire department's initial assessement results in no access restrictions then the event does not warrant UE declaration.

This EAL does not require a detailed assessment or quantification. If the initial assessment is delayed, cannot be completed or is inconclusive, and access restrictions are in place then classification of this event should be promptly made.

Personnel Injuries are considered any conditions that resulted for the uncontrolled toxic gas release that require transport of an individual(s) to the hospital for further evaluation or treatment. Injury to an individual for a small or incidental gas release (not an uncontrolled toxic gas release) is not included under this EAL. For example, an inhalation injury from a small or incidental release (small amount of localized fuming when a system is opened for maintenance) does not warrant classification under this EAL, however, an injury sustained when a leaking chemical pipe fills an area with hazardous fumes and a worker(s) is overcome and requires hospital evaluation/treatment, would warrant classification under this EAL.

Barrier Analysis

N/A

ESCALATION CRITERIA

Emergency Classification will escalate to an Alert if the Flammable Gas enter either a Plant Vital Area or an area contiguous (adjacent) to a Plant Vital Area and safe shutdown could be impeded.

DISCUSSION

This EAL should not be construed to include confined spaces that must be ventilated prior to entry or situations involving The fire department personnel who are using respiratory equipment during the performance of their duties unless it also affects personnel not involved with The fire department activates. These areas include the Drywell (when inerted) and ALL Confined Spaces. In addition, those situations that require personnel to wear respiratory protection equipment as the result of airborne contamination as required by Radiation Protection personnel do not meet the intent of this EAL.

An offsite event (such as a tanker accident or a barge accident) may place the Protected Area within the evacuation area. The evacuation is determined from the DOT Evacuation Tables for Selected Hazardous Materials in the DOT Emergency Response Guide for Hazardous Materials. Salem County Office of Emergency Management will notify the fire department of offsite release concerns from both sides of the river.

DEVIATION

None

REFERENCES

NUMARC NESP-007, HU3.1 and HU3.2
NEI 99-01, HU3 – Draft
HC.OP-AB.ZZ-0129 (Q), High Radiation, Smoke, or Toxic Gases in the Control Room Air Supply
HCGS Technical Specifications Section 3/4 7-6, Control Room Emergency Filtration System

9.0 Hazards - Internal/External

9.4 Toxic/Flammable Gases

UNUSUAL EVENT - 9.4.1.c

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

EAL

Uncontrolled Flammable Gas release within the Protected Area that RESULTS in Flammable Gas concentrations EXCEEDING **25% of the LEL**

AND

Routine Plant Operations are IMPEDED based on EITHER one of the following:

- **Access restrictions** caused by the **uncontrolled** release
- Personnel injuries have occurred as a result of the release

OPERATIONAL CONDITION - All

BASIS

An **uncontrolled Flammable Gas** release within the Protected Area, in high enough concentrations, will adversely affect the health and safety of plant personnel, along with the safe operation of the plant. This EAL specifically addresses those conditions where a Flammable Gas concentration EXCEEDING **25% of the LEL** (Lower Explosive Limit) exists anywhere within the Protected Area. Releases classified under this EAL include those that originate both onsite and offsite.

A **Flammable Gas** is considered to be any substance that can result in an ignition, sustained burn or detonation. **Uncontrolled Flammable Gas** releases are considered to be those releases that cannot be isolated / confined to a single compartment or area.

For example, an **uncontrolled release** of hydrogen into the Turbine Building in concentration exceeding 25% of the LEL warrants declaration of an Unusual Event. In comparison, a controlled release of Hydrogen during Generator purging or Hydrogen Tank trailer purging does not warrant event declaration, as these evolutions are controlled.

Flammable Gas release is considered to be IMPEDING normal plant operations if concentrations are high enough to restrict routine operator movements resulting in Access Restrictions. **Access Restrictions** are those actions that are put-in-place or left-in-place (evacuation of an area, no entry into an area, SCBA required for entry into an area), **after an initial assessment** of the release conditions is performed by the fire department. Access restrictions do not include short-term precautionary actions put in place prior to or during the initial assessment by the fire department.

- If the fire department's initial assessement results in implementation or continuation of access restrictions, then the UE should be declared.
- If the fire department's initial assessement results in no access restrictions required, then the event does not warrant UE declaration.

This EAL does not require a detailed assessment or quantification. If the initial assessment is delayed, cannot be completed or is inconclusive, and access restrictions are in place then classification of this event should be promptly made.

Personnel Injuries are considered any conditions that resulted for the **Uncontrolled Flammable Gas** release that require transport of an individual(s) to the hospital for further evaluation or treatment.

Barrier Analysis

N/A

ESCALATION CRITERIA

Emergency Classification will escalate to an Alert if the Flammable Gas enter either a Plant Vital Area or an area contiguous to a Plant Vital Area.

DISCUSSION

For Hydrogen Gas, the explosive limit is 4%. Hence, a threshold of 25% of the LEL equates to 1% Hydrogen. This EAL should not be construed to include those controlled evolutions that may discharge a Flammable Gas within the Protected Area, but present no danger to plant safety, since the evolution is planned and controlled.

An offsite event (such as a tanker accident or a barge accident) may place the Protected Area within the evacuation area. The evacuation is determined from the DOT Evacuation Tables for Selected Hazardous Materials in the DOT Emergency Response Guide for Hazardous Materials. Salem County Office of Emergency Management will notify the fire department of offsite release concerns from both sides of the river.

DEVIATION

None

REFERENCES

NUMARC NESP-007, HU3.1 and HU3.2
HC.OP-AB.ZZ-0129 (Q), High Radiation, Smoke, or Toxic Gases in the Control Room Air Supply
HCGS Technical Specifications Section 3/4 7-6, Control Room Emergency Filtration System

9.0 Hazards - Internal/External

9.4 Toxic/Flammable Gases

ALERT - 9.4.2.a

IC 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 Conditions

EAL

Uncontrolled Toxic Gas release within ANY one of the following Plant Structures

- Reactor Building
- Turbine Building
- Control/Aux Building
- Service Water Intake Structure
- Service/Rad Waste Building

AND

Toxic Gas concentrations result in ANY one of the following:

- An IDLH atmosphere
- Plant personnel report severe adverse health reactions, including burning eyes, nose, throat, or dizziness
- The Threshold Limit Value (TLV) being EXCEEDED

AND

Plant personnel are unable to perform actions necessary to complete a Safe Shutdown of the plant without appropriate personnel protection equipment

OPERATIONAL CONDITION - All

BASIS

An **uncontrolled Toxic Gas** release entering any of the plant structures listed in the EAL, that threatens the ability of plant personnel to perform actions required for safe shutdown of the plant, warrants declaration of an Alert. The EAL threshold includes those conditions that

present a significant challenge to plant personnel. This EAL specifically addresses only those plant structures that either contain safe shutdown equipment or are contiguous to those areas. Release classified under this EAL include those that originate both onsite and offsite. A **Toxic Gas** is considered to be any substance that is dangerous to life or limb by reason of inhalation or skin contact. **Uncontrolled Toxic Gas** releases are considered to be those releases that can not be isolated / confined to a single compartment or area, or are not as the result of a designed plant safety feature.

For example, an **uncontrolled release** of chlorine/ammonia into the Turbine Building that directly effects plant personnel, warrants declaration of an Alert. A Cardox discharge inside any area that contains this safety feature (i.e. Diesel Bays) does not warrant Alert declaration, unless personnel injuries have occurred as a direct result of the discharge.

Barrier Analysis

N/A

ESCALATION CRITERIA

Emergency Classification will escalated based on further damage to plant safety systems, loss of fission product barriers, or abnormal radiological releases. The EC may use Emergency Coordinator Discretion and escalate the classification to SAE based on the nature of the toxic gas release.

DISCUSSION

Access is considered impeded if the Toxic Gas concentrations are life threatening, i.e. require the use of personnel protective equipment. Use of protective equipment also limits the mobility and vision. The cause or magnitude of the gas concentration is not the major concern in this EAL, but rather that access required to an area that may be impeded. An IDLH atmosphere is any atmosphere that is determined to be Immediately Dangerous to Life and Health.

This EAL should not be construed to include confined spaces that must be ventilated prior to entry or situations involving Site Protection personnel who are using respiratory equipment during the performance of their duties unless it also affects personnel not involved with Site Protection activities. These areas include the Drywell (when inerted) and ALL Confined Spaces. In addition, those situations that require personnel to wear respiratory protection equipment as the result of airborne contamination as required by Radiation Protection personnel do not meet the intent of this EAL.

An offsite event (such as a tanker accident or a barge accident) may place the Protected Area within the evacuation area. The evacuation is determined from the DOT Evacuation Tables for Selected Hazardous Materials in the DOT Emergency Response Guide for Hazardous Materials.

DEVIATION

None

REFERENCES

NUMARC NESP-007, HA3.1 and HA3.2
HC.OP-AB.ZZ-0129 (Q), High Radiation, Smoke, or Toxic Gases in the Control Room Air Supply
HCGS Technical Specifications Section 3/4 7-6, Control Room Emergency Filtration System

9.0 Hazards - Internal/External

9.4 Toxic/Flammable Gases

ALERT - 9.4.2.b

IC 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 Conditions

EAL

Uncontrolled Flammable Gas release within ANY one of the following Plant Structures

- Reactor Building
- Turbine Building
- Control/Aux Building
- Service Water Intake Structure
- Service/Rad Waste Building

AND

Flammable Gas concentrations EXCEED **50% of the LEL**

AND

Plant personnel are unable to perform actions necessary to complete a Safe Shutdown of the plant without appropriate personnel protection equipment

OPERATIONAL CONDITION - All

BASIS

An **uncontrolled Flammable Gas** release entering any of the plant structures listed in the EAL, that threatens the ability of plant personnel to perform actions required for safe shutdown of the plant, warrants declaration of an Alert. The EAL threshold includes those conditions that present a significant challenge to plant personnel. This EAL specifically addresses only those plant structures that either contain safe shutdown equipment or are contiguous to those areas. Release classified under this EAL include those that originate both onsite and offsite. A **Flammable Gas** is considered to be any substance that is capable of being easily ignited or burning quickly. **Uncontrolled Flammable Gas** releases are considered

to be those releases that can not be isolated / confined to a single compartment or area, or are not as the result of a designed plant safety feature.

For example, an **uncontrolled release** of hydrogen into the Turbine Building in concentration exceeding 50% of the LEL (Lower Explosive Limit) warrants declaration of an Alert. In comparison, a controlled release of Hydrogen during Generator purging does not warrant event declaration, as this evolution is controlled.

Barrier Analysis

N/A

ESCALATION CRITERIA

Emergency Classification will escalated based on subsequent damage to plant safety systems, loss of fission product barriers, or abnormal radiological releases. The EC may use discretion and escalate the classification to SAE based on the nature of the flammablegas release.

DISCUSSION

For Hydrogen Gas, the explosive limit is 4%. Hence, a threshold of 50% of the LEL equates to 2% Hydrogen. This EAL should not be construed to include those controlled evolutions that may discharge a Flammable Gas within the Protected Area, but present no danger to plant safety, since the evolution is planned and controlled.

An offsite event (such as a tanker accident or a barge accident) may place the Protected Area within the evacuation area. The evacuation is determined from the DOT Evacuation Tables for Selected Hazardous Materials in the DOT Emergency Response Guide for Hazardous Materials.

DEVIATION

None

REFERENCES

NUMARC NESP-007, HA3.1 and HA3.2
HC.OP-AB.ZZ-0129 (Q), High Radiation, Smoke, or Toxic Gases in the Control Room Air Supply
HCGS Technical Specifications Section 3/4 7-6, Control Room Emergency Filtration System