



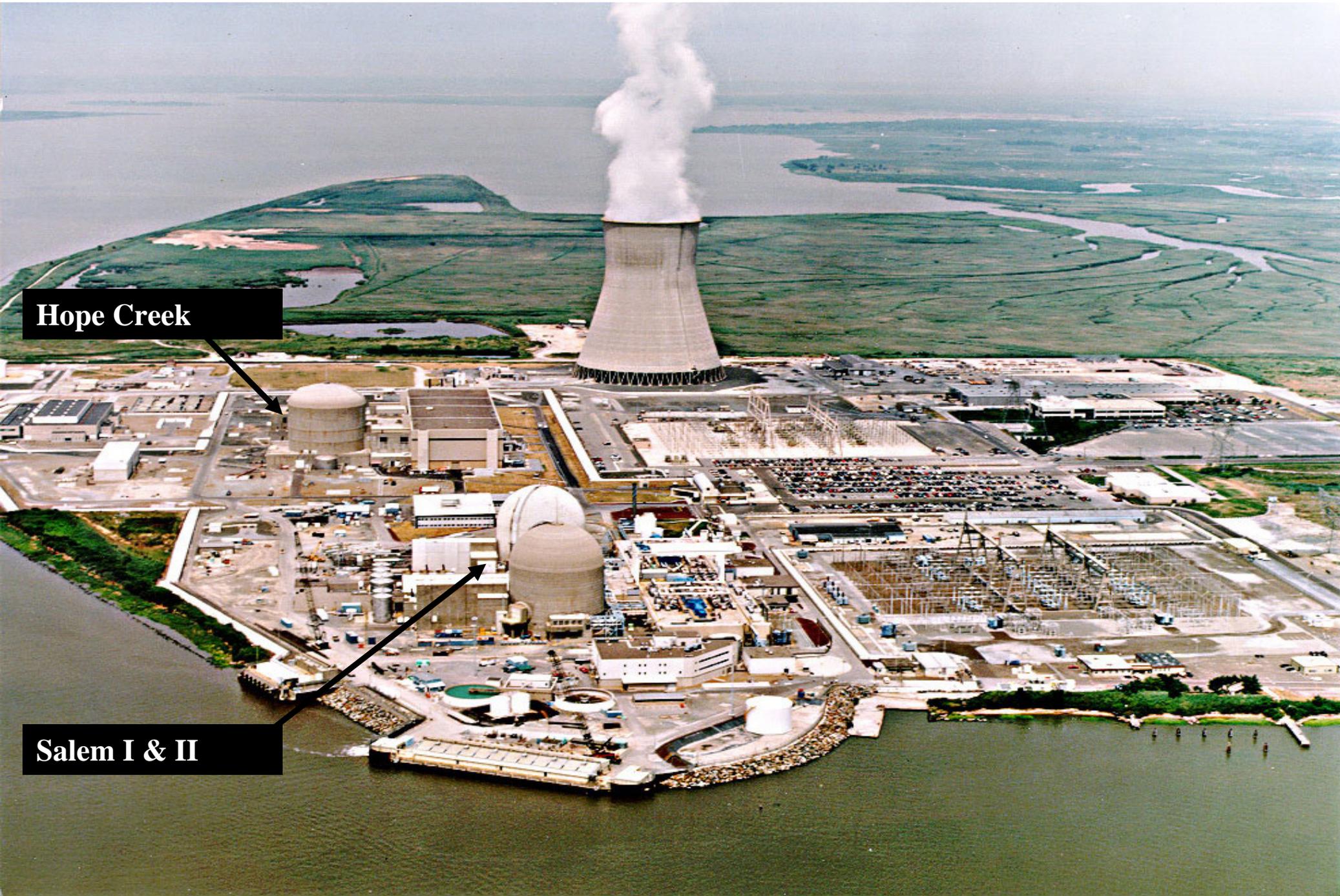
Salem and Hope Creek Nuclear Generating Stations

NJLMA
Educational Foundation, Inc.

Emergency Management – Utilities and Shore Communities

Kevin Chambliss – PSEG Nuclear - Director Special Project

Salem & Hope Creek Generating Stations



Hope Creek

Salem I & II

PURPOSE OF EMERGENCY PLAN

Purpose:

The purpose of the Emergency Plan is to protect the health and safety of the general public and site personnel from the potential hazards of a radiological emergency

- PSEG Emergency Response Organization (ERO) consists of approximately 1,000 employees
- 10 Mile Emergency Planning Zone (EPZ) population consists of approximately 40,000 people

EP's Core Functions:

- Drill and Exercise Coordination
- Radiation Protection Coordination
- Program Coordination
- Training Coordination
- Facilities and Equipment Coordination
- Offsite Coordination
- Station Compliance Coordination

Emergency Classification System

- The Emergency Classification System is designed to provide a consistent method for categorizing events or accidents into one of four emergency classifications:
 - 1. Unusual Event (UE) ...(*least severe*)
 - 2. Alert -
 - 3. Site Area Emergency (SAE)
 - 4. General Emergency (GE) ...(*most severe*)

Unusual Events (UE)

UEs are characterized as off-normal plant conditions that may not be particularly significant from an emergency response standpoint. Normal on-shift personnel can handle.

UE Examples:

- Onsite Fire not extinguished in < 15 minutes
- Hurricane, twister, earthquake
- Loss of offsite power
- Small leak in reactor coolant system
- Security Threat (no actual hostile actions onsite)

Emergency Classification - Overview for Offsite Response Orgs

Alert

An Alert is described as potential or actual safety system degradation.

Any radiological release is a small fraction of Environmental Protection Agency (EPA) Protective Action Guideline (PAG).

PSEG Emergency Response Organization is activated.

Lowest level at which some emergency off-site response is anticipated.

- State Emergency Operations Centers (EOCs) will activate. This may also occur at county and municipal levels.

ALERT Examples:

- Onsite Fire/explosion/flood of a magnitude that it damages multiple plant safety systems.
- Leak in the reactor coolant system that requires emergency cooling water systems to activate. (One Fission Product Barrier lost)
- Hostile Action affecting the site but outside of protected area (fence)

Site Area Emergency (SAE)

An SAE is described as an off-normal plant event or other conditions with major failures of plant functions needed to protect the plant or the public.

SAE Examples:

- Loss of two of three fission product barriers (Fuel damage and Coolant leak but containment is holding fine).
- Failure of Reactor to Trip (shutdown) and power >5%.
- Hostile Action affecting the Protected Area (inside the fence)

Site Area Emergency (SAE) cont.

Off-site Actions Taken by the States:

- Make decision to activate the Alert Notification System (ANS = Sirens) and Emergency Alert System (EAS) to keep the public informed.
- Alert all emergency response personnel and activate state, county, and local EOCs.
- Monitor appropriate locations.
- Alert contiguous and ingestion pathway states: 0-50 mile radius (NJ, DE, MD, PA)
- Provide assistance to the site, if required.
- May implement some protective actions.

General Emergency (GE)

A GE reflects conditions involving an actual or imminent substantial core degradation or melting with the potential for loss of containment integrity, (i.e., the loss of two fission product barriers and potential loss of the third.

Both situations could have actual or potential radiological release exceeding EPA PAG off-site).

Fission product barriers are those barriers established to separate the fission products (formed during the fission process) from the environment (more on this later).

Protective Action Recommendations (PARs) Overview for OROs

Plume Emergency Planning Zone (EPZ)

- The Plume EPZ is a 0-10 mile radius around the plant. This includes portions of the states of NJ and DE. The concern in this area is direct exposure caused by a radiological release. There are approximately 40,000 people residing in the Plume EPZ.

Ingestion Emergency Planning Zone (EPZ)

- The Ingestion EPZ is a 0-50 mile radius around the plant. This includes portions of the states of NJ, DE, PA, and MD. The concern is ingestion of radioactive contamination via food, water, and inhalation. There are approximately 3.5 million people residing in the Ingestion EPZ.

Protective Action Recommendations (PARs) Overview for OROs

PSEG Nuclear PARs:

A Protective Action Recommendation (PAR) of sheltering or evacuation out to a fixed distance is communicated to the states in the initial notification message for any GE declaration.

Offsite Actions Taken by the States:

- Make decision to activate the ANS and EAS to keep the public informed.
- Make and implement protective actions, including pathway measures.
- Regularly inform the public of emergency status.
- Coordinate field monitoring with federal and utility teams.
- Continuously assess event effects upon the public.
- State, County, and Municipal EOCs are activated, if not already done so.

Three Fission Product Barriers:

- **Fuel cladding...** (fuel rods incasing uranium pellets)
- **The Reactor Coolant System (RCS)...** (water piping and systems that keep the fuel from overheating)
- **Primary Containment...** (dome-like structure that surrounds the Reactor, RCS and major support systems)

Typical Event Classification Guide (ECG) Section

7.0 Electrical Power 7.1 Loss of AC Power Capabilities

Initiating Condition

Loss of All Offsite Power to Vital Buses for greater than 15 minutes

AC power capability to Vital Buses reduced to a Single Power Source for greater than 15 minutes such that any additional single failure would result in a complete loss of all 4.16 KV Vital Buses

Loss of All Offsite Power and All Onsite AC Power to 4.16 KV Vital Buses during either in Cold Shutdown or Refueling for greater than 15 minutes.

OPCON

All

1, 2, 3

4, 5, Defueled

EAL #

7.1.1

7.1.2.a

7.1.2.b

IF

IF

IF

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Unplanned Loss of Power from Station Service Transformers 1AX501 AND 1BX501 to ALL 4.16 KV Vital Buses

Loss of 4.16 KV Vital Bus Power Sources (Offsite and Onsite) which results in the availability of ONLY one 4.16 KV Vital Bus Power Source (Offsite or Onsite)

ALL 4.16 KV Vital Buses are deenergized

AND

> 15 minutes have elapsed

AND

> 15 minutes have elapsed

THEN

THEN

Action Required

Refer to Attachment 1
UNUSUAL EVENT

Refer to Attachment 2
ALERT

HOPE CREEK FISSION PRODUCT BARRIER TABLE

PSEG Internal Use Only

TABLE 3.0 FISSION PRODUCT BARRIERS

APPLICABLE OPERATIONAL CONDITIONS ARE 1, 2, 3 ONLY

NOTE
If the Loss or Potential Loss is considered **IMMINENT** (may occur within 2 hours), use judgment and classify as if the threshold is exceeded.

Instructions:

- In the table review the Emergency Action Levels of all columns and identify which need further review.
- For each of the three barriers, determine the EAL with the highest point value, and circle the corresponding EAL # and point value. No more than one EAL should be selected for each barrier.
- Add the point values circled for the three barriers and enter the sum below:
- Classify based on the point value sum as follows:

If the sum is:	Classify as:	Refer to:
1, 2	UNUSUAL EVENT	Attachment 1
3, 4	ALERT	Attachment 2
5, 6, 7, 8	SITE AREA	Attachment 3
9, 10	GENERAL	Attachment 4

- Implement the appropriate ECG Attachment per above chart.
- Continue to review the EALs on this Table for changes that could result in emergency escalation or de-escalation.

3.1 Fuel Clad Barrier

3.1.1 REACTOR WATER LEVEL	
POTENTIAL LOSS = 3 PTs	LOSS = 4 PTs
EAL # 3.1.1.a Reactor Water Level REACHES -161" (Top of Active Fuel) EXCLUDING intentional lowering of Reactor Water Level during an ATWS	EAL # 3.1.1.b RPV Level CANNOT be restored AND maintained above -190"

3.1.2 DRYWELL ATMOSPHERE POST ACCIDENT (DAPA) RADIATION LEVEL	
POTENTIAL LOSS = 0 PTs	LOSS = 4 PTs
Not Applicable	EAL # 3.1.2 DAPA Radiation Monitor reading ≥5,000R/hr

3.1.3 RCS IODINE CONCENTRATION	
POTENTIAL LOSS = 0 PTs	LOSS = 4 PTs
Not Applicable	EAL # 3.1.3 Reactor Coolant Sample Activity ≥300 µCi/gm Dose Equivalent I-131

3.1.4 EMERGENCY COORDINATOR JUDGMENT	
POTENTIAL LOSS = 3 PTs	LOSS = 4 PTs
EAL # 3.1.4.a ANY condition, in the opinion of the EC, that indicates a Potential Loss of the Fuel Clad Barrier	EAL # 3.1.4.b ANY condition, in the opinion of the EC, that indicates a Loss of the Fuel Clad Barrier

3.2 Reactor Coolant System Barrier

3.2.1 REACTOR WATER LEVEL	
POTENTIAL LOSS = 3 PTs	LOSS = 4 PTs
EAL # 3.2.1.a Reactor Water Level REACHES -129" EXCLUDING intentional lowering of Reactor Water Level during an ATWS	EAL # 3.2.1.b Reactor Water Level REACHES -161" (Top of Active Fuel) EXCLUDING intentional lowering of Reactor Water Level during an ATWS

3.2.2 RCS LEAK RATE/ DRYWELL PRESSURE	
POTENTIAL LOSS = 3 PTs	LOSS = 4 PTs
EAL # 3.2.2.a Unisolable RCS Leak Rate ≥50 gpm INSIDE Primary Containment	EAL # 3.2.2.b Valid High Drywell Pressure Condition (≥1.68 psig)

3.2.3 RCS LINE BREAK/CONTAINMENT BYPASS	
POTENTIAL LOSS = 3 PTs	LOSS = 4 PTs
EAL # 3.2.3.a RCS Line Break OUTSIDE Primary Containment, resulting in a Valid Isolation Signal for ANY one of the following systems: • NSSSS • HPCI • RCIC	EAL # 3.2.3.b Main Steam Line Break OUTSIDE Primary Containment resulting in an AUTOMATIC MSIV Isolation Signal
AND	AND
UNISOLABLE leakage OUTSIDE Primary Containment (AFTER ISOLATION from the Main Control Room has been attempted) as indicated by one of the following: • Downstream pathway to the environment exists • Radiation monitors, area temperature or flow	UNISOLABLE leakage OUTSIDE Primary Containment (AFTER ISOLATION from the Main Control Room has been attempted) as indicated by one of the following: • Downstream pathway to the environment exists • Radiation Monitors, area temperature or flow

3.2.4 EMERGENCY COORDINATOR JUDGMENT	
POTENTIAL LOSS = 3 PTs	LOSS = 4 PTs
EAL # 3.2.4.a ANY condition, in the opinion of the EC, that indicates a Potential Loss of the RCS Barrier	EAL # 3.2.4.b ANY condition, in the opinion of the EC, that indicates a Loss of the RCS Barrier

3.3 CNTMT Barrier

3.3.1 REACTOR WATER LEVEL	
POTENTIAL LOSS = 1 PT	LOSS = 0 PTs
EAL # 3.3.1 RPV Level CANNOT be restored AND maintained above -190"	Not Applicable

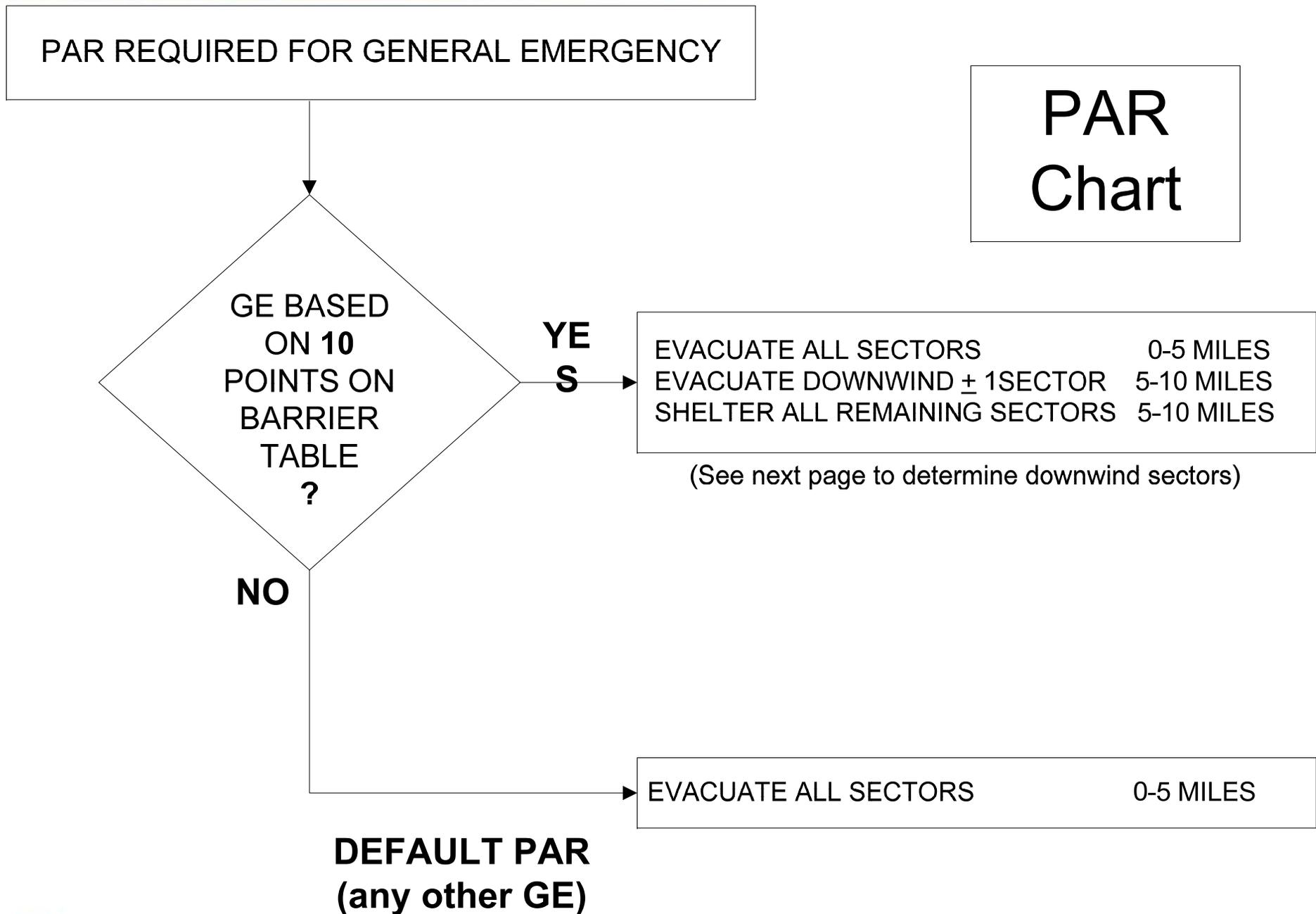
3.3.2 DRYWELL PRESSURE / H ₂	
POTENTIAL LOSS = 1 PT	LOSS = 2 PTs
EAL # 3.3.2.a Supp Chamber press CANNOT BE MAINTAINED below 65 psig	EAL # 3.3.2.b Containment Failure as indicated by a rapid drop in Drywell Pressure following a rise in pressure above 1.68 psig
OR	OR
EAL # 3.3.2.c Primary Containment H ₂ concentration >4% and O ₂ concentration >5%	EAL # 3.3.2.d Drywell Pressure response NOT consistent with LOCA conditions
	OR
	EAL # 3.3.2.e Containment is Vented by the Emergency Operating Procedures (EOPs)

3.3.3 DRYWELL ATMOSPHERE POST ACCIDENT (DAPA) RADIATION LEVEL	
POTENTIAL LOSS=1 PT	LOSS = 0 PTs
EAL # 3.3.3 DAPA Radiation Monitor reading ≥28,000R/hr	Not Applicable

3.3.4 RCS LINE BREAK/ CONTAINMENT BYPASS	
POTENTIAL LOSS = 1 PT	LOSS = 2 PTs
Not Applicable	EAL # 3.3.4 UNISOLABLE leakage OUTSIDE Primary Containment as indicated by one of the following: • Downstream pathway to the environment exists • Radiation monitors, area temperature, flow or sump level
	AND
	Containment Isolation is required as indicated by a signal for ANY one of the following systems: • NSSSS • HPCI • PCIS • RCIC
	AND
	Cannot be ISOLATED from the Main Control Room

3.3.5 EMERGENCY COORDINATOR JUDGMENT	
POTENTIAL LOSS = 1 PT	LOSS = 2 PTs
EAL # 3.3.5.a ANY condition, in the opinion of the EC, that indicates a Potential Loss of the Containment Barrier	EAL # 3.3.5.b ANY condition, in the opinion of the EC, that indicates a Loss of the Containment Barrier

EALs, Classification and PAR Process Overview for OROs



Offsite Response Support

Federal Organizations

The **U.S. Department of Energy (DOE)** provides radiological assistance teams generally requested by the states of New Jersey and Delaware. The DOE is responsible for coordinating the off-site radiological monitoring and evaluation activities of the federal government.

The **U.S. Nuclear Regulatory Commission (NRC)** approves and audits PSEG Nuclear's E-Plan. They provide support to our emergency facilities during declared emergencies. During an emergency the NRC is notified via a dedicated telephone line (Emergency Notification System - ENS) from the Control Room, TSC, or EOF, to their Rockville, Maryland operations center within one hour after identifying the existence of an emergency condition. The NRC is responsible for the coordination of the federal government's technical response activities. The Office of Inspection and Enforcement, Region I, King of Prussia, Pennsylvania dispatches a support team to our emergency facilities.

Federal Organizations (cont.)

The **U.S. Coast Guard (USCG)** is notified of all emergency events at Salem and Hope Creek Generating Stations by the states of NJ and DE. The USCG will provide control of river traffic, rescue and or notification operations on the Delaware River and associated waterways.

The **Federal Emergency Management Agency (FEMA)** is responsible for approving and auditing off-site emergency plans. They provide additional assistance and assessment for the state and local governments. FEMA has the responsibility for coordinating all off-site non-technical response activities of the federal government. They serve as the primary point of contact for requests of federal assistance initiated by state and local officials.

Offsite Response Support

State

In the event of an emergency at Hope Creek or Salem Stations, PSEG Nuclear will provide notification to the states of New Jersey and Delaware within fifteen minutes. The states work with PSEG Nuclear in the event of an emergency to develop, review, and implement protective actions for accidents endangering the public.

Local

The Memorial Hospital of Salem County provides medical support. Local volunteer squads provide back-up fire protection and ambulance support. The resources are provided at the request of the Emergency Coordinator of the affected unit. New Jersey State Police would coordinate response onsite to any Hostile Action events.

Teamwork = Integrated Response

Effective Response with PSEG Nuclear and Offsite Responders Working as a Team:

- In EOF: NJSP, NJBNE, DEMA, NRC, FEMA and PSEG Emergency Responders
- In ENC/JIC: NJSP, NJBNE, DEMA, NRC, FEMA, Salem and Cumberland Counties, LAC Township and PSEG Emergency Responders
- Incident Command: Same as above at local Incident Command Center.
- The following includes some pictures from last year's Hostile Action Based Drill and Annual Hospital Contaminated Injured Person Drill.

Incident Command During Hostile Action Drill



NJSP Bearcat Responds Onsite During Hostile Action Drill



LAC Township & PSEG EMTs - Joint Response Injured Man Drill



Eye-in-the-Sky

NJSP Locates Sniper in Hostile Action Drill



Salem Hospital - Contaminated Injured Person Drill



Questions???????

Questions???????