

**INTERIM FINDING REPORT
FOR REASONABLE ASSURANCE**

On the Adequacy of the Offsite
Radiological Emergency Response Planning
for the
PSEG Nuclear and PSEG Power Early Site Permit Application
Lower Alloways Township, Salem County, New Jersey

December 29, 2010

Prepared by the
U.S. Department of Homeland Security
Federal Emergency Management Agency
Protection and National Preparedness Division
Technological Services Division

Region II

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Executive Summary

On May 25, 2010, PSEG Power LLC, and PSEG Nuclear LLC (applicants) submitted an Early Site Permit (ESP) Application to the Nuclear Regulatory Commission (NRC) for the Salem/ Hope Creek Site in Salem County, New Jersey. The proposed PSEG Site is located near the existing Salem/ Hope Creek nuclear power plants, which are situated on the east bank of the Delaware River in Lower Alloways Creek Township, Salem County, New Jersey. The review of the materials provided with the ESP Application resulted in findings in all sixteen planning standards. Fifteen planning standards were found to be adequate. One planning standard was found to be not applicable to offsite planning and preparedness.

The following materials provided in the ESP Application were the basis for the review:

- State of New Jersey Radiological Emergency Response Plans for Nuclear Power Plants, May 14, 2009;
- State of New Jersey Radiological Emergency Response Plan Annex A, March, 2008, which contains the Salem County (Appendix 1), and Cumberland County (Appendix 2) Radiological Response Plans. Annex A also contains the Radiological Response Plans for the six townships in Salem County and the two townships in Cumberland County that are located within the 10 mile plume EPZ; and
- State of New Jersey Radiological Emergency Response Plan Standard Operating Procedures

NUREG-0654/FEMA-REP-1, Rev. 1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” amended March 2002, and its Supplements, the Interim REP Program Manual, dated August 2002, current FEMA guidance documents, and established industry practices were considered in making the determination as to the plans’ adequacy.

The review of the offsite emergency plans resulted in evaluation findings for all of the planning standards and associated criteria contained in NUREG-0654/FEMA-REP-1, Rev. 1, as amended, that are ORO responsibilities. Each planning standard and criterion was rated as:

- Adequate: Plans are adequate and there is reasonable assurance that they can be implemented with only limited or no corrections needed.
- Adequate – Corrections must be made: Plans are adequate but before a determination can be made as to whether they can be implemented, corrections must be made to the plans or supporting measures must be demonstrated (e.g., adequacy and maintenance of procedure, training, resource, staffing levels and qualifications, and equipment).
- Inadequate: Plans are inadequate and cannot be implemented until they are revised to correct deficiencies noted in the Federal review.
- N/A: The planning standard is not applicable to offsite response organizations.

The initial review resulted in the following interim evaluation findings (ratings for each individual criterion are summarized in Section IV, Technical Review Composite Rating Summary):

- Planning Standard A: Adequate
- Planning Standard B: N/A

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- Planning Standard C: Adequate
- Planning Standard D: Adequate
- Planning Standard E: Adequate
- Planning Standard F: Adequate
- Planning Standard G: Adequate
- Planning Standard H: Adequate
- Planning Standard I: Adequate
- Planning Standard J: Adequate
- Planning Standard K: Adequate
- Planning Standard L: Adequate
- Planning Standard M: Adequate
- Planning Standard N: Adequate
- Planning Standard O: Adequate
- Planning Standard P: Adequate

Adequacy of the PSEG ESP Application Emergency Plan review for OROs is also dependent on satisfactory demonstration of plan implementation during a joint exercise with the licensee and State and local governments and utilizing PSEG facilities.

I. Introduction

A. General Characteristics of the PSEG Site

There are two nuclear generating stations (three units) located on the PSEG site. The nuclear generating stations are Salem Nuclear Generating Station Units 1 and 2 and the Hope Creek Nuclear Generating Station. These stations are adjacent to each other and are located in Lower Alloways Creek Township, Salem County, New Jersey.

The PSEG site is situated on the eastern shore about one-third of the way across the Delaware River, which has a width of about two and one-half miles at this location. Both stations are roughly midway between Wilmington and Dover, Delaware, which are approximately 20 miles north and south of the site, respectively. Philadelphia is about 32 miles north-northeast of the site and Salem City is about seven and one-half miles north-northeast of the site.

There are no major highways or railroads within seven miles of the site. The only road access is through the PSEG road that connects to an existing secondary road three miles to the east of the site. There is also a waterborne access by way of the inter-coastal waterway channel.

The site is situated on the low-lying coastal plain in New Jersey. The region features extensive marsh and meadowlands. Most of the land within three miles of the site is undeveloped, being made up of tidal marshes, or river water. The nearest permanent resident on the New Jersey shore is approximately three miles east of the area. Most of the land within the five counties surrounding the area is undeveloped (48 percent) or is used for agriculture (42 percent). Developed urban areas constitute about 10 percent of the available land. Major farm products within the 25-mile radius include vegetables, poultry, dairy products, and field crops.

The net tidal flow is estimated at 400,000 cubic feet per second which produces a relatively high current velocity in the station vicinity. The water of the Delaware River at the site, and for some 25 miles upstream, is brackish. Therefore, the water is basically used by industry for cooling applications and not as a domestic water supply in this region. On the New Jersey side of the Delaware River, there are six towns within the 25-mile radius of the site. All have public water supplies. Salem City is the only municipality that obtains water from surface sources (Alloways Creek, about eight miles south-east of the area). Nearly all the water supply for private use is also obtained from wells, most of which are two inches in diameter and more than 75' deep. No nonproductive wells exist close to the site, and the nearest residences (summer cottages) are about three miles away.

B. Emergency Response Organization

Upon a State Declaration of Emergency, the Governor of the State of New Jersey assumes command of all State emergency response functions. The Governor is responsible for all broad decisions affecting public health and welfare within the affected area. Lead State Department Commissioners or Secretaries advise the Governor on policy matters affecting public safety. The Governor will oversee accident assessment which is performed by the New Jersey Department of

Environmental Protection's Bureau of Nuclear Engineering (BNE). The Governor, assisted by the BNE and the Governor's principal advisors, is also responsible for all radiological emergency operations, including the issuance of protective actions and media releases. In the Governor's absence, the Senate President has the authority of the Governor.

The New Jersey State Police Office of Emergency Management (OEM), led by the State Director or the Deputy Director, OEM, is responsible for coordination of the radiological emergency operations effort. The OEM is supported by the New Jersey State Police Special Operations and Field Operations Sections along with various state agencies. The OEM is also responsible for developing, maintaining and updating the State of New Jersey Emergency Response Plan.

The New Jersey Department of Environmental Protection's Bureau of Nuclear Engineering (BNE) serves as the lead state agency for accident assessment and also serves as the lead for food, water and milk control. The BNE recommends protective actions to the Governor, collects environmental samples and evaluates them in order to make initial recommendations and to monitor, assess and make recommendations to the Governor on a continuing basis.

The Salem County Deputy Emergency Management Coordinator (DEMC), as directed by the County Board of Chosen Freeholders, has primary responsibility for overall coordination of emergency response. Upon the receipt of a protective action decision (PAD) from the state, the County EMC provides overall coordination of the protective actions, requests additional support from the state and coordinates this support when it is received.

The Cumberland County Freeholder Liaison, a member of the Board of Chosen Freeholders, is responsible for emergency operations in Cumberland County. This individual, along with the County Emergency Management Coordinator, is responsible for implementing protective actions as directed by the State.

Both counties communicate and provide any requested assistance to the municipalities, which are under the operational control of the respective Mayors, each of whom is assisted by an Emergency Management Coordinator.

C. Plans

The *New Jersey State Radiological Emergency Preparedness Plan for Commercial Nuclear Power Plants* includes the basic plan as well as the organization concepts and polices and establishes the assignments of emergency responsibilities for radiological emergencies. The appendices and procedures also include operational concepts for specific emergency responsibilities for various state agencies.

The *State of New Jersey Radiological Emergency Response Plan for Annex A* includes, as Appendices, the Salem County (Appendix 1) and Cumberland County (Appendix 2) Radiological Emergency Preparedness Plans along with the Emergency Response Plans for the eight townships located within the 10-mile EPZ (Appendices 1.1-1.6 and Appendices 2.1-2.2).

The following plans were reviewed:

- *State of New Jersey Radiological Emergency Response Plan for Nuclear Power Plants*, May, 2009;
- *State of New Jersey Radiological Emergency Response Plan for Annex A*, March, 2008;
- *State of New Jersey Radiological Emergency Response Plan Standard Operating Procedures*:
 - Letters of Agreement;
 - Local Route Alerting Plans; and
 - State of New Jersey Department of Health and Senior Services Office of Emergency Medical Services *EMS Communication Plan JEMS – 4th Edition*, July 2006.

D. Basis for Findings

The status of emergency preparedness for offsite response to possible incidents resulting from an accident at the Salem/Hope Creek station has been determined based on review of the plans cited above.

Adequacy of the reviewed plans is dependent upon compliance with:

- 44 CFR part 353
- Guidance Memoranda
- NUREG-0654 FEMA-REP-1, Rev. 1

E. Evaluation Format

In accordance with the FEMA/NRC Memorandum of Understanding¹ FEMA agreed to furnish assessments, findings and determinations as to whether State, Tribal and local emergency plans and preparedness are adequate and continue to be capable of implementation (e.g., adequacy and maintenance of procedures, training, and resources, staffing levels and qualification and equipment adequacy). These findings and determinations are used by NRC under its own rules in connection with its licensing and regulatory requirements and FEMA supports its findings in the NRC licensing process and related court proceedings.²

NUREG-0654/FEMA-REP-1, Rev. 1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*, November 1980, is the guidance used to review plans and develop this Interim Finding Report.

¹ 44 CFR 353 Appendix A, June 17, 1993

² 44 CFR 350.3(e)

II. Review and Evaluation of Emergency Preparedness Plans and Procedures for the PSEG Site Against the Planning Standards of NUREG-0654/FEMA-REP-1, Rev. 1, as amended.

The following discussion presents the results of the review and evaluation for each planning criterion. A total of 109 criteria were evaluated. All were found to be adequate.

Rating Categories:

Adequate: The statements and concepts in the plan adequately meet the intent of the planning criterion. Recommendations for consideration may be provided.

Adequate – Corrections Must Be Made: Plans are adequate, but before a determination can be made as to whether they can be implemented, corrections must be made to the plans or supporting measures must be demonstrated (e.g. adequacy and maintenance of procedure, training, resource, staffing levels and qualifications, and equipment).

Inadequate: The statements and concepts in the plan do not adequately address the planning criterion.

N/A – Not Applicable: The planning criterion is not applicable to the organization/documents under review and is not required to be addressed in these documents. The planning criterion has to be addressed elsewhere in the plan.

N/R: Not Reviewed

- A. Assignment of Responsibility (Organization Control) Planning Standard: Primary responsibilities for emergency response by the nuclear facility licensee, and by State and local organizations within the Emergency Planning Zone have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.*

A. Evaluation: Adequate.

The plans provided for review meet all nine of the evaluation criteria under Planning Standard A in NUREG-0654/FEMA-REP-1, Rev. 1.

The State of New Jersey Radiological Emergency Response Plan (NJRERP), and Annex A, which includes the Salem County, Cumberland County, and municipal Radiological Emergency Preparedness Plans, identify the organizations that are intended to be part of the overall response [A.1.a]; specify the concept of operations of those organizations and their relationship to the total effort [A.1.b]; illustrate these interrelationships in a block diagram [A.1.c]; identify the specific individual (by title) who is in charge of the emergency response [A.1.d]; and provide for 24-hour per day emergency response including the manning of communications links [A.1.e].

Each plan specifies, as applicable, the functions and responsibilities for major elements and Key responsibilities in a Table [A.2.a] and contains the legal basis for the authorities that are detailed in the plan [A.2.b].

A list of written agreements referring to the concept of operations developed between Federal, State, and local agencies and other support organizations having an emergency response role within the Emergency Planning Zones are included in an appendix to the plans [A.3]. These agreements are available for review at the New Jersey OEM.

The individual responsible for assuring continuity of resources is specified, by title, in the State and County plans [A.4].

- B. Not Applicable-Licensee Responsibilities Only**

- C. *Emergency Response Support and Resources Planning Standard: Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the Licensee's near-site Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.*

C. Evaluation: Adequate.

The plans provided for review adequately meet all six evaluation criteria under Planning Standard C in NUREG-0654/FEMA-REP-1.

The specific person authorized to request federal assistance is detailed in the New Jersey Radiological Response Plan (NJRRP) [C.1.a], along with Federal resources and expected arrival times [C.1.b]. The county plans are not required to address this criterion. The NJRRP also identifies specific resources to be provided to support the Federal response and includes a pre-determined site for the Federal Radiological Monitoring and Assessment Center (FRMAC) [C.1.c]. The NJRRP states that following declaration of an Alert, a Site Area Emergency or a General Emergency, BNE staff will be deployed to the Emergency Operations Facility. The counties and municipalities do not send representatives to the EOF [C.2.a].

The NJRRP and Annex A both include a description of the capabilities of the federal resources that are expected to arrive, including FRMAC, and a brief description of the certified state environmental laboratory that is used to analyze radiological samples. The state lab is under contract and this contract is maintained at the Bureau of Nuclear Engineering Offices [C.3].

The State of New Jersey, in the NJRRP and Salem and Cumberland County, in Annex A, identify nuclear and other facilities relied upon in an emergency for assistance. This information is found in Attachment 3, which contains a list of letters of agreement with outside organizations. Copies of the actual agreements are on file at the New Jersey Office of Emergency Management. On 12/15/10, several of these agreements were reviewed and were found to be adequate [C.4].

- D. Emergency Classification System Planning Standard: A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by the facility licensees for determinations of minimum initial offsite response measures.*

D. Evaluation: Adequate.

The plans provided for review fully meet the two evaluation criteria under Planning Standard D in NUREG-0654/FEMA-REP-1, Rev. 1. Elements of both evaluation criteria are addressed in the plans.

The emergency classification schemes in the State of New Jersey Radiological Emergency Response Plan (NJRERP), which includes the Salem County and the Cumberland County Radiological Emergency Preparedness Plans, are consistent with the classification scheme provided by the applicant [D.3].

New Jersey, Salem County, and Cumberland County provide procedures that identify some emergency actions to be taken that are consistent with the emergency actions of the Nuclear Facility Operator [D.4] The New Jersey Radiological Emergency Response Plan describes the actions of the BNE for each specific emergency classification. For an Alert or higher declaration, representatives from the BNE will be dispatched to the EOF and State EOC. The BNE conducts an independent assessment of plant parameters and atmospheric dispersion models to determine dose projections and to create their own Protective Action Recommendation (PAR) which is reported to the State EOC.

During this process, licensee input is obtained and evaluated. The EOF Lead Dose Assessment person collects the appropriate data from licensee sources and ensures that this is the most current data available and that it has been confirmed by the licensee. The State Protective Action Recommendation (PAR) is compared to the licensee PAR and that any discrepancies that may exist between the two are identified. This serves as a basis for a discussion with the Governor/Governor's designee to determine a protective action decision.

- E. Notification Methods and Procedures Planning Standard: Procedures have been established for notification, by the licensee of State and local response organizations and for notification of emergency personnel by all response organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.*

E. Evaluation: Adequate.

The plans provided for review meet all five of the evaluation criteria under Planning Standard E in NUREG-0654/FEMA-REP-1, Rev. 1.

The State of New Jersey Radiological Emergency Response Plan (NJRERP), which includes the Salem County and the Cumberland County Radiological Emergency Preparedness Plans, includes procedures that describe the notification by the appropriate entity of the offsite response organizations consistent with the emergency classification [E.1].

The NJRERP and the county emergency preparedness plans state that procedures have been established for alerting, notifying, and mobilizing emergency response personnel [E.2].

New Jersey and both counties provide a system for disseminating appropriate information to the General Public. The Emergency Alert System (EAS) is used to provide the public with accurate and up-to-date information during a classified event at a nuclear power plant. Through the EAS process, the Governor (or designee) or the County Coordinator (or designee) have access to radio and television broadcast facilities within 15 minutes of a Protective Action Decision (PAD). Initial and followup messages are disseminated to the public through the activation of the prompt notification siren system and the generation of EAS messages [E.5].

New Jersey has established administrative and physical means, and the time required for notifying and providing prompt instructions to the public within the plume exposure pathway Emergency Planning Zone [E.6].

New Jersey has sample messages prepared for public dissemination [E.7]. The draft messages give instructions with regard to specific protective actions to be taken by occupants of affected areas. Messages include the appropriate content for the specific situation.

F. Emergency Communications Planning Standard: Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

F. Evaluation: Adequate.

The plans provided for review meet all of the seven evaluation criteria under Planning Standard F in NUREG-0654/FEMA-REP-1, Rev. 1.

The communications plans for emergencies are addressed in The State of New Jersey Radiological Emergency Response Plan (NJRERP) and in Annex A for Salem and Cumberland Counties. There is a provision for 24-hour per day notification [F.1.a]; a provision for communications with contiguous State/local governments within the emergency planning zones [F.1.b]; a provision for communications with Federal emergency response organizations [F.1.c]; and a provision for communications among Nuclear Facility Operator and the State and local Emergency Operations Centers and radiological monitoring teams [F.1.d].

A provision for alerting and activating emergency personnel in each response organization is addressed [F.1.e]. A coordinated communication link for fixed and mobile medical support facilities exists for the State and Counties [F.2]. Communication between these entities is described in the The State of New Jersey Department of Health and Senior Services Office of Emergency Medical Services EMS Communications Plan JEMS-4th Edition July 2006.

The New Jersey Radiological Emergency Response Plan states that communications among the State, County and municipal EOCs within the plume exposure EPZ will be tested monthly. This section also requires that communications between the State and federal response organizations and ingestion pathway states be tested quarterly. In addition, this section requires communications among the utility, County EOCs and field monitoring teams to be tested annually [F.3].

- G. Public Education and Information Planning Standard: Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.*

G. Evaluation: Adequate.

The plans provided for review meet all of the seven evaluation criteria under Planning Standard G in NUREG-0654/FEMA-REP-1, Rev. 1

The State of New Jersey, Salem County and Cumberland County have provisions for a coordinated periodic (at least annual) dissemination of information to the public regarding how they will be notified and what their actions should be in an emergency [G.1]. Information is provided to the permanent and transient populations located in the plume Emergency Response Zone. Updated information is provided annually [G.2]. Both the State of New Jersey Radiological Emergency Response Plan (NJRERP) and Annex A designate a point of contact and identify the Joint News Center (JNC) for use by the news media during an emergency [G.3.a]. New Jersey, Salem and Cumberland County have each designated a spokesperson that will have access to all necessary information [G.4.a] and have established arrangements for the timely exchange of information among designated spokespersons [G.4.b]. Coordinated arrangements for dealing with rumors are provided [G.4.c]. In addition, coordinated programs will be conducted at least annually to acquaint news media with the emergency plans, information concerning radiation, and points of contact for release of public information [G.5].

H. Emergency Facilities and Equipment Planning Standard: Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

H. Evaluation: Adequate.

The plans provided for review meet all of the six evaluation criteria under Planning Standard H in NUREG-0654/FEMA-REP-1, Rev. 1.

The State of New Jersey, Salem County, Cumberland County and the municipalities that are located within the 10 mile EPZ have each established an Emergency Operations Center for use in directing and controlling response functions [H.3]. The plans and procedures provide for timely activation and staffing of the facilities and centers [H.4]. Sufficient radiological monitoring equipment is provided for offsite radiological monitoring in the vicinity of the nuclear facility [H.7]. Provisions have been made to inspect, inventory and operationally check emergency equipment/instruments at least once each calendar quarter and after each use [H.10]. There are sufficient reserves of instruments/equipment to replace those that are removed from emergency kits for calibration or repair. Equipment is required to be calibrated annually.

The State of New Jersey Radiological Emergency Response Plan (NJRERP) and Annex A, which applies to the counties and municipalities, each include, in an appendix, identification of emergency kits by general category (protective equipment, communications equipment, radiological monitoring equipment and emergency supplies) [H.11]. New Jersey has established a central point for the receipt and analysis of all field monitoring data and coordination of sample media [H.12]. This criterion is not applicable to the counties and municipalities.

I. Accident Assessment Planning Standard: Adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

I. Evaluation: Adequate.

The plans provided for review meet all of the five evaluation criteria under Planning Standard I in NUREG-0654/FEMA-REP-1, Rev. 1. These criteria are not applicable to Salem County, Cumberland County or the municipalities because they do not deploy field monitoring teams or perform accident assessment. The State of New Jersey performs these functions for the counties and municipalities that are located in the EPZ.

New Jersey describes their capability and resources for field monitoring within the plume exposure Emergency Planning Zone, which are an intrinsic part of the concept of operations [I.7]. New Jersey will, where appropriate, provide methods, equipment and expertise to make rapid assessments of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways. This will include activation, notification means, field team composition, transportation, communication, monitoring equipment and estimated deployment times [I.8].

New Jersey has capabilities to detect and measure radioiodine concentrations in air in the plume exposure EPZ as low as 10^{-7} microcuries per cubic centimeter ($\mu\text{Ci}/\text{cm}^3$) under field conditions and in the presence of noble gas and background radiation. The State of New Jersey Radiological Emergency Response Plan (NJRERP) requires that a sample size of 10 cubic feet be taken. The plan also requires that the air sample be taken at or near the centerline of the plume and describes a method of purging the filter and cartridge to reduce interference from background and noble gases [I.9].

New Jersey has established a means for relating the various measured parameters to dose rates for key isotopes and gross radioactivity measurements. Provisions have been made for estimating integrated dose from the projected and actual dose rates and for comparing these estimates with the Protective Action Guides. The detailed provisions are described in separate procedures [I.10].

New Jersey has Standard Operating Procedures to assist in locating and tracking the airborne radioactive plume using Federal and State resources [I.11].

J. Protective Response Planning Standard: A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate (66 FR 5427). Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

J. Evaluation: Adequate.

The plans provided for review meet all of the seventeen evaluation criteria under Planning Standard J in NUREG-0654/FEMA-REP-1, Rev. 1.

New Jersey, Salem and Cumberland Counties and the municipalities have included provisions for evacuation routes and transportation for onsite individuals to some suitable offsite location, including alternatives for inclement weather, high traffic density and specific radiological conditions [J.2].

New Jersey has established capabilities for implementing protective measures based on protective action guides and other criteria, consistent with the recommendations for U.S. Environmental Protection Agency (EPA) regarding exposure resulting from the passage of radioactive plumes, EPA-400-R-92-001 and with those of U.S. Food and Drug Administration/U.S. Department of Health and Human Services (FDA/DHHS) regarding radioactive contamination of human food and animal feeds [J.9].

The State of New Jersey Radiological Emergency Response Plan (NJRERP) and Annex A for Salem and Cumberland Counties and the municipalities include:

- maps showing evacuation routes, evacuation areas, pre-selected radiological sampling and monitoring points, relocation centers in host areas, and shelter areas [J.10.a];
- maps showing population distributions around the SHCNGS by evacuation areas [J.10.b];
- the means for notifying all segments of the transient and resident population [J.10.c];
- the means for protecting those persons who are mobility impaired physically or because of institutional or other confinement [J.10.d];
- provisions for the use of radioprotective drugs, particularly for emergency workers and institutionalized persons within the plume exposure EPZ [J.10.e];

- the method by which decisions for administering radioprotective drugs to the general population are made during an emergency and the pre-determined conditions under which such drugs may be used by offsite emergency workers. [J.10.f];
- plans for relocating people from the emergency planning zone (EPZ) and for transporting them from the Reception Center (RC) to the Congregate Care Centers (CCC). [J.10.g] and
- The Reception Centers and CCC that are outside the EPZ boundary. [J.10.h]

The State of New Jersey Radiological Emergency Response Plan (NJRERP), in Annex A, describes the evacuation of the general population, special facilities, schools and marine (Delaware River and Bay). This section refers to Evacuation Time Estimates, which were developed by KLD Associates. A basis for this study was a model which included: an equilibrium traffic distribution and assignment model; a macroscopic traffic simulation model and an intersection capacity model. As a result of the study, specific areas were identified where congestion could take place and traffic control points were developed based on these results [J.10.i]. Annex A of the State Plan describes the process utilized for access control and includes the organizational responsibilities for such control [J.10.j]. Annex A also includes the identification of and means for dealing with potential impediments (e.g., seasonal impassability of roads) to use of evacuation routes, and contingency measures [J.10.k].

The State of New Jersey Radiological Emergency Response Plan (NJRERP), in Annex A, which includes the counties and municipalities, describes the evacuation of the general population, special facilities, schools and Delaware River and Bay. This section refers to Evacuation Time Estimates (ETEs), which were developed by KLD Associates and includes a description of the study and summarizes the results. The entire population of the EPZ, including the general public and special facilities, can be evacuated in 2-3 hours in most situations [J.10.l].

The State of New Jersey Radiological Emergency Response Plan (NJRERP), and Annex A, which applies to the counties and municipalities, includes the bases for the choice of recommended protective actions from the plume exposure pathway during emergency conditions. These include expected local protection afforded in residential units or other shelter for direct and inhalation exposure, as well as ETEs. This criterion is not applicable to the counties and municipalities [J.10.m]. These plans also include the general protective measures to be used for the ingestion pathway. Provisions for maps of detailed crop information and lists of food and milk producers and purveyors are accomplished by a reference to their availability and a description of how the Department of Health and Human Services and Department of Agriculture would obtain this information [J.11].

New Jersey, Salem County, and Cumberland County describe the means for registering and monitoring of evacuees at relocation centers in host areas. Trained county and municipal volunteers, using available equipment, including portal monitors, are capable

of monitoring within about a 12-hour period all residents and transients in the plume exposure EPZ expected to be arriving at relocation centers [J.12].

K. Radiological Exposure Control Planning Standard: Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

K. Evaluation: Adequate.

The plans provided for review meet all of the five evaluation criteria under Planning Standard K in NUREG-0654/FEMA-REP-1, Rev. 1.

New Jersey, Salem County and Cumberland County and the municipalities have made provisions for the 24-hour per day capability to determine doses received by emergency personnel and volunteers involved in a nuclear accident and for distribution of direct-reading dosimeters (DRDs) and permanent record dosimeters (PRDs) [K.3.a]. The state, counties and municipalities have also include provisions to ensure that dosimeters are read at intervals not exceeding 30 minutes and that records are completed and maintained [K.3.b].

New Jersey, Salem County and Cumberland County and the municipalities have made provisions for authorizing workers to receive exposures in excess of EPA General Public Protective Action Guides [K.3.c].

New Jersey specifies the action levels for determining the need for decontamination [K.5.a] and the means for radiological decontamination of emergency personnel wounds, supplies, instruments and equipment, and for waste disposal [K.5.b] in Standard Operating Procedures (SOPs), and the Counties include this information by reference to the appropriate SOP. These criteria are not applicable to the municipalities.

L. Medical and Public Health Support Planning Standard: Arrangements are made for medical services for contaminated injured individuals.³

L. Evaluation: Adequate.

The plans provided for review meet all of the three evaluation criteria under Planning Standard L in NUREG-0654/FEMA-REP-1, Rev. 1.

New Jersey, Salem County, and Cumberland County have each arranged for local and backup hospital and medical services with the capability for evaluation of radiation exposure and uptake. The plans submitted for review also provide for the handling and transport of contaminated injured individuals [L.1].

Locations of Primary and backup hospitals capable of providing medical treatment of contaminated injured individuals are clearly listed in the plans and letters of agreement are listed [L.3]. First aid squads capable of transporting contaminated injured patients are also listed in the plans [L.4].

³ The availability of an integrated emergency medical services system and a public health emergency plan serving the area in which the facility is located and, as a minimum, equivalent to the Public Health Service Guide for Developing Health Disaster Plans, 1974, and to the requirements of an emergency medical services system as outlined in the Emergency Medical Services System Act of 1973 (PL 93-154 and amendments in the 1979 PL 96-142), should be a part of and consistent with overall State or local disaster control plans and should be compatible with the specific overall emergency response for the facility.

M. Recovery and Reentry Planning and Post-Accident Operations Planning Standard: General plans for recovery and reentry are developed.

M. Evaluation: Adequate.

The plans provided for review meet all three evaluation criteria under Planning Standard M in NUREG-0654/FEMA-REP-1, Rev. 1.

The State of New Jersey Radiological Emergency Response Plan For Nuclear Power Plants, in Section III.F.9, Rev. 14, May, 2009, assigns responsibility to the State Department of Environmental Protection (DEP) as the lead state agency for recovery operations. This agency performs radiological assessments and notifies the State Office of Emergency Management (OEM) when reentry is permitted. The OEM is the lead agency for reentry operations. The State Police Field Operations Section (FOS) and New Jersey department of Motor Vehicles assist with traffic control operations as needed. Standard Operating Procedures are in place for: requesting federal assistance (SOP-701); discussion points for an advanced party meeting with federal agencies (SOP-702); permitting non-emergency workers entry into restricted areas (SOP-704), post plume activities (SOP-705); relocation (SOP-706); and return (SOP-707) [M.1].

Plans submitted for review specify the means for informing members of the response organizations that a recovery operation is to be initiated, and of any changes in the organizational structure that may occur [M.3].

Standard Operating procedures provide a method for periodically estimating total population exposure [M.4]. The process involves determining the affected sector and then converting the sector to Emergency Response Planning Area (ERPA) for distances of 0-5 and 5-10 miles. According to this procedure, dose to the affected public (TEDE, CEDE and CDE) is calculated using actual dose, plant effluent dose projections or default dose projections. Protective action recommendations result from calculated dose, which is compared to the EPA Protective Action Guidelines (PAGs).

N. Exercises and Drills Planning Standard: Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

N. Evaluation: Adequate.

The plans provided for review meet all of the 14 evaluation criteria under Planning Standard N in NUREG-0654/FEMA-REP-1, Rev. 1.

The plans provide for biennial exercises that are conducted as set forth in Nuclear Regulatory Commission and Federal Emergency Management Agency rules and guidelines [N.1.a]. These exercises will include mobilization of State and local personnel and resources that are sufficient in order to verify the capability to respond to an accident scenario; observation and critique by qualified personnel from Federal, State, or local governments; varied scenarios such that all major elements of the plans and preparedness organizations are tested within a six year period; provisions to start an exercise between 6:00 p.m. and 6:00 a.m. or on the weekend once every six years; varied weather conditions; and some exercises will be unannounced [N.1.b].

The plans detail the types of drills to be conducted including:

- Communication drills [N.2.a]
- Medical Emergency drills [N.2.c]
- Radiological Monitoring drills [N.2.d]
- Health Physics drills [N.2.e]

The plans describe how exercises and drills are to be carried out and the requirements for those exercises and drills in accordance with evaluation criteria N.3.a, b, c, d, e, and f. They also state that qualified observers from Federal, State, or local governments will observe and critique exercises or drills [N.4].

The State of New Jersey, Salem County, and Cumberland County have established means for evaluating observer and participant comments on areas needing improvement, including emergency plan procedural changes, and for assigning responsibility for implementing corrective actions, and have established management control to be used to ensure that corrective actions are implemented [N.5].

- O. *Radiological Emergency Response Training Planning Standard: Radiological emergency response training is provided to those who may be called on to assist in an emergency.*

O. Evaluation: Adequate.

The plans provided for review meet all of the 11 evaluation criteria under Planning Standard O in NUREG-0654/FEMA-REP-1, Rev. 1.

The plans provide for the training of appropriate individuals [O.1]. Information is provided on the training of personnel that are part of mutual aid agreements as required by evaluation criterion [O.1.b].

The scope of the training programs includes the following categories:

- Directors or coordinators of response organizations [O.4.a]
- Personnel responsible for accident assessment [O.4.b]
- Radiological monitoring teams and radiological analysis personnel [O.4.c]
- Police, security and fire-fighting personnel [O.4.d]
- First aid and rescue personnel [O.4.f]
- Local support services personnel including Civil Defense/Emergency Service personnel [O.4.g]
- Medical response personnel [O.4.h]
- Personnel responsible for transmission of emergency information and instructions [O.4.j]

The plans also provide for initial and annual retraining of response personnel [O.5].

P. Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans Planning Standard: Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

P. Evaluation: Adequate

The plans provided for review meet all of the nine criteria under Planning Standard P in NUREG-0654/FEMA-REP-1, Rev. 1.

Plans submitted for review identify training for those individuals responsible for the planning effort [P.1] and identify the person responsible for the planning effort [P.2]. Plans also designate Emergency Planning Coordinators, who are responsible for the development and updating of emergency plans and coordination of these plans with other response organizations [P.3].

The State of New Jersey Radiological Emergency Response Plan (NJRERP), and Annex A, which applies to the counties and municipalities will undergo an annual review. This review will be conducted in conjunction with the critique of the annual exercise and will take into account any necessary changes identified by drills and exercises [P.4]. When changes are made, revisions are sent to each County Emergency Management Coordinator (EMC) for inclusion in their plans and the municipalities in their respective counties. These revisions are expected to be hand delivered to all county, municipal and private organizations with missions identified in the plans. Revision numbers and dates are marked on the bottom of the affected pages. Formal plan changes and revised pages are dated and distributed annually by the State OEM [P.5].

The State of New Jersey Radiological Emergency Response Plan (NJRERP), and Annex A, which applies to the counties and municipalities contain detailed listings of supporting plans and their sources [P.6]. These plans contain as an appendix listing, by title, procedures required to implement the plan. The listing includes the section(s) of the plan to be implemented by each procedure [P.7], a specific table of contents and procedures have been cross-referenced to the criteria in NUREG-0654/FEMA-REP-1 [P.8]. Each plan provides for the updating of telephone numbers on a quarterly basis [P.10].

III. Technical Review Composite Rating Summary

State of New Jersey and Salem/Hope Creek Radiological Emergency Plans and Procedures
(Criteria applicable to the NRC Licensee only are not included in the list below)

Element	Rating	Element	Rating	Element	Rating
A.1.a	Adequate	H.3	Adequate	M.1	Adequate
A.1.b	Adequate	H.4	Adequate	M.3	Adequate
A.1.c	Adequate	H.7	Adequate	M.4	Adequate
A.1.d	Adequate	H.10	Adequate	N.1.a	Adequate
A.1.e	Adequate	H.11	Adequate	N.1.b	Adequate
A.2.a	Adequate	H.12	Adequate	N.2.a	Adequate
A.2.b	Adequate	I.7	Adequate	N.2.c	Adequate
A.3	Adequate	I.8	Adequate	N.2.d	Adequate
A.4	Adequate	I.9	Adequate	N.2.e	Adequate
C.1.a	Adequate	I.10	Adequate	N.3.a	Adequate
C.1.b	Adequate	I.11	Adequate	N.3.b	Adequate
C.1.c	Adequate	J.2	Adequate	N.3.c	Adequate
C.2.a	Adequate	J.9	Adequate	N.3.d	Adequate
C.3	Adequate	J.10.a	Adequate	N.3.e	Adequate
C.4	Adequate	J.10.b	Adequate	N.3.f	Adequate
D.3	Adequate	J.10.c	Adequate	N.4	Adequate
D.4	Adequate	J.10.d	Adequate	N.5	Adequate
E.1	Adequate	J.10.e	Adequate	O.1	Adequate
E.2	Adequate	J.10.f	Adequate	O.1.b	Adequate
E.5	Adequate	J.10.g	Adequate	O.4.a	Adequate
E.6	Adequate	J.10.h	Adequate	O.4.b	Adequate
E.7	Adequate	J.10.i	Adequate	O.4.c	Adequate
F.1.a	Adequate	J.10.j	Adequate	O.4.d	Adequate
F.1.b	Adequate	J.10.k	Adequate	O.4.f	Adequate
F.1.c	Adequate	J.10.l	Adequate	O.4.g	Adequate
F.1.d	Adequate	J.10.m	Adequate	O.4.h	Adequate
F.1.e	Adequate	J.11	Adequate	O.4.j	Adequate
F.2	Adequate	J.12	Adequate	O.5	Adequate
F.3	Adequate	K.3.a	Adequate	P.1	Adequate
G.1	Adequate	K.3.b	Adequate	P.2	Adequate
G.2	Adequate	K.4	Adequate	P.3	Adequate
G.3.a	Adequate	K.5.a	Adequate	P.4	Adequate
G.4.a	Adequate	K.5.b	Adequate	P.5	Adequate
G.4.b	Adequate	L.1	Adequate	P.6	Adequate
G.4.c	Adequate	L.3	Adequate	P.7	Adequate
G.5	Adequate	L.4	Adequate	P.8	Adequate
				P.10	Adequate

IV. Reasonable Assurance

After a thorough review of currently available Offsite Plans and Procedures, based upon the standards and criteria of NUREG-0654 FEMA-REP-1, Rev. 1, a determination has been made that the plans are adequate and there is reasonable assurance that the plans can be implemented with no corrections needed. A qualifying REP exercise will be demonstrated by PSEG Nuclear in conjunction with New Jersey and the risk Counties participation.

V. Acronyms and Definitions

Acronym	Definition
CCC	Congregate Care Center
CDE	Committed Dose Equivalent
CFM	Cubic Feet per Minute
COL	Combined License
DRD	Direct Reading Dosimeter
EAL	Emergency Action Level
EAS	Emergency Alert System
ECL	Emergency Classification Level
EOC	Emergency Operations Center
EPA	(U.S.) Environmental Protection Agency
EPZ	Emergency Planning Zone
ERPA	Emergency Response Planning Area
ETE	Evacuation Time Estimate
FDA	(U.S.) Food and Drug Administration
FEMA	Federal Emergency Management Agency
FRMAC	Federal Radiological Monitoring and Assessment Center
FRMAP	Federal Radiological Monitoring and Assessment Plan
GE	General Emergency
JIC	Joint Information Center
KI	Potassium Iodide
LOA	Letter of Agreement
mR/hr	milli-Roentgen per hour
NUREG	Nuclear Regulatory Commission Publication
PAD	Protective Action Decision
PAG	Protective Action Guide
PAR	Protective Action Recommendation
PIO	Public Information Officer
RAP	Radiological Assistance Program
RC	Reception Center
REM	Roentgen Equivalent Man
REP	Radiological Emergency Preparedness
REPP	Radiological Emergency Preparedness Plan
RERHP	Radiological Emergency Response Host Plan
SAE	Site Area Emergency
SRD	Self Reading Dosimeter
TBD	To Be Determined
TCP	Traffic Control Point
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
μCi	micro (μ) Curies

INTERIM FINDING REPORT for
REASONABLE ASSURANCE

On the Adequacy of the Offsite

Radiological Emergency Response Planning

For the State of Delaware

Public Service Enterprise Group (PSEG) Early Site Permit (ESP) Application

Lower Alloways Creek Township, Salem County, New Jersey

January 5, 2011

Prepared by the
U.S. Department of Homeland Security
Federal Emergency Management Agency
Technological Hazards Division

Region III

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Executive Summary

On May 25, 2010, PSEG Power, LLC and PSEG Nuclear, LLC (Applicants) submitted an Application for an Early Site Permit (ESP) to the U.S. Nuclear Regulatory Commission (NRC) for an ESP Site, located on the southern part of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, Salem County, New Jersey. Other existing nuclear facilities licensed by the NRC located at this site include Salem Generating Station (SGS) Units 1 and 2 and Hope Creek Generating Station (HCGS) Unit 1. Part 5, Supplemental Information of the ESP application contained the State of Delaware Radiological Emergency Plan; the Maryland Core Emergency Operations Plan, Radiological Incident Annex; and the Commonwealth of Pennsylvania Emergency Operations, Annex E, Radiological Emergency Response to Nuclear Power Plant Incidents. A review of the most recent materials provided with the ESP Application resulted in findings for all sixteen Planning Standards. All Planning standards were found to be Adequate.

The following materials were provided for review for this Interim Finding Report:

- *State of Delaware, Radiological Emergency Plan, Rev. 9, October 2009*
- *Maryland Core Emergency Operations Plan; Fixed Nuclear Facilities (FNF) Appendix (Formerly Annex Q) to Radiological Incident Annex, June 2010*
- *Pennsylvania State Emergency Response Plan, December 2009*
- *Commonwealth of Pennsylvania Emergency Operations Plan, Annex E, Radiological Emergency Response to Nuclear Power Plant Incidents, May 2010*
- *Evacuation Time Estimate within the Plume Exposure Emergency Planning Zone for the Salem/Hope Creek Nuclear Generating Station", January 2004*

NUREG-0654 FEMA-REP-1, Rev.1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," amended March 2002, its Supplements, the Interim REP Program Manual (August 2002), and current FEMA guidance documents were considered in making the determination as to the plans' adequacy.

The review of the offsite emergency plans resulted in evaluation findings for all of the planning standards and associated criteria contained in NUREG-0654 FEMA-REP-1, Rev.1, as amended, that are Offsite Response Organization (ORO) responsibilities. Each planning standard and criterion was rated as:

- **Adequate:** Plans are adequate and there is reasonable assurance that they can be implemented with only limited or no corrections needed.
- **Adequate – corrections must be made:** Plans are adequate, but before a determination can be made as to whether they can be implemented, corrections must be made to the plans or supporting measures must be demonstrated (e.g. adequacy and maintenance of procedures, training, resources, staffing levels and qualifications, and equipment).
- **Inadequate:** Plans are inadequate and cannot be implemented until they are revised to correct deficiencies noted in the Federal review.
- **N/A:** The planning standard is not applicable to offsite response organizations.

This review resulted in the following interim evaluation findings (ratings for each individual criterion are summarized in Section III, Criterion Rating Summary):

- Planning Standard A: Adequate
- Planning Standard B: N/A
- Planning Standard C: Adequate
- Planning Standard D: Adequate
- Planning Standard E: Adequate
- Planning Standard F: Adequate
- Planning Standard G: Adequate
- Planning Standard H: Adequate
- Planning Standard I: Adequate
- Planning Standard J: Adequate
- Planning Standard K: Adequate
- Planning Standard L: Adequate
- Planning Standard M: Adequate
- Planning Standard N: Adequate
- Planning Standard O: Adequate
- Planning Standard P: Adequate

Adequacy of the PSEG Site ESP Application Emergency Plan Review for OROs is also dependent on:

- Satisfactory demonstration of plan implementation during a joint exercise with licensee and State and local governments, utilizing PSEG site facilities.

I. Introduction

A. General Characteristics of the PSEG Site

PSEG has not selected a particular reactor design to be constructed at the site. In order to provide sufficient design information to enable the NRC to determine that the site is suitable for a new plant, a surrogate design has been provided. The surrogate plant is a set of bounding parameters, the plant parameter envelope (PPE).

The PSEG Site is located on the southern part of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, Salem County, New Jersey. The site is 18 miles south of Wilmington, Delaware, 30 miles southwest of Philadelphia, Pennsylvania, and 7-1/2 miles southwest of Salem, New Jersey. Based on 2000 census data, 33,871 people are estimated to reside within 10 mi. of the site; that figure is estimated to increase to 42,743 by 2010. An estimated 5,196,583 residents are located within 50 mi. of the PSEG Site; that figure is estimated to increase to 5,418,212 by 2010.

The plume exposure Emergency Planning Zone (EPZ) for the PSEG Site includes portions of New Castle and Kent Counties.

The Ingestion Pathway Zone (IPZ) for the PSEG Site includes all or portions of New Castle, Kent, and Sussex Counties, Delaware; Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, and Salem Counties, New Jersey; Bucks, Chester, Delaware, Lancaster, Montgomery, and Philadelphia Counties, Pennsylvania; and Caroline, Cecil, Harford, Kent, and Queen Anne's Counties, Maryland.

B. Emergency Response Organization

The Delaware Code Annotated gives the Governor wide powers in the event of a disaster beyond local control and authorizes the Governor to delegate such powers as deemed fit to the Delaware Emergency Management Agency (DEMA) Director, or designee. DEMA, under the direction of the Governor, will coordinate state, private and federal emergency response, as well as information from the Salem/Hope Creek Nuclear Generating Station (SHCNGS) to aid county emergency operations from the State Emergency Operations Center (EOC). DEMA will direct county requests for assistance to the appropriate state or federal agency.

New Castle, Kent, and Sussex Counties will fully mobilize and utilize their resources to mitigate the consequences of the emergency. The State of Delaware will implement its planned radiological emergency response operations commensurate with the severity of the situation. The state will assume direction and control of all offsite activities in relation to an incident at the SHCNGS and continue its role of overall coordination through the duration of the incident and its aftermath. The counties must comply with state direction and control and continue coordination and utilization of their resources in confirmation thereto. Since the resources of the plume zone counties are minimal with respect to a radiological emergency, when such county

resources are exhausted, inadequate or unavailable, the counties will request state assistance and guidance from DEMA in accordance with emergency procedures.

Upon receipt of notification of an emergency at the SHCNGS which requires state and county government response, the Delaware EOC will be activated. Throughout the duration of the emergency, the State EOC will serve as the focal point of state emergency operations and information. The New Castle, Kent and Sussex County EOCs will serve as the focal points for their respective county emergency operations and information. Members of the Technical Assessment Center (TAC) are located at the State EOC during a radiological emergency. Plume zone exposure operations are directed by the TAC, which is co-chaired by the Division of Public Health Chief, Health Systems Protections and the Administrator, Office of Radiation Control and the Division of Water Resources. The TAC is responsible for assessing the severity of the emergency by making offsite dose projections, utilizing radiological source term and current meteorology, integrating the results of offsite monitoring and sampling efforts, and evaluating reported plant conditions from PSEG Nuclear. Using either utility or state offsite dose assessments, or both, the TAC Chairperson may recommend to the DEMA Director, or designee, implementation of appropriate protective actions.

The Governor is in command and control of all Delaware ingestion exposure pathway efforts, but may delegate authority to the DEMA Director, or designee. The DEMA Director, or designee, will be responsible for operations at the State EOC regarding the planning, coordination and implementation of actions required to execute the Governor's ingestion exposure pathway decisions. The TAC is responsible for the review and evaluation of radiation monitoring data and analysis of laboratory results. The TAC Chairperson will provide recommendations on ingestion exposure pathway operations to the DEMA Director, or designee. The DEMA Director, or designee, will keep the Governor advised of the TAC ingestion exposure pathway recommendations. The TAC will continue to receive and evaluate radiological information and provide recommendations to the DEMA Director, or designee, until the long term radiological monitoring and assessments are completed and the return phase has been implemented.

C. Plans

The State of Delaware utilizes the State of Delaware Radiological Emergency Plan (REP) and Standard Operating Procedures (SOP) as a guide for implementation of response in the event of an emergency at the SHCNGS. The REP includes a description of the Planning Basis, Concept of Operations, Agency Responsibilities, County Operations, Plan Testing, Maintenance and Agreements. The Agency Responsibilities detail federal, state, local and private agency procedures for the various protective and parallel actions described in the Concept of Operations. Delaware has existing mutual aid agreements with the adjacent states of Maryland, Pennsylvania, and New Jersey. A complete list of Memoranda of Understanding (MOU) and Letters of Agreement are found in the Agreements section of the REP. SOPs are detailed pre-established operational instructions, which direct an agency's actions to respond to an emergency situation. These procedures will be used by agencies to perform assigned responsibilities for protective, and parallel, actions.

The following plans were reviewed:

- *State of Delaware, Radiological Emergency Plan, Rev. 9, October 2009*
- *Maryland Core Emergency Operations Plan; Fixed Nuclear Facilities (FNF) Appendix (Formerly Annex Q) to Radiological Incident Annex, June 2010*
- *Evacuation Time Estimate (ETE) within the Plume Exposure Emergency Planning Zone for the Salem/Hope Creek Nuclear Generating Station", January 2004*
- *Pennsylvania State Emergency Response Plan, December 2009*
- *Commonwealth of Pennsylvania Emergency Operations Plan, Annex E, Radiological Emergency Response to Nuclear Power Plant Incidents, May 2010*

The *Evacuation Time Estimate within the Plume Exposure Emergency Planning Zone for the Salem/Hope Creek Nuclear Generating Station", January 2004*, was also used in the review of the plans.

D. Basis for Findings

The status of emergency preparedness for offsite response to possible incidents resulting from an accident at the SHCNGS has been determined based on review of the plans cited above.

Adequacy of the reviewed plans is dependent upon:

- 44 CFR part 350
- Guidance Memoranda
- NUREG-0654 FEMA-REP1, Rev.1

E. Evaluation Format

In accordance with the Memorandum of Understanding (MOU) (44 CFR 353, Appendix A) with the NRC, FEMA agreed to furnish assessments, findings and determinations as to whether State, Tribal, and local emergency plans and preparedness are adequate and continue to be capable of implementation (e.g., adequacy and maintenance of procedures, training, and resources; staffing levels and qualification; and equipment adequacy). These findings and determinations are used by NRC under its own rules in connection with its licensing and regulatory requirements and FEMA supports its findings in the NRC licensing process and related court proceedings.¹

NUREG-0654/FEMA-REP-1 Rev. 1 *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*, issued November 1980 and amended March 2002, is the guidance used to review plans and develop this Interim Finding Report. Each planning standard has an overall rating.

¹ 44 CFR 350.3(f)

II. Review and Evaluation of Emergency Preparedness Plans and Procedures for the PSEG Early Site Permit against the Planning Standards of NUREG-0654 FEMA-REP-1, Rev. 1

The following table and discussion present the results of the review and evaluation for each planning criterion. A total of 109 criteria were evaluated; when considering the State of Delaware Radiological Emergency Plan includes plans for the two risk counties – Kent and New Castle, along with the three state plans affected by the ingestion pathway (Maryland, Pennsylvania and New Jersey) – over 300 separate plan assessments occurred. All criteria were found to be Adequate.

- A. Assignment of Responsibility (Organization Control): *Primary responsibilities for emergency response by the nuclear facility licensee, and by State and local organizations within the Emergency Planning Zone have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.*

A. Evaluation: Adequate

The plans provided for review meet all nine evaluation criteria of Planning Standard A in NUREG-0654/FEMA-REP-1.

Each plan identifies the organizations (state, local, federal and private) that are intended to be part of the overall response [A.1.a]; specifies the concept of operations of those organizations and their relationship to the total effort (including Facilities, Public Information, Emergency Classification Levels, Notification and Communication, Command and Coordination, Accident Assessment, Protective and Parallel Actions) [A.1.b]; illustrates these interrelationships in block diagrams [A.1.c]; identifies the specific individual (by title) who is in charge of the emergency response, by agency and from an overall state and county perspective [A.1.d]; and provides for 24-hour per day emergency response, including the manning of communications links [A.1.e].

In addition, each plan specifies the functions and responsibilities for major elements and key individuals by title and summarizes the information in a table showing primary and support responsibilities for each agency [A.2.a]. Each plan contains the legal basis for the authorities detailed in the plan under the applicable title and chapter of the Delaware Code [A.2.b].

The State REP contains a number of written agreements, which identify the emergency measures to be provided, the mutually acceptable criteria for their implementation and specify arrangements for exchange of information [A.3].

The individual responsible for assuring continuity of resources (including the capability for continuous 24-hour operations for a protracted period) is specified, by title, in each plan [A.4].

- B. Onsite Emergency Organization: *On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities are specified.*

B. Evaluation: N/A

There are no assigned offsite responsibilities for this planning standard.

- C. Emergency Response Support and Resources: *Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the Licensee's near-site Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.*

C. Evaluation: Adequate

The plans provided for review meet all six evaluation criteria of Planning Standard C in NUREG-0654/FEMA-REP-1.

The specific person(s) – Governor or DEMA Director – authorized to request Federal assistance [C.1.a] and the Federal resources expected, including arrival times, are detailed in the REP [C.1.b]. The REP describes State resources available to support the Federal Response, including landing facilities for aircraft and logistical arrangements such as communications, equipment and materials [C.1.c].

The REP specifies that a designated technical representative will represent Delaware at the licensee's Emergency Operations Facility (EOF) in the event of a Site Area or General Emergency declaration [C.2.a].

The REP identifies both the primary (private company) and backup (Pennsylvania Department of Environmental Protection) laboratories, along with their general capabilities and expected availability to provide radiological monitoring and analysis services. The plan also addresses the laboratories' notification requirements and methods, as well as the agency, and location, for the return of analysis results [C.3].

The REP identifies nuclear and other facilities, organizations or individuals, which can be relied upon in an emergency to provide assistance. Details are provided through accompanying Letters of Agreement/Memoranda of Understanding [C.4].

D. Emergency Classification System: A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by the facility licensees for determinations of minimum initial offsite response measures.

D. Evaluation: Adequate

The plans provided for review meet both of the two evaluation criteria of Planning Standard D in NUREG-0654/FEMA-REP-1.

The REP contains detailed information on an emergency classification and emergency action level scheme consistent with the facility licensee [D.3].

The REP includes various classifications and summarized actions that should be taken by the licensee, state and local officials are outlined in a table. These pre-planned responses to each emergency classification by state and local governments help ensure the successful and timely implementation of protective and parallel actions. The implementation of the REP is accomplished in two phases: the “initial phase” is a pre-planned response to each emergency classification; this phase establishes initial communications between the licensee and state and local governments, to provide a complete exchange of information. The “operational phase” is the implementation of protective and parallel actions as deemed necessary to minimize public exposure to radiation and ensure their health and safety. Protective actions include: evacuation, shelter-in-place, access control, ingestion exposure control, relocation, re-entry, recovery, and return. Parallel actions include: emergency medical services, radiation exposure control, law enforcement and crime prevention, social services, public health and sanitation, and fire control and rescue. Other key activities include: notification and communication, command and coordination, and accident assessment [D.4].

- E. Notification Methods and Procedures: *Procedures have been established for notification, by the licensee of State and local response organizations and for notification of emergency personnel by all response organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.*

E. Evaluation: Adequate

The plans provided for review meet all five evaluation criteria of Planning Standard E in NUREG-0654/FEMA-REP-1.

The REP describes the emergency notification process for the licensee to notify offsite response organizations consistent with the emergency classification (with specific types of information referenced), including verification of messages through the Initial Contact Message Form. Should an event occur at a commercial nuclear facility in an adjacent state, affecting a portion of Delaware within the 50-mile EPZ, that state will be responsible for notification. Per the plan, DEMA is responsible for notifying state, county, federal and private agencies [E.1].

The REP outlines the procedures for initial notification as a result of an emergency classification and the method of mobilization of emergency response personnel, including emergency response staffing, by position and location at the state and local level [E.2].

The State of Delaware will disseminate appropriate information (contained in initial and follow-up messages received from the license) to the public, through the activation of the prompt notification siren system, and messages broadcast over EAS stations. Activities are coordinated through the State Public Information Officer (PIO) [E.5].

The REP describes the means where, upon receipt of proper authorization by appropriate state authorities, the siren system and river and bay alerting and notification can occur on a 24/7 basis. Activation of the EAS network will proceed under the direction of the Governor, the Director of DEMA, or their designee. This process will facilitate notifying, and providing prompt instructions to, the public within the plume exposure EPZ [E.6].

A REP SOP contains pre-scripted messages, intended for the public, consistent with the licensee's classification scheme and providing specific instructions, including protective actions, where appropriate. Detailed releases have been developed for: an Alert; a Site Area Emergency (2 – generic and schools/daycare); a General Emergency (2 – shelter and evacuation); a Termination Message; Geographic Descriptions; Ingestion Pathway; Potassium Iodide (KI) [E.7].

F. Emergency Communications: Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

F. Evaluation: Adequate

The plans provided for review meet all seven evaluation criteria of Planning Standard F in NUREG-0654/FEMA-REP-1.

The REP describes provisions for 24-hour notification and activation of the emergency response network. Emergency communications is facilitated through 24-hour warning points at the Delaware State Police or the County Emergency Communications Centers [F.1.a]. The REP identifies appropriate provisions for communications with contiguous State/local governments within the Emergency Planning Zone through the respective state emergency management agencies – Maryland Emergency Management Agency (MEMA); New Jersey Office of Emergency Management (NJOEM); and Pennsylvania Emergency Management Agency (PEMA) [F.1.b]. An SOP to the REP outlines the Federal agencies to be mobilized and includes provisions for communications with those Federal emergency response organizations [F.1.c]. The REP describes arrangements, as appropriate, for communications between the nuclear facility and the EOF, State and local EOCs, and radiological monitoring teams, including a specific reference to the communications equipment to be utilized [F.1.d]. An SOP contains the details for alerting or activating emergency personnel in each response organization, including emergency response staffing by position and location [F.1.e].

Within the appropriate sections of the REP, New Castle and Kent Counties each identify a coordinated communication link for fixed and mobile medical support facilities. Support is available at the State level through the Delaware State Fire School and the Division of Public Health [F.2].

The REP identifies appropriate emergency communications periodic testing (providing specificity) arrangements, including coordination of all communication drills by DEMA [F.3].

- G. Public Education and Information: *Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.*

G. Evaluation: Adequate

The plans provided for review meet all seven evaluation criteria of Planning Standard G in NUREG-0654/FEMA-REP-1.

The REP describes an annual program for dissemination of emergency information to the public. The program is coordinated between the State of Delaware and PSEG Nuclear and includes both information content and method of dissemination via brochures, placards and calendars [G.1].

The coordinated public information program described in the REP include details on general radiological information, nuclear power plant information, emergency plan provisions, prompt notification system description, radiological emergency protective actions, as well as any other additional emergency provisions. Emergency information is also provided concerning the special needs of the handicapped, provisions for school evacuation, locations of reception centers and shelters and bus route information for those without private means of transportation. Placards are placed in public areas such as motels, phone booths, etc. and highway/road signs are placed around the EPZ to provide information to the transient population. A separate brochure has been developed for farmers, to include information on the effects of radiation and methods to protect farm animals and products [G.2].

The REP identifies points of contact and physical locations for use by news media during an emergency, with the Emergency News Center and Joint Information Center in Woodstown, NJ serving as the focal point [G.3.a].

The REP designates the State Public Information Officer as the individual responsible for coordinating the release of state announcements which relate to offsite activities; that position interfaces with counterparts at New Castle and Kent Counties. These positions have access to all necessary information [G.4.a]; establishes arrangements for the timely exchange of information among designated spokespersons through the exchange of information developed jointly between PSEG and the State of Delaware with public information officers in the two counties (who are responsible to ensure its accuracy as it applies to their jurisdiction) [G.4.b]; and, describes how coordinated arrangements for dealing with rumors are established, through a public inquiry hot line and a rumor control system using a toll-free number [G.4.c].

The REP describes activities associated with the annual program to acquaint news media and the public with the radiological emergency preparedness program and points of contact for release of information in a nuclear power plant emergency. The program includes meetings arranged by

DEMA and conducted at convenient locations and times; PSEG Nuclear representatives are in attendance to answer questions specific to their organization and operations [G.5].

H. Emergency Facilities and Equipment: Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

H. Evaluation: Adequate

The plans provided for review meet all six evaluation criteria of Planning Standard H in NUREG-0654/FEMA-REP-1.

The REP provides the general location of the State, New Castle and Kent County Emergency Operations Centers (EOC), which serve as the facilities for directing and controlling emergency response and disaster operations for their respective jurisdictions [H.3].

The REP identifies appropriate arrangements for timely activation and staffing of the facilities and centers that are described in the plan. Agencies staffing the respective EOCs will ensure representation will support continuous 24-hour staffing for a protracted period [H.4].

The REP, through an SOP, details the equipment to be used in offsite radiological monitoring, along with the instructions/procedures in its use. Equipment inventories and checklists are provided for both the plume and ingestion phases [H.7].

The REP provides for DEMA to quarterly inspect, inventory and operationally check emergency response equipment prior to (after) each use and contains appropriate arrangements to replace instruments removed for calibration or repair and requires calibrations at the frequencies specified by the equipment suppliers [H.10].

Appendix II to the State of Delaware's Radiological Emergency Program Annual Letter of Certification identifies the location and type of equipment contained in emergency kits [H.11].

The REP establishes the Technical Assessment Center (TAC), located at the Delaware State EOC as the central location for receipt and analysis of all field monitoring data. The TAC also coordinates analysis of sample media and will determine the transport and laboratory to be used for isotopic analysis of sample media [H.12].

- I. Accident Assessment: *Adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.*

I. Evaluation: Adequate

The plans provided for review meet all five evaluation criteria of Planning Standard I in NUREG-0654/FEMA-REP-1.

The REP, and accompanying SOPs, describe, in detail, the capabilities, resources and instructions for field monitoring within the plume exposure EPZ. This includes staffing, equipment, instrumentation, plume identification and air and radiation monitoring [I.7].

The REP and SOPs provide for the methods, equipment (including software programs), and trained staff to make a rapid assessment of the actual, or potential, magnitude of a release. The release pathways are considered as part of this assessment. Activation, staffing and necessary equipment to perform monitoring is included in the SOPs, along with transportation, communication, and estimated deployment times [I.8].

The Computer Support Staff, in coordination with the Data Analysis Coordinator, perform calculations of the field team air samples, after the field teams purge the iodine cartridge of noble gas and count the sample in an area of low background. Calculations performed by this process have verified the capability to detect and measure radioiodine concentrations in air in the plume exposure EPZ well below 10⁻⁷ µCi/cc [I.9].

The REP and procedures establish the means for relating measured parameters to dose rates for key isotopes, through the use of dose assessment software. The software is capable of integrating the dose from projected and actual measured parameters; the results obtained from this dose assessment are then compared to the protective action guides for the development of protective action recommendations [I.10].

Although the REP identifies state resources as being the primary means of locating and tracking the airborne radioactive plume, the plan also describes the method for requesting Federal assistance, if needed [I.11].

J. Protective Response: A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate (66 FR 5427). Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

J. Evaluation: Adequate

The plans provided for review meet all seventeen evaluation criteria of Planning Standard J in NUREG-0654/FEMA-REP-1.

The REP describes provisions for evacuation routes for on-site individuals to a suitable offsite location within the State of New Jersey (the location of the site) [J.2].

The REP establishes a capability for implementing protective measures based on protective action guides and other criteria. The protective action guides are specifically referenced in two comprehensive SOPs addressing plume exposure pathway Protective Action Recommendations (PARs) and preparation of PARs for the post-emergency phase [J.9].

The REP includes appropriate maps showing evacuation routes, Emergency Response Planning Area (ERPA), access/traffic control points, reception centers, and air sampling routes and locations; due to the level of detail of certain maps contained in the REP, a Site Assistance Visit was conducted to review the data [J.10.a] and maps showing population distribution around the nuclear facility, by Delaware's four ERPA [J.10.b]. The REP describes the means for notifying all segments of the transient and resident population, through the use of a siren system; mobile route alerting, in the event of a siren failure; river and bay alerting; and the EAS system [J.10.c]. Per an SOP, the REP contains the methods for accounting for special populations and describes the process used to notify, and transport, special populations, when necessary. Included are those persons whose mobility is impaired due to institutionalization or other confinement, to include the general population, health care centers, licensed day care, pre-school and correctional institutions; a separate SOP focuses solely on schools [J.10.d]. Provisions for the use of radio-protective drugs for emergency workers and institutionalized persons within the plume exposure EPZ is addressed in the REP and accompanying SOPs through a specific Delaware protective action guide that, if exceeded results in the recommendation of the ingestion of KI by emergency workers, the public, special populations and schools. Dependent upon the location/situation, KI is either pre-distributed or distributed by DEMA at the Alert Emergency Classification Level. The quantities (either distributed or pre-distributed) are identified in the plan and procedures [J.10.e]. The REP includes the method by which decisions by the State Health Department for administering radioprotective drugs to the general population are made during an emergency and the pre-determined conditions under which such drugs may be used by offsite emergency workers. Specifically, Delaware uses a dose of 5 REM to the Child Thyroid as the level at which the Department of Health representative at the Technical Assessment Center makes the

recommendation to the Director of DEMA for emergency workers, special populations, schools and the general public to ingest KI [J.10.f]. The REP describes comprehensive means of relocating the population in risk areas, through methods and guidelines for effective traffic and access control, as well as an overview of evacuation bus routes for those needing transportation and the coordination, by DEMA, of resources needed to support the special needs population (a register of names is maintained by the two risk counties) [J.10.g]. The REP provides detailed information on relocation centers at least 5 miles beyond the boundaries of the plume exposure emergency planning zone (EPZ) [J.10.h]. The REP provides details from the PSEG Evacuation Time Estimate Study (*Evacuation Time Estimate within the Plume Exposure Emergency Planning Zone for the Salem/Hope Creek Nuclear Generating Station*, January 2004), which adequately describes the analysis undertaken and the results obtained, to include areas of traffic congestion in increments of time and estimates for evacuating under various parameters (weather conditions and times/day of the week). The evacuation time estimates provide decision-makers with specific information applicable to protective action implementation [J.10.i]. The REP includes procedures for controlling access to evacuated areas and the organizations responsible for such control. Pre-designated access control points have been established approximating the five and ten mile radii, along with specific agency responsibilities [J.10.j]. The REP specifies means of identifying potential impediments to use of evacuation routes and the means for dealing with them. If such an impediment should occur, the Delaware State Police would work with the DelDOT Traffic Management Center to address the situation and re-route traffic, as necessary. The Salem Hope Creek Nuclear Generating Station Emergency Evacuation Traffic Operations Manual provides details for dealing with impediments and identifies contingency measures [J.10.k]. The REP references the PSEG January 2004 Evacuation Time Estimate study. Time estimates for evacuation of various sectors and distances based on a dynamic analysis (time-motion study under various conditions) for the plume exposure pathway EPZ is presented [J.10.l]. The REP, through an SOP for the development of plume pathway PARs, addresses the bases for the choice of recommended protective actions for the plume exposure pathway during emergency conditions, including protective actions such as evacuation and sheltering, and the selective considerations that can influence these decisions, including shielding factors and evacuation time estimates [J.10.m].

The REP describes the protective measures to be used for the ingestion pathway, including the methods for protecting the public in the event of food contamination. Protective measures are identified for both precautionary actions and those protective actions implemented after verification of contamination of foodstuffs, milk, and other ingested materials. Sampling and analysis methods to be implemented when required are also provided. The TAC makes recommendations on interdiction of contaminated products and coordinates all federal support. A comprehensive set of maps and a computerized directory is maintained. Ingestion pathway planning for the contiguous states of Maryland, and Pennsylvania has previously been found to be adequate under previous COL reviews for Calvert Cliffs and Bell Bend. The New Jersey plans were found to be adequate by FEMA Region II under this review process [J.11].

The REP contains a description of the means for receiving and registering evacuees and conducting monitoring and decontamination operations. State agencies have been assigned to perform registration and recording functions, as well as providing necessary social services.

There is sufficient personnel and equipment to perform monitoring and decontamination and ensure the processing of evacuees within the desired time frame – about 12 hours [J.12].

K. Radiological Exposure Control: *Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.*

K. Evaluation: Adequate

The plans provided for review meet all five evaluation criteria of Planning Standard K in NUREG-0654/FEMA-REP-1.

The REP identifies the methods for 24-hour-per-day capability to determine doses received by emergency personnel involved in a nuclear accident, including distribution of self reading and permanent record dosimeters. Emergency workers assigned missions in the ten mile EPZ are issued self reading dosimeters (electronic) and a Dosimeter of Legal Record (DLR). Emergency workers in low radiation areas and those not assigned a mission within the ten mile EPZ are monitored through the use of area-placed dosimetry. Exposure guidelines, including turn-back values, are issued to every emergency worker [K.3.a]. The REP includes information to ensure that dosimeters are read at appropriate frequencies (required every 15 minutes) and provides for maintaining dose records for emergency workers involved in any nuclear accident (an Emergency Worker Permanent Dose Record Card is utilized to maintain both cumulative daily dosimeter totals and DLR records for each individual) [K.3.b].

The REP establishes a consistent decision chain for authorizing emergency workers to incur exposures that exceed the EPA general public Protective Action Guides, including authorization of exposure for lifesaving missions. Permission to exceed the PAG's can only be given by the Governor of Delaware, or designee, after consultation with the Division of Public Health representative in the TAC, through the DEMA Director, or designee [K.4].

The REP identifies action levels for determining the need for decontamination, for both high, and low, background areas (action levels for high background areas are for use only during the early phase of an incident involving major releases of particulates). The procedures for general public and emergency worker monitoring and decontamination use the action levels for low background areas [K.5a]. The REP provides guidelines for decontamination of wounds, instruments, equipment, and vehicles and for disposal of contaminated wastes. Radioactive waste disposal is addressed in multiple SOPs [K.5.b].

- L. Medical and Public Health Support: *Arrangements are made for medical services for contaminated injured individuals.*²

L. Evaluation: Adequate

The plans provided for review meet all three evaluation criteria of Planning Standard L in NUREG-0654/FEMA-REP-1.

The REP describes arrangements for local and backup medical services (MS-1) hospitals. The plan identifies the two facilities which serve as Delaware's MS-1 hospitals: Wilmington and Christiana Hospitals, Christiana Care Health Services. The capability for evaluation of radiation exposure and adequate handling by the hospitals is clearly delineated. In addition, a SOP specifically addresses the transport and handling of radiologically contaminated and/or individuals [L.1].

The REP references a formal letter of agreement with the Salem County Memorial Hospital to provide back-up treatment and care, if necessary. The Delaware National Guard and volunteer fire companies could serve as a transportation resource [L.3].

The REP describes arrangements for transporting victims of radiological accidents to medical support facilities. Ambulance personnel are trained on the steps necessary to handle and transport a contaminated individual. Specific transportation resources (fire company/ambulance services). Advance life support can be provided by the two risk counties [L.4].

² The availability of an integrated emergency medical services system and a public health emergency plan serving the area in which the facility is located and, as a minimum, equivalent to the Public Health Service Guide for Developing Health Disaster Plans, 1974, and to the requirements of an emergency medical services system as outlined in the Emergency Medical Services System Act of 1973 (PL 93-154 and amendments in the 1979 PL 96-142), should be a part of and consistent with overall State or local disaster control plans and should be compatible with the specific overall emergency response for the facility.

M. Recovery and Reentry Planning and Post accident Operations: General plans for recovery and reentry are developed.

M. Evaluation: Adequate

The plans provided for review meet all three evaluation criteria of Planning Standard M in NUREG-0654/FEMA-REP-1.

The REP includes general plans for reentry and recovery. The Protective Action Guides contained in the plan address relocation, reentry, recovery and return. The Concept of Operations divides each of the functional areas into applicable responsibilities associated with specific agencies/organizations [M.1].

Upon a determination that reentry actions remain as the sole function, the REP contains a provision for the DEMA Director, or designee, to communicate with the appropriate agencies and alter the structure of the emergency response organization, as necessary [M.3].

The REP describes how TAC computer support personnel will utilize the MIDAS program to perform dose assessment for actual or projected radiological releases and, in conjunction with field analysis, the TAC will periodically determine population dose following an accident at a nuclear power plant [M.4].

N. Exercises and Drills: Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

N. Evaluation: Adequate

The plans provided for review meet all fourteen evaluation criteria of Planning Standard N in NUREG-0654/FEMA-REP-1.

DEMA is responsible for the overall development of exercise and drill scenarios and will include the mobilization of adequate resources of SHCNGS, as well as the state and counties, to demonstrate the ability to respond to an emergency [N.1.a]. The REP commits to DEMA coordinating an emergency response exercise of the plan at least once every 12 months (plus or minus three months). All EOCs involved will be fully manned. Federal and state observers will be on-hand to evaluate and critique the biennial full-participation exercise (every 2 years). The critique will be the basis for review and improvement of the REP. The exercise scenario will be varied from year to year so that all major elements of the REP and all preparedness organizations are tested within a six-year periods. Exercises will be conducted off-hours (6:00 p.m. – 4:00 a.m), under various weather conditions and may be unannounced [N.1.b].

NUREG Criteria N.2 addresses periodic drills. The REP states that:

- Communication drills will include the aspect of understanding the content of messages as part of the described communications drill. Testing will occur as follows: communications with state and county agencies within the plume EPZ – monthly; with federal agencies and states within the ingestion pathway – quarterly; between SHCNGS, the state and county EOCs and field assessment teams – annually [N.2.a].
- The Division of Public Health, Office of Emergency Medical Services, will participate in annual medical emergency drills conducted by DEMA. A medical emergency drill will involve simulated contaminated individuals and participation from an ambulance service, an offsite medical treatment facility and other local support service agencies, as necessary. Medical drills will be evaluated by FEMA biennially, and may be conducted in conjunction with the full-scale biennial exercise [N.2.c].
- Radiological monitoring drills will be conducted annually for both the plume exposure pathway EPZ and the ingestion exposure pathway EPZ and will include provisions for sampling, dose projections, communications and record keeping. These drills will be evaluated by FEMA biennially, and may be conducted in conjunction with the full-scale biennial exercise [N.2.d].
- Health physics (accident assessment) drills will be conducted semiannually. These drills involve the response to, and analysis of, simulated elevated airborne and liquid samples and direct radiation measurements in the environment [N.2.e].

NUREG Criterion N.3 addresses how exercises and drills are to be carried out to allow free play for decision making. The REP describes how exercise and drills are to be carried out in accordance with FEMA guidance, as follows:

- The scenario will include the objectives of each exercise, together with observation (evaluation) criteria [N.3.a].
- The dates, times, places and participating organizations will be included in the scenario [N.3.b].
- The scenarios will include simulated events [N.3.c].
- The exercise scenario will include a schedule of real and simulated initiating events [N.3.d].
- Exercise scenarios will include a narrative summary describing the conduct of drills with simulated casualties, offsite fire departments, rescue personnel, protective clothing, deployment of radiological monitoring teams and public information activities [N.3.e].
- Observers are to be provided with copies of the exercise objectives, the local plan, exercise report forms and other relevant materials [N.3.f].

The REP states that qualified observers from county, state, private and/or federal agencies will observe and critique the required exercises and drills. A critique meeting will be organized by the DEMA Director, or designee; all participants and observers will attend this meeting. At the conclusion of the meeting, the DEMA Director, or designee, will prepare a written summary of observer and participant comments, which he will distribute to observers and participants [N.4].

Overall responsibility for the maintenance and updating of the plans and procedures, including the incorporation of requested changes, changes indicated by plan review and changes identified by drills and exercises will be the responsibility of the DEMA Director, or designee. Following the critique meeting, the DEMA Director, or designee, will be responsible for seeing to it that all comments are acted upon and, for preparing and distributing a formal, written evaluation of the action taken [N.5].

- O. Radiological Emergency Response Training: *Radiological emergency response training is provided to those who may be called on to assist in an emergency.*

O. Evaluation: Adequate

The plans provided for review meet all eleven evaluation criteria of Planning Standard O in NUREG-0654/FEMA-REP-1.

The REP lists radiological emergency response training provided to those who may be called on to assist in an emergency and assures the training of appropriate individuals. The DEMA Director, or designee, is responsible for the coordination, scheduling, staffing and updating of the training program. The participation of appropriate state personnel is the responsibility of the DEMA Director, or designee; participation of appropriate local personnel is the responsibility of the appropriate risk county director [O.1 and O.1.b].

The REP indicates the training program will use courses, drills, exercises and subsequent critiques to instruct and develop all emergency response disciplines, including directors and coordinators of response organizations (command and control personnel) [O.4.a]; a training program, and associated requirements, for accident assessment staff, involving the FEMA Radiological Accident Assessment course [O.4.b] and radiological monitoring teams and radiological analysis personnel, involving the FEMA Radiological Emergency Response Operations course and the Advance Radiation Incident Operations course [O.4.c]; police and fire fighting personnel [O.4.d]; first aid and rescue personnel [O.4.f]; local support services personnel, including Civil Defense/Emergency Service personnel (operational personnel) [O.4.g]; medical support personnel [O.4.h]; and personnel responsible for transmission of emergency information and instructions (communications personnel) [O.4.j].

The REP addresses the provision for periodic (annual) retraining of personnel with emergency response responsibilities. The REP defines two alternatives for the refresher training – personnel primarily involved with planning and personnel involved with the mechanics of a radiological emergency response [O.5].

P. Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans: Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

P. Evaluation: Adequate

The plans provided for review meet all nine of the evaluation criteria of Planning Standard P in NUREG-0654/FEMA-REP-1.

The REP references FEMA's Radiological Emergency Preparedness Planning course and annual refresher training, which informs personnel primarily involved with planning of new requirements and provides them with feedback from other planning efforts [P.1].

The REP designates the DEMA Director, or designee, as having the overall authority for the maintenance and updating of plans and procedures [P.2].

Overall responsibility for the maintenance and updating of the plans and procedures, including the incorporation of requested changes, changes indicated by plan review and changes identified by drills and exercises, is the responsibility of the DEMA Director, or designee. The two risk counties have responsibility for maintaining their respective sections of the REP [P.3].

The REP states the plans and procedures will be comprehensively reviewed annually and immediately after the FEMA exercise and the revisions generated soon thereafter. DEMA will conduct audits periodically to ensure that changes have been posted [P.4].

The REP contains a listing, by organization, individual title/location and controlled copy number, of the 263 agencies/organizations at the state, federal and local level, along with private entities, holding copies of the REP. They also describe how revisions will be marked and dated to show where changes have been made [P.5].

The REP contains a listing of supporting plans and their source [P.6].

The REP contains a list of Standard Operating Procedures by title, agency, facility, and function [P.7].

The REP includes a table of contents and a NUREG-0654 cross-reference, by applicable criteria [P.8].

The REP directs that telephone numbers in emergency procedures be updated quarterly [P.10].

III. Review Composite Rating Summary State of Delaware and Risk Counties of New Castle and Kent’s Radiological Emergency Response Plans

(Criteria applicable to the NRC Licensee only are not included in the list below)

Criterion	Rating		Criterion	Rating		Criterion	Rating	
	State	Counties		State	Counties		State	Counties
A.1.a	Adequate	Adequate	H.3	Adequate	Adequate	M.1	Adequate	Adequate
A.1.b	Adequate	Adequate	H.4	Adequate	Adequate	M.3	Adequate	N/A
A.1.c	Adequate	Adequate	H.7	Adequate	Adequate	M.4	Adequate	N/A
A.1.d	Adequate	Adequate	H.10	Adequate	Adequate	N.1.a	Adequate	Adequate
A.1.e	Adequate	Adequate	H.11	Adequate	Adequate	N.1.b	Adequate	Adequate
A.2.a	Adequate	Adequate	H.12	Adequate	Adequate	N.2.a	Adequate	Adequate
A.2.b	Adequate	Adequate	I.7	Adequate	Adequate	N.2.c	N/A	Adequate
A.3	Adequate	Adequate	I.8	Adequate	Adequate	N.2.d	Adequate	Adequate
A.4	Adequate	Adequate	I.9	Adequate	N/A	N.2.e	Adequate	N/A
C.1.a	Adequate	N/A	I.10	Adequate	N/A	N.3.a	Adequate	Adequate
C.1.b	Adequate	N/A	I.11	Adequate	N/A	N.3.b	Adequate	Adequate
C.1.c	Adequate	Adequate	J.2	Adequate	Adequate	N.3.c	Adequate	Adequate
C.2.a	Adequate	Adequate	J.9	Adequate	Adequate	N.3.d	Adequate	Adequate
C.3	Adequate	N/A	J.10.a	Adequate	Adequate	N.3.e	Adequate	Adequate
C.4	Adequate	Adequate	J.10.b	Adequate	Adequate	N.3.f	Adequate	Adequate
D.3	Adequate	Adequate	J.10.c	Adequate	Adequate	N.4	Adequate	Adequate
D.4	Adequate	Adequate	J.10.d	Adequate	Adequate	N.5	Adequate	Adequate
E.1	Adequate	Adequate	J.10.e	Adequate	Adequate	O.1	Adequate	Adequate
E.2	Adequate	Adequate	J.10.f	Adequate	Adequate	O.1.b	Adequate	Adequate
E.5	Adequate	Adequate	J.10.g	Adequate	Adequate	O.4.a	Adequate	Adequate
E.6	Adequate	Adequate	J.10.h	Adequate	Adequate	O.4.b	Adequate	N/A
E.7	Adequate	Adequate	J.10.i	Adequate	Adequate	O.4.c	Adequate	N/A
F.1.a	Adequate	Adequate	J.10.j	Adequate	Adequate	O.4.d	N/A	Adequate
F.1.b	Adequate	Adequate	J.10.k	Adequate	Adequate	O.4.f	N/A	Adequate
F.1.c	Adequate	Adequate	J.10.l	Adequate	Adequate	O.4.g	N/A	Adequate
F.1.d	Adequate	Adequate	J.10.m	Adequate	N/A	O.4.h	Adequate	Adequate
F.1.e	Adequate	Adequate	J.11	Adequate	N/A	O.4.j	Adequate	Adequate
F.2	Adequate	Adequate	J.12	Adequate	Adequate	O.5	Adequate	Adequate
F.3	Adequate	Adequate	K.3.a	Adequate	Adequate	P.1	Adequate	Adequate
G.1	Adequate	Adequate	K.3.b	Adequate	Adequate	P.2	Adequate	Adequate
G.2	Adequate	Adequate	K.4	Adequate	Adequate	P.3	Adequate	Adequate
G.3.a	Adequate	Adequate	K.5.a	Adequate	Adequate	P.4	Adequate	Adequate
G.4.a	Adequate	Adequate	K.5.b	Adequate	Adequate	P.5	Adequate	Adequate
G.4.b	Adequate	Adequate	L.1	Adequate	Adequate	P.6	Adequate	Adequate
G.4.c	Adequate	Adequate	L.3	Adequate	N/A	P.7	Adequate	Adequate
G.5	Adequate	Adequate	L.4	Adequate	Adequate	P.8	Adequate	Adequate
						P.10	Adequate	Adequate

IV. Reasonable Assurance

After a thorough review of currently available Offsite Plans and Procedures, based upon the standards and criteria of NUREG-0654 / FEMA-REP-1, Rev.1, a determination has been made that the plans are adequate and there is Reasonable Assurance that the plans can be implemented with no corrections needed. A qualifying exercise will be demonstrated by PSEG Nuclear in conjunction with the State of Delaware and risk Counties.

V. Acronym Key

Acronym	Definition
ACP	Access Control Point
ARC	American Red Cross
COL	Combined License
DELDOT	Delaware Department of Transportation
DEMA	Delaware Emergency Management Agency
DHS	(U.S.) Department of Homeland Security
DLR	Dosimeter of Legal Record
DOE	(U.S.) Department of Energy
DRD	Direct Reading Dosimeter
EAL	Emergency Action Level
EAS	Emergency Alert System
ECL	Emergency Classification Level
EMA	Emergency Management Agency
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EOP	Emergency Operations Plan
EPA	(U.S.) Environmental Protection Agency
EPZ	Emergency Planning Zone
ERPA	Emergency Response Planning Area
ESP	Early Site Permit
ETE	Evacuation Time Estimate
FDA	(U.S.) Food and Drug Administration
FEMA	Federal Emergency Management Agency
FNF	Fixed Nuclear Facility
FRMAC	Federal Radiological Monitoring and Assessment Center
HCGS	Hope Creek Generating Station
IFR	Interim Finding Report
IPZ	Ingestion Pathway Zone
JIC	Joint Information Center
JFO	Joint Field Office
KI	Potassium Iodide
LOA	Letter of Agreement
MEMA	Maryland Emergency Management Agency
MOU	Memorandum of Understanding
mR/hr	milli-Roentgen per hour
MS-1	Medical Services
NAWAS	National Warning System
NJOEP	New Jersey Office of Emergency Preparedness
NPP	Nuclear Power Plant
NRC	(U.S.) Nuclear Regulatory Commission
NUREG	Nuclear Regulatory Commission Publication
ORO	Offsite Response Organization

Acronym	Definition
PAG	Protective Action Guide
PAR	Protective Action Recommendation
PEMA	Pennsylvania Emergency Management
PIO	Public Information Officer
PPE	Plant Parameter Envelope
PRD	Permanent Record Dosimeter
PSEG	Public Service Enterprise Group
RAI	Request for Additional Information
REM	Roentgen Equivalent Man
REP	Radiological Emergency Plan
RRA	Requirement(s) for Reasonable Assurance
SEOC	State Emergency Operations Center
SGS	Salem Generating Station
SHCNGS	Salem/Hope Creek Nuclear Generating Station
SOP	Standard Operating Procedure
SRD	Self Reading Dosimeter
TAC	Technical Assessment Center
TBD	To Be Determined
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
μCi	micro (μ) Curies