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1.0 DEFINITIONS

The terms defined in this section are those which are used in special context in this document or are unique to the Susquehanna Steam Electric Station (SSES).

- 1.1 ACCIDENT - An unforeseen and unintentional event which may result in an emergency.
- 1.2 ALERT - An Emergency Condition, see definition 1.13.
- 1.3 ASSESSMENT ACTIONS - Those actions taken during or after an incident to obtain and process information that is necessary to make decisions to implement specific emergency measures.
- 1.4 CONTROL ROOM - The location of the Control Panels from which the reactor and its auxiliary systems are controlled.
- 1.5 CONTROLLED_ZONE - The area enclosed by the outer perimeter of the Turbine, Reactor, and Radwaste Buildings for the operating Units.
- 1.6 CONTROLLED_ZONE_EVACUATION - Evacuation of nonessential individuals from some or all of the Controlled Zone.
- 1.7 CORPORATE MANAGEMENT COMMITTEE (CMC) - The PP&L Management group which determines major policy commitments for the company. The CMC membership includes the President of the company, and the other top executives.
- 1.8 CORRECTIVE ACTIONS - Those emergency measures taken to ameliorate or terminate an emergency situation.
- 1.9 DOSE PROJECTION - A calculated estimate of the potential radiation dose to individuals at a given location, normally offsite, (determined from the quantity of radioactive material released and the appropriate meteorological transport and dispersion parameters).
- 1.10 DOSE RATE - The amount of radiation an individual can potentially receive per unit of time.
- 1.11 EMERGENCY ACTIONS - Those steps taken, as a result of exceeding an Emergency Action Level in the Emergency Plan, to ensure that the situation is assessed and that the proper corrective and/or protective actions are taken.
- 1.12 EMERGENCY ACTION LEVELS (EAL) - Operational or radiological parameters which, when exceeded, require the implementation of portions of this plan. EAL's for various emergency conditions are specified in Table 4.1.
- 1.13 EMERGENCY CONDITION - The characterization of several classes of emergency situations consisting of exclusive groupings including the entire spectrum of possible

radiological emergency situations. The four classes of emergencies, listed in increasing severity, which PP&L has incorporated into this Emergency Plan are outlined in Sections 4.0 of this plan.

- 1.14 EMERGENCY COORDINATORS - Designated Susquehanna SES staff members responsible for coordinating specific emergency organization functions. These coordinating positions are:
- o Operations Coordinator
 - o Communications Coordinator
 - o Radiation Protection Coordinator
 - o Security Coordinator
 - o Administrative Coordinator
 - o Technical Support Coordinator
 - o Maintenance Coordinator
 - o I&C Coordinator
- 1.15 EMERGENCY DIRECTOR - The PP&L individual responsible for direction of onsite activities during an emergency at the Susquehanna SES.
- 1.16 EMERGENCY MANAGERS - Designated Susquehanna SES and General Office Personnel who are responsible for managing specific emergency organization functions. These manager positions are:
- o Recovery Manager
 - o Technical Support Manager
 - o General Office Support Manager
 - o Site Support Manager
 - o Radiation Support Manager
 - o Administrative Support Manager
 - o EOF Support Manager
 - o Public Information Manager
- 1.17 EMERGENCY OPERATIONS CENTERS - Designated State and county civil defense emergency management headquarters facilities, designed and equipped for the purpose of exercising effective coordination and control over disaster operations carried out within their jurisdiction.
- 1.18 EMERGENCY OPERATIONS FACILITY - PP&L Emergency Response Facility located near the reactor site to provide continuous coordination and evaluation of PP&L activities during an emergency having or potentially having environmental consequences.
- 1.19 EMERGENCY PLAN IMPLEMENTING PROCEDURES - Specific procedures defining in detail the action to be taken in the event of an emergency condition. The Emergency Plan Implementing Procedures will be separate from, but may incorporate and refer to, normal plant operating procedures and instructions.

- 1.20 EMERGENCY PLANNING ZONE - There are two Emergency Planning Zones. The first is an area, approximately ten (10) miles in radius around the Susquehanna SES, for which emergency planning consideration of the plume exposure pathway has been given in order to ensure that prompt and effective actions can be taken to protect the public in the event of an accident. The second is an area approximately 50 miles in radius around the Susquehanna SES, for which emergency planning consideration of the ingestion exposure pathway has been given.
- 1.21 EXCLUSION AREA - That area around Susquehanna SES within a radius of 1,800 feet.
- 1.22 FSAR - Final Safety Analysis Report, Susquehanna SES, Units 1 & 2.
- 1.23 GENERAL EMERGENCY - An Emergency Classification. See definition 1.13.
- 1.24 GENERAL OFFICE ENGINEERING SUPPORT CENTER - The general office area activated for Nuclear Plant Engineering resources in support of technical problem resolution.
- 1.25 General Office Nuclear Emergency Support Center (G.O.N.E.S.C.) - PP&L Emergency Response Facility located at the General Office to provide additional technical and administrative support to the Emergency Operations Facility (EOF) and Technical Support Center (TSC) and communicate with PP&L Corporate Management during an emergency.
- 1.26 LOW POPULATION ZONE (LPZ) - The area immediately surrounding the exclusion area within a three mile radius of the site. The total number of residents and the population density are such that appropriate protective measures could probably be taken on their behalf if a serious accident were to occur at Susquehanna SES.
- 1.27 MEDIA OPERATIONS CENTER - The designated location from which news releases, press conferences and other media interfacing can be provided.
- 1.28 OFFSITE - Any area outside the PP&L site boundary surrounding the Susquehanna SES. See definition 1.44.
- 1.29 OFFSITE RADIOLOGICAL INCIDENT - Any radiation incident affecting areas beyond the site boundary and posing a significant threat to public health and safety.
- 1.30 ONSITE - The area within the PP&L site boundary surrounding Susquehanna SES. See definition 1.45.
- 1.31 OPERATIONAL SUPPORT CENTER (OSC) - The primary on-site assembly area for operations support team personnel during the initial phase of an emergency.

- 1.32 PLANT PROCEDURES - Those procedures utilized by the plant operations staff to control and manipulate the plant under both normal and abnormal circumstances. These procedures include Alarm Response, Off-normal, Emergency Operating Procedures, and Emergency Plan Implementing Procedures.
- 1.33 POWER DISPATCHER - Individual manning the PP&L Power Control Center in the corporate headquarters in Allentown.
- 1.34 PROTECTED AREA - The area within the station inner security fence (Protected Area Barrier) designated to implement the requirements of 10CFR73.
- 1.35 PROTECTIVE ACTIONS - Those emergency measures taken for the purpose of preventing or minimizing off-site radiological exposures.
- 1.36 PROTECTIVE ACTION GUIDES (PAG) - Projected radiological dose or dose commitment values to individuals in the general population that warrant protective action following a release of radioactive material.
- 1.37 RADIATION DOSE - The quantity of radiation absorbed by the body or any portion of the body. A rem is a unit of dose measurement.
- 1.38 RADIOACTIVE MATERIAL - Any solid, liquid, or gas which emits radiation spontaneously.
- 1.39 RADIOLOGICAL EMERGENCY RESPONSE TEAM (RERT) - The response team from the Division of Radiological Health, State Board of Health, Pennsylvania Emergency Management Agency, and other State agencies, which will be dispatched to the scene of radiological emergencies. The team provides technical guidance and other services to local governments or an affected nuclear facility.
- 1.40 RECOVERY ACTIONS - Those actions taken after the emergency to restore the plant as nearly as possible to its pre-emergency condition.
- 1.41 RECOVERY MANAGER - The PP&L individual responsible for the management of emergency response activities during an emergency at Susquehanna SES.
- 1.42 REM (Acronym for roentgen equivalent man) - A unit of measure of radiation dose in biological tissue.
- 1.43 REMOTE ASSEMBLY AREA - A designated area, outside the exclusion area, for the assembly of evacuated plant personnel, if necessary, during a Site Evacuation.
- 1.44 SITE EVACUATION - Evacuation of all nonessential personnel within the plant site area (the fenced in area of Susquehanna SES).

- 1.45 SITE EMERGENCY PLANNING BOUNDARY - The SSES site area is enclosed by an irregular boundary. At its closest point, the site emergency planning boundary is .341 miles away from the center of the reactor buildings, at its farthest point, it is 1.140 miles away. The site emergency planning boundary is depicted on Figure 6.1.
- 1.46 SITE EMERGENCY - An Emergency Condition. See definition 1.13.
- 1.47 STATE - The Commonwealth of Pennsylvania.
- 1.48 STATION ASSEMBLY AREA - An area designated for the assembly of specific groups of individuals for the purpose of personnel accountability.
- 1.49 TECHNICAL SUPPORT CENTER - A designated on-site location where the conditions during and after an accident can be analyzed to provide technical and radiological assessments of the accident to the Emergency Director.
- 1.50 THYROID DOSE - Radiation exposure to the thyroid through inhalation of ingestion of radioactive materials.
- 1.51 UNUSUAL EVENT - An Emergency Condition. See definition 1.13.
- 1.52 WHOLE BODY EXPOSURE - Direct radiation exposure to the body from external sources.

2.0 SCOPE AND APPLICABILITY

Susquehanna SES includes two 1100 MWe boiling water reactor electrical generating units. The station is located in Salem Township, Luzerne County, in east central Pennsylvania, about five miles northeast of Berwick, Pennsylvania (See Figure 2.1). This Emergency Plan applies to the operation of Unit 1 during the construction of Unit 2, and to both units upon completion and operation of Unit 2. A separate construction site Emergency Plan, which identifies actions related to construction emergencies, supplements this plan for the applicable construction period.

This Plan provides guidance for both on-site and off-site emergency situations. It ranges in scope from relatively minor events and occurrences involving small releases of radioactive material, up to and including a major nuclear incident having significant off-site radiological consequences. This Plan, together with the interrelated State, County, and Municipal radiological emergency response plans, provides detailed guidance and direction for taking emergency measures by Emergency Response Personnel to ensure the health and safety of the public living within the 10-mile Emergency Planning Zone for Susquehanna SES. Additional guidance is provided in state and county plans for ingestion pathway preventative measures out to 50 miles (See Figure 2.2). Interrelationships of this Plan with procedures, other plans and emergency arrangements include:

- 1) Susquehanna SES Plant Procedures provide detailed instructions for the recognition and immediate response to abnormal events. These procedures identify, in particular, initiating events which could lead to degradation in the level of safety of the plant. These procedures are periodically reviewed to ensure compatibility with the Emergency Plan and Emergency Plan Implementing Procedures.
- 2) Emergency Plan Implementing Procedures provide detailed instructions to station and corporate support personnel for implementing the provisions of this Plan. These Emergency Plan Implementing Procedures interrelate with the Plant Procedures and describe subsequent and supplementary actions to be taken in response to emergency conditions. A typical listing of Emergency Plan Implementing Procedures is contained in Appendix C.
- 3) This plan interfaces with applicable portions of the Susquehanna SES Physical Security Plan and Security Training and Qualifications Plan.
- 4) The elements of response to off-site emergency conditions are outlined in the emergency plans and

operating procedures of the responsible off-site emergency organizations. Continuing liaison with these organizations ensures compatibility and proper interrelationship with this Plan. The following emergency plans are available through the respective agency.

PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY (PEMA)

Annex E to Commonwealth of Pennsylvania "Disaster Operations Plan," Nuclear Incidents (Fixed Facility)

DEPARTMENT OF ENVIRONMENTAL RESOURCES/BUREAU OF RADIATION PROTECTION (DER/BRP)

Bureau of Radiation Protection "Plan for Nuclear Power Generating Station Incidents"

LUZERNE COUNTY CIVIL DEFENSE (LCCD)

"Radiological Emergency Response Plan For Incidents at the Susquehanna Steam Electric Station"

COLUMBIA COUNTY EMERGENCY MANAGEMENT AGENCY (CEMA)

"Radiological Emergency Response Plan For Incidents at the Susquehanna Steam Electric Station"

- 5) The coordination and liaison with off-site emergency organizations include formal agreements that individual organizations will perform their respective emergency functions in response to requests from Susquehanna SES. An index and summary description of these letters of agreement are contained in Appendix A.

3.0 SUMMARY OF EMERGENCY PLAN

The Susquehanna SES Emergency Plan describes the total emergency preparedness program established, implemented and coordinated by PP&L, to ensure the capability and readiness for coping with and mitigating both on-site and off-site consequences of radiological and other emergencies. The Plan covers the spectrum of emergencies from minor incidents to major emergencies involving protective measures by off-site response organizations. Included are guidelines for immediate response, assessment of emergency situations, defined action criteria, and delineation of support functions. Emergency Plan Implementing Procedures provide detailed information for individuals who may be involved with specific emergency response functions.

This Emergency Plan provides for a graded response for distinct classifications of emergency conditions, action within those classifications, and criteria for escalation to another classification. This classification system is also used by The Pennsylvania Emergency Management Agency, Department of Environmental Resources/Bureau of Radiation Protection, Luzerne County Civil Defense, and the Columbia County Emergency Management Agency. The emergency conditions used are classified in four categories; Unusual Event, Alert, Site Emergency and General Emergency.

The PP&L organization for control of emergencies begins with the on-shift station personnel and contains provisions for augmentation and extension to include other station personnel, PP&L corporate personnel, and outside emergency response organizations.

Susquehanna station personnel and PP&L support personnel are responsible for on-site emergency actions and limited off-site activities, such as off-site radiological surveillance.

The total emergency program includes the support of state, federal and local emergency organizations. Detailed provisions are made for implementing protective measures against direct radiation exposure and inhalation of radioactive material for members of the public within a radius of at least ten miles from the Susquehanna SES. Additional preventive measures may be taken beyond that distance to preclude ingestion pathway exposures.

Specific arrangements and agreements are made with local off-site support organizations to provide:

- o Fire and rescue
- o Emergency medical transportation
- o Hospital medical treatment
- o Law enforcement and traffic control

State, County and Federal agencies having lead responsibilities specifically related to this Plan are:

- o Pennsylvania Emergency Management Agency (PEMA) - The lead state-agency for radiological emergency planning, response and recovery and for providing guidance to local government for development of radiological emergency plans and programs.
- o Department of Environmental Resources/Bureau of Radiation Protection (DER/BRP) - The State-level agency responsible to provide guidance and recommendations for specific off-site protective measures.
- o Luzerne County Civil Defense (LCCD) - The host county emergency response coordinating agency, responsible for implementing off-site action upon either direct notification from the Susquehanna SES or from PEMA.
- o Columbia County Emergency Management Agency (CEMA) - The agency having the same emergency response capabilities and responsibilities within Columbia County as does LCCD with Luzerne County.
- o US Nuclear Regulatory Commission (NRC) - The Federal agency responsible for verifying that appropriate emergency plans have been implemented and for conducting investigative activities associated with a radiological emergency.
- o US Department of Energy (DOE) - The Federal agency responsible to provide assistance in emergency action essential for the control of immediate hazards to public health and safety.

The mechanisms through which this Plan provides for the proper response to emergency conditions at Susquehanna SES include:

1) Initiation

The first station individual who becomes aware of an emergency condition ensures that notification is made and details are provided to the operators in the Control Room. This recognition and the initiation of emergency response may also be from Control Room instrumentation. Appropriate initial action is taken in accordance with Plant Procedures. The Shift Supervisor assumes the role of Susquehanna SES Emergency Director, and continues in that capacity until relieved by the Superintendent of Plant or his designated alternate. The Unit Supervisor has the responsibility for plant operating functions while the Shift Supervisor is acting as Emergency Director.

2) Initial Assessment

The Susquehanna SES Emergency Director performs assessment action relative to the situation in accordance with Section 6.0 of this Plan and the Emergency Plan Implementing Procedures. This assessment and concurrent classification of the emergency are based on available information such as verbal communication, Control Room instrumentation, dose projection data, and follow-up monitoring or other supportive information. The assessment and the emergency classification designation is updated as new information becomes available.

3) Initial Emergency Action

The Susquehanna SES Emergency Director ensures the activation and alerting of both on-site and off-site emergency personnel and organizations. Off-site notification for various emergency conditions are discussed in Section 6.0, and are summarized as follows:

- o Requests for assistance, such as fire fighting and medical transportation, from local off-site support groups may be made by telephone to the individual group(s). Provisions are also made to contact appropriate groups through the 911 emergency telephone system or by message relay through LCCD or CEMA.
- o Notification to off-site authorities of an Unusual Event is primarily to ensure that those agencies are cognizant of the details of events which may arouse public concern. The authorities will be informed on a timely, but not necessarily on an immediate emergency basis. These notifications of an unusual event will be made to PEMA, LCCD and NRC.
- o Notification to the above listed off-site authorities shall commence immediately upon the declaration of an Alert or Site Emergency. Upon declaration of a General Emergency, immediate notification is made to PEMA, LCCD, CEMA and NRC. Section 4.0 describes the time limitations between the first indication of an event and declaration of the applicable emergency condition. Direct "hot line" telephone connections are provided for making immediate notifications to each of the agencies.

On-site protective actions, including criteria and methods, are described in Section 6.0. The primary protective action is evacuation of non-essential

personnel and the use of protective equipment and clothing for those personnel who are required to perform emergency activities. Provision is made for larger areas of evacuation commensurate with existing conditions.

- o A Controlled Zone Evacuation may be implemented by the Susquehanna SES Emergency Director up to the area within the security fence.
- o A Site Evacuation, when implemented by the Susquehanna SES Emergency Director, encompasses the entire site area around the Susquehanna SES.

Off-site protective actions are addressed in Section 6.4.2 and in Table 4.1. Such actions are primarily the responsibility of State and local emergency organizations, but may be based on recommendations by the Susquehanna SES Emergency Director, EOF Support Manager, or Recovery Manager.

4) Restoration

Provisions are made for establishing a restoration organization commensurate with the scope and magnitude of the emergency condition. These provisions include the assignment of qualified individuals to fill the following positions as may be appropriate:

- o Restoration Manager
- o Plant Operations Manager
- o Technical Support Manager
- o Manager of Radiological Control and Waste Management
- o Construction Support Manager
- o Advisory Support
- o Scheduling/Planning Manager
- o Administration and Logistics Manager
- o Public Information Manager

Functions of the above responsibility areas are described in Section 9.0.

Termination from a severe emergency involving off-site consequences will be through joint evaluation by the Restoration Manager, DER/BRP, and NRC.

4.0 EMERGENCY CONDITIONS

4.1 CLASSIFICATION SYSTEM

Emergency conditions are classified into four categories which cover the entire spectrum of probable and postulated accidents. These categories, or classifications, are Unusual Event, Alert, Site Emergency and General Emergency. Action level criteria are specified for determining and declaring each emergency classification. Planning is coordinated with State and county agencies to ensure that this classification system is compatible with the system used by those agencies. The system provides for notification of appropriate emergency response organizations and for implementation of actions immediately applicable to a specific condition. Provisions are included for upgrading the classification level and the corresponding response in the event of a change in the emergency condition.

This section identifies and describes the scope of events which comprise each of the four emergency classifications. Recognition and action level criteria are based on readily available information such as Control Room instrumentation. Immediate actions for response to conditions involving plant operating parameters, such as Technical Specification Limiting Conditions for Operation (LCO's), are detailed in the Plant Procedures. Other immediate actions and follow-up actions are identified in Section 6.0 and described in detail in applicable Emergency Plan Implementing Procedures.

The emergency classification system, initiating conditions, and bases for each initiating condition are defined in Table 4.1. This table demonstrates how an initiating condition leads directly to the appropriate emergency classification based on the magnitude of the event. In many cases, the proper classification is immediately apparent from in-plant instrumentation. In other cases, more extensive assessment is necessary to determine the applicable emergency classification. In any case, continuing re-assessment is required to ensure that the classification is consistent with the conditions. The emergency actions that will be taken for each of the four emergency classifications are shown in Table 4.2.

4.1.1 Unusual Event

Events within this classification represent abnormal plant conditions. They do not, by themselves, constitute significant emergency conditions and have no off-site radiological consequences. Some of these events could, however, indicate a potential degradation in the level of plant safety and/or could escalate to a more severe condition if appropriate action is not taken.

Conditions which constitute the Unusual Event classification include:

- 1) Radiological effluents exceed Technical Specification limits for instantaneous release
- 2) Abnormal occurrences which result in the operator taking the plant from operating status to a hot shutdown condition
- 3) Significant fuel cladding degradation
- 4) Valid initiation of an Emergency Core Cooling System (ECCS)
- 5) Inadvertent criticality
- 6) Nearby or on-site release of potentially harmful quantity of toxic or flammable material
- 7) Natural phenomena:
 - o Tornado with impact on site
 - o Hurricane with impact on site
 - o Flood with probable closure of designated evacuation routes
 - o Earthquake, detected on station seismic instrumentation
- 8) Significant inplant fire within the plant
- 9) Explosion inside security protected area, with no significant damage to station facilities
- 10) Aircraft crash on-site, unusual aircraft activity over facility or train derailment on-site.
- 11) Transportation of externally contaminated injured individual from site to offsite medical facility.
- 12) Failure of a safety/relief valve to close following reduction in reactor pressure.
- 13) Security threat or attempted entry or attempted sabotage.
- 14) Loss of all off-site power or loss of all on-site AC power supplies
- 15) Plant conditions exist that warrant increased awareness on the part of plant management or state and/or local off-site authorities.

Conditions within the Unusual Event classification correspond to the same classification within the LCCD, CEMA and PEMA plans.

The Emergency Director shall declare an Unusual Event as soon as it has been indicated and verified. All reasonable efforts shall be implemented to make this verification within 15 minutes of the initial indication of the event. Notification to LCCD, PEMA, NRC and PP&L Headquarters shall be initiated immediately following the classification of the Unusual Event.

4.1.2 Alert

This classification is characterized by events which indicate an actual degradation of the level of plant safety. It requires response by the plant emergency organization, augmentation of on-site emergency resources, and constitutes the lowest level for which off-site agency emergency response may be anticipated.

Conditions which constitute an Alert classification include:

- 1) Radiological effluents exceed ten times the Technical Specification instantaneous release limits
- 2) Reactor coolant system leak rate greater than 50 gpm
- 3) Severe fuel cladding degradation
- 4) Unexpected in-plant high radiation levels or airborne contamination which indicates a severe degradation in the control of radioactive material.
- 5) Unexpected inplant high radiation levels or airborne contamination which indicates a severe fuel handling accident.
- 6) Loss of all off-site power and all onsite AC power supplies
- 7) Loss of all on-site vital DC power
- 8) Failure of the reactor protection system to initiate and complete a scram which brings the reactor subcritical
- 9) Loss of significant decay heat removal capability
- 10) Control room evacuation
- 11) Loss of most Control Room annunciators

- 12) Entry of toxic or flammable gases into the facility, with subsequent habitability problems
- 13) Natural phenomena occurrence:
 - o Tornado strikes plant vital structures
 - o Hurricane delivers winds near design basis levels
 - o Earthquake greater than Operating Basis Earthquake level
 - o Low river water level near design levels
- 14) Fire lasting more than 15 minutes and potentially affecting the safe shutdown of the plant.
- 15) Explosion damage to facility affecting plant operation.
- 16) Aircraft or missile strikes a station structure
- 17) Turbine failure causing casing penetration
- 18) Ongoing Security compromise
- 19) MSIV malfunction causing leakage
- 20) Plant conditions exist that warrant precautionary activation of Technical Support Center and placing Emergency Operations Facility and other key emergency personnel on standby

The Susquehanna SES Emergency Director shall declare an Alert as soon as the event has been indicated and verified. All reasonable efforts shall be implemented to make this verification within 15 minutes of the initial indication of the event. Notification to LCCD, PEMA, NRC and PP&L Headquarters shall be initiated immediately following declaration of an Alert.

Events within the Alert classification correspond to the same classification within the LCCD, CEMA and PEMA plans.

4.1.3 Site Emergency

A Site Emergency is characterized by events involving actual or probable major failures of plant functions needed for protection of the public. Most events within this classification constitute actual or potential for significant releases of radioactive material to the environment. Although emergency actions involving members of the public may not be necessary, off-site emergency response organizations should be mobilized and ready to implement protective measures.

Conditions which constitute a Site Emergency include:

- 1) Radiological Effluent release corresponds to greater than 50 mr/hr W.B. or 250 mr/hr thyroid for a half-hour or 500 mr/hr W.B. or 2500 mr/hr thyroid for two minutes at the emergency plan boundary.
- 2) Major damage to irradiated fuel with actual or clear potential for significant release of radioactive material to the environment
- 3) Damage to irradiated fuel due to uncontrolled decrease in the fuel pool level to below the level of the fuel.
- 4) Emergency plan boundary dose is projected to exceed 500 mrem within 1 hour.
- 5) Known loss of coolant accident greater than makeup capacity
- 6) Steam line break occurs outside of containment without isolation
- 7) Degraded core with possible loss of coolable geometry
- 8) Loss of functions needed to bring the reactor subcritical and loss of ability to bring the reactor to cold shutdown.
- 9) Most annunciators lost and plant transient initiated.
- 10) Delayed control room evacuation.
- 11) Toxic or flammable gases enter vital areas, restricting access and restricted access constitutes a safety problem.
- 12) An on-going adversary event threatens imminent loss of physical control of the plant
- 13) Loss of all offsite power and loss of onsite AC power capabilities is sustained longer than 15 minutes.
- 14) Loss of all vital on-site DC power sustained for more than 15 minutes
- 15) Severe natural phenomena occurrence with plant not in cold shutdown
 - o Tornado or sustained winds impacting station in excess of design levels
 - o Safe Shutdown Earthquake (SSE) occurs
 - o Low river water level outside design levels.

- 16) Severe damage to safe shutdown equipment from fire, explosion, aircraft crash or missile impact when plant is not in cold shutdown.
- 17) Loss of capability to achieve cold shutdown.
- 18) Plant conditions exist that warrant activation of all emergency centers and monitoring teams or a precautionary notification to the public near the site

The Susquehanna SES Emergency Director shall declare a Site Emergency as soon as the event has been indicated and verified; but in no case shall this verification time exceed 15 minutes. Notification to LCCD, PEMA, NRC and PP&L Headquarters shall be initiated immediately following declaration of a Site Emergency.

This classification of events corresponds to the same classification within the LCCD, CEMA and PEMA plans.

4.1.4 General Emergency

This emergency class is characterized by events, occurring or having occurred, which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity and/or release of large quantities of radioactive material to the environment. Total activation of the on-site and off-site emergency organizations is required for such events. Actions involving off-site populations are probable.

Conditions which constitute a General Emergency are:

- 1) Radiological Effluent release corresponds to greater than 1 r/hr W.B. or 5 r/hr to the child thyroid at the emergency plan boundary
- 2) Offsite doses are projected to exceed 1 rem W.B. or 5 rem thyroid due to the event
- 3) Loss of 2 out of 3 fission product barriers (fuel cladding, reactor coolant pressure boundary and primary containment), with potential loss of the third barrier.
- 4) Core Melt
- 5) Loss of capability to achieve cold shutdown, with possibility of release of large amounts of radioactivity.
- 6) Loss of coolant accident with possibility of imminent release of large amounts of radioactivity.
- 7) Loss of functions needed to bring the reactor subcritical and transient in progress that makes

release of large amounts of radioactivity in a short period possible.

- 8) Loss of physical control of facility.
- 9) Plant conditions exist that make release of large amounts of radioactivity in a short time possible, and notification of recommended action to the public near the site should be considered.

The Susquehanna SES Emergency Director or Recovery Manager shall declare a General Emergency as soon as an event or combination of events within this category is indicated and verified. For indications based on radiological effluents, the verification time shall not exceed 15 minutes. For less apparent indications, the Emergency Director shall ensure that an appropriate Alert or Site Emergency is in effect and determine the applicability of a General Emergency as soon as possible. Notification to LCCD, DER/BRP, CEMA, PEMA, NRC and PP&L Headquarters shall be initiated immediately following the declaration of General Emergency.

Accidents of this class correspond to the same classification within the LCCD, CEMA and PEMA plans.

4.2 SPECTRUM OF POSTULATED ACCIDENTS

The classification and corresponding protective actions relative to significant emergency conditions are based primarily on the resultant or potential radiation doses. Methods are described in this Plan and in Emergency Plan Implementing Procedures for projecting, measuring and evaluating those doses.

The discrete accidents addressed in this section are those which are defined in the Susquehanna SES Units 1 and 2 FSAR as "design basis accidents". The following discussion of these postulated accidents and Table 4.1 identify the instrumentation and other mechanisms for prompt detection and continued assessment, and demonstrates how each accident is encompassed within the emergency classification system of this Plan.

The manpower needs for taking immediate action to minimize damage to the plant and equipment, and to initiate protective measures for on-site and off-site individuals are provided by the normal shift operating crew. The composition of this around-the-clock crew, the emergency assignments for these individuals, and arrangements for augmenting the emergency support personnel, are described in Sections 5.2 and 5.3.

4.2.1 Control_Rod_Drop_Accident

This accident is postulated to occur with the reactor in hot startup condition, and very conservative calculations indicate failure of about 770 fuel rods. The main steam line radiation monitors detect the significant increase in activity and initiate closure of the main steam isolation valves (MSIV). Valve closure is completed in about 5.5 seconds. During that time interval, noble gases and radioiodines are transported with the steam to the condenser. Release of radioactivity to the environment is by way of leakage from the turbine building.

Initial assessment of this accident, performed by the Plant Control Operator under the direction of the Susquehanna SES Emergency Director, includes evaluation of the source term. Data available for the evaluation are direct radiation levels at the locations of various turbine building ARMS, and an indication of the airborne radioactivity concentration from the turbine building/radwaste building vent exhaust monitor. Emergency Plan Implementing Procedures provide general guidance for dose projections based on the turbine building source term. Data from the continuous monitoring devices may be supplemented by information obtained by the radiological monitoring team.

The Susquehanna SES Emergency Director designates protective action commensurate with the projected and/or measured doses. For doses in the range of the maximum estimates shown in Table 15.4-15 of the FSAR, the emergency actions may include:

- 1) Declare an Alert
- 2) Implement Controlled Zone Evacuation

4.2.2 Fuel_Handling

This accident is postulated to occur with the reactor in shutdown condition with the vessel head removed, and results in failure of about 125 fuel rods. The reactor building ventilation radiation monitoring system alarms, isolates the ventilation system, and starts operation of the Standby Gas Treatment System (SGTS), all within about one minute. Noble gases and radioiodines are released to the reactor coolant, migrate to the secondary containment, and are released to the environment after filtration through the SGTS.

Initial assessment of this accident includes the performance of dose projections in accordance with Emergency Plan Implementing Procedures. Dose projections utilize data from the reactor building vent monitor, standby gas treatment vent monitor, and meteorological instrumentation.

In the event that projected doses are in the range of the maximum estimate shown in Table 15.7-16 of the PSAR, the emergency actions may include:

- 1) Declare either an Alert or a Site Emergency
- 2) Implement Controlled Zone Evacuation
- 3) Consider Implementation of a Site Area Evacuation

4.2.3 Main Steam Break

This accident is postulated to occur with the reactor in operating status. The steam line break occurs outside the containment and releases steam for a period of about 5.5 seconds, until complete closure of the MSIVs. Noble gases and radioiodines in the coolant are assumed to be released directly to the environment.

Due to the short duration and the direct release to the environment, there is no feasible mechanism to monitor the actual release. However, an estimate of the resultant doses can be made and compared to those shown in Table 15.6-9 of the PSAR for worst case conditions. Actual doses are proportional to the fission product activity in the steam, as monitored by the off-gas release rate, prior to the accident. The doses in Table 15.6-9 of the PSAR are based on the assumption that the off-gas release rate is at the upper limiting condition for operation. Actual dose estimates, and corresponding emergency actions, may be scaled by the Susquehanna SES Emergency Director, based on the off-gas release rate prior to the accident. Consideration may also be given to the relative benefit from taking or not taking specific protective action, based on the short-term duration of exposure associated with this accident.

Emergency actions for worst case conditions may include:

- 1) Declare either an Alert or a Site Emergency
- 2) Implement Controlled Zone Evacuation

4.2.4 Instrument Line Break

This accident is postulated to occur with the reactor in operating status. A small line connected to the primary coolant system ruptures at a location which is outside the drywell, but inside the secondary containment. Noble gases and radioiodines are released for about ten minutes prior to shutdown of normal ventilation and initiation of the SGTS. Operator recognition of the accident is by a combination of alarms or abnormal readings from: area radiation monitors, ventilation process radiation monitors, temperature monitors, and leak detection systems.

Emergency actions which may be specified in response to the dose estimates shown in Table 15.6-4 of the FSAR include:

- 1) Declare an Alert
- 2) Implement Controlled Zone Evacuation

4.2.5 Loss of Coolant Accident (LOCA)

This accident is postulated to involve a complete circumferential break of a recirculating loop pipe inside the primary containment, with the reactor operating at full power. The accident results in release of a significant quantity of fission products into the primary containment, leakage into the secondary containment, and release to the environment through the SGTS. Containment failure, although not likely, must be considered possible.

The occurrence of a design basis LOCA is uniquely identified by low-low reactor water level and high drywell pressure signals from the reactor protection system sensors and high radiation signal from the containment accident radiation monitor(s). The signals result in reactor scram and MSIV closure within 5.5 seconds. Operation of the emergency core cooling system is initiated within about 30 seconds.

The following emergency actions would be taken by the Susquehanna SES Emergency Director in response to design basis LOCA dose estimates in Tables 15.6-16 and 15.6-17 of the FSAR:

- 1) Declare a Site Emergency
- 2) Implement Controlled Zone Evacuation

4.2.6 Off-Gas Treatment System Failure

This accident is postulated to be initiated by an occurrence such as earthquake (greater than SSE design basis), explosion, or fire. The accident results in release of the stored inventory of noble gas in the system, including that contained in the charcoal adsorption beds. In addition to recognition of the initiating event, the operator is provided with recognition and assessment information from alarmed instrumentation such as ARMs, off-gas system loss of flow, and vent release activity.

Emergency actions which may be specified by the Susquehanna SES Emergency Director, based on the maximum estimated doses shown in Table 15.7-4 of the FSAR include:

- 1) Declare a Site Emergency
- 2) Implement Controlled Zone Evacuation

4.2.7 Air Ejector Line Failure

This accident is postulated to result from a seismic event (greater than SSE) which is more severe than the design basis of the system. The noble gas and radioiodine activity from the air ejector, which is normally processed by the off-gas treatment system, is discharged to the environment via the turbine building ventilation system. The accident is recognized by the sounding of the off-gas system loss of flow alarm and ARMS. Assessment of the severity includes evaluation of the off-gas activity release rate prior to the accident and results of on-site monitoring.

Emergency actions, based on the estimated doses shown in Table 15.7-4 of the FSAR include:

- 1) Declare an Alert
- 2) Implement Controlled Zone Evacuation

4.2.8 Liquid Radwaste Failure

This accident is postulated to be rupture of a concentrates waste tank in the radwaste enclosure. Airborne radioactivity released during the accident passes directly to the environment via the turbine/radwaste building vent. A high water level alarm on the radwaste building sump alarms and activates the sump pumps. Radwaste building ARMS and on-site monitoring provide data for assessing the magnitude of the radiological consequences.

Emergency actions, based on the maximum estimated doses shown in Table 15.7-10 of the FSAR, may include:

- 1) Declare an Alert
- 2) Implement Controlled Zone Evacuation

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(UNUSUAL EVENT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Conditions</u> ¹
1. Radiological effluents exceed Technical Specification limits for instantaneous release.	1. (A OR B OR C OR D) A. Building Vent Stack Monitoring System high radiation alarm annunciation or indication on Panel 0C669 or 0C677. <u>OR</u> B. Service Water Effluent high radiation alarm annunciation on Panel 1C668 or indication on Panel 1C601. <u>OR</u> C. RHR Service Water Loop A or B Rx effluent high radiation alarm annunciation on Panel 1C601 or indication on Panel 1C600. <u>OR</u> D. Report of radiological effluent on technical specification limit being exceeded.	1. NUREG 0654, Example 2 - Unusual Event.
2. Significant fuel cladding degradation	2. (A OR B OR C) A. Off-gas Pre-treatment Monitor high radiation alarm annunciation on Panel 1C601 or indication on Panel 1C600. <u>OR</u>	2. NUREG 0654, Example 3a and 3b - Unusual Event. (Modified to reflect actual monitor setpoints rather than values from NUREG.)

¹Appendix F lists the NUREG 0654 Initiating Conditions not used and the basis for not including them in this table.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(UNUSUAL EVENT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Conditions</u> ¹
2. Significant fuel cladding degradation (Cont'd)	<p>B. Off-gas Post-treatment Monitor high radiation alarm annunciation on Panel OC673 or indication on Panel 1C322.</p> <p><u>OR</u></p> <p>C. Reactor coolant activity, as determined by sample analysis; greater than or equal to 2 $\mu\text{Ci/cc}$ of I-131 equivalent.</p>	
3. Abnormal occurrences which result in the operator taking the plant from operating status to a hot shutdown condition	<p>3. (A OR B OR C)</p> <p>A. Implementation of a controlled shutdown in response to a Tech Spec Action statement.</p> <p><u>OR</u></p> <p>B. Indications or alarms on process or effluent parameters not functional in control room to an extent requiring plant shutdown as a result of significant loss of assessment or communication capability. (e.g., plant computer, safety parameter display system, all meteorological instrumentation.)</p> <p><u>OR</u></p> <p>C. Turbine rotating component failure causing the operator to rapidly shutdown the plant.</p>	<p>3. NUREG 0654, Example 4, 5, 8, 9, 11 and 14e - Unusual Event. (Modified to refer to response to LCO in general which includes all specific examples in NUREG.)</p>

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(UNUSUAL EVENT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Conditions</u> ¹
8. Aircraft crash on-site, unusual aircraft activity over facility or train derailment on-site.	8. Visual observation or notification received by control room operator.	8. NUREG 0654, Example 14a and 14b - Unusual Event.
9. Transportation of externally contaminated injured individual from site to off-site medical facility.	9. As deemed appropriate by Shift Supervisor.	9. NUREG 0654, Example 16 - Unusual Event.
10. Significant fire within the plant.	10. (A OR B) A. (1 AND 2) 1. Activation of fire brigade by Shift Supervisor. <u>AND</u> 2. Duration of fire longer than 15 minutes after time of notification.	10. NUREG 0654, Example 10 - Unusual Event.
11. Explosion inside security protected area; with no significant damage to station facilities.	11. Visual observation or notification received by control room operator.	11. NUREG 0654, Example 14c - Unusual Event.
12. Failure of a safety/relief valve to close following reduction in Rx pressure.	12. (A AND B AND C) A. Indication of open safety/relief valve on Panel 1C601. <u>AND</u>	12. NUREG 0654, Example 6 - Unusual Event.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(ALERT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Conditions</u> ¹
1. Radiological effluents exceed 10 times the Technical Specification instantaneous limits.	1. (A OR B OR C OR D) A. Building Vent Stack Monitoring System indication on Panel OC669 or OC677. <u>OR</u> B. Service Water Effluent radiation indication on Panel 1C600. <u>OR</u> C. RHR Service Loop A or B Rx effluent radiation indication on Panel 1C600. <u>OR</u> D. Report of radiological effluent release exceeding 10 times technical specifications.	1. NUREG 0654, Example 15 - Alert.
2. Reactor coolant system leak rate greater than 50 gpm.	2. (A OR B) A. Drywell floor drain pump A or B Hi-Hi alarm on Panel 1C601 AND 2 or more drywell floor drain pumps continuously running as indicated on Panel 1C601. <u>OR</u> B. Other estimates of Rx coolant system leakage.	2. NUREG 0654, Example 5 - Alert.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(ALERT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition¹</u>
3. Severe fuel cladding degradation	3. (A OR B OR C OR D) A. Off-gas Pre-treatment monitor High-High radiation alarm annunciation on Panel OC651 or indication on Panel 1C600. <u>OR</u> B. Reactor coolant activity greater than 300 $\mu\text{Ci/cc}$ of equivalent I-131, as determined by sample analysis. <u>OR</u> C. Main Steam Line High radiation trip annunciation or indication on Panel 1C651. <u>OR</u> D. The containment post-accident monitor indication on Panel 1C601 greater than 200 rem.	3. NUREG 0654, Examples 1a and 1b - Alert. (With addition of post-accident monitor indication.)
4. Unexpected in plant high radiation levels or airborne contamination which indicates a severe degradation in the control of radioactive material.	4. (A OR B) A. Area Radiation Monitor reading 1000 times normal annunciation on Panel 1C601 or indication on Panel 1C600. <u>OR</u> B. Airborne contamination levels reported greater than MPC limits.	4. NUREG 0654, Example '6 - Alert.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(ALERT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
5. Loss of all off-site power <u>AND</u> all on-site AC power supplies.	5. (A AND B) A. Loss of power to Startup Transformer 10 and 20 annunciation or indication on Panel 0C653. <u>AND</u> B. Failure of all diesel generators to start or synchronize annunciation or indication on Panel 0C653.	5. NUREG 0654, Example 7 - Alert.
6. Loss of on-site vital DC power.	6. (A AND B) A. Less than 210 volts on the 250 VDC main distribution panel buses; 1D652 <u>AND</u> 1D662, as indicated by trouble alarms on Panel 1C651. <u>AND</u> B. Less than 105 volts on the 125 VDC main distribution buses; 1D612, 1D622, 1D632 <u>AND</u> 1D642 as indicated by trouble alarms on Panel 1C651.	6. NUREG 0654, Example 8 - Alert.
<p><u>NOTE:</u> Buses are not tripped on undervoltage condition.</p>		

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(ALERT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
7. Failure of the reactor protection system to initiate and complete a scram which brings the reactor subcritical.	<p>7. (A AND B AND C)</p> <p>A. Trip of at least one subchannel in each trip system (RPS A and RPS B) as indicated by annunciators and trip status lights on Panel 1C651.</p> <p><u>AND</u></p> <p>B. Failure of control rods to insert as confirmed by the full core display indication on Panel 1C651 or process computer indications.</p> <p><u>AND</u></p> <p>C. Failure to bring the reactor subcritical confirmed by neutron count rate on the neutron monitoring indication on Panel 1C651.</p>	7. NUREG 0654, Example 11 - Alert.
8. Loss of some of the decay heat removal capability.	<p>8. (A OR B)</p> <p>A. (1 OR 2)</p> <p>Loss of both RHR service water loops as indicated by:</p> <p>1. Low flow indication or annunciation on Panel 1C601.</p> <p><u>OR</u></p> <p>2. Other indication.</p> <p><u>OR</u></p>	8. NUREG 0654, Example 10 - Alert. (Reworded for clarity.)

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(ALERT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	B. Loss of RHR loops A <u>AND</u> B as indicated by low flow indication or annunciation on Panel 1C601.	
9. Control Room evacuation	9. (A AND B)	9. NUREG 0654, Example 20 - Alert.
	A. Initiation of control room evacuation procedures.	
	<u>AND</u>	
	B. Establishment of control of shutdown systems from local stations.	
10. Loss of most control room annunciators.	10. As determined by control room operator from direct observation.	10. NUREG 0654, Example 14 - Alert.
11. Entry of toxic or flammable gasses into the facility, with subsequent habitability problems.	11. Visual observation, direct measurement or notification received by the control room operator.	11. NUREG 0654, Example 18d - Alert.
12. Natural Phenomenon Occurrence	12. (A OR B OR C OR D)	12. NUREG 0654, Examples 17a, b, c and d - Alert. (Modified to reflect Susquehanna design basis levels and deleting flood as design basis phenomena.)
	A. Tornado with reported wind velocities greater than 200 mph impacting on site.	
	<u>OR</u>	
	B. Hurricane or sustained greater than 70 mph winds as indicated on Panel 0C653.	
	<u>OR</u>	

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(ALERT)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	C. Earthquake with greater than operating basis earthquake (OBE) levels as indicated on Panel OC696. <u>OR</u> D. River level below 72 inches as indicated on Panel OC671.	
13. On-Site Fire/Explosion	13. (A OR B) A. Fire lasting more than 15 minutes and potentially affecting the safe shutdown of the plant. <u>OR</u> B. (1 AND 2) Explosion damage to facility affecting plant operation as determined by: 1. Direct observation or notification received by control room operator. <u>AND</u> 2. Shift Supervisor evaluation.	13. NUREG 0654, Examples 13 and 18c - Alert.
14. Aircraft or missile strikes a station structure.	14. Direct observation or notification received by control room operator.	14. NUREG 0654, Examples 18a and 18b - Alert.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
<p>1. Radiological effluent release corresponds to greater than 50 mr/hr W.B. or 250 mr/hr thyroid for a half-hour or 500 mr/hr W.B. or 2500 mr/hr thyroid for 2 minutes at the emergency plant boundary.</p> <p><u>OR</u></p> <p>Emergency plan boundary dose is projected to exceed 500 mrem within 1 hr.</p>	<p>1. (A OR B)</p> <p>Dose projections based on:</p> <p>A. Building vent stack monitoring system indications on Panel OC669 or OC677.</p> <p><u>OR</u></p> <p>B. Field monitoring data on-site or off-site.</p>	<p>1. NUREG 0654, Examples 13a, b and c - Site Area Emergency. (Modified to have conservative dose trigger level below EPA protective action guidelines and to utilize actual meteorology and actual plant effluents rather than estimates from plant conditions since Susquehanna dose projection techniques are relatively sophisticated and rapid.)</p>
<p>2. Major damage to irradiated fuel with actual or clear potential for significant release of radioactive material to the environment.</p>	<p>2. (A AND B)</p> <p>A. Dropping, bumping or otherwise rough handling of a new <u>OR</u> irradiated fuel bundle with irradiated fuel in the pool.</p> <p><u>AND</u></p> <p>B. (1 OR 2)</p> <p>1. Refueling floor area radiation monitor reading 1000 times normal annunciation on Panel 1C601 or indication on 1C600.</p> <p><u>OR</u></p> <p>2. Reactor Building vent stack monitoring system high radiation annunciation or indication on Panel OC669 or OC677.</p>	<p>2. NUREG 0654, Example 10 - Site Area Emergency. (Wording modified for clarity.)</p>

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
3. Damage to irradiated fuel due to uncontrolled decrease in the fuel pool level to below the level of the fuel.	<p>3. (A AND B)</p> <p>A. (1 OR 2)</p> <p>1. (a AND b)</p> <p>a. Uncovering of irradiated fuel confirmation by low water level annunciation on Panel OC211.</p> <p><u>AND</u></p> <p>b. A high seal leak flow alarm annunciated on OC211.</p> <p><u>OR</u></p> <p>2. Visual observation of water level below irradiated fuel in the pool.</p> <p><u>AND</u></p> <p>B. (1 OR 2)</p> <p>1. Refueling floor area radiation monitor annunciation on Panel 1C651 or indication on Panel 1C600.</p> <p><u>OR</u></p> <p>2. Reactor Building vent stack monitoring system high radiation annunciation or indication on Panel OC669 or OC677.</p>	3. NUREG 0654, Example 10 - Site Area Emergency. (Wording modified for clarity.)

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
4. Known loss of coolant accident greater than make-up capacity.	4. Water level below (and failure to return to) top of active fuel for greater than three minutes as indicated on fuel zone level indicator on Panel 1C601.	4. NUREG 0654, Example 1 - Site Area Emergency.
5. Steam line break occurs outside of containment without isolation.	5. (A OR B OR C OR D) A. (1 AND 2) 1. Failure of both MSIVs in the line with the leak to close as indicated by position indication on Panel 1C601. <u>AND</u> 2. (a OR b OR c) a. High MSL flow annunciation on Panel 1C601 or indication on Panel 1C652. <u>OR</u> b. High steam tunnel temperature annunciation on Panel 1C601 or indication on Panel 1C614. <u>OR</u> c. Other indication of main steam leakage outside containment. <u>OR</u>	5. NUREG 0654, Example 4 - Site Area Emergency.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	c. HPCI steamline high flow annunciation on Panel 1C601. <u>OR</u> d. HPCI steamline tunnel ventilation high delta temperature annunciation on Panel 1C601. <u>OR</u> e. HPCI turbine exhaust diaphragm high pressure annunciation on Panel 1C601. <u>OR</u> f. Other indication of steam leakage from the HPCI system. <u>OR</u> D. Any other unisolatable steam line breaks.	
6. Degraded core with possible loss of coolable geometry.	6. (A OR B OR C) A. (1 AND 2 AND 3) 1. Failure of control rod(s) to fully insert on a scram or shutdown indication on full core display, Panel 1C651. <u>AND</u>	6. NUREG 0654, Example 2 - Site Area Emergency.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	<p>2. Upscale readings on LPRM strings (greater than 94 watts/cm) adjacent to not-fully inserted rods as indicated by LPRM up-scale alarms on Panel 1C651.</p> <p><u>AND</u></p> <p>3. Reactor coolant activity greater than 300 $\mu\text{Ci/cc}$ of equivalent I-131 as determined by sample analysis.</p> <p><u>OR</u></p> <p>B. Reactor coolant activity greater than 1,000 $\mu\text{Ci/cc}$ of equivalent I-131 as determined by sample analysis.</p> <p><u>OR</u></p> <p>C. The containment post-accident monitor indication on Panel 1C601 greater than 400 rem.</p>	
7. Loss of functions needed to bring the reactor subcritical and loss of ability to bring the reactor to cold shutdown.	<p>7. (A AND B AND C)</p> <p>A. Inability to insert sufficient control rods to bring the reactor subcritical as indicated by count rate on the neutron monitoring instrumentation on Panel 1C651.</p> <p><u>AND</u></p>	7. NUREG 0654, Example 9 - Site Area Emergency. (Reworded for clarity.)

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	<p>B. (1 OR 2 OR 3)</p> <p>Failure of both loops of standby liquid control to inject into the vessel indicated by:</p> <ol style="list-style-type: none"> 1. Low pump discharge pressure indication on Panel 1C601. <p><u>OR</u></p> <ol style="list-style-type: none"> 2. Failure of valve C31-F008 position light on Panel 1C601 to indicate open. <p><u>OR</u></p> <ol style="list-style-type: none"> 3. Failure of explosive valves 1F004 A and B position lights to indicate open (fired). <p><u>AND</u></p> <p>C. Rx coolant temperature greater than 200°F as indicated on Panel 1C651.</p>	
8. Most annunciators lost and plant transient initiated while annunciators are lost.	<p>8. (A AND B)</p> <p>A. Direct observation of control room operator that most annunciators are lost.</p> <p><u>AND</u></p>	8. NUREG 0654, Example 12 - Site Area Emergency.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	B. (1 OR 2 OR 3 OR 4)	
	1. Low - Low reactor water level indication on Panel 1C651 followed by ECCS initiation on Panel 1C601.	
	<u>OR</u>	
	2. Reactor coolant temperature change greater than 100°F per hour indication on recorder TR-1R006 on Panel 1C007 (Reactor Bldg. Elevation 683').	
	<u>OR</u>	
	3. High Rx pressure indication on Panel 1C651 and followed by scram indication on Panel 1C651.	
	<u>OR</u>	
	4. Any indication that transient has occurred or is in progress.	
9. Delayed Control Room Evacuation	9. (A AND B)	9. NUREG 0654, Example 18 - Site Area Emergency.
	A. Initiation of control room evacuation procedures.	
	<u>AND</u>	
	B. Shutdown systems control at local stations not established within 15 minutes.	

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
10. Toxic or flammable gasses enter vital areas, restricting access and restricted access constitutes a safety problem.	<p>10. (A AND B)</p> <p>A. Shift Supervisor's evaluation.</p> <p><u>AND</u></p> <p>B. (1 OR 2)</p> <p>1. Visual observation, direct measurement or notification received by control room operator.</p> <p><u>OR</u></p> <p>2. High chlorine level annunciation or indication on Panel OC681 with isolation of primary or alternate air intakes.</p>	10. NUREG 0654, Example 16c - Site Area Emergency.
11. An on-going adversary event threatens imminent loss of physical control of the plant.	<p>11. (A AND B)</p> <p>A. Report from Security of physical attack on the plant involving imminent occupancy of the control room, auxiliary shutdown panels or other vital area.</p> <p><u>AND</u></p> <p>B. Shift Supervisor evaluation.</p>	11. NUREG 0654, Example 14 - Site Area Emergency. (Modified to reflect guidance in NUREG 0818.)

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
12. Loss of all off-site power and loss of on-site AC power supplies for greater than 15 minutes.	<p>12. (A AND B AND C)</p> <p>A. Loss of power to Startup Transformer 10 <u>AND</u> 20 annunciation or indication on Panel 0C653.</p> <p><u>AND</u></p> <p>B. Failure of <u>all</u> diesel generators to startup or synchronize indication or annunciation on 0C653.</p> <p><u>AND</u></p> <p>C. The above conditions exist for greater than 15 minutes.</p>	12. NUREG 0654, Example 6 - Site Area Emergency.
13. Loss of all vital on-site DC power sustained for greater than 15 minutes.	<p>13. (A AND B AND C)</p> <p>A. Less than 210 volts on the 250 VDC main distribution panel buses, 1D652 <u>AND</u> 1D662, as indicated by trouble alarms on Panel 1C651.</p> <p><u>AND</u></p> <p>B. Less than 105 volts on the 125 VDC main distribution buses; 1D612, 1D622, 1D632 <u>AND</u> 1D642 as indicated by trouble alarms on Panel 1C651.</p> <p><u>AND</u></p>	13. NUREG 0654, Example 7 - Site Area Emergency.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	<p>C. The above condition exists for greater than 15 minutes.</p> <p><u>NOTE:</u> Buses are not tripped on undervoltage condition.</p>	
14. Severe natural phenomenon occurrence, with plant not in cold shutdown.	<p>14. (A AND B)</p> <p>A. Reactor Coolant Temperature greater than 200°F as indicated on Panel 1C651.</p> <p><u>AND</u></p> <p>B. (1 OR 2 OR 3 OR 4)</p> <p>1. Hurricane or sustained winds greater than 80 mph as indicated on Panel 0C653.</p> <p><u>OR</u></p> <p>2. Earthquake with greater than Safe Shutdown Earthquake (SSE) levels as indicated on Panel 0C696.</p> <p><u>OR</u></p> <p>3. River level below 60 inches as indicated on Panel 0C671.</p> <p><u>OR</u></p> <p>4. Tornado with reported wind velocities greater than 220 mph impacting on site.</p>	14. NUREG 0654, Example 15a, b and c - Site Area Emergency. (Modified to use Susquehanna specific design levels and deleting flood as design basis.)

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
15. Severe damage to safe shutdown equipment from fire, explosion, aircraft crash or missile impact when plant not in cold shutdown.	<p>15. (A AND B AND C)</p> <p>A. Visual observation or notification received by control room operator.</p> <p><u>AND</u></p> <p>B. Shift Supervisor evaluation.</p> <p><u>AND</u></p> <p>C. Reactor Coolant temperature greater than 200°F as indicated on Panel 1C651.</p>	15. NUREG 0654, Examples 11, 16a and 16b - Site Area Emergency.
16. Loss of capability to achieve cold shutdown.	<p>16. (A AND B AND C)</p> <p>A. Loss of main condenser system as indicated by closed turbine stop and bypass valve position indications on Panel 1C651.</p> <p><u>AND</u></p> <p>B. (1 OR 2)</p> <p>1. Loss of both RHR service water loops as indicated by low flow indication or annunciation on Panel 0C653.</p> <p><u>OR</u></p>	16. NUREG 0654, Example 8 - Site Area Emergency. (Modified to reflect PP&L opinion that this example should have been based on failure to achieve cold shutdown. Failure to achieve hot shutdown is covered in Example 9.)

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(SITE EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	2. Loss of both RHR loops as indicated by flow indication or annunciation on Panel 1C601. <u>AND</u> C. Reactor Coolant temperature greater than 200°F as indicated on Panel 1C651.	
17. Plant conditions exist that warrant activation of all emergency centers and monitoring teams <u>OR</u> a precautionary notification to the public near the site.		17. NUREG 0654, Example 17 - Site Area Emergency.

TABLE 4.1

CLASSIFICATION OF EMERGENCY CONDITIONS
(GENERAL EMERGENCY)

<u>Initiating Conditions</u>	<u>Emergency Action Levels</u>	<u>Basis for Initiating Condition</u> ¹
	2. Reactor Vessel level drops below (and fails to return to) top of active fuel for greater than three minutes as indicated on fuel zone level indicator on Panel 1C601.	
7. Loss of capability to achieve cold shutdown with possibility of release of large amounts of radioactivity.	7. (A AND B AND C)	7. NUREG 0654, Example 6a - General Emergency.
	A. Suppression pool temperature greater than 290°F indicated on the computer output (MAT 12,13,14, 15 or 16).	
	<u>AND</u>	
	B. Loss of main condenser system as indicated by closed turbine stop and bypass valve position indications on Panel 1C651.	
	<u>AND</u>	
	C. (1 OR 2)	
	1. Loss of both RHR service water loop as indicated by low flow indication or annunciation on Panel 1C601.	
	<u>OR</u>	
	2. Loss of both RHR loops as indicated by flow indication or annunciation on Panel 1C601.	

TABLE 4.2

EMERGENCY ACTIONS BASED ON CLASSIFICATION

<u>Classification</u>	<u>Licensee Actions</u>	<u>Off-Site Agency Actions</u>
1. Unusual Event	<p>1. Promptly notify plant emergency management personnel of event particulars and an assessment of safety significance of the event.</p> <p><u>and</u></p> <p>2. Notify LCCD, PEMA and NRC of "unusual event".</p> <p><u>and</u></p> <p>3. Close out event with verbal summary followed by written summary via LER program prompt notification (24-hr.) provision.</p> <p><u>or</u></p> <p>Escalate to higher emergency classification if appropriate.</p> <p><u>and</u></p> <p>If action statement (3) above is implemented, a written close out will be submitted to the NRC in 14 days.</p>	<p>1. Notify key officials and public if deemed necessary by county/state Emergency Director.</p> <p><u>and</u></p> <p>2. Provide assistance if requested and able.</p> <p><u>and</u></p>
2. Alert	<p>1. Promptly notify state/local authorities and NRC of Alert status and reason for alert.</p> <p><u>and</u></p>	<p>1. Provide assistance, if requested and able.</p> <p><u>and</u></p>

TABLE 4.2

EMERGENCY ACTIONS BASED ON CLASSIFICATION

<u>Classification</u>	<u>Licensee Actions</u>	<u>Off-Site Agency Actions</u>
3. Site Emergency	<ol style="list-style-type: none"> Promptly inform off-site authorities of site emergency status and reason for emergency, if known. <u>and</u> Augment resources by activating EOF and off-site monitoring teams. <u>and</u> Dispatch on-site and off-site monitoring teams and associated communications for instances where radiation releases appear imminent of have occurred. <u>and</u> Provide a dedicated individual for plant status updates to off-site authorities and periodic press briefings. <u>and</u> Make senior technical and management staff on-site available for consultation with NRC and state on a periodic basis. <u>and</u> 	<ol style="list-style-type: none"> Provide, if able, any assistance required. <u>and</u> Augment resources by activating primary emergency response centers. <u>and</u> Assure that systems for public notification of emergency status is in standby and initiate preparation for subsequent public periodic updates. <u>and</u> Alert to standby status other emergency personnel and dispatch personnel to duty stations. <u>and</u> Provide off-site monitoring results to licensee and others and jointly assess them. <u>and</u>

TABLE 4.2

EMERGENCY ACTIONS BASED ON CLASSIFICATION

<u>Classification</u>	<u>Licensee Actions</u>	<u>Off-Site Agency Actions</u>
4. General Emergency	1. Same as for "Site Emergency" classification.	1. Provide requested assistance, if able. <u>and</u> 2. Activate immediate public notification of emergency status and provide public periodic updates. <u>and</u> 3. Recommend protective actions for Emergency Planning Zone population and Emergency Ingestion Zone agricultural products. <u>and</u> 4. Augment resources by activating EOF and any other primary response centers. <u>and</u> 5. Dispatch key emergency personnel including monitoring teams and associated communications. <u>and</u> 6. Activate other emergency services personnel and dispatch to duty stations. <u>and</u>

TABLE 4.2

EMERGENCY ACTIONS BASED ON CLASSIFICATIONClassificationLicensee ActionsOff-Site Agency Actions

7. Provide off-site monitoring results to licensee and jointly assess these.

and
8. Continuously assess information from licensee and off-site monitoring teams with regard to changes to protective actions already initiated for public and evacuation resources.

and
9. Maintain General Emergency status until close-out or reduction of emergency class.

5.0 ORGANIZATIONAL CONTROL OF EMERGENCIES

The on-site emergency organization and its augmentation and extension off-site are discussed in this section. Included are the authorities and responsibilities of key individuals and groups, and the communication links for notifying, alerting, and mobilizing emergency personnel.

PP&L's Emergency Plan is based upon a four phase approach to accident response and mitigation.

The first phase involves the immediate response to the emergency condition. This consists of identification of the condition, initiation of prompt corrective action and initiation of prompt notification to local, state and federal agencies as well as appropriate members of PP&L's Emergency Response Organization. This initial phase is implemented by the on-shift organization. The on-shift organization has been staffed and trained to be capable of both safely operating the unit and quickly and effectively responding to an emergency condition. Initially, the Shift Supervisor, the highest ranking management individual on-shift, will assume the role of Emergency Director. He is responsible for initiating both corrective action and emergency management activities. He will designate a communications coordinator and instruct him to initiate call-in of selected personnel. He will have the capability to perform initial dose projections and make resulting recommendations regarding off-site protective actions. At this initial phase, the Operations Support Center is activated with shift personnel. The Shift Supervisor will designate an Operations Support Center Coordinator who will organize and direct in-plant emergency team functions as directed by the Emergency Director. Upon activation of phase two, additional personnel will be available, and control and dissemination of these teams will shift to the technical support center.

The second phase of accident response and mitigation is the activation of the on-site Emergency Organization. Upon notification by the on-shift organization, the Plant Superintendent or his designated alternate, will report to the site to assume the role of Emergency Director. Additionally, support coordinators in areas of technical assessment, radiological assessment and operational coordination will also report to the site along with their support staffs. These individuals form the nucleus of the Emergency Director's Team and will activate the Technical Support Center. The Technical Support Center will be fully functional within a 30 to 60 minute time frame of initial notification. As the Plant Superintendent and his support coordinators arrive, they will be brought up to date by the Shift Supervisor and then will in turn assume responsibility from the Shift Supervisor for their particular areas of expertise. Thus, within 30 to 60 minutes of notification, the emergency management activities, including communications, will be under the control of the Plant Superintendent or his designated alternate; the dose projection

and assessment activities will be directed by the Radiation Support Coordinator; technical expertise in the areas of reactor engineering, thermal hydraulics, plant design, etc., will be directed by the Technical Support Coordinator and the Operation Coordinator will provide a focal point for all operational activities. Thus, the Emergency Director's Organization will take over all emergency management and support activities from the on-shift organization leaving the on-shift organization to devote their entire efforts towards establishing and maintaining the plant in a safe, stable condition.

The third phase is activation of Off-site support. This is the organization which will man the Emergency Operations Facility (EOF) the General Office Nuclear Emergency Support Center (GONESC) and the General Office Engineering Support Center (GOESC) to provide in-depth technical support and off-site radiological assessment. The EOF staff will assume responsibility for overall management of the accident off-site radiological projection and assessment activities, and communications to off-site agencies and personnel. They also provide the interface to the GONESC and GOESC where substantial technical and administrative support is available. The EOF will be fully functional within 3 hours of notification. The EOF is manned primarily by personnel normally from the General Office. The Recovery Manager who is also located in the General Office is responsible for overall management of the emergency. In addition Support Managers in the areas of radiological, technical and operations/communications will report to the EOF with their staffs.

The GONESC and GOESC are also manned by personnel from the General Office. They are activated in 30-60 minutes of notification. These support centers headed by the General Office Support Manager and Engineering Support Leader respectively, interface with the EOF staff to provide extensive technical and administrative support to the plant. The GONESC is also the primary communications link to PP&L Corporate Management. Until the EOF is fully manned, these support centers report to the TSC and take direction from and directly support the activities of the TSC. Thus the EOF, GONESC and GOESC relieve the Emergency Director and on-site organization of external responsibilities allowing them to devote their entire efforts to in-plant activities.

Because of the unique demands of offsite radiological monitoring and assessment activities, additional dedicated resources are applied to this function as quickly as possible in the EOF. These additional resources, called the Interim Radiological Assessment Team (IRAT), will be functional within 30-60 minutes of notification. IRAT is composed of personnel whose normal work location is SSSES. IRAT, under the direction of the EOF Support Manager, will assume off-site radiological assessment activities from the TSC and report to the Emergency Director until relieved by the Radiological Support Manager and his staff.

The last phase is that of restoration and will be headed by a Restoration Manager. This phase leads ultimately to the return to service of the unit. The organizational and philosophical concepts that will be utilized during this phase are highly dependent upon the nature of the emergency. The restoration phase would not begin until there was complete assurance that the plant was in a stable shutdown condition and that there would be no inadvertent or unplanned significant release of radioactivity to the environment.

From the above, it can be seen there is a clear succession of responsibility with respect to emergency management activities from the on-shift organization through the On-site Emergency Director and ultimately to the Recovery Manager. All personnel taking part in these organizations will be properly trained as to their responsibilities under emergency conditions and the authority they have with respect to implementation of same.

5.1 NORMAL OPERATING ORGANIZATION

The Susquehanna SES organization for normal operation is shown in Figure 5.1. This organization is applicable to the operation of Units 1 and 2. The figure shows the levels of responsibility within the station and indicates the typical number of personnel in each job category during normal working hours (8 a.m. - 4 p.m. weekdays, excluding holidays). The minimum shift crew, at all other times consists of:

One (1)	Shift Supervisor (SRO)
One (1)	Unit Supervisor (SRO)
One (1)	Assistant Unit Supervisor (RO)
Two (2)	Licensed Operators (RO)
One (1)	Shift Technical Advisor
Four (4)	Non-Licensed Operators
One (1)	Health Physics Technician
One (1)	Chemistry Technician
One (1)	Security Shift Supervisor
One (1)	Assistant Security Shift Supervisor
Twelve (12)	Security Officers

5.2 ON-SITE EMERGENCY ORGANIZATION

The Susquehanna SES on-site emergency organization is illustrated in Figure 5.3. This organization applies to emergency conditions lasting more than about one hour and up to the implementation of the Restoration Organization outlined in Section 9.0. An on-call emergency organization duty roster is maintained to ensure the following emergency management positions within the emergency organization can be filled within 30 to 60 minutes.

- o Plant Superintendent or designated alternate (Emergency Director)
- o Radiation Protection Coordinator

- o Operations Coordinator
- o Technical Support Coordinator
- o Communications Coordinators
- o Administrative Coordinator

The on-site emergency organization begins with the minimum shift crew as shown on Figure 5.2 and expands to include others as they are needed. Additional available manning is detailed in Table 5.2.

The Emergency Director will have available, via duty rosters and call-in procedures, personnel with collective expertise in radiological measurement and control, damage control, off-site radiological measurement, plant engineering and emergency management. The areas of expertise, numbers of personnel available, reporting location and time availability are delineated in Table 5.2. Required Personnel will be in the TSC or on-call 24 hours a day during the emergency.

This section describes the positions and responsibilities of the on-site emergency organization. Table 5.1 summarizes typical emergency activity assignments for station personnel. Actual assignments will be addressed in the Emergency Plan Implementing Procedures.

5.2.1 Emergency Director

The Shift Supervisor shall assume the role of the Susquehanna SES Emergency Director until such time as he is relieved of that responsibility by the Superintendent of Plant, or his designated alternate. Typical alternates are the Assistant Superintendent of Plant, the Supervisor of Operations, and the Technical Supervisor.

The Shift Supervisor shall ensure that the Superintendent of Plant, or designated alternate, is promptly notified of an emergency condition.

The Susquehanna SES Emergency Director shall assume full responsibility for the implementation and administration of the Emergency Plan and is responsible for assuring continuity of resources until he relinquishes those responsibilities to the Recovery Manager. The responsibility and authority of the Susquehanna SES Emergency Director are set forth in Appendix E.

The Emergency Director cannot relinquish any of the above responsibilities until the arrival of and assumption of responsibilities by the Recovery Manager at the Emergency Operations Facility. At that time, he may relinquish, to the Recovery Manager, any of the above responsibilities except those related to the responsibility to maintain the Unit in a safe shutdown condition with adequate core cooling and no uncontrolled radioactive material releases.

Functional responsibilities of the Emergency Director include:

- 1) Immediately upon notification of an existing or potential emergency, report to the Control Room and initiate assessment activities, including classification of the emergency and dose projections if appropriate.
- 2) Unilaterally implement the immediate on-site corrective and protective actions to bring the incident under control and mitigate its effects.
- 3) Assure that appropriate notifications and recommendations to off-site organizations are made within 15 minutes.
- 4) Appoint Emergency Coordinators for assistance with current and continuing emergency control, but assume those responsibilities until the positions are filled.
- 5) Augment the on-site emergency organization with duty roster personnel and other available station staff members as dictated by the emergency condition.
- 6) Continue re-assessment of emergency status and make appropriate recommendations including protective actions to off-site organizations.
- 7) Ensure that information released is accurate and released through the proper channels.
- 8) Activate Emergency Facilities described in Section 7.0.
- 9) Assign technical liaison to Emergency Operation Centers, if requested.
- 10) Communicate with and provide information to the Recovery Manager, EOF Support Manager, Public Information Manager, and General Office Support Manager.
- 11) Issuance of Radioprotective Drugs in accordance with prescribed procedures and in consultation with the Radiation Protection Coordinator and medical consultants.
- 12) Taking essential corrective action which may involve the risk of higher-than-normal radiation exposure to emergency response personnel. Table 6.2 and Section 6.5.1 provide the basic criteria for this decision. Time permitting, consultation shall be made with medical consultants.

5.2.2 Operations Coordinator

This position may apply to both short-term and long-term emergencies, and will be filled by the Supervisor of Operations or a designated alternate. Typical alternates are Shift Supervisor or a Senior Results Engineer. Primary responsibilities of the Operations Coordinator are:

- 1) Direct Control Room and in-plant operational activities through the Shift Supervisor.
- 2) Advise the Emergency Director on matters concerning plant operations.

5.2.3 Communications Coordinator

A Plant Control Operator will be appointed, if plant conditions permit, for short-term responsibilities. For a long-term emergency, the position of Communications Coordinator will be filled by a Simulator Instructor. A typical alternate for this position is a member of the Susquehanna Training Staff.

Responsibilities of the Communications Coordinator include:

- 1) Make proper notification to off-site organizations.
- 2) Initiate call-in procedures as requested by the Emergency Director.
- 3) Function as liaison for emergency-related communications between the Emergency Director and on-site and off-site emergency groups.
- 4) Maintain records concerning the emergency.

5.2.4 Radiation Protection Coordinator

This position will be filled by the Health Physics Supervisor. Typical alternates for the position of Radiation Protection Coordinator are the Radiological Support Supervisor and the Health Physics Foreman. Responsibilities of the Radiation Protection Coordinator include:

- 1) Perform initial dose projection and off-site environmental assessment until these functions are performed by the off-site Radiation Support Manager.
- 2) Provide technical advice to the Emergency Director and the Operations Coordinator on radiological aspects of on-site emergency activities.
- 3) Provide technical advice to the Emergency Director concerning recommendations for off-site protective actions.

- 4) Maintain Communication with and provide information to the off-site Radiation Support Manager.
- 5) Maintain Communication with and provide radiological information to DER/BRP until relieved of this responsibility by the EOF Support Manager or Radiation Support Manager.
- 6) Provide on-site radiation monitoring personnel for effluent release assessment.
- 7) Provide radiation monitoring personnel for emergency team efforts.
- 8) Assist in personnel decontamination efforts.

5.2.5 Technical Support Coordinator

This position will be filled by the Technical Supervisor. Typical alternates are the Plant Engineering Supervisor or the Reactor Engineering Supervisor.

Responsibilities of the Technical Support Coordinator and his staff include:

- 1) Analyze mechanical, electrical, and instrument and control problems; determine alternate solutions, design and coordinate the installation of short-term modifications.
- 2) Analyze thermohydraulic and thermodynamic problems and develop solutions.
- 3) Assist in the development of Emergency Procedures, Operating Procedures, etc., as necessary for conducting emergency operations.
- 4) Analyze conditions and develop guidance for the Emergency Director and operations personnel.
- 5) Resolve questions concerning Operating License requirements with NRC representatives.
- 6) Maintain lead technical responsibility, coordinating dissemination of technical work assignments to EOF and General Office Technical groups.
- 7) Maintain communication with and provide technical information to DER/BRP until relieved of this responsibility by the Assistant Technical Support Manager or Technical Support Manager.

5.2.6 Administrative Coordinator

This position will be filled by the Personnel and Administrative Supervisor. Typical alternates are the Administrative Supervisor or the Material Supervisor.

Responsibilities of the Administrative Coordinator and his staff include:

- 1) Coordinate provisions for transportation, food and other logistical support for emergency personnel.
- 2) Provide personnel and work schedules for relieving emergency personnel.
- 3) Act as liaison with outside groups in providing additional resources such as manpower, equipment, supplies and transportation.

5.2.7 Security Coordinator

This position will be filled by the Supervisor of Security. Typical alternates are the Security Training Supervisor, an offduty Security Shift Supervisor or an offduty Assistant Security Shift Supervisor.

Responsibilities of the Security Coordinator and his staff include:

- 1) Maintain plant security and institute appropriate contingency measures.
- 2) Account for personnel in accordance with Emergency Plan Implementing Procedures.
- 3) Provide access and traffic control for off-site PP&L locations such as the EOF.

5.2.8 Operations Support Center Coordinator

This position will be filled by the Assistant Unit Supervisor. Responsibilities of the Operations Support Center Coordinator are:

- 1) Direct the activities of the in-plant Emergency Teams such as damage control, fire brigade and first aid and rescue until relieved of this responsibility by the TSC.

NOTE

The fire brigade has a fire brigade leader (Assistant Unit Supervisor of the unaffected unit) who actually directs the fire fighting efforts in accordance with the Susquehanna SES FSAR and Fire Protection Review Report. However, the coordination of

various team activities will be the responsibility of the Operations Support Center Coordinator, until relieved of this responsibility by the TSC .

- 2) Responsible for coordinating the availability and assignment of personnel supporting activities for the Emergency Director and other emergency organization managers until relieved of this responsibility by the TSC.

5.2.9 Radio Communicator

This position will be typically filled by a Maintenance or an I&C Engineer. Responsibilities of the Radio Communicator are:

- 1) Maintain radio communications with all on-site teams.
- 2) Maintain an up-to-date status of in-plant radiological conditions.
- 3) Track dose levels of on-site team members.

5.2.10 Maintenance and I&C Coordinators

These positions are typically filled by the Maintenance and I&C Supervisors respectively. Typical alternates are the Electrical Maintenance Supervisor, Mechanical Maintenance Supervisor and I&C engineer. Responsibilities of these positions are:

- 1) Organizing, briefing, dispatching, and directing, as necessary, the on-site damage control teams.
- 2) Providing personnel assistance and support to in-plant teams as necessary.
- 3) Supporting technical group activities and operations as necessary.

5.3 OFF-SITE RESOURCES & ACTIVITIES

Necessary management and technical resources to support the on-site staff in the event of an accident will be provided in a time frame commensurate with the need for such resources. The Emergency Plan Implementing Procedures provide specific plans for contacting and activating these resources which includes call-out rosters and communications capabilities.

5.3.1 Emergency Operations Facility

The Susquehanna Emergency Operations Facility (EOF) is located offsite but near the Susquehanna Site. The Off-Site Emergency Organization manning the EOF is illustrated in Figure 5.4 and 5.5. The following personnel are notified of all levels of emergencies.

- o Recovery Manager
- o Public Information Manager

Manning of the EOF is required for a Site Emergency or General Emergency only. Manning of the EOF for an Unusual Event or Alert is the decision of the Recovery Manager. The personnel who, at the direction of the Recovery Manager, will man the EOF are:

5.3.1.1 EOF Support Manager

The Construction Site Superintendent shall assume the role of EOF Support Manager. A typical alternate for this position is the Project Construction Manager.

The EOF Support Manager and staff report to the EOF within 30 to 60 minutes of notification. The EOF Support Manager is responsible for:

- 1) Ensuring the proper set up of the EOF.
- 2) Off-site radiological activities carried out by the Interim Radiological Assessment Team (IRAT), including:
 - o Off-site dose calculations, projections and assessment.
 - o Off-site radiological monitoring team activities and control.
 - o Maintenance of communications and necessary updating of DER/BRP radiological.
- 3) Providing radiological assessment and protective action recommendations to the Emergency Director.

5.3.1.2 Recovery Manager

The Vice President-Nuclear Operations shall assume the role of PP&L Recovery Manager. Typical alternates for this position are the Manager-Nuclear Support and Manager-Nuclear Plant Engineering.

The Recovery Manager is responsible for providing continuous coordination and evaluation of PP&L activities during an emergency having or potentially having environmental consequences. He is the individual in charge of the PP&L emergency response and is responsible for assuring continuity of resources.

Other functions of the EOF under the direction of the Recovery Manager are the following:

- o Evaluate the magnitude and effects of actual or potential radioactive releases from the plant

- o Recommend appropriate offsite protective measures to DER/BRP.
- o Manage all PP&L emergency resources including the General Office Support Facilities.
- o Coordinate activities of off-site emergency response organizations, including the NRC and PEMA (interface with government authority)
- o Provide current information on conditions potentially affecting the public to the NRC and to State and local emergency response agencies as well as to the public via the Public Information Manager.

NOTE

The Emergency Director assumes all this responsibility until the EOF is manned and he is relieved by the Recovery Manager.

The Recovery Manager will be on-call and available to report to the EOF as soon as reasonably possible. Under normal circumstances, the Recovery Manager should arrive within three hours.

5.3.1.3 Technical Support Manager

The Manager-Nuclear Plant Engineering shall assume the role of Technical Support Manager. Typical alternates for this position are the Manager-Nuclear Design and Supervisor-Nuclear Plant Engineering Mechanical Group.

Responsibilities of the Technical Support Manager include:

- o Writing emergency and contingency procedures
- o Providing design and analysis information to the onsite Technical Support Center
- o Coordinating tasks with other organizations
- o Providing additional personnel to the Technical Support Center, if required
- o Support for planning and re-entry restoration operations
- o Advising the Recovery Manager on technical activities

The Technical Support Manager will be available to report to the EOF as soon as reasonably possible following notification. The Technical Support Manager shall have a staff that is capable of functioning within three hours of notification. They will be available until the Recovery Manager determines this level of support is no longer needed.

5.3.1.4 Site Support Manager

The Manager-Nuclear Safety Assessment shall assume the role of Site Support Manager. Typical alternates for this position are Supv. Nuclear Operations Support and Supv.-Nuclear Maintenance Support.

Responsibilities of the Site Support Manager include:

- o Provide liaison between the Site Technical Support Center and remainder of the offsite emergency resources
- o Provide personnel to work onsite, if required
- o Communicating with the Technical Support Center
- o Coordinating data and information flow
- o Communicating with the Technical Support Center, Public Information Manager, and General Office Support Manager.

The Site Support Manager will be on-call and available to report to the EOF as soon as reasonably possible following notification.

The Site Support Manager shall have a staff that is capable of functioning within three hours of notification and will be available on-call until the Recovery Manager determines this level of support is no longer needed.

5.3.1.5 Administrative Support Manager

A Senior Project Engineer within the project construction organization shall assume the role of Administrative Support Manager. Typical alternates for this position are Senior Project Engineers within the project construction organization.

Responsibilities of the Administrative Support Manager include:

- o Providing personnel and work schedules for relieving emergency personnel.
- o Providing housing, food, office equipment, etc., for offsite support personnel
- o Making necessary contractual arrangements for the emergency response efforts
- o Procuring equipment, supplies, and additional personnel needed to support the emergency response efforts.
- o Providing additional manpower for scheduling activities deemed appropriate by the Recovery Manager

The Administrative Support Manager will be available to report to the EOF 30 to 60 minutes following notification.

The Administrative Support Manager shall have a staff that is capable of functioning within 30 to 60 minutes after the accident and should be available on-call until the Recovery Manager determines this level of support is no longer needed.

5.3.1.6 Radiation Support Manager

The Radiological and Environmental Services Supervisor shall assume the role of Radiation Support Manager. A typical alternate for this position is the Radiological Group Supervisor.

Responsibilities of the Radiation Support Manager include:

- o Evaluating the magnitude and effects of actual or potential radioactive releases from the plant
- o Recommending appropriate offsite protective measures to the Recovery Manager
- o Communicating with the Radiation Protection Coordinator in the TSC and with DER/BRP radiological personnel.
- o Assigning offsite monitoring teams

The Radiation Support Manager will be available to report to the EOF as soon as reasonably possible following notification.

The Radiation Support Manager shall have a staff that is capable of functioning within three hours of notification. They will be available until the Recovery Manager determines this level of support is no longer needed.

5.3.2 Public Information Manager

The Special Assistant to the President-Susquehanna shall assume the role of Public Information Manager and shall manage the activities at the Media Operations Center, located at the Special Office of the President, Berwick or the Berwick YMCA. Typical alternates for this position are the Public Information Director-Susquehanna SES or a Public Information Specialist-Susquehanna, additional upper management technical resources will be provided if emergency conditions warrant.

Responsibilities of the Public Information Manager include:

- o Serving as official company spokesman
- o Preparing and disseminating SSES information to the public via the news media
- o Interpreting plant status information for the news media and other agencies

- o Arranging for news media conferences
- o Rumor control

The Public Information Manager will be available to report to the MOC within 30 to 60 minutes of notification.

The Public Information Manager shall have a staff that is capable of functioning within 30 to 60 minutes after the accident and should be available on-call until the Emergency Director or Recovery Manager determines this level of support is no longer needed.

5.3.3 General Office Support Facilities

Emergency Support from the General Office is provided primarily from two locations--the General Office Nuclear Emergency Support Center (GONESC) and the Engineering Support Center (ESC).

The GONESC is located in the Corporate Offices in Allentown and is intended to coordinate information flow within PP&L, particularly to the Company's corporate management. In addition, the GONESC is responsible for certain external communications and for providing logistical support as may be requested by the EMERGENCY DIRECTOR or RECOVERY MANAGER.

Activation of the GONESC is automatic during a SITE or GENERAL EMERGENCY, and may also occur in an UNUSUAL EVENT or ALERT if the RECOVERY MANAGER deems such action appropriate.

Upon notification to activate, the GENERAL OFFICE SUPPORT MANAGER and his staff report to the GONESC and set up for operations.

The ESC is also located in the Corporate Offices in Allentown and is intended to act as an extension of the technical support function directed by the TECHNICAL SUPPORT MANAGER in the EOF. The ESC staff is responsible for technical support to the TSC and/or the EOF as requested, for updating the GONESC staff with current technical data on the plant status, for looking ahead to determine potential trouble spots and developing contingency plans.

Activation of the ESC is automatic in a SITE or GENERAL EMERGENCY, and may also occur in an UNUSUAL EVENT or ALERT if the RECOVERY MANAGER deems such action appropriate.

5.3.3.1 General Office Support Manager (GOSM)

The General Office Support Manager (GOSM) position is assumed by the Vice President-Engineering and Construction Nuclear upon activation of the General Office. Typical alternates for this position are the Assistant Project Director-Susquehanna and the Manager-Nuclear Administration. Responsibilities of the GOSM include:

- 1) Coordination of the flow of technical information internal to PP&L and specifically, to the members of the Corporate Management Committee.
- 2) Coordination of information flow to Allegheny Electric, INPO, and the NOTEPAD system.
- 3) Direction, coordination, and assessment of the adequacy of services provided from the General Office and elsewhere which are requested by the TSC and/or EOF.
- 4) Contacting GE, Bechtel, and INPO, informing them of the EMERGENCY, and requesting them to be available should their assistance be necessary.
- 5) Providing the following (and other) services at the request of the EMERGENCY DIRECTOR or the RECOVERY MANAGER:
 - o Coordination of the mobilization of Nuclear Department or other company organizations required to contribute to emergency operations.
 - o Arranging for consultants, contractors, or other external services.
 - o Assisting in locating equipment or spare parts.
 - o Preparing and administering contracts for external services.
 - o Assisting in the preparation of procedures for emergency repairs and/or modifications.
 - o Obtaining funding authorization for emergency expenditures.

5.3.3.2 Engineering Support Leader

The Engineering Support Leader (ESL) position is assumed by an individual of at least the Nuclear Plant Engineering Group Supervisor level upon activation of the General Office. The responsibilities of the ESL include:

- 1) Prioritizing assigned tasks and allocating available resources based on the time frame necessary to meet the needs of the Technical Support Manager.
- 2) Ensuring the assumptions used in solving technical problems are commensurate with the needs of the Technical Support Manager.

5.3.4 Local Off-Site Support Groups

The nature of an emergency may require augmenting on-site response groups with local services, personnel and equipment. Support from local organizations may be obtained as necessary from the following organizations:

- o The Berwick Hospital
- o Geisinger Medical Center
- o Shickshinny Area Volunteer Ambulance Association
- o Shickshinny Fire Department
- o Pond Hill-Lily Lake Fire Co. (Ambulance Service)
- o Nescopeck Ambulance Association
- o Salem Township Fire Co. No. 1
- o Hobbie Volunteer Fire Co. (Ambulance Service)
- o East Berwick Hose Co. No. 2
- o Pennsylvania State Police

Specific methods for notification of these organizations are contained in Emergency Plan Implementing Procedures.

5.3.5 Off-site Support Services

An emergency at the Susquehanna SES may require additional technical services and equipment. This type of assistance may be obtained from the following organizations.

- | | |
|---|-------------------------------------|
| o Radiation Management Corporation | o Bechtel Power Corp. |
| o General Electric Company | o PJM Nuclear Utility Support Group |
| o Institute of Nuclear Power Operations | |

Notification of these organizations is the responsibility of the General Office Support Manager. A listing of these organizations, their support capabilities and availability is found in Table 5.3.

5.4 COORDINATION WITH PARTICIPATING GOVERNMENT AGENCIES

5.4.1 State and Local Agencies

This section identifies the principal State and local governmental agencies having action responsibilities for radiological emergencies in the vicinity of the Susquehanna SES.

The radiological emergency response plans of these agencies describe their respective responsibilities, authorities, capabilities and emergency functions. Initial notification to each responsible agency will include, but not be limited to, the following information:

- o Caller's Name
- o Emergency Classification
- o Brief Description of Emergency Condition
- o Recommended Agency Response

As additional information becomes available, this information will be directed to all responsible agencies. The Emergency Plan Implementing Procedures provide a format for providing initial and follow-on information. Following is a summary of the provisions for preparedness and response to radiological emergencies by each organization, as well as the primary and alternate methods of emergency notification:

Luzerne County Civil Defense (LCCD) is the lead governmental agency for off-site coordination and response in Luzerne County. The LCCD emergency plan is entitled "Luzerne County Radiological Emergency Response Plan for the Susquehanna Steam Electric Station."

The LCCD plan includes provision for:

- o Planning and coordination with local, State and Federal authorities
- o Initial response to notification by Susquehanna SES.
- o Alert and warning of local populations
- o Evacuation and other protective measures for local populations
- o Emergency services
- o Situation analysis
- o Operation of Emergency Operations Center

The LCCD plan also contains emergency procedures for the local organizations which are assigned action or support responsibilities under that plan.

The primary method of notification to LCCD is a direct telephone "hot line". Secondary methods are radio and regular telephone.

Columbia County Emergency Management Agency (CEMA) is the lead governmental agency for off-site coordination and response in Columbia County. The CEMA emergency plan is entitled "Columbia County Radiological Emergency Response Plan for the Susquehanna Steam Electric Station."

The CEMA plan includes provision for:

- o Planning and coordination with local, State and Federal authorities
- o Initial response to notification by Susquehanna SES
- o Alert and warning of local populations
- o Evacuation and other protective measures for local populations
- o Emergency services
- o Situation analysis

The CEMA plan also contains emergency procedures for the local organizations which are assigned action or support responsibilities under that plan.

The primary method of notification to CEMA is a direct telephone "hot line". Secondary methods are radio and regular telephone.

Pennsylvania Emergency Management Agency (PEMA) is the lead governmental agency for coordination and response of emergency activities at the State level. The PEMA emergency plan is entitled "Annex E to Commonwealth of Pennsylvania Disaster Operations Plan." The PEMA plan includes provision for:

- o Issuance of planning guidance
- o Coordination of State response to nuclear incidents
- o Coordination of multi-county Emergency Response Planning
- o Operation of emergency operations center
- o Provision for emergency public information
- o Coordination of State agencies and departments

The primary method of notification to PEMA is by direct telephone "hot line" during normal working hours. During holidays and off-hours notification is by regular telephone.

Department of Environmental Resources/Bureau of Radiation Protection (DER/BRP) is the lead governmental agency for providing technical advice and consultation to State and local organizations in evaluation of appropriate off-site preventive and protective measures. The DER/BRP emergency plan is entitled "Plan for Nuclear Power Generating Station Incidents." The DER/BRP plan provides for:

- o Technical consultation on Radiological and Plant conditions
- o Accident assessment
- o Recommendations for protective actions
- o Recommendations for protection of potable water and food
- o Recommendations for recovery and re-entry (off-site)
- o Operation of Emergency Operations Center

The initial notification to DER/BRP will be made by PEMA. Direct "hot line" communications are also established between Susquehanna SES and DER/BRP for transmitting technical information and/or recommendations.

5.4.2 Federal Agencies

The principal Federal government agencies having emergency responsibilities relative to the Susquehanna SES, and a summary of those responsibilities are:

US Nuclear Regulatory Commission (NRC), Region I, is responsible for conducting investigative activities associated with a radiological emergency, and verifying that emergency plans have been implemented and the proper agencies notified.

The primary method of notification to NRC is by "hot line" telephone. A secondary method is by regular telephone. Facilities are available at the TSC and EOF for NRC use.

US Department of Energy (DOE), Brookhaven Area Office, will respond to requests from the Susquehanna SES and provide assistance which is limited to advice and emergency action essential for control of the immediate hazards to public health and safety. All requests for assistance from DOE will be made following consultation with the DER/BRP.

The primary method of notification to DOE is by telephone. Notification may also be made through NRC. DOE assistance will arrive at the EOF within eight (8) hours of their notification. Facilities are available at the EOF for DOE use.

Federal Emergency Management Agency (FEMA), FEMA has the primary role in coordinating the Federal response to a commercial nuclear power plant accident by serving as the primary point of contact for requests for Federal assistance from state and local officials and other Federal agencies. FEMA is responsible for coordinating all non-technical response activities of the Federal government.

TABLE 5.2

MINIMUM ON-SITE AND OFF-SITE EMERGENCY ORGANIZATION CAPABILITIES*

MAJOR FUNCTIONAL AREA	LOCATION	MAJOR TASKS	POSITION TITLE OR EXPERTISE	ON SHIFT	AVAILABILITY 30-60 MIN	AS SOON AS REASONABLY POSSIBLE
Plant Operations and Assessment of Operational Aspects	Control Room and/or Plant Proper	Establish and maintain safe shutdown condition	Shift Supv. (SRO)	1		
			Unit Supv. (SRO)	1		
			Control Room Operator (RO)	2		
			Auxiliary Operator	4		
Emergency Direction and Control	Control Room	Overall Emergency Management & Coordination	Shift Supv.	1 ^A		
	TSC		Emergency Director		1 ^B	
	EOF		Recovery Mgr.			1
Notification/ Communication	Control Room	Notify PP&L, State, Local & Federal personnel & maintain communication	Comm. Coord.	1 ^A		
	TSC		Comm. Coord.		2	
	EOF		Comm. Coord.			2
	Power Control Center		System Operator	1 ^E		
Radiological Accident Assessment & Support of Operational Accident Assessment	TSC	Overall Management & Coordination	Rad. Protection Coordinator		1	
	EOF	Overall Management & Coordination	Rad. Support Mgr.			1 ^F
	EOF		EOF Support Manager		1 ^F	
	TSC	Inplant Surveys	HP Technicians	1	2	
	TSC	On-Site Surveys	Survey Team Personnel		2	2
	EOF	Off-Site Surveys	Survey Team Personnel		2	4
	OSC	Radiation Protection	Health Physics	2 ^A	2	2
		o Access Control	Trained Personnel			
		o HP Coverage				
		o Personnel Monitoring				
		o Dosimetry				
	OSC	Radiochemistry/Chemistry Analysis	Chemistry Technician	1	1	
	EOF	Accident Assessment and Characterization	Plant Operations/Refueling Ops			1
			Fire Protection			1
			Chemical Engr./Radiochemistry			1
			Radwaste Mgmt./Decontamination/			1
			Rad Control/HP			1
	EOF	Off-Site Dose Calculation and Assessment	Plant Maintenance			1
			Rad Assessment Team		3	2
TOTAL				26	41	24

TABLE 5.2

MINIMUM ON-SITE AND OFF-SITE EMERGENCY ORGANIZATION CAPABILITIES*

NOTES

- A - Will be provided by Shift Personnel normally assigned other functions, not reflected in availability totals.
- B - Plant Superintendent, or his designated alternate, will assume the role of Emergency Director upon arrival on-site. At that time Emergency Management activities will be carried out from the Technical Support Center.
- E - The System Operator in the Power Control Center (Allentown) is responsible for activation of the off-site emergency organization and corporate notifications.
- F - Overall management of Radiological Accident Assessment will be assumed by the EOF Support Manager upon his arrival at the EOF. However, the Rad. Protection Coordinator will remain in charge of in-plant activities. The Radiation Support Mgr. will relieve the EOF Support Manager of this function upon arrival at the EOF.
- * The personnel listed on this table are the nucleus of the PP&L emergency manpower resources (with one unit operational) that will be available to respond to an emergency in the time frame indicated. Additional personnel will be available to augment this nucleus. Areas of significant support not listed on this table include: Public Information Personnel in the Media Center, Technical Support Personnel located in the General Office in Allentown, and Administrative and Logistics Support Personnel located on-site and off-site.

NOTE:

Activation of the PP&L Emergency on-site and off-site organizations is the responsibility of the Shift Supervisor/Emergency Director. The details are specified in "Emergency Plan - Implementing Procedure - 002 (EP-IP-002), Emergency Management Notifications. Personnel assigned responsibilities in these organizations are listed on duty rosters maintained in the Plant Control Room, TSC, EOF, and the Allentown Power Control Center. All on-call personnel can be paged via the radio paging system.

(MG/P10-05)

TABLE 5.3

ADDITIONAL ASSISTANCE FROM OUTSIDE PP&L

<u>Name/Address</u>	<u>Emergency Function</u>	<u>Availability (Hours)</u>	<u>Reporting Location</u>
1. <u>Committed Resources</u>			
o General Electric 175 Curtner Avenue San Jose, CA 95125 (408) 925-3005	Engineering advise & Analysis for NSSS equipment	N/A	GE facilities in San Jose
	Operations and Maintenance expertise on NSSS equipment	48	EOF (Site Support Mgr.)
o Bechtel P.O. Box 3965 San Francisco, CA 94119 (415) 768-2760	Engineering & Analysis	N/A	Bechtel Facilities in San Francisco
	Engineering Expertise	48	EOF (Technical Support Mgr.)
o Radiation Mgmt. Corp. 3508 Market Street Suite 400 Philadelphia, PA 19104 (215) 243-2970	HP & Environmental Calculations & Analysis	N/A	RMC facilities in Philadelphia
	HP/Environmental expertise	4	EOF (Rad Support Mgr.)
o INPO 1820 Water Place Atlanta, GA 30339 (404) 953-0904	Operations & Maintenance expertise	On call 24 hrs. a day	EOF (Technical Support Mgr.)
	Dissemination of information	N/A	INPO HQ in Atlanta
o PJM Nuclear Utility Support Group	Operations, Maintenance Rad con personnel for augmenting emergency staffing	4	EOF (Site Support) Mgr.)

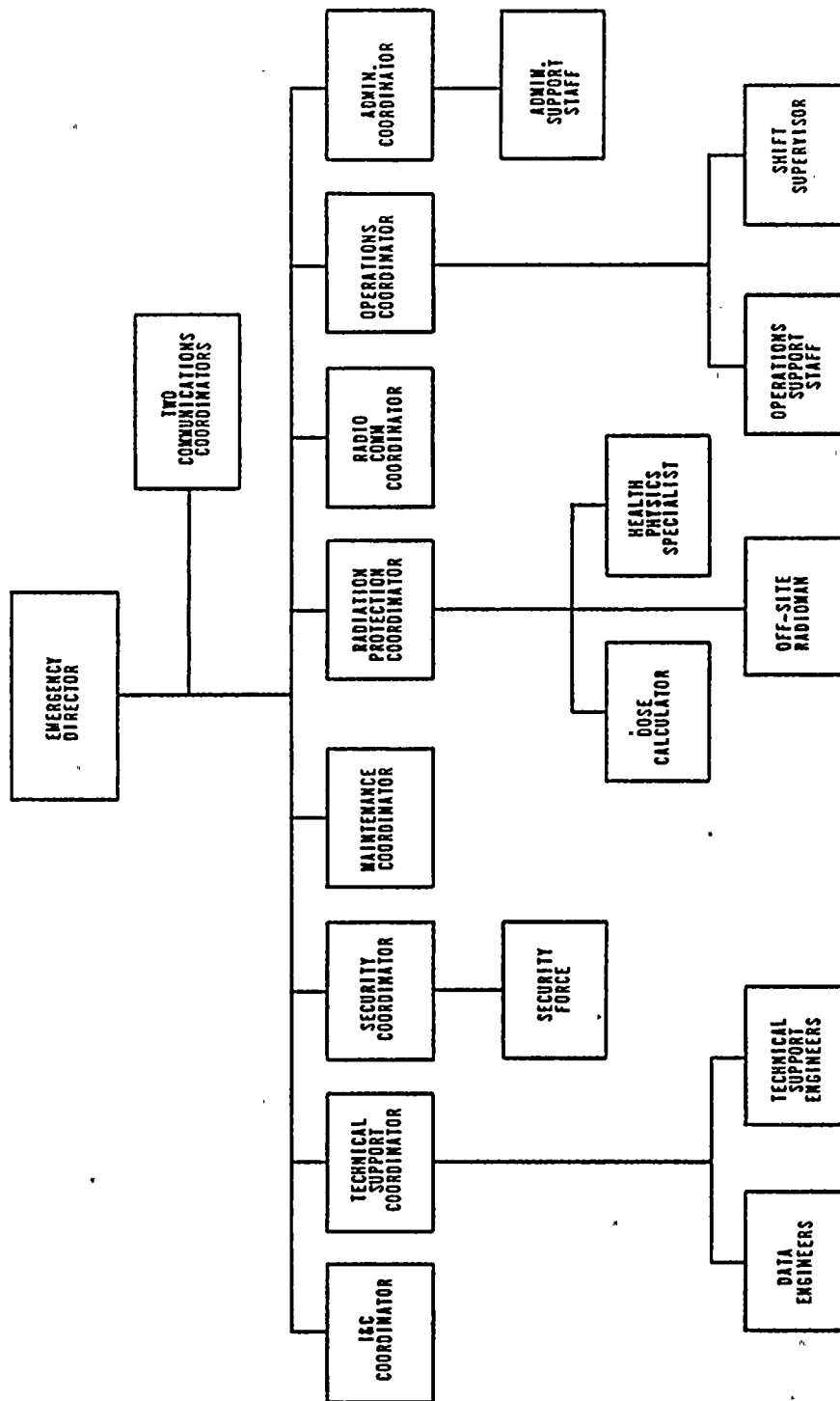
TABLE 5.3

ADDITIONAL ASSISTANCE FROM OUTSIDE PP&L

<u>Name/Address</u>	<u>Emergency Function</u>	<u>Availability (Hours)</u>	<u>Reporting Location</u>
2. <u>Available Resources</u>			
o Quadrex Corp. 1700 Dell Avenue Campbell, CA 95008 (408) 866-4510	Engineering Expertise	24 hrs.*	EOF (Tech. Support Mgr.)
	Operations Expertise	24 hrs.*	EOF (Site Support Mgr.)
o Gilbert Associates P.O. Box 1498 Reading, PA 19603 (215) 775-2600	Engineering Expertise	4 hrs.*	EOF (Tech. Support Mgr.)
o Nuclear Safety Assessment Center 3412 Hillview Avenue P.O. Box 10412 Palo Alto, CA 94303 (415) 855-2000	Analysis & Engineering Evaluation	N/A	NSAC facilities in Palo Alto
o Cooper Bessemer North Sandusky St. Mount Vernon, OH 43050 (614) 397-0121	Expertise on Diesel Generators	24 hrs.*	EOF (Tech. Support Mgr.)
o Rad Services 500 Penn Center Pittsburgh, PA 15235	Expertise on Nuclear Instrumentation	24 hrs.*	EOF (Tech. Support Mgr.)
o Fleet Helicopter Service Route 309 & Hilltop Road Coopersburg, PA 18036 (215) 282-4100	Transportation & Helicopter Service	4 hrs.	EOF (Recovery Mgr.)

* Time after initial notification which could only be made during normal working hours.

(MG/P10-26)

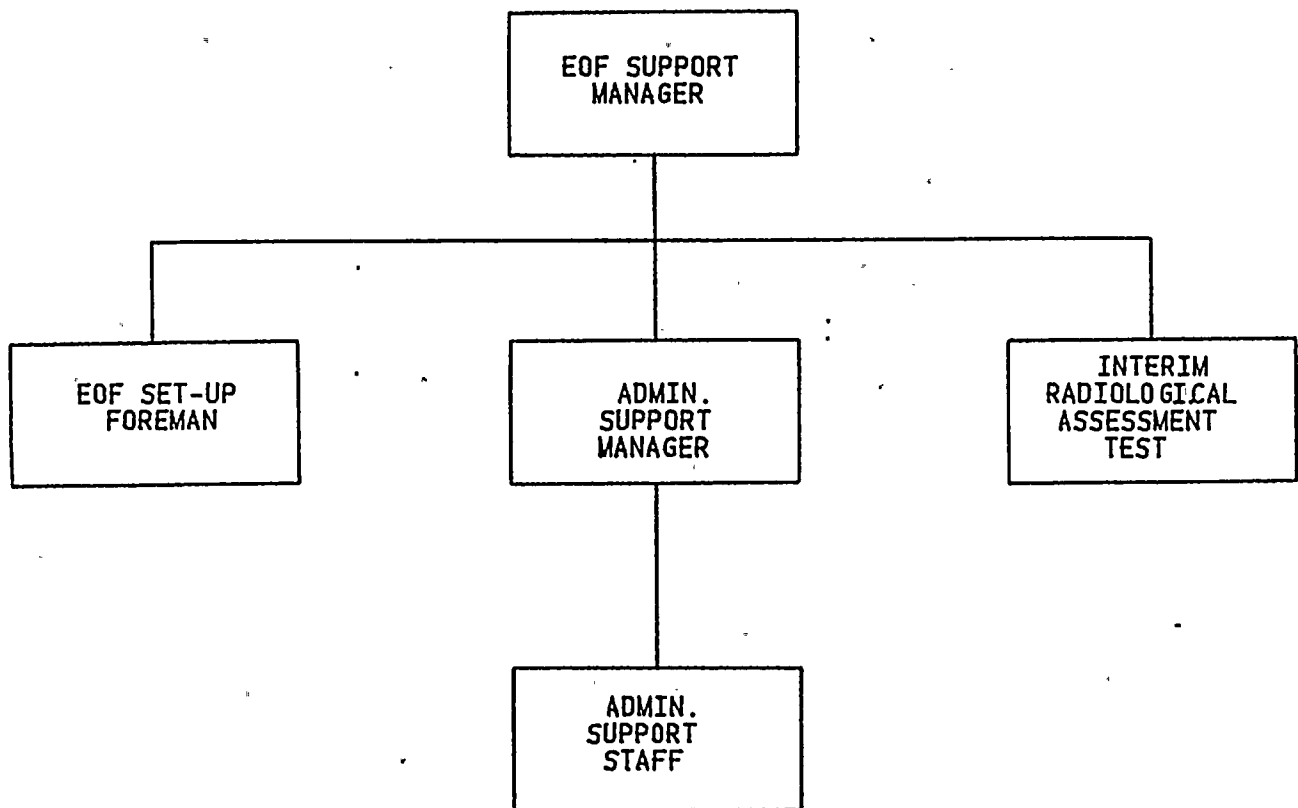


Rev. 6, 10/82

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 AND 2
EMERGENCY PLAN

ON-SITE
EMERGENCY ORGANIZATION

FIGURE 5.3

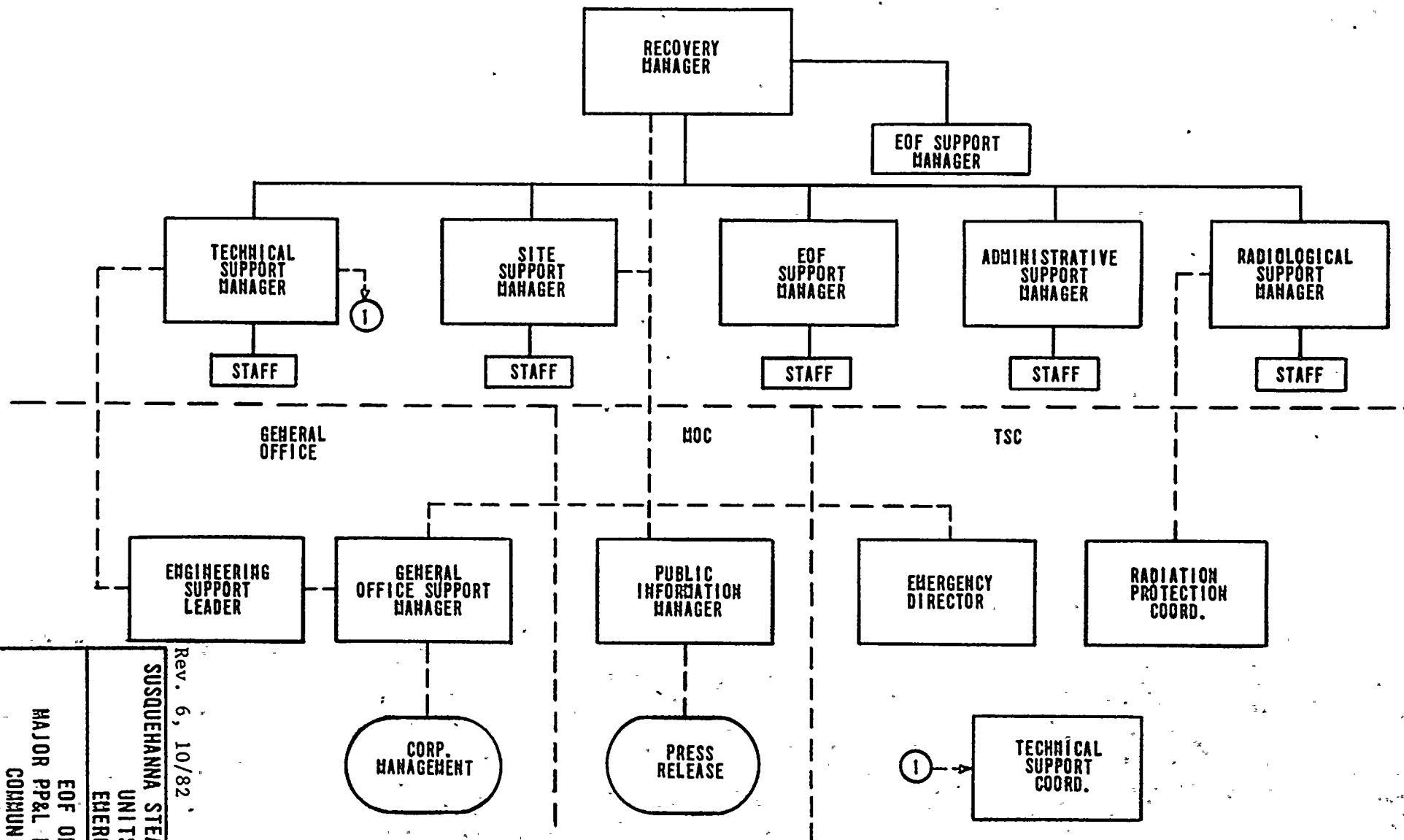


Rev. 7, 11/83

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 AND 2
EMERGENCY PLAN

PP&L INITIAL
EOF ORGANIZATION

FIGURE 5.4



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SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 AND 2

EMERGENCY PLAN

EOF ORGANIZATION
MAJOR P&L EMERGENCY FACILITY
COMMUNICATION LINKS

FIGURE 5.5

100-100000

100-100000

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6.0 EMERGENCY MEASURES

Emergency actions are initiated primarily in response to alarmed instrumentation, but may be through notification to the Control Room by the first individual at the Susquehanna SES to become aware of an apparent emergency situation. The Unit Supervisor must take the necessary, immediate action and ensure that the Shift Supervisor is promptly notified. The Shift Supervisor assumes the role of Susquehanna SES Emergency Director until he is relieved of that responsibility by the Superintendent of Plant or his designated alternate. The Emergency Director assesses and classifies the condition, initiates the appropriate corrective and protective actions and ensures activation of the necessary segments of the total emergency organization.

6.1 ACTIVATION OF EMERGENCY ORGANIZATION

This section describes the provisions for notifying or activating groups within the emergency organization in response to emergency events at the Susquehanna SES. Action levels are recognition criteria which dictate the appropriate emergency classifications described in Section 4.0. More detailed methodology for each classification is described in Emergency Plan Implementing Procedures. This includes message authentication requirements.

Table 6.1 summarizes the notification/activation of both the on-site and the off-site emergency organization and designates immediate action requirements for each emergency classification.

6.1.1 On-Site Emergency Organization

Upon being informed of an emergency event, as defined in Section 4.0, the Shift Supervisor will assess the condition. He will ensure that appropriate actions have been initiated to maintain the safe and proper operation of the plant. If the event requires implementation of this Plan, the Shift Supervisor shall assume the role of Emergency Director and:

- 1) Classify the condition as an Unusual Event, Alert, Site Emergency or General Emergency as appropriate.
- 2) Implement immediate actions in accordance with this Plan and the applicable Emergency Plan Implementing Procedures.
- 3) Notify affected individuals at the plant as required for Local Area, Controlled Zone or Site Area Evacuation. These notifications will be made over the PA system and/or the plant emergency alarm system, if applicable, per the appropriate implementing procedure.

- 4) Notify the Superintendent of Plant or his designated alternate, inform him of the situation, and request that he relieve the Shift Supervisor as Emergency Director if appropriate. For conditions within the Unusual Event classification, the role of Emergency Director is likely to remain with the Shift Supervisor through termination of the condition, due to probable short duration or low severity of the event.
- 5) Ensure that on-site emergency response individuals and groups are notified, using the PA system or direct communications. Depending on the nature and severity of the condition, these individuals with their respective groups may include:
 - o Operations Coordinator
 - o Communications Coordinator
 - o Radiation Protection Coordinator
 - o Technical Support Coordinator
 - o Administrative Coordinator
 - o Security Coordinator
 - o Operations Support Center Coordinator
 - o Maintenance Coordinator
 - o I&C Coordinator
- 6) Ensure that off-duty station personnel are notified to assist as necessary with emergency activities. These notifications will be made, via the radio paging system or by telephone backup, to individuals designated for off-duty availability status to fill key emergency response positions. Those key positions are identified in Section 5.0. Other off-duty personnel will be called in as required.

6.1.1.1 Security and Accountability

Accountability of on-site personnel during an emergency will be accomplished through the use of the physical security system and personnel accountability procedures. The physical security system clearly establishes who, by name, is within the protected area. Personnel will be summoned to accountability areas during an emergency via an alert signal transmitted over the public address system. The names of the personnel reporting in will be compared to those logged through the security system in order to ensure total accountability. The specifics of the accountability process are identified in the Emergency Plan Implementing Procedures.

6.1.2 Off-Site Emergency Organization

6.1.2.1 Emergency Support Groups

The Emergency Director shall ensure that appropriate off-site emergency support groups are contacted to provide the type and level of assistance which may be necessary to deal with the existing emergency condition. The organizations listed below may be contacted for assistance. Methods available for contacting these support groups include direct telephone communications with individual organizations, use of the 911 telephone system for emergency services and message relay through LCCD or CEMA.

- o Salem Township Fire Company No. 1 (fire and rescue)
- o East Berwick Hose Company No. 2 (fire and rescue)
- o Shickshinny Area Volunteer Ambulance Association (ambulance service)
- o Shickshinny Fire Department (fire)
- o Nescopeck Ambulance Association (ambulance service)
- o Hobbie Volunteer Fire Company (ambulance service)
- o Pond Hill-Lily Lake Fire Company (ambulance service)
- o Berwick Hospital (medical treatment)
- o Geisinger Medical Center (backup medical treatment and life flight)
- o Radiation Management Corporation (backup medical support)
- o Pennsylvania State Police (traffic control and other assistance)

6.1.2.2 Off-Site Authorities

The Emergency Director shall ensure that off-site authorities are notified and apprised of emergency events at the Susquehanna SES. Notifications shall be made to:

- o PEMA
- o LCCD
- o NRC

Notification of an Unusual Event is primarily to ensure that the authorities are cognizant of the details of events which may arouse public concern and initiate inquiries by news media or members of the public.

Notification to the above listed off-site authorities shall commence immediately upon the declaration of an Unusual Event, Alert, or Site Emergency. In addition to the above, CEMA will be notified immediately upon declaration of a General Emergency. Direct "hot line" telephone connections are provided to each of these agencies for this purpose. Section 4.0 describes the time limitations between the first indication of an event and declaration of the applicable emergency condition.

Each of the off-site agencies will activate the appropriate segments of their emergency organization, based on information provided from Susquehanna SES and in accordance with their respective emergency plans. The DER/BRP will be notified initially by PEMA. Following the initial notification for events involving a significant release of radioactive material, direct and continuing communications will be maintained between DER/BRP and Susquehanna SES. Following Initial notification, subsequent notifications of escalation of the emergency condition shall be from Susquehanna SES to DER/BRP, DER/BRP will notify PEMA, PEMA will in turn notify LCCD and CEMA.

Backup radiological emergency assistance for a General Emergency may be provided by the U. S. Department of Energy in Brookhaven, NY. The decision to request this assistance will be made in consultation with DER/BRP. Notification to request this assistance may be made by telephone to DOE or message relay through NRC.

6.1.2.3 PP&L Off-Site Organization

Notification of the Recovery Manager will be made for all levels of emergencies.

The method for notifying the Recovery Manager from Susquehanna SES is via the Power Dispatcher in the Power Control Center. The Power Dispatcher will be notified of all levels of emergencies via a hotline connection between the SSES Control Room and the Power Control Center. Backup radio communications are also available. An on-call Recovery Manager duty roster will be kept in the Power Control Center for use by the Power Dispatcher.

For an Unusual Event or Alert, the Recovery Manager will determine what additional off-site resources should be notified and where the off-site support resources should report. The Power Dispatcher, through the Lehigh Service Center Services Dispatcher, will notify all required personnel via telephone or paging system.

For a Site or General Emergency, the Emergency Operations Facility will be manned by the offsite emergency managers listed below and any additional support personnel deemed necessary by the Recovery Manager. The EOF Support Manager and his staff will be notified to activate the EOF via the use of pagers or direct telephone communications. When required and upon EOF activation, off-site monitoring teams will be called in by the Communications Coordinator calling the Central Division Services Dispatcher; the dispatcher will call-in the necessary team members in accordance with his call-in roster. The Lehigh Service Center Services Dispatcher will notify all required personnel, other than the Recovery Manager, off-site monitoring teams, EOF Support Manager and his staff, via telephone or paging system.

- o EOF Support Manager
- o Recovery Manager
- o Technical Support Manager
- o Radiation Support Manager
- o Site Support Manager

6.1.2.4 Special Office of the President

The Susquehanna SES Emergency Director shall ensure that the PP&L Special Office of the President in Berwick is promptly notified and provided with available details of any Unusual Event, Alert, Site Emergency or General Emergency. The staff of that office will transmit information regarding the emergency and items of potential interest to municipal groups, initiate appropriate news releases and respond to questions from public information representatives. After the Recovery Manager assumes control of the EOF, he will update the Public Information Manager.

6.2 ASSESSMENT ACTIONS

Provisions are made for assessment throughout the course of an emergency to ensure effective coordination, direction and upgrading of emergency activities in a timely manner. The assessment actions are described in detail in Emergency Plan Implementing Procedures. The assessment functions and the general methodology and techniques utilized are identified in this section. Initial assessments are made solely by the on-site emergency organization. Upon activation of the EOF, off-site support personnel will be used to aid in these assessments.

6.2.1 Unusual Event

Continuous assessment of the status of plant systems and radiological conditions is provided by plant instrumentation and is supplemented by routine surveillance functions. The occurrence of an Unusual Event will be recognized by instrument alarms or indications, surveillance results or

other observation of an off-normal condition by an individual at the station.

Many events within this classification involve exceeding the LCO for plant operating parameters. For these cases, assessment and corrective actions are described in detail in Plant Procedures. Supplementary assessment actions are described, where appropriate, in Emergency Plan Implementing Procedures.

For events which require dispatching of emergency teams, such as fire or first aid, the initial and continuing assessment will be performed by the team leader. His training and experience enable him to evaluate the condition, implement the proper corrective action and escalate the response as necessary.

Off-site dose projections will be performed if the event involves radiological effluents exceeding the Technical Specification limits for instantaneous release. These dose projections are based on the rate and estimated duration of the release, and the current meteorological parameters. They will be continually repeated throughout the duration of the release to reflect any significant changes. Methods for performing rapid dose projections include the use of the Plant Process Computer, nomographs and map overlays which are described in detail in Section 6.2.5 and the Emergency Plan Implementing Procedures.

6.2.2 Alert

Assessment actions for an Alert include upgrading of the functions performed for an Unusual Event based on the condition. Examples are:

- o Increase surveillance of in-plant instrumentation.
- o Obtain additional assistance from off-duty personnel and/or off-site support groups.
- o Assemble off-site radiological monitoring teams.
- o Intensify dose projection activities.
- o Deploy on-site radiological monitoring team to perform direct radiation measurements and air sampling.
- o Deploy on-site damage control team.

6.2.3 Site Emergency

Assessment actions for a Site Emergency will be responsive to the increased probability of major failure of plant safety functions and release of significant quantities of radioactive material. Examples include:

- o Increase surveillance of instrumentation which may provide information on the status of the core and reactor coolant system.
- o Deploy off-site monitoring teams to perform direct radiation measurements, sampling and analysis of air and other environmental media.
- o Correlate dose projection results with off-site monitoring data.
- o Coordinate off-site dose assessment activities with DER/BRP.
- o Increase reactor coolant sampling and analysis frequency.

6.2.4 General Emergency

Assessment actions for a General Emergency will be based on the likelihood of substantial core degradation, potential loss of containment integrity and probable release of large quantities of radioactive material. Surveillance of instrumentation relative to the core condition, reactor coolant system activity, containment pressure and radiation level, and radioactive effluents will be increased. Dose projection and off-site monitoring efforts will be increased and continuous communications will be maintained with DER/BRP to ensure that off-site dose assessments are based on the best available information.

6.2.5 Off-Site Dose Projection

In the event of an accident at the Susquehanna SES, the Emergency Director will be responsible for initiating off-site dose projection and assessment activities. This activity will initially be performed from the Control Room. Available in the Control Room is data from the effluent monitors, vent stack flow monitoring stations, and the meteorological tower. This information will serve as inputs for computerized off-site dose projections. As a backup, manual calculations can be performed using mini computers or overlays. A Health Physics Technician will assist in making off-site dose projections and report results to the Emergency Director.

The Control Room, TSC and EOF are provided with site and county maps for use in conjunction with isopleths for manual calculation of off-site dose. The thyroid and whole body dose isopleths serve as a backup to the computerized dose projection systems.

Concurrently, the Emergency Director will call in personnel to the TSC to perform the off-site dose projection

activities. The Radiation Protection Coordinator will report to the TSC within 30-60 minutes. Subsequently, the off-site dose projection activities at the TSC will be turned over to the EOF Support Manager at the EOF. The EOF Support Manager will report to the EOF within one hour of notification. Upon arrival at the EOF the Radiation Support Manager will relieve the EOF Support Manager of off-site radiological responsibilities.

The dose projections are verified by the off-site monitoring teams who are directed to selected monitoring location(s) by the Radiation Protection Coordinator, EOF Support Manager or Radiation Support Manager via radio communication. The results of the off-site monitoring teams surveys are used to up-date projected doses and dose calculational assumptions. This process will be reiterated throughout the duration of the release in order to maintain an updated status of dose rates and accumulated dose within the pathway of the plume.

The initial on and off-site monitoring team(s) will be staffed as required within 30-60 minutes. Additional team(s) will be dispatched within one to four hours.

Each off-site monitoring team will be supplied with an ionization survey meter, low volume air sampler, noble gas monitor and iodine analysis capability. TLD's are located at 16 sites around the station to provide early information on accumulated off-site doses. Three sets of TLD's are provided at each of these sites; one set for very early collection/exchange and readout, one set for dose accumulation during the period of release and one set for the total dose assessment due to the accident. The latter set has 66 TLD's at as many locations extending from the station to a distance of 92 miles.

The Emergency Director, and subsequently the Recovery Manager, will recommend appropriate protective actions to DER/BRP based upon the results of the off-site dose projection activities.

As described above, the emergency management activities are organized to facilitate rapid assessment of the off-site dose consequences of effluents from the station. All personnel assigned to off-site dose monitoring functions will be properly trained as to their technical areas of expertise and responsibilities under emergency conditions.

6.2.5.1 Meteorology

The Susquehanna SES on-site meteorological measurement system is based upon an on-site 300' primary meteorological tower located to the ESE of the station. The primary tower provides measurements of wind speed, wind direction, and wind variability at its 10 and 60-meter levels, temperature differential between the 10 and 60-meter levels, and ambient

temperature and dewpoint at the 10-meter level. Precipitation is measured at ground level. In case of primary tower failure, a 10-meter on-site backup meteorological tower will provide measurements of wind speed, wind direction, and wind variability.

The meteorological systems are instrumented to provide continuous data to the control room and to the Plant Process Computer for utilization in the TSC and EOF on an interim basis. Ultimate distribution of the data to the TSC and the EOF will be implemented through the Emergency Response Computer System. Real-time averages of the primary meteorological parameters are maintained by the Plant Process Computer and are input to the Computerized Radiation Dose Projection Service (RADDOSE) to characterize the stability and movement of the air layer into which radioactive effluents would be released for purposes of emergency dose projection.

Additional meteorological information for emergency dose projection will be available as needed from the National Weather Service Station at the Wilkes-Barre Scranton Airport at Avoca, about 30 miles northeast of the Susquehanna site, and the Philadelphia Forecast office of the National Weather Service.

6.2.5.2 Computer Methods

A computer program called the Emergency Radiation Dose Projection Service (RADDOSE) is available to produce initial atmospheric transport and diffusion estimates for effluent releases. For each identified point of interest (sector centerlines and population centers) this subsystem will calculate whole body and thyroid integrated doses, dose rate and time until the dose reaches a Protective Action Guideline (PAG) level. Additionally, on a per sector basis, RADDOSE will calculate plume dimension and travel time information.

6.2.5.2.1 Dispersion Model

RADDOSE will calculate ground level air-borne concentrations on the centerline of any of sixteen (16) meteorological sectors. The dispersion equation was developed from Equation 1 of Regulatory Guide 1.145 and was modified to also calculate concentrations at points not on the centerline of the plume. The model assumes a constant mean wind direction for each calculational cycle.

A correction to the directional transport of the plume centerline will be made for wind speeds less than two meters/second and stable atmospheric conditions (Pasquill stabilities E, F, and G) to account for the influence of abrupt elevation changes on the local wind circulation patterns. It is assumed that the plume will remain confined

to the river valley when it encounters a steep rise in elevation. This gives rise to the three (3) following stable, light-wind speed flow adjustments.

For upvalley flow (wind directions S, SSW, and SW), the plume centerline is assumed to be confined to the center of the narrow river valley (approximately 600 meters wide) with lateral dispersion restricted to, at most, 150 meters. No limit, however, is applied to the vertical dispersion. To account for the deviation from straight-line transport caused by restricting the plume to the river valley, corrections to the positions of the plume centerline and off-centerline concentrations are made through the use of coordinate transformations at the appropriate distances along the plume.

For downvalley flow (wind directions WNW, NW, NNW, N, NNE, and NE) in which the plume would impact the southern river valley wall, the plume is assumed to be transported to within a specific distance (depending on the initial wind direction) of the valley wall and then transported downvalley in a direction of 260°. This causes the plume centerline to remain roughly parallel to this valley wall at a distance of approximately 1000 meters. Since the valley in this direction is quite wide, no limitation is placed on the lateral dispersion.

For measured wind directions of E, ESE, SE, and SSE, the plume is already within 1000 meters of the constraining northern valley wall, so the wind direction is initially assumed to be ENE (which would transport the plume downvalley roughly parallel to the valley wall). As in the case of the other downvalley flow case, no limitation is placed on the lateral dispersion.

All other stable, light-wind speed conditions (wind directions ENE, WSW, and W) encounter no abrupt changes in topography; therefore, no terrain corrections are necessary.

Real-time meteorological data is acquired directly by the plant process computer system from both the primary and backup meteorological towers. The primary tower indications at ten (10) meters of wind speed, wind direction and temperature gradient are the preferred input source. Wind speed, wind direction and wind direction variance can also be obtained from the backup tower if a primary tower input fails. Additionally, the capability exists for the operator to manually enter any required meteorological parameter should both the primary and backup values become unavailable.

6.2.5.2.2 Health Physics Considerations

In the event of an unplanned radioactive release from either the reactor building vent, turbine building vent or standby gas treatment vent, gross noble gas and I-131 readings are available from the continuous air monitors (CAM). This data must be manually entered into RADDOS.

Ten (10) Design Basis Accident (DBA) types can be selected by the operator to most closely approximate the type of release occurring. The selection of a DBA allows RADDOS to select the applicable average gamma energy and the radioiodine percentage in the release mixture for the whole body and thyroid dose calculations. A Composite DBA type release will be assumed by RADDOS if no DBA is entered to assure conservatism for both Noble gas and Iodine releases.

Additionally, the release rate of individual isotopes can be entered by the operator as determined by a grab sample analysis. Grab sample data would then be used by RADDOS to determine the isotopic composition of the effluent and to assign average decay energies for each detected isotope for the dose calculation.

The whole body dose equation is the summation of two equations to account for the gamma immersion dose from noble gases and radioiodines. The decay of radioisotopes, as a function of time from start of accident is not considered in these equations when only gross release data (CAM's) are available. A decay factor for travel time to the receptor may be used when grab sample data is entered into RADDOS. Wet deposition of iodine will be calculated as a function of travel time from point of release.

RADDOS will retain an accumulated (integrated) dose for each calculational point of interest (centerline and population areas). The accumulated dose represents the dose which will be or has been received at a locale due to the plume passage of radioactivity already released to the environs. The accumulated dose will be computed by summing the dosage from each calculation sequence since the release began for each locale. Separate accumulated doses will be maintained for the whole body immersion and the thyroid inhalation. Since all releases from SSES are assumed to be ground level releases, the peak relative dose rate at any locale will occur at the time the plume first arrives at that point. RADDOS will also project the number of minutes remaining until the dose at each locale reaches a Protective Action Guideline level.

The plume size at any downwind distance from the point of release is defined to be the crosswind distance at which plume concentration is ten (10) percent of plume centerline concentration at the same downwind distance. The plume width will then be twice the calculated crosswind distance.

In the event a release source term is unknown for a release period but actual field measurements of dose rate have been made at a known location and time, RADDose will back calculate the source term.

6.2.5.2.3 Man-Machine Interface

RADDose will on-demand or on a periodic basis, calculate the projected whole body and thyroid doses for up to a maximum of twenty-four (24) distances in each of sixteen (16) meteorological sectors around the plant. Projected whole body and thyroid dose calculations can also be performed for up to a maximum of twenty-one (21) specific point locations.

The system will also allow for operator "Study" cases (as opposed to the "Real-Time" case) to be run with outputs as previously described. All inputs to the study case can be manually changed without affecting the real-time inputs to allow for maximum flexibility in emergency dose predictions. The values so calculated (either through real-time or study conditions) will be logged to the selected line printer (one of three) and also will be made available for CRT display.

A) Real-Time Analysis

The Real-time analysis prediction is the main function of the service. Since the outputs associated with the initial predictive run are required as soon as possible, minimal information is required to be input, as many defaults are assumed. The real-time analysis can be single runs (demanded at any time) in which case the outputs are accumulated but no further runs occur unless operator initiated. The operator, however, has the option of running the real-time analysis on a periodic basis.

B) Study Case Analysis

The study case option will allow for total predictive analysis without affecting the real-time analysis. The two predictive options (real-time and study) are totally separate and thus interaction is eliminated. Study case and real-time analysis can be performed concurrently. Priority is given to the real-time analysis run. Should a study case be running and not near completion, it is aborted to allow a real-time analysis to run. The study case is automatically restarted at the completion of the real-time analysis.

Maximum flexibility for predictive analysis will be included in the study case option. The user can at any time (independent of the real-time option) perform a study analysis. The input parameters can be set to their real-time counterparts by user request. The user

can specify which doses (real-time, last pass study case, or zero accumulated) to use as input to the run. All outputs (hard copy or CRT) for study case runs are clearly marked as such to prevent misinterpretation and possible unnecessary safety measures. The study case analysis cannot be run on a periodic basis as its real-time counterparts.

6.2.5.3 Manual Methods

Manual methods are used as backup to the computer programs.

o Airborne Release

Data from the meteorological tower and vent monitors will be used with isopleths to project whole body and thyroid doses. A second manual method of projecting doses is also available, the mini computer. The mini computers use the same inputs as the isopleths and provide more detailed output. These estimates will necessarily be conservative since parameters such as wet and dry deposition and radioactive decay are not taken into account.

o Liquid Release

Estimates of downstream river water concentrations will be made by employing discharge monitor data, discharge flow rates and river elevation readings. The river elevation will be used to estimate the travel time to the point of interest. The degree of mixing, obtained from a graph will be utilized, together with the discharge monitor data, and the discharge flow rates to calculate downstream concentrations.

6.3 CORRECTIVE ACTION

Detailed operating procedures and Plant Procedures are utilized by the plant operating personnel to assist them in recognizing emergency events and taking the corrective actions necessary to place the plant in a safe condition. Additionally, Emergency Plan Implementing Procedures describe subsequent and supplemental corrective actions for the scope of potential situations within each of the emergency classifications. These procedures are designed to guide the actions of the personnel to correct or mitigate the condition as early and as near to the source of the problem as feasible. The Emergency Plan Implementing Procedures are also utilized as emergency training media and are the basis for response during periodic emergency drills.

Some essential corrective actions may involve the risk of higher-than-normal radiation exposure to emergency response personnel. Such actions could involve preventing the

release of large quantities of radioactive material, reducing damage to major equipment or life saving actions. Table 6.2 and Section 6.5.1 specify the limits for such emergency radiation exposure and other relevant criteria to be considered. The Emergency Director is responsible for all corrective actions taken to mitigate the consequences of the accident on-site, even after the EOF is activated.

6.4 PROTECTIVE ACTIONS

Protective actions are implemented to prevent or mitigate consequences to individuals during or after a radiological incident. Protective actions within the Susquehanna SES site boundary are the responsibility of the Susquehanna SES Emergency Director, but may include assistance by off-site organizations. Protective actions outside the Susquehanna SES site boundary are primarily the responsibility of State and local emergency organizations, but may include coordination of activities, dissemination of appropriate data, and recommendations by the Susquehanna SES Emergency Director, EOF Support Manager, or Recovery Manager. Protective action recommendations are outlined in Table 6.4.

6.4.1 On-Site Protective Actions

The primary protective measure for on-site personnel in an emergency is prompt evacuation from areas which may be affected by significant radiation, contamination or airborne radioactivity.

Respiratory protective equipment and clothing are provided at the plant and in the various emergency equipment kits for all personnel who may be required to perform emergency activities, including those personnel with off-site agencies, such as fire and ambulance, providing on-site support.

Control of in-plant contamination is in accordance with Susquehanna SES Health Physics procedures. In the event of radioactive contamination outside fenced security areas, but within the exclusion area, access to such areas shall be controlled by PP&L.

There are no potentially affected agricultural products or water supplies within the Susquehanna SES exclusion area.

Following are some significant aspects of the evacuation categories for implementation of protective actions for on-site personnel:

6.4.1.1 Local Area Evacuation

This category refers to evacuation from one area to another area within the same building. The initiation of a Local Area Evacuation results from ARM or CAM

alarm(s) sounding in the same area within a building or from observed conditions such as smoke or toxic gas, which may indicate a possible habitability problem. The initial response for individuals is to evacuate to an unaffected area of the building, notify the plant Control Room of the conditions and await further instruction. The Emergency Director shall assess the situation, activate appropriate procedures to rectify the condition and inform, via the PA system, the personnel when to return to their respective work area.

6.4.1.2 Controlled Zone Evacuation

The initiation of a Controlled Zone Evacuation results from ARM, CAM or other applicable monitor alarms, (i.e., fire alarms). Notification for personnel to proceed with a Controlled Zone Evacuation shall be announced over the plant PA system or the emergency alarm system. The initial mandatory response by individuals is the same as for a Local Area Evacuation; namely, evacuation to an unaffected area. In this case, however, the nearest such area may not be in the same building, and multiple ARM, CAM or fire alarms are probable.

The actual decision to implement a Controlled Zone Evacuation is the responsibility of the Susquehanna SES Emergency Director. This decision is based largely on his evaluation and judgement of the magnitude and severity of the particular situation. Factors to be considered must include the apparent levels of radiation and/or airborne radioactivity involved, the exposure to personnel that would result from evacuating as well as not evacuating to Assembly Areas. In the event of multiple fire alarms within the Controlled Zone, with no potential hazard to personnel, such as construction workers in unaffected areas, the Susquehanna SES Emergency Director may deem it prudent not to evacuate such personnel and allow work to continue.

A Controlled Zone Evacuation shall be implemented within the times specified in Table 6.3 for each range of dose rates or radioiodine concentrations prevailing within the affected areas. These times at the specified levels correspond approximately to radiation doses of 5,000 mrem to the whole body, or 25,000 mrem to the thyroid. Personnel accountability of station personnel, visitors and non-construction contractors is made at the assembly areas. Accountability of evacuated and non-evacuated personnel will be performed in accordance with Emergency Plan Implementing Procedures and the results transmitted to the Susquehanna SES Emergency Director.

6.4.1.3 Site Area Evacuation

Site Area Evacuation requires that all individuals within the Susquehanna SES site area, except for Control Room operations personnel and others with specific emergency assignments, leave the site. If off-site assembly is required by the Emergency Director, personnel will go to the Remote Assembly Area. The Primary Remote Assembly Area is the Susquehanna Energy Information Center (NE Sector) PP&L structure, as shown in Figure 6.1. The alternate Remote Assembly Area is the Susquehanna Emergency Operations Facility (WSW Sector). Security personnel and assembly area leaders will: be advised of the designated area, help to ensure that all personnel proceed to the designated location, provide access control, and provide for personnel accountability.

Implementation of a Site Area Evacuation is the responsibility of the Susquehanna SES Emergency Director. That decision is based on the severity of the incident, the likelihood of escalation, and the radiation and airborne radioactivity levels throughout the station. Table 6.3 provides radiological and timing guidelines which will be considered by the Emergency Director when making the decision to perform site Area Evacuation.

Notification of a Site Area Evacuation is made via the plant emergency alarm system, consisting of evacuation siren and message announcement.

Accountability is accomplished in passage through the security gate and supervisory checks at the assembly area. Personnel and vehicle contamination surveys are performed at the Remote Assembly Area, using portable survey instruments.

6.4.2 Off-Site Protection Actions

The responsibility for actions to protect off-site individuals rests with the Commonwealth of Pennsylvania, as described in Annex E of the Commonwealth of Pennsylvania Disaster Operations Plan. PEMA is responsible for implementation of that plan.

DER/BRP is responsible for evaluating information obtained from the Susquehanna SES and other sources and recommending appropriate off-site protective actions to PEMA. Such recommendations, based on all available data, local constraints and other considerations may include:

- o Shelter for affected populations
- o Evacuation within a specified radial distance

- o Administration of thyroid prophylaxis
- o Control of contaminated agricultural products

The principal off-site local coordinating agency for providing response to radiological emergencies in the vicinity of the Susquehanna SES is LCCD. Since the area and population inside the ten-mile emergency planning zone are partially within Columbia County, parallel emergency response functions are provided by CEMA. Upon notification by PEMA of a situation which may require protective actions for off-site populations, LCCD and CEMA will initiate appropriate actions in accordance with specific instructions from the notifying party, and within the guidelines of the LCCD and CEMA emergency plans. If PEMA has lost communication or is otherwise unavailable, it is possible that the Susquehanna SES Emergency Director, EOF Support Manager or Recovery Manager will contact LCCD and CEMA directly with protective action recommendations. If time permits, LCCD and CEMA will obtain a review and verification by PEMA of recommendations made by the Susquehanna SES Emergency Director, EOF Support Manager, or Recovery Manager.

LCCD and CEMA have the capability and detailed plans for implementing protective actions which include:

- o Implement prompt notification of the population within ten miles of the Susquehanna SES through the use of the Public Notification System described in Section 6.6.
- o Transmit specific instructions to potentially affected populations
- o Provide assistance for evacuation of the population within the ten-mile emergency planning zone
- o Provide reception and mass care centers for evacuated individuals

Occupants within the ten-mile emergency planning zone of the Susquehanna SES will be provided with information regarding emergency planning. This information will describe the method by which they will be notified of an emergency and will provide specific instructions to follow upon receiving such notification. Additional discussion of the content and method of distribution of this information is contained in Section 8.0.

A detailed study has been conducted of the status and capacities of roads, traffic patterns and demography within the ten-mile emergency planning zone. This study includes the estimated times to evacuate all or segments of the population, identifies potential problem areas and provides contingencies for dealing with adverse conditions. This

study was utilized in the development of detailed evacuation plans by PEMA, LCCD and CEMA. This study is presented in Appendix G.

6.5 AID TO AFFECTED PERSONNEL

Established procedures provide for control of emergency exposure, personnel contamination, and for assistance to injured persons including situations involving complications due to the presence of radiation or radioactive contamination.

6.5.1 Emergency Exposure

All reasonable measures shall be taken to maintain the radiation exposure of emergency personnel who provide rescue, first aid, decontamination, ambulance or medical treatment services within applicable quarterly limits specified in 10CFR20. Table 6.2 summarizes the emergency exposure criteria for entry or re-entry into areas for purposes of undertaking protective or corrective actions, such as fire control, minimizing damage to facilities and reducing the release of effluents, and for carrying out life saving activities. Methods and conditions for permitting volunteers to receive emergency radiation exposures are described in Emergency Plan Implementing Procedures, and provide for expeditious decisions with consideration to known and reasonable balance of associated risks.

6.5.2 Decontamination and First Aid

Personnel contamination in emergency situations shall be controlled to the extent feasible by the normal methods of using protective clothing and surveying for contamination following the removal of such clothing. Personnel decontamination areas, consisting of showers and sinks which drain to the radwaste system, are available for either routine or emergency use. Station employees are instructed in the proper methods of removal of minor contamination from skin surfaces. Decontamination efforts involving significant amounts of contamination, particularly in the vicinity of facial openings, however, shall normally be performed under the direction of Health Physics personnel. Detailed methods for personnel decontamination are described in Health Physics procedures. A listing of typical decontamination equipment located at the personnel decontamination areas is provided in Enclosure 1 of Appendix D. (Appendix D lists equipment and supplies relative to this Plan.)

During an emergency condition requiring site evacuation, Health Physics personnel will conduct personnel surveys of individuals as they are evacuated. These personnel surveys shall consist of using hand-held friskers to monitor for potential contamination including a check of shoes and

hands. If personnel decontamination is required, the personnel will be properly transported to the radiological access control point at the EOF and then to the personnel decontamination facility at the EOF. This facility is provided with personnel decontamination showers, hold-up tank, and personnel monitors. Health Physics personnel trained in decontamination procedures would be assigned to the EOF if this function needed to be performed.

At least two persons who are qualified in first aid methods shall be on-site at all times. First aid to injured personnel can normally be performed in conjunction with any necessary decontamination methods. However, if immediate treatment of the injury is vital, that treatment shall take precedence over decontamination. This philosophy also extends to off-site emergency assistance involving radioactive contamination. For that purpose, measures are established to ensure timely off-site medical treatment, as described in Sections 6.5.3 and 6.5.4.

6.5.3 Medical Transportation

Arrangements have been made for the transportation of patients from the Susquehanna SES, who may have injuries complicated with radioactive contamination or who may have been involved in a radiation incident, to a medical treatment facility. Organizations with which these arrangements have been made are:

Shickshinny Area Volunteer Ambulance Association
Shickshinny, PA

Pond Hill-Lily Lake Fire Co.
Pond Hill, PA

Nescopeck Ambulance Association
Nescopeck, PA

Hobbie Volunteer Fire Co.
Hobbie, PA

Ambulance emergency supply kits, which typically contain items shown in Enclosure 3 of Appendix D, are available for use.

6.5.4 Medical Treatment

Arrangements have been made for medical treatment of patients from the Susquehanna SES, who may have injuries complicated with radioactive contamination at:

The Berwick Hospital
Berwick, PA

Arrangements have been made for backup hospital support for handling patient referrals, patient overloads or local support hospital evacuation at:

The Geisinger Medical Center
Danville, PA.

Similar arrangements have been made, through Radiation Management Corporation, Philadelphia, PA, for medical treatment of contamination injuries and significant over-exposures to radiation, and for evaluation of radioactive material uptakes at:

Radiation Medicine Center
Hospital of the University of Pennsylvania
Philadelphia, PA

The arrangements with Radiation Management Corporation also include provision for consultation with experts in radiation and nuclear medicine.

The Radiation Medicine Center is adequately supplied and equipped to receive and treat contaminated patients. A set of contamination control supplies are provided at the Berwick Hospital and the Geisinger Medical Center. A typical list of this equipment is shown in Enclosure 4 to Appendix D.

6.6 PUBLIC NOTIFICATION SYSTEM

An early alert siren system consisting of 110 sirens ranging from 107 db to 125 db exists within the ten-mile Emergency Planning Zone (EPZ) around Susquehanna SES. Siren location was determined by a detailed study including field surveys, actual determination of average background noise level, and consideration of population distribution within the ten-mile EPZ.

Activation of the Siren System is via radio control from Luzerne County Civil Defense and Columbia County Emergency Management Agency EOC. Activation by either County EOC will activate the entire siren system.

The Nuclear Emergency Alert signal is a steady 3-5 minute wail. This annunciation will occur three times within the first 15 minutes of activation. Public response is to proceed indoors and tune their radio or television to the Emergency Broadcast System Network serving their local area for appropriate additional information.

This public notification system provides a means to alert the population within the ten-mile EPZ. Testing of the system will take place annually and will include independent verification of the system's ability to alert the general public. Figure 6.2 shows the location, coverage area and

size of the sirens that make up the public notification system.

TABLE 6.1
SUMMARY OF IMMEDIATE NOTIFICATION AND RESPONSE

EMERGENCY	CRITERIA	IMMEDIATE NOTIFICATIONS		IMMEDIATE ACTIONS	
CLASS		ON-SITE ¹	OFF-SITE	ON-SITE PERSONNEL	OFF-SITE PERSONNEL
UNUSUAL EVENT	Off Normal Events Which By Themselves Do Not Constitute Significant Events, But Could Indicate a Potential Degradation in the Level of Safety of the Plant	<ul style="list-style-type: none"> o Fire Brigade o Damage Control Teams o Rescue Teams o First Aid Teams o Monitoring Teams o Security Force o Dose Projection Personnel 	<ul style="list-style-type: none"> o Fire Units o Rescue Assistance o Ambulance Service o Hospital o PP&L Headquarters o LOCD, PEMA & NRC³ o Special Office of the President 	<ul style="list-style-type: none"> o Fight Fire o Perform Emergency Repair o Surveillance Function o Conduct Rescue Operation o Administer First Aid o On-Site Monitoring and Dose Projection o Appropriate Security Measures o Perform Continuing Assessment 	<ul style="list-style-type: none"> o Provide Fire Fighting Assistance o Assist Damage Control o Assist Rescue Operations o Provide Medical Transportation o Provide Hospital Medical Treatment o Provide Information to the Public via the Media
ALERT	Events Which Indicate an Actual Degradation in the Level of Safety of the Plant	<ul style="list-style-type: none"> o Fire Brigade o Damage Control Teams o Monitoring Teams o Dose Projection Personnel o Security Force 	<ul style="list-style-type: none"> o Appropriate Local Assistance o PP&L Headquarters o Special Office of the President o LOCD, PEMA, NRC² 	<ul style="list-style-type: none"> o Fight Fire o Perform Emergency Repairs o On-Site & Off-Site Monitoring o Off-Site Dose Projections o Appropriate Security Measures o Activate TSC o Augment On-Shift Resources o Perform Continuing Assessment 	<ul style="list-style-type: none"> o Provide Assistance As Required o Provide Assistance As Required o Conduct Confirmatory Calculations o Alert Key Personnel o Maintain Eng. Communications o Provide Info to Public via Media

(HG/P10-06)

TABLE 6.1 (Cont'd.)
SUMMARY OF IMMEDIATE NOTIFICATION AND RESPONSE

EMERGENCY CLASS	CRITERIA	IMMEDIATE NOTIFICATIONS		IMMEDIATE ACTIONS	
		ON-SITE ¹	OFF-SITE ²	ON-SITE PERSONNEL	OFF-SITE PERSONNEL
SITE EMERGENCY	Events Which Involve Actual or Likely Major Failures of Plant Functions Needed for Protection of the Public	<ul style="list-style-type: none"> o Appropriate Emergency Teams o Security Force o All Other Station Personnel 	<ul style="list-style-type: none"> o Appropriate Local Assistance 	<ul style="list-style-type: none"> o Take Appropriate Corrective Action o On-site Monitoring o Appropriate Security Measures o Augment Resources/Activate Emergency Centers o Personnel Evacuation as Appropriate 	<ul style="list-style-type: none"> o Provide On-Site Assistance as Required
			<ul style="list-style-type: none"> o LOCD, PEMA & NRC² 		<ul style="list-style-type: none"> o Place Public Notification System and Procedures in Standby Status o Implement Appropriate Near-Site Emergency Protective Measures
			<ul style="list-style-type: none"> o PP&L Headquarters 	<ul style="list-style-type: none"> o Alert Total Emergency Organization o Perform Continuing Assessment 	<ul style="list-style-type: none"> o Activate and Man Response Centers o Maintain Emergency Communications o Offsite Monitoring & Dose Projections o Recommend Off-Site Action
			<ul style="list-style-type: none"> o Special Office Of The President 	<ul style="list-style-type: none"> o Provide info for offsite dose proj. 	<ul style="list-style-type: none"> o Provide info to the Public via the media
GENERAL EMERGENCY	Events Which Involve Actual or Imminent Substantial Core Degradation or Melting with Potential for Loss of Containment Integrity	<ul style="list-style-type: none"> o Appropriate Emergency Teams o Security Force o All Other Station Personnel 	<ul style="list-style-type: none"> o Appropriate Local Assistance 	<ul style="list-style-type: none"> o Take Appropriate Corrective Action o On-site Monitoring o Appropriate Security Measures o Augment Resources/Activate Emergency Organization o Personnel Evacuation as Appropriate 	<ul style="list-style-type: none"> o Provide On-Site Assistance as Required
			<ul style="list-style-type: none"> o LOCD, CEMA, PEMA & NRC² 		<ul style="list-style-type: none"> o Implement Appropriate Off-site Emergency Protective Measures
			<ul style="list-style-type: none"> o PP&L Headquarters 	<ul style="list-style-type: none"> o Activate Total Emergency Organization o Perform Continuing Assessment 	<ul style="list-style-type: none"> o Fully Staff Response Centers o Activate All Emergency Response Personnel
			<ul style="list-style-type: none"> o Special Office Of The President 		<ul style="list-style-type: none"> o Maintain Emergency Communications o Recommend Off-Site Action o Continuously Evaluate Dose Projections o Provide info to Public via Media

¹On-Site notification is normally by plant PA system.

²Notification is required within 15 minutes of indication and verification of the event.

³Timely, but not necessarily immediate, notification.

(HG/P10-06)

Table 6.2

EMERGENCY EXPOSURE CRITERIA

Planned exposure to the whole body and/or specific organs should not exceed the following recommendations of the National Council on Radiation Protection and Measurements.

Organ	Protective or Corrective Actions	Life Saving Actions
Whole body	25 rem	100 rem
Hands and forearms (including whole body component)	100 rem	300 rem
Thyroid	125 rem	No limit ⁽¹⁾

Additional General Criteria

- o Only volunteers will be given planned Emergency Exposure.
- o Whenever practical consideration shall be given to dividing exposure among as many additional personnel as possible.
- o Potassium Iodide utilization for iodide prophylaxis shall require the approval of the Emergency Director in consultation with the Radiation Protection Coordinator and medical consultants. It is recommended that potassium iodide only be administered in situations where potential exposure of the thyroid may exceed 25 rem.
- o All reasonable measures must be taken to control contamination and internal exposure.
- o Persons performing emergency activities should be familiar with exposure consequences.
- o Women capable of reproduction should not take part in these actions.
- o Retrospective doses shall be evaluated on an individual case basis.

(1) Thyroid exposure should be minimized to the extent feasible by the use of respirators and/or thyroid prophylaxis. However, no upper limit is specified for life saving action, since the complete loss of thyroid may be considered acceptable for saving life.

Table 6.3

CRITERIA FOR EVACUATION OF
CONTROLLED ZONE AND/OR SITE AREA³

Whole Body Dose Rate Reaches ¹ ---(mrem/hr)-----	Implement Evacuation ---Within---	Radioiodine Concentration Reaches ² -----(μ Ci/cc)-----
Up to 600	8 hours	Up to 1×10^{-5}
600 to 1000	4 hours	1×10^{-5} to 2×10^{-5}
1000 to 2500	2 hours	2×10^{-5} to 4×10^{-5}
2500 to 5000	1 hour	4×10^{-5} to 7×10^{-5}
5000 to 10,000	30 minutes	7×10^{-5} to 1×10^{-4}
10,000 to 20,000	15 minutes	1×10^{-4} to 3×10^{-4}
>20,000	IMMEDIATELY	$>3 \times 10^{-4}$

1. Whole body dose to non-emergency personnel not to exceed 5000 mrem from the event.
2. Maximum concentration for specified time corresponds to approximately 25,000 mrem adult thyroid dose commitment. Radioiodine concentration vs. adult thyroid dose commitment based on July, 1977 Draft, Appendix D, to USEPA Manual of Protective Action Guides. Radioiodine nuclide distribution corresponds to T+4 hours following reactor shutdown.
3. In using Table 6.3, it is important to recognize that there is no direct correlation between the whole body dose rates and the radioiodine concentrations; and the measurements or projections of each must be performed independently. In the event that only a direct radiation determination is available, with no corresponding knowledge of the concentration or fraction of the total which is attributable to radioiodine, the most conservative assumptions specified in the USEPA Manual for Protective Action Guides would be required. Such assumptions, based only on direct radiation determinations, would likely result in gross over-estimation of thyroid dose commitment.

TABLE 6.4

PROTECTIVE ACTION RECOMMENDATIONS

A. Gaseous ReleaseI. General PublicPP&L Actions

Determine the following:

1. Length of time release in progress.
2. Anticipated length of time release will continue.
3. Rate of release.
4. Stability of release rate.
5. Meteorological Conditions
 - a. Wind Speed
 - b. Precipitation
 - c. Stability Class
 - d. Wind Direction
6. Quantity of release.
7. Calculate projected dose.

PP&L RecommendationsRecommend Sheltering if:

1. Projected doses are expected to exceed .5 Rem Whole Body or 2.5 Rem to infant thyroid but not to exceed 5 Rem or 25 Rem respectively and
2. The combination of warning time, plume arrival time and release time is not long enough to effect evacuation; or
3. After evaluating time of day, weather and road conditions, evacuation cannot be effected so as to avoid a significant fraction of expected exposure; and/or
4. Sheltering appears to be the best option available.

Recommend Evacuation if:

1. A core melt accident is underway which involves or expects to involve a loss of containment integrity by melting through or direct release to the atmosphere; or
2. Projected doses are expected to approach or exceed 1 Rem Whole Body or 5 Rem to the infant thyroid; and

TABLE 6.4

PROTECTIVE ACTION RECOMMENDATIONS

A. Gaseous ReleasePP&L ActionsPP&L Recommendations

- a) Release time is expected to be long.
 - b) Evacuation could be well underway before plume arrival based on wind speed and travel conditions.
 - c) Substantial dose savings can be made by avoiding exposure to surface deposition of radioactivity.
3. After evaluating all conditions, evacuation appears to be the best option available.

TABLE 6.4

PROTECTIVE ACTION RECOMMENDATIONS

Gaseous Release
(Cont.)

II. Dairy Cows

PP&L ActionResultsPP&L Recommendations

1. Determine the following:

a. Peak activity for I^{131}

a. Pasture .27 $\mu\text{Ci/kg}$
 milk .012 $\mu\text{Ci/l}$
 or
 1.5 Rem projected dose
 to the infant thyroid
 whichever is first.

b. Meteorological Conditions

- (1) Wind Speed
- (2) Precipitation
- (3) Stability Class
- (4) Wind Direction

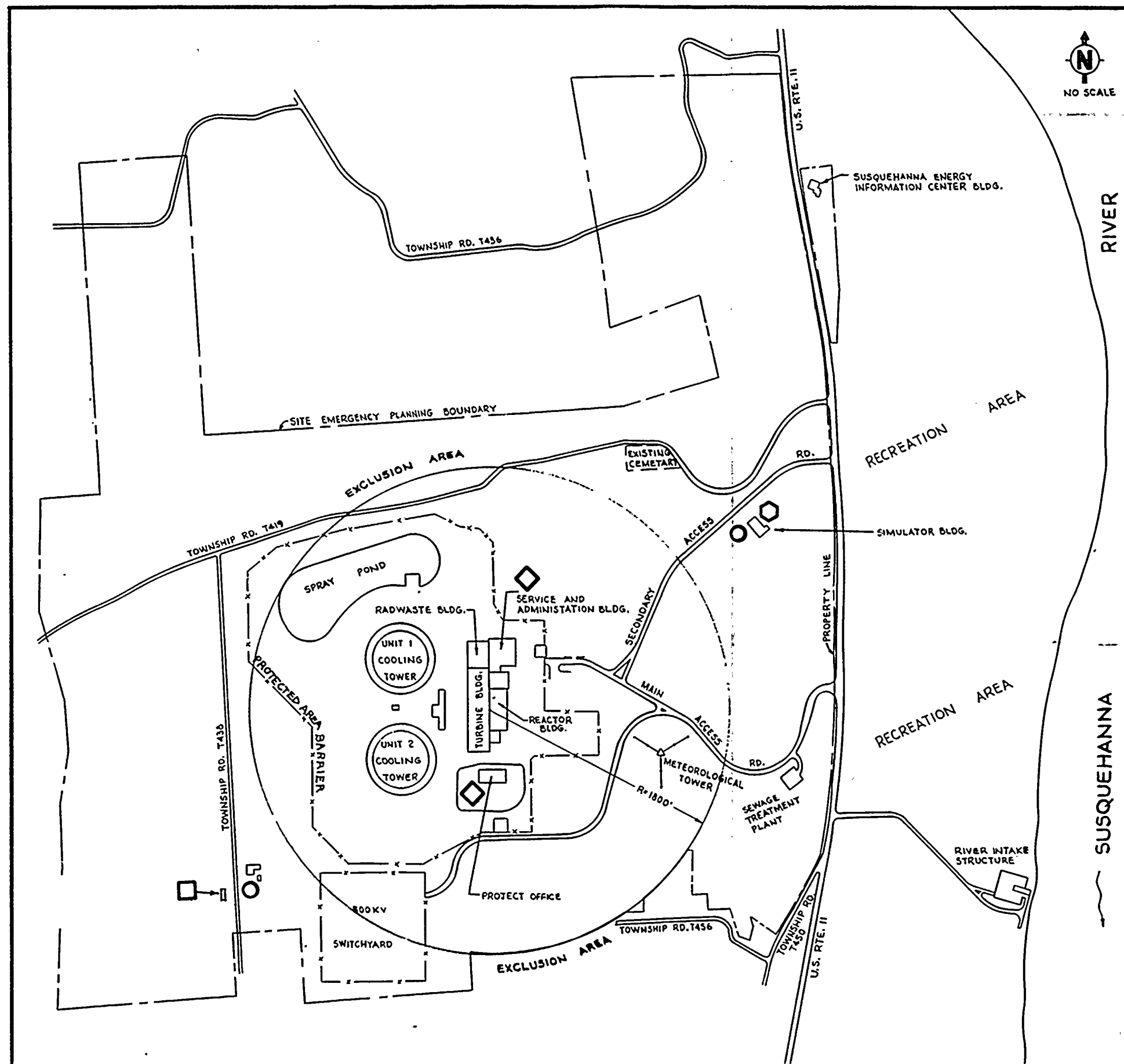
b. Known sectors
 potentially affected

DER/BRP to recommend
 appropriate protective
 action to affected
 farmers.

TABLE 6.4

PROTECTIVE ACTION RECOMMENDATIONS

<u>Emergency Conditions</u>	<u>PP&L Action</u>	<u>Results</u>	<u>PP&L Recommendations</u>
B. Liquid Radioactive Release into Susquehanna River	<ol style="list-style-type: none"> Determine the following: <ol style="list-style-type: none"> Source of release Quantity of release Anticipated length of time release will continue. Notify:. <ol style="list-style-type: none"> DER/BRP Danville Water Authority NRC Initiate sampling of: <ol style="list-style-type: none"> Release point Susquehanna River 	<p>If the:</p> <ol style="list-style-type: none"> Limits specified in 10CFR20 Appendix B are exceeded: 	<ol style="list-style-type: none"> Assess Danville Water Authority in-line monitor reading. Based on above, consider termination of user intake of all downstream users.
C. Plant in a degraded condition with potential for significant release of radioactive material.	<ol style="list-style-type: none"> Evaluate potential source(s) and quantity of release. Perform Dose Projection based on potential release. 	<ol style="list-style-type: none"> If exceed limits specified for gaseous or liquid release. 	<ol style="list-style-type: none"> Protective actions based on the criteria for the type of release.



- - REMOTE ASSEMBLY AREA
- ◊ - INTERIM EOF
- ◊ - CONTROLLED ZONE ASSEMBLY AREA
- - EMERGENCY OPERATIONS FACILITY

Rev. 5, 9/81

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 AND 2
EMERGENCY PLAN

MAP OF SSES EMERGENCY FACILITIES

FIGURE 6.1

7.0 EMERGENCY FACILITIES AND EQUIPMENT

Emergency facilities and equipment are provided to ensure the capabilities for prompt, efficient assessment and control of situations over the entire spectrum of probable and postulated emergency conditions. The facilities and associated equipment, and their emergency functions, are described in this section.

7.1 ON-SITE EMERGENCY CENTERS

7.1.1 Station Control Room

The station Control Room is the primary location for the initial assessment and coordination of corrective actions for essentially all emergency conditions. The Control Room is equipped with the readout and controls for all critical plant systems, the readout and assessment aids related to radiological and meteorological monitoring systems, and access to all station communication systems. A typical listing of Control Room emergency equipment is provided in Enclosure 13 of Appendix D.

Off-site emergency coordination functions initially served by the Control Room will be transferred to the Technical Support Center or Emergency Operations Facility for a Site or a General Emergency as deemed appropriate by the Susquehanna SES Emergency Director. The primary consideration is to ensure that the number of personnel involved with the emergency in the Control Room shall not impair the safe and orderly shutdown of the reactor or the operation of plant safety systems.

7.1.2 Technical Support Center

The Technical Support Center (TSC) provides a location for plant management and technical support personnel to assemble to advise plant operations personnel during an emergency. The TSC personnel will provide guidance for management of emergency conditions and accident mitigation.

The technical personnel manning the TSC have access to analytical programs needed to effectively analyze conditions in the plant. The TSC location on the observation gallery overlooking the Control Room permits visual contact and easy access to information in the Control Room which might not be available in the TSC.

The TSC facilities may be used for normal daily activities provided these activities do not degrade the TSC emergency responsiveness or reliability. During normal operating conditions, the TSC will provide office space for the Supervisor of Operations, Operations Staff Engineers and Shift Technical Advisors. The facilities may also be used as a research or reference area by other station personnel because of the extensive information located here.

The TSC is located in the existing Control Room mezzanine above the Control Room at elevation 741'-1" of the control structure and occupies approximately 2500 square feet. The TSC is within approximately two minutes travel time of the Control Room by elevator or stairs. Reference Figures 7.1 and 7.2.

The TSC is designed to provide working space and facilities for 25 people and is a controlled access area. The Emergency Director (ED) and the on-site emergency response team will be located in the TSC.

The composition of the on-site emergency response team is discussed in Section 5.2. Space is available in the TSC for the Nuclear Regulatory Commission Emergency Response Team.

7.1.2.1 Spatial Layout Description

The TSC includes the following spaces (Reference Figure 7.3):

1) Work Areas:

The work areas adjoin the Monitoring Area. The work areas accommodate modular tables and cubicle-type work spaces. The Plant Technical Specifications, Plant Operating Procedures, Emergency Operating Procedures and Final Safety Analysis Report are located in bookcases in these work areas.

2) Monitoring Area:

The monitoring area is designed to house the Safety Parameter Display Unit, Emergency Response Computer System Display Unit, Unit Monitoring Console, video copier and stack monitoring panel.

3) Conference Room:

The conference room will accommodate 16 people grouped around a conference table composed of several modular reference tables.

4) Document Control Area:

This area houses all the document reproduction facilities such as a copy machine, telecopy machine, and microfilm and microfiche reader printers.

Also located in this area is the vertical stick file for selected as-built drawings. Under-counter cabinets are provided for storage of administrative supplies.

Records (duplicate copies, not originals) will be stored within the TSC in this area. Records stored in the TSC will include design documents as required to diagnose plant problems at the system level. Documents

such as as-built drawing in the form of microfilm/microfiche, will be stored in metal cabinets.

5) NRC Conference Room:

This room is provided for NRC consultation.

7.1.2.2 Fire Detection

The halon system shall incorporate a cross-zone ionization detector system. A single detector release shall actuate a predischARGE alarm within the space and at the fire protection panel C-650 in the Control Room. The halon shall be released by the activation of two or more detectors.

7.1.2.3 Fire Protection

A halon system is provided, designed in accordance with NFPA 12A and shall provide a concentration of 5 to 7 percent flooding. The halon system shall provide fire damper releases for all duct openings located in the perimeter of the protected space.

7.1.2.4 Structural Design Criteria

The TSC is located on the mezzanine floor, EL. 741'-1", above the Control Room in the control structure which is a Seismic Category I structure, as defined in NRC Regulatory Guide 1.29, "Seismic Design Classification". This structure is designed in accordance with Chapter 3.0 of the Final Safety Analysis Report.

7.1.2.5 Habitability

7.1.2.5.1 Post-Accident Radiation Doses

7.1.2.5.1.1 Allowable

TSC personnel are protected from radiological hazards, including direct shine and airborne activities for postulated accident conditions to the same degree as control room personnel. Applicable criteria are specified in General Design Criterion 19, Standard Review Plan 6.4, and NUREG-0737, Item II.B.2.

7.1.2.5.1.2 Postulated

The radiation dose to personnel occupying the TSC is the same as the Control Room personnel. The doses from controlling accidents are summarized in Chapter 15.0 of the Final Safety Analysis Report.

7.1.2.5.1.3 Radiation Monitoring

To ensure adequate radiological protection of the TSC personnel, permanent commercial grade monitors are provided to alarm on high gross gamma radiation dose rates. In addition, airborne radioactivity concentrations will be monitored by portable

monitors. The monitoring systems shall include local alarms with trip levels set to provide early warning to TSC personnel of adverse conditions. Means to distinguish the presence or absence of iodine will be provided.

7.1.2.5.2__HVAC

The TSC HVAC system is a part of the Control Room HVAC system which is described in FSAR Section 9.4.1.

7.1.2.5.3__Shielding

Shielding requirement for the TSC is the same as for the Control Room for total dose to occupants from direct shine and airborne. Exposure will not exceed 5 Rem whole body for the duration of the accident. This is in accordance with General Design Criterion 19, USNRC Standard Review Plan 6.4, and NUREG-0737, Item II.B.2. Duration of occupancy and method of analysis is the same as that used for the control room.

7.1.2.5.4__Occupant Accommodations

No sleeping accommodations or toilet facilities are provided in the TSC. Use of the plant's existing facilities at grade level of the control structure for washing and toilet accommodations is available. There is a unit kitchen with electric range, under-counter refrigerator and sink in the TSC. Potassium iodide and self-contained breathing apparatus are provided in the TSC.

7.1.2.6__Communication Links

The TSC communication system is comprised of priority access voice links-hotlines, telephone lines tied through the plant switchboard, local outside commercial lines, VHF and UHF radio, and the plant public address system. These facilities provide reliable normal and emergency, primary and backup communication links between the TSC and the Control Room, the EOF, the MOC the NRC and all the communication functions required in the TSC for initial notification and early recommendations to on- and off-site authorities prior to staffing the EOF.

The description of the communication facilities in the TSC is as follows.

7.1.2.6.1__Telephone

Normal telephone service for the TSC will use the plant Private Automatic Branch Exchange (PABX) system and local outside commercial lines. Direct Allentown General Office branch exchange telephone service is also provided.

7.1.2.6.2 Hotlines

Priority access voice communication links with automatic signaling is provided at several locations in the TSC. The hotline facilities have the capability for individual or conference calling between the TSC and the following:

- a. Emergency Operations Facility (EOF)
- b. Control Room (CR)
- c. Pennsylvania Emergency Management Agency (PEMA)
- d. Luzerne County Civil Defense (LCCD)
- e. Columbia County Emergency Management Agency (CEMA)
- f. Nuclear Regulatory Commission, Emergency Notification System (ENS)
- g. Nuclear Regulatory Commission, Health Physics Network (HPN)
- h. Department of Environmental Regulation/Bureau of Radiation Protection (DER/BRP)
- i. Operational Support Center (OSC)
- j. Allentown General Office
- k. Media Operations Center (MOC)

7.1.2.6.3 Radio

The TSC has both a four-channel 450 MHz UHF and a two-channel 150 MHz VHF radio system with digital voice privacy capability.

The two-channel VHF radio is contained in a single desktop control console. This system is used as an emergency backup to the telephone system for communication with LCCD, CEMA, and Allentown General Office, and to communicate with the field monitoring teams.

The four-channel UHF radio is operated from a single desk top control console. The UHF radio will provide primary and backup security, emergency, operational and maintenance communication links.

7.1.2.6.4 Public Address System

The system provides two-way communication facilities for speech input at handset stations. Each station is capable of originating and receiving communication by switching to either a pager channel or to one of five non-interfacing party-line channels.

7.1.2.6.5 Facsimile

A facsimile machine is provided in the TSC.

7.1.2.7 Power Supply

The TSC is an integral part of the existing power block as described in Chapter 8.0 of the FSAR.

7.1.2.8 Instrumentation

The TSC utilizes the same field sensors and signal conditioning equipment which is provided to monitor the nuclear steam supply system and the balance of plant systems. The quality, accuracy, and reliability of the TSC instrumentation is therefore identical to the field instrumentation used to operate the plant. This approach has been taken so that people working in different areas will work with the same data. A detailed description of this instrumentation is provided in Chapter 7.0 of the FSAR.

The data from these instruments shall be collected by two data acquisition systems: the Plant Computer System and the Safety Parameter Display System (SPDS). The Plant Computer System is described in Chapter 7.0 of the Final Safety Analysis Report. SPDS is described herein.

7.1.2.9 TSC Data Presentation

The TSC will include human factors engineered man-machine capabilities to allow personnel to determine:

- o plant conditions during normal operation
- o plant steady-state conditions prior to an accident
- o transient conditions producing an initiating event
- o plant system dynamic behavior during an accident

The man-machine interface will be provided by devices tied to the SPDS and Plant Process Computer (PCS).

7.1.2.9.1 Equipment

The location in the TSC of the equipment described below is shown in the Monitoring Area of Figure 7.3, Technical Support Center Floor Plan.

- (1) Two CRTs housed in the SPDS console (both CRTs will be switchable to either Unit 1 or Unit 2); these CRTs will display information related to the Safety Parameter Display System.
- (2) A video copier for the hard copy output of SPDS data.
- (3) Two plant computer system units monitoring consoles switchable to either Unit 1 or Unit 2 are located on the UMC Table. Graphic and parameter displays,

depicting the conditions of the plant systems, which are normally used by plant operators will be accessible at the UMC Table.

(4) A video copier for the hardcopy output of PCS data.

7.1.2.9.2 Data

In general, safety-related data will be provided by the SPDS. Other plant operational data will be provided by the Plant Computer System.

The information available in the TSC will be the same as that available in other SPDS/PCS locations.

SPDS data is described herein. The Plant Computer System is described in the FSAR Section 7.7.

7.1.2.10 Records and Documents

7.1.2.10.1 Available Records and Documents

The TSC will contain, as specified in the Susquehanna SES Emergency Plan, up-to-date records for use during emergency conditions. These records include:

- o Emergency Plan Implementing Procedures.
- o Current Plant Technical Specifications
- o Plant Operating Procedures
- o Emergency Operating Procedures
- o Final Safety Analysis Report
- o Drawings, schematics and diagrams showing current conditions of plant structures and systems
- o Dose Calculation Manuals

7.1.2.10.2 Records Management System

The records listed above shall be updated and managed by the Susquehanna SES Document Control Center (DCC) utilizing DCC Administrative Procedures.

7.1.2.11 Security

Although the TSC contains no vital equipment, it is located within a plant vital area and is subject to the vital area access controls as identified in FSAR Section 13.6.

7.1.3 Operations Support Center

The Operational Support Center is the primary on-site assembly area for operations support team personnel during the initial phase of an emergency. This area provides a central location for the assembly, accountability, and dispatching of on-shift emergency team personnel required to perform such functions as: fire fighting, first aid, search and rescue, damage control and on-site radiation monitoring. Equipment required for these teams to perform their functions, as outlined in Appendix D of the Emergency Plan, is stored and maintained in this facility.

During normal plant operations, this area will serve as an operations staff work area for shift changeover purposes as well as shift work assignment area. The Non-Emergency use of the OSC will not degrade its primary purpose as an Operations Support Center.

The OSC is located in the existing Unit #2 Shift Supervisor's Office at the south end of the Control Room on EL. 729'-1" of the control structure. The OSC, approximately 340 square feet in size, is an assembly point for operational support personnel to receive work assignments.

7.1.3.1 Habitability

7.1.3.1.1 Post-Accident Radiation Doses

7.1.3.1.1.1 Allowable

OSC personnel shall be protected from radiological hazards, including direct shine and airborne activities for postulated accident conditions to the same degree as Control Room personnel. Applicable criteria are specified in General Design Criterion 19, Standard Review Plan 6.4, and NUREG-0737, Item II.B.2.

7.1.3.1.1.2 Postulated

The radiation dose to personnel occupying the OSC is the same as the Control Room personnel. The doses from controlling accidents are summarized in Chapter 15.0 of the Final Safety Analysis Report.

7.1.3.1.1.3 Radiation Monitoring

To ensure adequate radiological protection of the OSC personnel, a permanent commercial grade monitor will alarm on high gross gamma radiation dose rates.

7.1.3.1.2 HVAC

The OSC HVAC system, like the TSC HVAC system, is a part of the Control Room HVAC system which is described in FSAR Section 9.4.1.

7.1.3.1.3 Shielding

Shielding requirement for the OSC is the same as for the Control Room for total dose to occupants from direct shine and airborne. Exposure will not exceed 5 Rem whole body for the duration of the accident. This is in accordance with General Design Criterion 19, USNRC Standard Review Plan 6.4, and NUREG-0737, Item II.B.2. Duration of occupancy and method of analysis is the same as that used for the Control Room.

7.1.3.1.4 Occupant Accommodations

No toilet facilities are provided in the OSC. Use of the Plant's existing facilities at grade level of the control structure for washing and toilet accommodations is available.

7.1.3.2 Communications

The OSC communication system includes priority access voice links-hotlines; the plant public address system and telephone lines tied through the plant switchboard.

7.1.3.2.1 Telephone

The normal telephone service for the OSC will use the plant Private Automatic Branch Exchange (PABX) system. The PABX has the capability to reach on- and off-site locations.

7.1.3.2.2 Hotlines

Priority access voice communication links with automatic signaling is provided in the OSC. The OSC hotline has the capability of calling the TSC or the Control Room.

7.1.3.2.3 Public Address System

The public address (PA) system is an extension of the plant PA system. The system provides two-way communication facilities for speech input at hand-set stations. Each station is capable of originating and receiving communications by switching to either a page channel or to one of five non-interfering party line channels.

7.2 PP&L OFF-SITE EMERGENCY CENTERS

7.2.1 Media Operations Center

The Media Operations Center (MOC) will be utilized for all news conferences during a site and general emergency or when deemed necessary by the Public Information Manager. The Berwick YMCA, Berwick, PA, is the designated Media Operations Center with dedicated space to accommodate news conferences for 500 people. Appropriate facilities will be provided for news media personnel.

7.2.2 Emergency Operations Facility

The Emergency Operations Facility (EOF) is an emergency response facility located near the site. The EOF will provide continuous coordination and evaluation of PP&L activities during emergencies having or potentially having environmental impact.

In addition to PP&L emergency personnel, the EOF provides space for various governmental agencies such as NRC, FEMA, PEMA and DOE during these emergencies. Upon activation of the EOF, any information on conditions affecting the public will originate from the EOF, however the dissemination of this information will occur at the Media Operations Center.

The non-emergency activities of the EOF are such that its main function, that of an emergency response facility, is not degraded. During normal plant operation the EOF will be used to provide office space for the Nuclear Emergency Planning Group and for personnel to maintain computer systems housed therein. In addition, space is provided for training purposes and other operational support functions.

The site location of the EOF is in North Central Pennsylvania in Luzerne County approximately 5-1/4 miles north of the Town of Berwick in Salem Township, approximately 2,500 feet southwest of the control structure (Reference Figures 7.4 and 7.5). The site fronts on County Road T-438. Direct access to the site will be maintained over a 12' wide stoned roadway from RtT-438 to the 500 kV Switchyard.

7.2.2.1 ARCHITECTURE

The design philosophy developed for this facility incorporates two major facets: functional, efficient space to house the emergency operation and appropriate environment to promote the operating efficiency of the emergency staff.

The 16,500 square feet, one-story building is a rectangular structure, 167' long by 99' wide. The exterior walls are 12" reinforced concrete with a brick facing. The shed roof is a 9-1/2" reinforced concrete slab. The concrete was utilized to provide the required radiological protection.

Fifty (50) parking stalls are provided at the EOF. In addition, parking space for five (5) emergency response monitoring vans is provided at the side and rear of the building. Communication and power hook-ups are available for each van.

7.2.2.1.1 Spacial Layout Description

The EOF is divided into three areas Reference Figure 7.6:

A. Emergency Operations Response

This area is composed of private, semi-private and open office areas to assure the smooth flow and evaluation of data from the plant site. Features are:

1. A receptionist's area near the main entrance.
2. Offices for emergency managers and support personnel.
3. One office for the NRC to house five people.
4. Space for PEMA and/or FEMA. (Pennsylvania Emergency Management Agency/Federal Emergency Management Agency).
5. A work area for 35 people located in a central core area. Also included in this area is a room for maps and documents.
6. One conference room for up to 15 people.

B. Support Areas for Emergency Response

These areas are provided to accommodate the needs of the EOF staff during an emergency condition. The areas provided are mechanical and electrical equipment, toilets, kitchen and eating facilities, storage areas and a multi-purpose meeting room.

C. Computer Room

A computer room is located in the EOF to support SPDS and other mini-computer systems. The size of the area is approximately 1,500 square feet. Also, a computer work room of approximately 750 square feet in size, is provided to accommodate up to four (4) employees responsible for the operation and maintenance of the computer equipment. This results in a total requirement of approximately 2,250 square feet of floor space. Additional features are:

1. Raised access flooring for computer room and computer work room.
2. Semi-private office for four (4) computer personnel.
3. Inverter back-up power system to carry electrical load for 15 minutes.
4. Independent cooling system for computer equipment.
5. Exterior access to provide for equipment installation.
6. Paper and material storage area.

7.2.2.1.2 Fire Protection

1. Automatic wet pipe sprinklers on an ordinary hazard pipe schedule are provided throughout the building except below the computer room floor and above ceilings where no combustible materials are present.
2. Computer Area
A total flooding, automatic halon 1301 system protects the room volumes and the volume of the spaces beneath the floors of the computer room and computer work room with a 5% concentration.
3. The halon system is actuated by a cross-zoned product of combustion detection system.

7.2.2.2 Structural Design Criteria

7.2.2.2.1 Governing Codes and Regulations

1. BOCA - "Basic Building Code/1978."
2. UBC - "Uniform Building Code/1979."
3. ASTM - American Standard Testing Materials.
4. ACI - American Concrete Institute.

7.2.2.2.2 Structure Classification

Building Classification: D-5, Non-Hazardous Commercial, Industrial Office.

Construction Type: Type III, Incombustible, height limit 4-story, maximum floor area allowed 20,000 square feet unsprinklered. Maximum travel distance to an approved exit is 150 feet.

NRC Classification: The EOF is classified as a structure, the failure of which would not result in release of significant radioactivity, and is not required for reactor shutdown. This structure is classified as Non-Category I.

7.2.2.3 Habitability

Habitability systems are designed to ensure habitability inside the EOF during normal and abnormal station operating conditions including post LOCA radiological protection requirements. Adequate water, sanitary facilities and medical supplies are provided to meet the reasonable requirements of normal staffing levels during and after an accident.

7.2.2.3.1 Post Accident Radiation Shielding

The EOF is designed to provide sufficient shielding to reduce by a factor of more than 5 the gamma radiation shine from external post accident sources, including both direct shine from the reactor building and from airborne radioactivity outside the EOF which is released from the reactor building. The walls and ceiling of the EOF are designed to provide a minimum thickness of nine inches of concrete. Based on the attenuation of 0.7 MeV gamma radiation, this concrete provides a protection factor of greater than 5. In addition, all entrances and exits from the building and all penetrations through walls and ceiling have a labyrinth design which prevents direct shine from outside sources into any part of the building which is normally occupied without passing through at least nine inches of concrete.

7.2.2.3.2 HVAC

7.2.2.3.2.1 Design Basis

This system provides heating, cooling, ventilation and control of environmental conditions in the Emergency Operations Facility (EOF). The system is designed to accomplish the following objectives during normal and emergency plant operation:

- a) Whenever the building is occupied, maintain the space temperature at $75^{\circ}\text{F} \pm 5^{\circ}$ for personnel comfort and to ensure the operability of the equipment and instruments located inside the EOF under normal and emergency plant operating conditions.
- b) Maintain a slightly positive pressure above atmosphere inside the EOF, in order to inhibit air leakage into the building. This is not applicable for operation during isolation mode.
- c) In a post-accident emergency, the HVAC system is designed to provide radiation protection for occupants of the EOF from airborne fission products. During emergency mode of operation, outside air shall be filtered through filter system consisting of High Efficiency Particulate Filters (HEPA). The changeover from the normal operation mode to emergency operation mode shall be manual. Capability for total isolation of HVAC system shall be provided. During this mode a portion of the recirculation air will be filtered through HEPA filters.
- d) Maintain airflow from areas of lesser to areas of greater potential radioactive contamination.

7.2.2.3.2.2 System Description

Figure 7.7 shows schematic representation for this system giving details of the airflow, duct layout, instrumentation and equipment parameters.

The system design includes air handling units, filtration unit (including fan), condensing units, variable air volume boxes, glycol cooling units for computer room air conditioners, exhaust fans, electric heating coils, radiant heating panels, intake and exhaust dampers and louvers, refrigerant piping, ducting instrumentation and controls and other components required for proper operation of the system.

Two identical size air handling units provide conditioned air through the low pressure supply duct work and bypass type variable air volume boxes to supply air outlets located in the various areas of the building. Area thermostats are provided for individual control. Electric duct heaters are provided in the main supply duct from each air handler, for providing heating during cold weather. Perimeter area heating is provided by ceiling mounted radiant heating panels. Building entrance vestibules are heated using wall insert heaters. Electrical space heaters are provided in electrical and mechanical equipment rooms. System air return is provided through the plenum space between the hung ceiling and the roof. System cooling is provided by two air cooled condensing units located outside the building. Each air handling unit is piped to its condensing unit and refrigerant type direct expansion cooling coils accomplish the cooling function. Toilet rooms, janitor's closet and shower areas are provided with ducted exhaust system using exhaust fans. Separate exhaust is provided for battery room and exhaust hood located in the sample preparation room.

Computer room cooling and humidity requirements are provided by a separate system consisting of remote glycol coolers, humidifiers, air handling units, instrumentation and controls. Ventilation requirements for this area are provided by the central air handling units.

Normal System Operation:

The air handling units provide heating or cooling as required. These units are operated on an economy cycle and maximum outside air is used for cooling when the enthalpy of the outside air is lower than the enthalpy of the return air. Minimum outside air and air cooled condensing units are used to provide ventilation and cooling respectively, when the enthalpy of outside air is higher than the enthalpy of the return air. Electric heating coils, perimeter heating, and other heaters are used as necessary. Area thermometers regulate the air flow and therefore, the cooling to the various areas. Exhaust systems are operated as required.

Emergency Operation Mode:

During this mode of operation, the system will operate with minimum outside air and the building will be slightly pressurized. Outside air is filtered through the filter bank consisting of prefilters, HEPA filters, fan, isolation dampers and controls as required. Outside air flow during this mode shall be limited to 2,000 cfm maximum.

System Isolation Mode of Operation:

The system is also designed to provide total system isolation and partial recirculation through filter units for operation during an emergency requiring total system isolation. This changeover is manual. During this mode, all exhaust fans would be stopped and the building will not be maintained at a positive pressure.

Equipment Requirements:

The equipment and the system components are not designed to meet seismic category I requirements or qualified as Engineered Safety Features. All HVAC equipment except HEPA filters are commercial grade quality. HEPA filters shall be suitable for nuclear application.

7.2.2.3.2.3 Safety Evaluation

The system, as designed, meets the EOF functional requirements as stated in NUREG-0696. The system includes a tie connection between the two supply air system ducts so that partial cooling can be provided in the event one of the units is not functioning.

7.2.2.3.2.4 Instrumentation Requirements

All the control switches for the control of the various system components are located on a control panel in the mechanical equipment room. Local annunciators are provided in the mechanical equipment room of the EOF. The following abnormal conditions are alarmed at the local control panel:

- a) Air handling unit fan failures.
- b) Condenser unit fan failures.
- c) Filtration system failure (combined alarm).
- d) Failure of battery room exhaust fan.
- e) Failure of other exhaust fans.
- f) Failure of computer room cooling system (combined).

Filtration system is provided with a local panel and following alarms:

- 1) High pressure differential across the HEPA filters.

- 2) Filtration system fan failure.

7.2.2.3.3 Radiation Monitoring

To ensure adequate radiological protection of EOF personnel, the following radiation monitoring systems are installed.

- 1) Outside Air Intake Radiation Monitoring System

This system consists of a radiation detector installed in the outside air intake duct and connected to electronic circuits which activate both audible and visual alarms when radiation levels of outside air exceed a preset trip point. The alarms are placed in an area where they can be heard in normally occupied areas of the EOF. When the alarm sounds, previously designated personnel will be responsible for manually routing the inlet air through the emergency air clean-up trains.

- 2) Iodine Sampling

The concentration of airborne radioiodine during an emergency will be determined by use of a portable low volume air sampler with silver zeolite cartridges (permanently assigned to the EOF). The cartridge will be analyzed for radioiodines by gamma spectrum analysis.

7.2.2.3.4 Water Supply

No municipal water supply is available near the EOF; therefore, a well system is provided with adequate treatment to make it potable. This well is not within the pathway of groundwater flow from the station and is not anticipated to ever become contaminated. But if an accident occurs with the potential to contaminate the groundwater, the capability exists to sample and analyze the well water at the EOF.

7.2.2.4 Communication

The EOF communication system includes priority access voice links-hotlines, telephone lines tied through the plant switchboard, local outside commercial lines, VHF and UHF radio. The combination of these facilities will be used to manage and coordinate on and offsite emergency response activities and disseminate information to responsible government agencies. The combination of these facilities forms the redundancy and thus the reliable normal and emergency, primary and backup communication network. The TSC and Control Room will provide the initial notification and early recommendations to offsite authorities prior to staffing the EOF.

The description of the communication facilities in the EOF are as follows.

7.2.2.4.1 Telephone

The normal telephone service for the EOF uses the plant Private Automatic Branch Exchange (PABX) system and local outside commercial lines.

Direct Allentown General Office branch exchange telephone service will also be provided.

7.2.2.4.2 Hotlines

Priority access voice communications links with automatic signaling is provided at several locations in the EOF. The hotline facilities have the capability for individual or conference calling between the EOF and the following:

- a. Technical Support Center (TSC)
- b. Control Room (CR)
- c. Pennsylvania Emergency Management Agency (PEMA)
- d. Luzerne County Civil Defense (LCCD)
- e. Columbia County Emergency Management Agency (CEMA)
- f. Nuclear Regulatory Commission, Emergency Notification System (ENS)
- h. Department of Environmental Resources/Bureau of Radiation Protection
- i. Allentown General Office
- j. Media Operations Center (MOC)

7.2.2.4.3 Radio

The EOF has both a four-channel 450 MHz UHF and a two-channel 150 MHz VHF radio system with digital voice privacy capability.

The two-channel VHF radio is contained in a single desktop control console. This system is used as an emergency backup to the telephone system and to communicate with the field monitoring teams.

The four-channel UHF radio is operated from a single desk top control console. The UHF radio provides primary and backup security, emergency, operational, and maintenance communication links.

7.2.2.4.4 Facsimile

A facsimile machine is provided in the EOF.

7.2.2.5 POWER SUPPLY

7.2.2.5.1 PL Distribution - Normal Service

The normal electrical service to the EOF is from the Pennsylvania Power and Light Company distribution network. The main distribution feeder emanates from the Berwick 66-12 kV substation. The service rating to the EOF is 300 KVA, 480/277 volt, three phase (Reference Figure 7.8).

7.2.2.5.2 Emergency Generator

The standby diesel generator is sized for complete operation of the facility. On loss of utility power, automatic transfer is made to the standby diesel generator which will accept load within ten seconds (Reference Figure 7.8).

7.2.2.5.3 Uninterruptable Power Supply (UPS)

The UPS system is completely static design with rectifier, battery and inverter being the main components. The system is sized to carry all critical loads. The critical loads are defined to include computer equipment, security, emergency lighting and telephone systems (Reference Figure 7.8).

7.2.2.6 EOF Data Presentation

The EOF includes human factors engineered man-machine interface capabilities to allow personnel to:

- o access environmental conditions
- o coordinate radiological monitoring activities
- o recommend implementation of off-site emergency plans

The man-machine interface in the EOF is provided by devices tied to SPDS and the Plant Computer System.

7.2.2.6.1 Equipment

Data Display equipment will be located within the Central Office Area and in other locations throughout the EOF as required to support the functions being performed at those locations.

The system is designed to provide the interface to the following devices:

- (1) CRTs for the display of general plant safety-related data contained in the SPDS for specific EOF functions.
- (2) CRTs to provide information sent directly from the plant Computer System.
- (3) A video copier to provide hard copy output of the Plant Computer System data.

(4) A Printer for the hard copy output of SPDS data.

7.2.2.7 Records and Documents

7.2.2.7.1 Available Records and Documents

The EOF contains up-to-date records for use during emergency conditions. These records include:

- o Up-to-date drawings, schematics and diagrams showing current conditions of plant structures and systems.
- o Emergency Plan Implementing Procedures.
- o Current plant technical specifications.
- o Plant Operating Procedures.
- o Emergency Operating Procedures.
- o Current Emergency Plans for:
 - Pennsylvania Power & Light Co.
 - Commonwealth of Pennsylvania
 - Luzerne County Civil Defense
 - Columbia County Emergency Management Agency
- o Radiological Records
- o Off-site population distribution and evacuation planning.
- o Off-site Dose Calculation Manual

7.2.2.7.2 Records Management System

The records listed above are updated and managed by the Susquehanna SES Document Control Center (DCC) utilizing DCC Administrative Procedures.

7.2.2.8 Security

During an emergency, access to the entire EOF will be limited to only those personnel with proper authorization. Intrusion detection devices will be located in and around the EOF to monitor the facility during unoccupied periods.

7.2.2.9 Backup Emergency Operations Facility

7.2.2.9.1 Function

The Backup EOF provides space and facilities for maintaining the continuity of primary EOF functions, dose projection and senior management decision making capability, during emergency

conditions that would require EOF personnel to evacuate the primary EOF or the primary EOF was inaccessible.

7.2.2.9.2 Location

The designated location for the Backup EOF is at the PP&L Central Division Service Center auditorium at 344 South Poplar Street, Hazleton, PA. This location is 13 air miles from Susquehanna SES (Reference Figure 7.9).

7.2.2.9.3 Staffing

In order to perform the functional requirements mentioned above, the minimum staffing consists of the Recovery Manager, the Radiation Support Manager, and their staffs. Other management positions within the off-site emergency organization can perform their functions out of the Allentown Corporate Emergency Control Center at the discretion of the Recovery Manager.

The task functions of the minimum staff personnel required to ensure continuity of functions at the Backup EOF are as described in Section 5.3.

7.2.2.9.4 Spacial Layout Description

The available space at the Backup EOF can easily be set up in a configuration allowing easy access and coordination of information necessary to carry on the function of the EOF. Being located in a main PP&L Service Center provides for ease of access to support facilities that may be needed in an emergency situation; this would include office equipment and support personnel. Space is available for the minimum PP&L emergency organization staff as well as the NRC and other agency staff that would normally support the activities at the primary EOF.

7.2.2.9.5 Communication

The Backup EOF communication system consists of normal telephone lines capable of reaching outside numbers via the Bell Telephone System and also tied into the PP&L Centrex Allentown Exchange System for toll-free calls to all locations within the PP&L Service Area.

Radio communication with the field monitoring teams will be maintained with portable two-channel 150 mhz VHF radio units. These portable units would also provide a backup means of communication with the Plant Control Room and TSC.

7.2.2.9.6 Data Evaluation

All SPDS data displays available in the EOF will be available in the General Office. These displays will be monitored and the data assessed in the General Offices by the normal General Office emergency staff augmented by the Technical Support Manager. All

pertinent data and evaluations will be transmitted to the backup EOF via telephone.

7.2.2.9.7 Records and Documents

The following up-to-date records are maintained at the Central Division Service Center:

- o Current Emergency Plans for:
 - Pennsylvania Power and Light Company
 - Commonwealth of Pennsylvania
 - Luzerne County Civil Defense
 - Columbia County Emergency Management Agency

The following records will be transported from the primary EOF or the Allentown Emergency Control Center to the Backup EOF upon activation of this facility:

- o Susquehanna SES Off-Site Dose Calculation Manual
- o Emergency Plan Implementing Procedures
- o Radiological Records
- o Off-Site population distribution and evacuation planning

7.3 COUNTY AND STATE EMERGENCY CENTERS

7.3.1 County Emergency Centers

The ten-mile emergency planning zone for the Susquehanna SES includes areas and populations in Luzerne and Columbia Counties. Each of these county jurisdictions has Emergency Operations Centers which meet or exceed the minimum Federal criteria for sufficient space, communications, warning systems, self-sufficiency in supplies and accommodations and radiological protection factor. Both counties maintain full-time employees, providing 24-hour per day coverage at their EOC, to coordinate emergency planning and evaluation. "Hotline" telephone connections between Susquehanna SES and each County EOC ensures prompt notification capability during all Emergency Classifications.

Location of the county Emergency Operations Centers are:

- o Luzerne County Emergency Operations Center
Luzerne County Office of Civil Defense
Luzerne County Court House
Wilkes-Barre, Pennsylvania
- o Columbia County Emergency Operations Center
Columbia County Emergency Management Agency
Columbia County Court House
Bloomsburg, Pennsylvania

7.3.2 State Emergency Center

The State Emergency Operations Center is located at the PEMA headquarters, in the Transportation Building, in Harrisburg. This center is equipped with a reliable communications system which ties all area and county emergency operations centers with PEMA headquarters. During an emergency, representatives from appropriate State agencies will assemble at the State Emergency Operations Center to manage and support the emergency response activities. Facilities are available at the near-site EOF for PEMA personnel. Twenty-four hour per day coverage at their EOC and maintenance of the PEMA call-out duty roster is described in Annex E of the PEMA Disaster Operations Plan.

7.4 ASSESSMENT FACILITIES

The primary emergency assessment facility is the station Control Room. Supplementary and complimentary assessment functions are performed in the EOF and the TSC.

In addition to the systems, equipment and instrumentation for assessing plant status, the following provide for both initial and continuing assessment of emergency conditions.

7.4.1 Radiation Monitoring System

This on-site system, consisting of ARMs, CAMs and process monitors, contributes to personnel protection, equipment monitoring and accident assessment by measuring and recording radiation levels and concentrations of radioactive material at strategically selected locations throughout the station. A listing of these radiological monitors is contained in Enclosure 6 to Appendix D.

7.4.2 Fire Detection Systems

Fire protection at the Susquehanna SES is provided by a complete network of fire suppression and extinguishing systems. These systems and associated fire alarms are activated by a variety of fire and smoke detection devices which are located throughout the plant. These fire detection systems are identified in the Susquehanna SES FSAR and Fire Protection Review Report.

7.4.3 Natural Phenomena Monitors

Monitors are provided for detecting and recording natural phenomena events that could result in plant damage due to ground motion or structural vibration. These monitoring systems are identified in Enclosure 5 to Appendix D.

7.4.4 Environmental Monitoring

The primary functions of the environmental radiological monitoring program are to establish the pre-operational background levels, detect any gradual buildup of long-lived radionuclides, and verify that operation of the plant has no detrimental effect on the health and safety of the public or the environment. Sampling media from the environmental monitoring locations may, however, be utilized to obtain valuable assessment data in the event of an accident involving the release of a significant amount of radioactive material. Enclosure 8 to Appendix D identifies the environmental monitoring systems.

7.4.5 Emergency Monitoring Team Equipment

A listing of equipment provided for use by on-site and off-site radiological monitoring teams to aid in emergency assessment is contained in Appendix D.

7.5 PROTECTIVE FACILITIES

Facilities and designated assembly locations are provided which ensure adequate radiological protection for personnel assigned to emergency duties in the plant, and for the accommodation of other personnel evacuated from areas that may be affected by radiation and/or airborne radioactivity.

7.5.1 Control Room

In addition to serving as the first-line control for emergency situations, the Control Room has the following features which provide protection for personnel who may have emergency or operational duties throughout the course of any emergency:

- 1) Adequate shielding by concrete walls to permit continuous occupancy under severe accident conditions.
- 2) An emergency air supply system, equipped with HEPA and activated charcoal filters.
- 3) Continuous monitoring of radiation levels in the Control Room and throughout the plant by the ARM system, with readout in the Control Room.
- 4) Emergency and essential lighting and power.
- 5) Basic protection equipment for emergency teams (Appendix D), and listings of emergency supplies/equipment, and their locations within the station.
- 6) Communications systems, as described in Section 7.6.

Additional details regarding the design and inherent protective capabilities of the station Control Room are discussed in the Susquehanna SES Units 1 and 2 FSAR.

7.5.2 Station Assembly Areas

Specific locations are designated for assembly and accountability of personnel at the station in the event of an emergency condition classified as an Alert or higher. These areas provide space to accommodate all personnel who may be at the station. They are located on the basis of logical access routes and physical separation from likely areas of radiation and/or airborne radioactivity. The specific locations and the individuals assigned can be found in the Emergency Plan Implementing Procedure for Personnel Assembly and Accountability.

7.5.3 Remote Assembly Areas

Upon declaration of a Site Evacuation, the Emergency Director has the option to send personnel to their homes or to Remote Assembly Areas. These areas are designated for assembly of personnel which can be used to augment the plant staff. The location of these Remote Assembly Areas were selected on the basis of:

- 1) Space availability for all personnel who may be within the exclusion area at the time of an evacuation.
- 2) Assurance of a controlled area, for control of ingress/egress, for contamination surveys and for possible establishment of decontamination stations.

If, based on radiological measurements at the Remote Assembly Areas and/or data from the Control Room, these locations are deemed by the Susquehanna SES Emergency Director to be appropriate, provisions can be made for the movement of evacuees to an unaffected area.

7.6 COMMUNICATIONS SYSTEMS

Communications systems are described in each facility discussion except for the following:

1) Commonwealth/Bell Telephone System

Locations of Extensions include:

- o Control Room
- o Operations Support Center/Technical Support Center
- o Emergency Operations Facility
- o Station Assembly Areas
- o Remote Shutdown Panel
- o Media Operations Center
- o General Office Nuclear Emergency Support Center
- o General Office Engineering Support Center

2) Plant Emergency Alarm System

A plant emergency alarm system provides audible warning of emergency conditions to plant personnel. The system consists of a multi-tone generator, tone selector switch, area selector switch, and message tape recorder. The Emergency Alarm System is integral to the PA System and is powered via the Vital AC UPS. The Plant Emergency Alarm System is tested at least weekly.

7.7 ON-SITE FIRST AID AND MEDICAL FACILITIES

First aid treatment facilities, equipped with normal industrial first aid supplies, are located near the Access Control Area and near the machine shop.

Standard first aid kits are at designated locations throughout the station, including:

- o Control Room
- o Access Control Area
- o Machine Shop
- o Instrument Shop
- o Chemistry Laboratory
- o Health Physics Office
- o North and South Security Gates
- o Technical Support Center
- o Operations Support Center

The first aid kits are checked periodically, in accordance with station procedures, and replenished as necessary.

Stretchers are stored at designated locations including the following areas:

- o Turbine Operating Floor
- o Reactor Building (2 locations)
- o Access Control Area
- o Radwaste Building

7.8 DAMAGE CONTROL EQUIPMENT

Damage control equipment consists of normal and special purpose tools and devices used for maintenance functions throughout the station. Personnel assigned to damage control teams are cognizant of the locations of specific equipment which may be required in an emergency. The Susquehanna SES Emergency Director has access to keys for maintenance tool cribs, shops and other locations where appropriate damage control equipment may be stored.

Heavy duty and specialized equipment, and trained equipment operators, will be provided, if necessary, through the PP&L Recovery Manager.

7.9. INFORMATION SYSTEMS

This section provides conceptual design descriptions for emergency facilities information systems.

7.9.1 Safety Parameter Display System

The purpose of the SPDS is to provide a continuous indication of the safety status of the plant. SPDS data will be presented as described in this section. Its function is to aid the control room and TSC staff in rapidly detecting abnormal operating conditions, by enabling the staff to achieve a timely status assessment without surveying the entire Control Room.

SPDS will include sensors and signals, data acquisition equipment, data preparation equipment, and a data display device. Separate SPDS systems will be provided for Unit 1, Unit 2, and the EOF.

The SPDS will focus on the plant symptom based emergency procedures. The system will track and display the parameters which serve as symptoms for entry to the emergency procedures. This provides an integrated approach to emergency response improvements.

SPDS will consist of three separate software/hardware systems: one serving the control room and the TSC for each unit, the third serving the EOF and General Office. Data for Unit 1 and Unit 2 is collected separately by dedicated Data Acquisition Systems.

7.9.1.1 Data Acquisition

Data acquired for the SPDS will consist of safety related parameters and, therefore, isolation will be provided for that data.

Because the SPDS will contain a small computer dedicated to performing data acquisition, data processing, and data display functions solely for the SPDS, data scan and monitoring of the safety parameters will be independently achieved.

Because of the importance of the display of SPDS safety parameters, the data acquisition hardware will be designed to achieve maximum scanning communication availability. Expandability criteria will also be factored into the data acquisition design.

7.9.1.2 Data Preparation

Once the data has been acquired, it is prepared and then output to the SPDS display. Data from the data acquisition system will be stored in memory and processed before it is presented to personnel. The type of data to be stored is described in Section 7.9.4.

Software will be developed to provide for data acquisition, preparation, and presentation. The data base will include raw data converted to engineering units, validated data, and calculated data, which will be used for trends or time derivatives.

7.9.1.3 Data Presentation

The SPDS display will be responsive to transient conditions and will be sufficient to indicate the plant status. A simple primary display will be designed, using human factors engineering criteria, to give an overall system status, and will include as a minimum the following parameters: Reactivity control, reactor core cooling and heat removal from primary system, reactor coolant system integrity, radioactivity control and containment integrity. The display will be easily accessible and visible. An audible notification will be included in the Control Room to alert personnel of an unsafe operating condition.

7.9.1.4 Availability

A detailed availability determination has not been performed for the SPDS. From previous experience, it is known that systems of this straight forward design should be able to achieve very high availability in the 99% area above cold shutdown, and 80% area during cold shutdown. During the course of the continuing design and implementation, availability will remain one of the primary goals. The design will be tested analytically with availability calculations and modified to improve availability where that is possible.

The availability of the system will also be enhanced by a comprehensive maintenance program and with built-in facilities to aid in that maintenance activity. In addition to achieving high availability through a sound design and through selecting quality equipment, availability will be further enhanced by minimizing the mean time to repair.

7.9.2 The Plant Computer System

The Plant Computer System (PCS) lends itself to utilization in emergency data configuration for the following reasons:

- o It is a recent-generation plant process computer.
- o It contains CRT graphic and trending capabilities.
- o It provides for historical data recording and retrieval.

- o It has flexibility to permit interfacing to additional I/O equipment.
- o It has a proven high degree of reliability.
- o It is capable of scanning and processing all of the data needed in the EOF and TSC that is not provided in SPDS.
- o It is located in a secure area within the control structure.

7.9.2.1 Data Acquisition

The data acquisition employed by the Plant Computer System (PCS) contains most parameters required by the ERF. These parameters are defined in Section 7.9.3. The ERF data acquired by the PCS undergoes the normal validity and error checking applied to all PCS inputs. Isolation will be applied to all safety-related signals.

7.9.2.2 Data Preparation

Display formats needed by the ERF will be generated and stored within the Plant Computer System, using the existing format generators in the PCS.

The system to manage the data will be designed such that input/output processing overhead will be minimized.

Proven system and application software has been developed which performs data display and system security. The data base includes different forms of data such as raw data, data converted to engineering units, data checked on a real-time basis, and various types of calculated data.

The system determines the data that is displayed and the available output format.

User interaction with the system will also be determined by the software. Although identical, the I/O processes for data display in the TSC will function independently of those for EOF.

7.9.2.3 Data Presentation

The TSC will contain two CRTs tied to the Plant Computer System which will provide for display functions in the TSC. Procedures and methods for keyboard call-up and error indication of TSC functions will be identical to those in use in the control room. Two SPDS CRTs (separate from the PCS console) will be provided in the TSC but will be tied to the SPDS, which is independent of the Plant Computer System.

The EOF will contain two CRTs tied to the Plant Computer System which will provide for display functions in the EOF. The display console in the EOF will be functionally identical to that in the TSC, and therefore, EOF I/O request procedures will be identical to those of the TSC.

Data will be presented in formats which will be easy to understand and interpret. Variables not in a normal condition will be presented with an indication of that condition. Alarms will be represented in a fashion similar to the control room computer by using similar color-coding techniques. Output formats will be designed according to human factors engineering criteria, and will include pattern and coding techniques.

7.9.2.4 Availability

System availability of 98% is attainable provided software development is conducted on the Unit 2 system. Once fuel load on Unit 2 begins software development could reduce availability to 97%. These figures are based on analytical calculations and represent the minimum availability figures that can be guaranteed.

7.9.3 Emergency Response Data

This section describes the data available from either the Plant Process Computer System or SPDS.

7.9.3.1 Process Computer System

The Process Computer monitors most of the critical plant parameters. All parameters essential for performance of TSC and EOF functions are available in the Process Computer System or SPDS. As additional instrumentation is added to the control room, the decision will be made on a case-by-case basis as to whether that data provided should be available in the TSC or EOF. If the decision is made that a parameter is essential for performance of TSC or EOF functions that parameter will be made available on the Process Computer System or SPDS.

7.9.3.2 Data in the SPDS

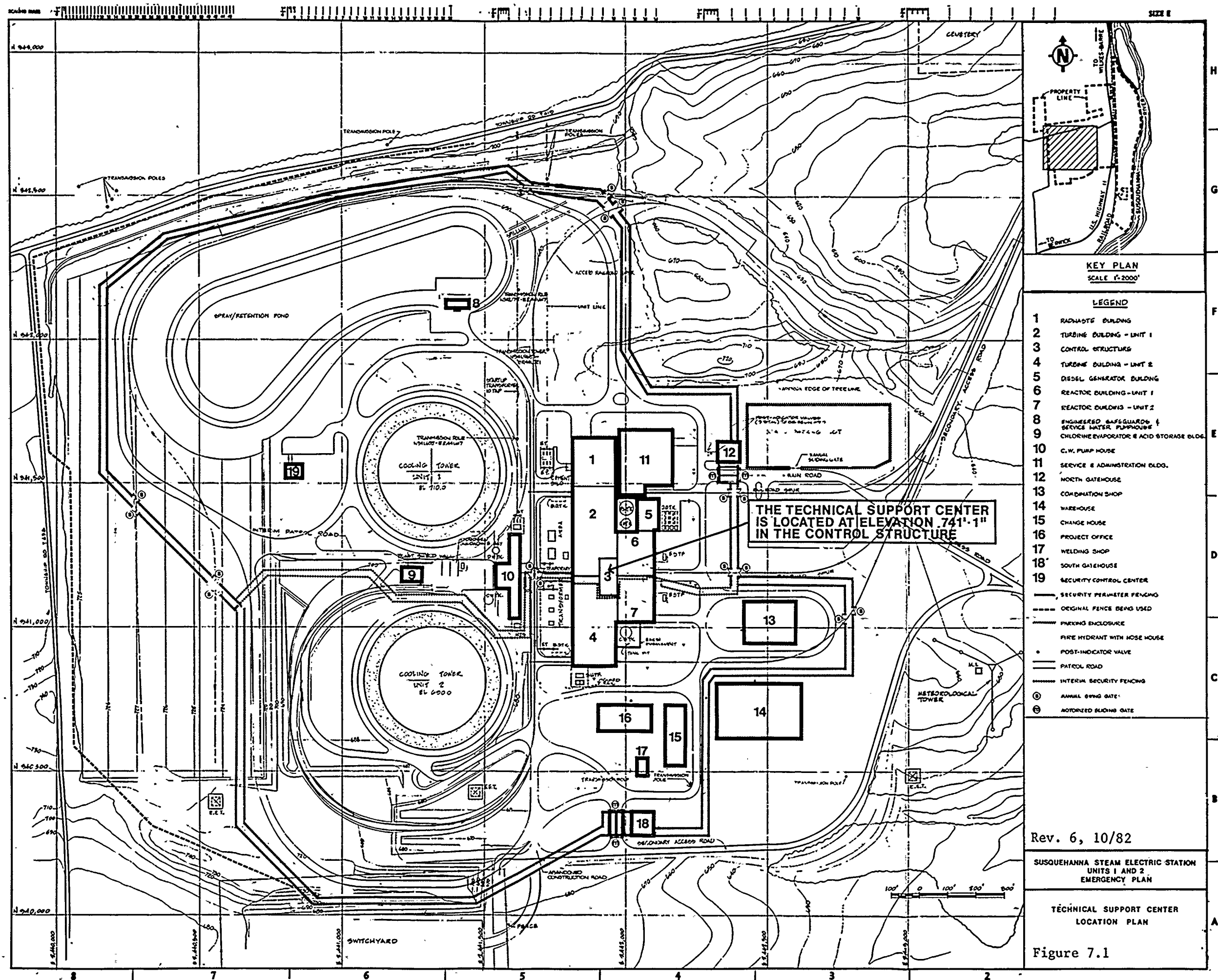
SPDS data will be displayed in the control room, TSC and EOF. The SPDS safety parameter set primary variables are specified in Table 7-1.

The Susquehanna SES emergency procedures were developed from the BWR Emergency Procedure Guidelines (EPG's). The EPG's were developed by GE and BWR Owner's Group to comply with Task Action Plan Item I.C.1 item 3 as clarified by NUREG-0737. The Owner's Group performed a comprehensive study to identify a minimum set of EPG's which provide coverage of plant safety functions and PSAR Chapter 15 events. The NRC has evaluated the EPG's and found them acceptable for trial implementation. Table 7-1 presents a list of parameters which have been derived from the plant emergency procedures and will form the safety parameter set for the SPDS.

Where available, inputs will be taken from redundant sensors. This will allow SPDS to validate critical parameters on a real-time basis. The accuracy of the data acquired will be consistent

with accuracy needed to perform the various emergency functions. The time resolution of each sensor signal will depend on the potential transient behavior of the variable being measured, and the scan rate for each variable will be determined accordingly. One sample per second will be the fastest that any given variable will be scanned.

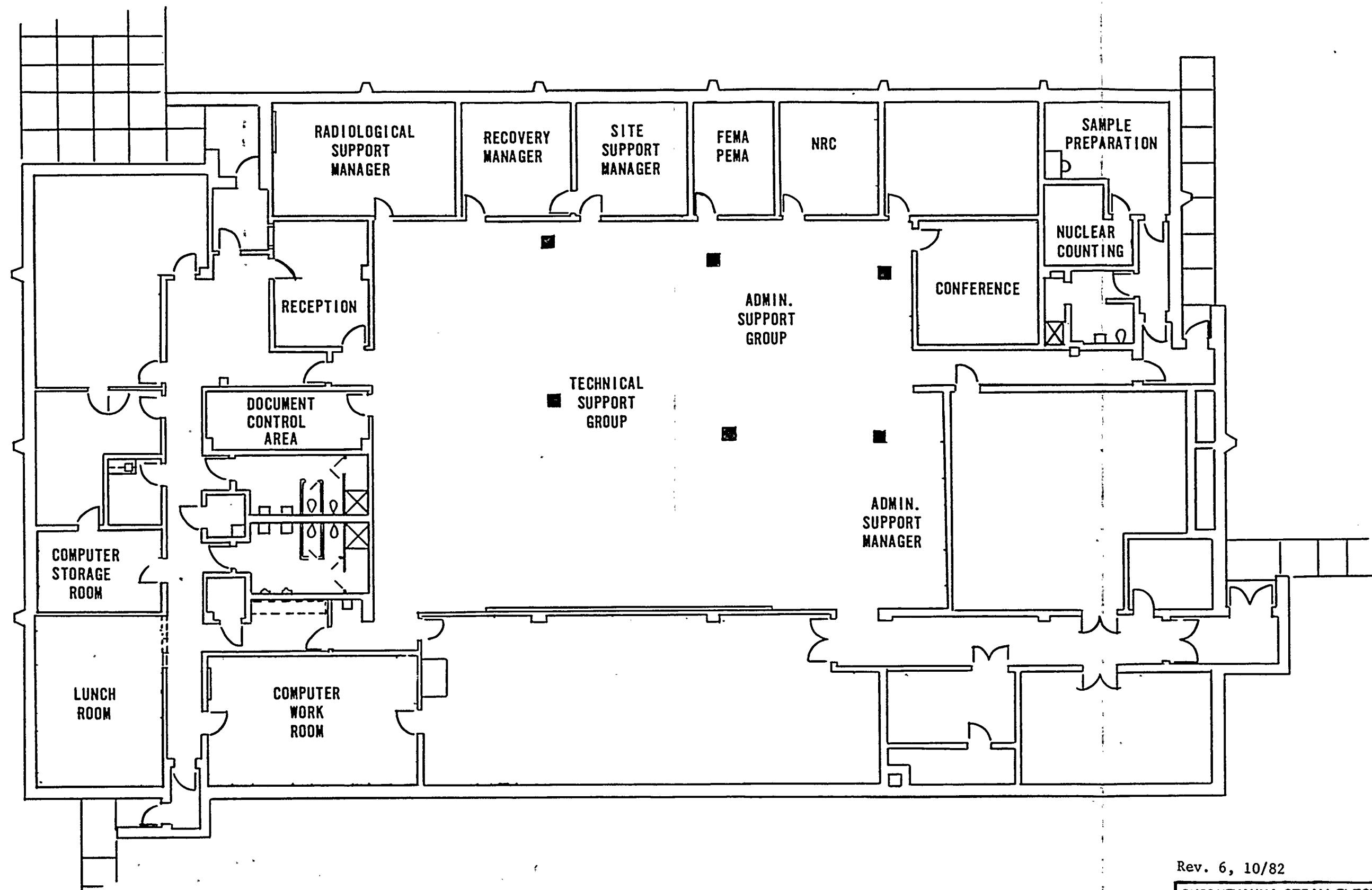
All signal interfaces to safety systems will utilize isolation devices to prevent interference, degradation, or damage to any element of those safety systems as specified in 10 CFR 50 General Design Criteria 22, 23, and 24, and in IEEE Standard 279-1971 Sec. 4.7, "Control and Protection System Interaction."



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SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 AND 2
EMERGENCY PLAN

TECHNICAL SUPPORT CENTER
LOCATION PLAN



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SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 AND 2
EMERGENCY PLAN

EMERGENCY OPERATIONS FACILITY
FLOOR PLAN

Figure 7.6

8.0 MAINTAINING EMERGENCY PREPAREDNESS

A concept of in-depth preparedness is employed regarding the Susquehanna SES emergency program. This concept is emphasized in the training program and in preparedness drills and exercises. Personnel shall be trained to provide an in-depth response capability for required actions in an emergency situation. This section includes the means to achieve and maintain preparedness and to ensure maintenance of an effective emergency program.

8.1 ORGANIZATIONAL PREPAREDNESS

8.1.1 Training

Emergency training will include:

- 1) All unescorted personnel entering or working within the Susquehanna SES Controlled Zone will receive as a minimum, the following instruction.
 - o Orientation in the content of the Susquehanna SES Emergency Plan and the Emergency Plan Implementing Procedures.
 - o Orientation in the implementation of the Susquehanna SES Emergency Plan, including the assignment of duties and responsibilities, location of emergency centers and assembly areas, and the location of emergency equipment and supplies, where applicable.
 - o Orientation in individual employee responsibilities with regard to the use of emergency facilities and equipment, familiarization with station alarms and personnel response, and the use of applicable station communications systems.
 - o Orientation in instructions and requirements associated with personnel accountability, evacuation, and radiation exposure criteria.
 - o Orientation in radiation protection with emphasis on the principles and use of protective clothing, equipment, and personnel dosimetry.
- 2) Those individuals working on the Susquehanna SES site, inside the protected area, but outside the Controlled Zone, will be provided with instructions on warning signals, assembly areas and evacuation routes.
- 3) Personnel assigned to the PP&L emergency organization with specific Emergency Plan duties and responsibilities shall receive specialized training for

their respective assignments. Table 8.1 delineates which personnel will receive specialized training, the type of training and the required frequency of such training.

- 4) The Pennsylvania Emergency Management Agency develops, conducts, coordinates, and promotes a training program throughout the State and assists the counties in developing training policy for disaster operational readiness. The county and local Civil Defense Directors are responsible for planning and conducting disaster preparedness training of respective emergency response personnel. PP&L will work closely with PEMA and the county Civil Defense Directors in coordinating training programs. In addition, orientation training for State and county agencies and personnel involved in Susquehanna SES emergency planning efforts will be made available by PP&L.
- 5) The civil defense organizations listed below will be invited, on at least an annual basis, to participate in a training program at the Susquehanna SES. The program will relate the importance of effective planning for emergency situations and interfaces between the PP&L emergency organizations and the off-site (i.e., State, county, and Federal) emergency organizations. The program will also include a review of the Susquehanna SES Emergency Plan and appropriate Emergency Implementing Procedures, with particular emphasis given to the classification of emergencies; emergency action levels; reporting requirements; assessment, protective, and corrective actions; and communications networks.
 - o Pennsylvania Emergency Management Agency
 - o Luzerne County Civil Defense
 - o Columbia County Emergency Management Agency
 - o Ten Mile EPZ Municipal/Township Emergency Management Coordinators
- 6) At least annually, the Department of Environmental Resources/Bureau of Radiation Protection will be invited to participate in a training program at the Susquehanna SES. The program will, as does the program for the civil defense organizations, relate the importance of effective planning for emergency situations, the interface between the PP&L emergency organizations and the offsite (i.e., State, county, and Federal) emergency organizations. The program will include a review of the Susquehanna SES Emergency Plan and appropriate Emergency Plan Implementing Procedures, with particular emphasis given to the classification of emergencies; emergency action levels; reporting requirements; assessment, protective, and corrective actions; and communications networks. In addition, specific review of dose calculations/projections,

protective actions guides, and reportable information will also be conducted.

- 7) The State Police will, on at least an annual basis, be invited to participate in a training program on appropriate Emergency Plan Implementing Procedures, with emphasis on the classification of emergencies, communications, and specific areas of responsibility.
- 8) PP&L will provide orientation and training to local off-site support organizations as specified in respective letters of agreement and as required to ensure a high state of emergency preparedness and response capability between these organizations and the Susquehanna SES emergency organization. These local organizations and personnel who may provide on-site emergency assistance will be encouraged to become familiar with the Susquehanna SES (including the physical plant layout), key station personnel, and will be invited to attend Emergency Plan orientation and training courses conducted by or for PP&L. Such training will be provided on at least an annual basis to the appropriate organizations and personnel as follows:

The local fire and rescue companies will be invited to participate in a training program that will include:

- o Interface with the Site Security Force during emergencies
- o Basic Health physics indoctrination and training
- o Susquehanna SES facility layout
- o On-site fire protection system equipment (permanent and portable)
- o Differences between on-site firefighting equipment and fire company supplied equipment
- o Communications system
- o Review of appropriate sections of the Susquehanna Emergency Plan and Emergency Plan Implementing Procedures
- o The on-site emergency organization with specific emphasis on the interface between the Susquehanna SES fire brigade and fire company personnel

The local medical support organizations and personnel will be invited to participate in a training program that will include as applicable:

- o Interface with the Site Security Force during emergencies
- o Basic health physics indoctrination and training
- o Susquehanna SES facility layout

8.1.2 Drills and Exercises

Periodic drills and exercises will be conducted in order to test the state of emergency preparedness of all participating personnel, organizations, and agencies. Each drill or exercise will be conducted to: (1) ensure that the participants are familiar with their respective duties and responsibilities, (2) verify the adequacy of the Susquehanna SES Emergency Plan and the methods used in the Emergency Plan Implementing Procedures, (3) test communications networks and systems, (4) check the availability of emergency supplies and equipment, (5) verify the operability of emergency equipment, and (6) verify the adequacy of the interrelationship with off-site agency plans.

Drills and exercises will be conducted to simulate actual emergency conditions as closely as possible and may be scheduled such that more than one drill or exercise can be conducted simultaneously. Drill scenarios will be prepared that involve participation of several emergency teams and all or specific parts of the on-site and off-site emergency organizations including varying degrees of participation of State, county and Federal agencies and organizations and local off-site support personnel and organizations. The off-site emergency response organizations and agencies will be notified at least thirty days in advance of the scheduled date of the drill or exercise.

Recommendations for revisions to the Susquehanna SES Emergency Plan and the Emergency Plan Implementing Procedures and/or the upgrading of emergency equipment and supplies, as a result of a drill or exercise, will be reviewed, acted on accordingly and tracked to completion. Records will be maintained for each major drill. Drills will be conducted as follows:

1) Medical Emergency Drill

- o At least one drill per calendar year shall be conducted. The drill will involve the participation of some, if not all, of the local medical support personnel and organizations (e.g., physician, ambulance service, hospital, etc.) and will involve cases of contaminated/injured personnel and/or possible radiation overexposure.

2) Fire Emergency Drill

- o At least one drill shall be conducted per calendar quarter.
- o At least one drill in the calendar year shall involve the participation of a local fire department.

3) Radiation Emergency Drill

- o A major drill appropriate to a Site or General Emergency shall be conducted at least once per calendar year.
- o The drill shall provide for the coordination with and participation by off-site emergency response personnel, organizations, and agencies including those of State and county governments.
- o At least once every five years a joint exercise appropriate to a Site or General Emergency that involves Federal, State, and county emergency response personnel, organizations, and agencies will be conducted. The scope of the exercise will test the respective emergency plans to the extent which is reasonably achievable. The degree of public participation in this exercise shall be determined by the appropriate State and local agencies.

4) Communications Drill

- o Telephone and Radio Communications Drills will be conducted with participation of PEMA, DER/BRP, LCCD, CEMA, and NRC on a monthly basis.
- o Annually, a full-scale drill will be conducted with the off-site monitoring team radio communications network. This may be held in conjunction with the annual Radiation Emergency Drill.
- o Annually, a full-scale test and verification of the Public Notification System will be conducted.

5) Radiological Environmental Monitoring Drills

An annual drill requiring the collection and analysis of environmental sample media (e.g., water, vegetation, soil and air) will be conducted. Provisions for record-keeping and communications will be monitored.

6) Health Physics Drills

Semi-annual drills involving response to and analysis of simulated elevated airborne and legend samples and direct radiation measurements will be conducted.

Annually, a drill including the usage of the post-accident sampling system will be conducted. Simulated elevated samples will be used during the conduct of this drill.

Following the conduct of drills, critiques will be held to clearly identify deficiencies and action plans for resolution of same. All agencies, county, State and Federal, who participated in said drills will be invited to participate in the critiques. Procedures will be established to assure the timely implementation of corrective actions.

8.1.3 Overall Coordination of Nuclear Emergency Planning

The Manager-Nuclear Support is responsible for the overall coordination of all nuclear emergency planning activities. He will be assisted in this effort by: the Superintendent of Plant - Susquehanna SSES for activities involving the Susquehanna Site, the Manager - Nuclear Training for on-site and off-site training, the Special Assistant to the President - Susquehanna for communications with the public and news media, the Manager - Nuclear Administration for assuring the operational readiness of the General Office Nuclear Emergency Support Center and General Office Engineering Support Center, and the Manager - Nuclear Quality Assurance for audits of Emergency Planning procedures.

Within the framework of this overall coordination task, the Manager - Nuclear Support is typically responsible for:

- o the preparation, coordination of review and up-date of the SSES Emergency Plan.
- o the preparation, coordination of review and up-date of Emergency Plan Implementing Procedures relating of off-site activities.
- o the conduct of all emergency plan drills and exercises, excluding fire and security drills (which are the responsibility of the Superintendent of Plant - SSES).
- o defining the scope of PP&L initiated emergency plan training for PP&L emergency plan participants and those off-site agencies supporting PP&L emergency planning activities.
- o the initial training of emergency response personnel.
- o the on-going training designed to intergrate the efforts personnel assigned to the Emergency Operations Facility and Media Operations Center.
- o coordinating the emergency planning interface between PP&L, the Pennsylvania Emergency Management Agency, the Pennsylvania Department of Environmental Resources Bureau of Radiological Protection, the Federal Emergency Management Agency and the Nuclear Regulatory Commission.

- o establishing and maintaining the proper inter-relationship between Municipal, County, State and PP&L Emergency Plans.
- o coordinating the maintenance and testing of the 10 mile Emergency Planning Zone siren warning system.
- o assuring the operational readiness (for emergency response) of the Emergency Operations Facility and the Back-up Emergency Operations Facility.
- o establishing on-going efforts aimed at program improvement and utilization of advanced communications techniques, as appropriate.

8.2 REVIEW AND UPDATING

Reviewing and updating the Susquehanna SES Emergency Plan and Emergency Plan Implementing Procedures are primarily the responsibility of the Manager-Nuclear Support. The Susquehanna Review Committee (SRC) is responsible to ensure independent and documented reviews of the Susquehanna SES emergency preparedness program. This shall include an annual review and audit of emergency drills, exercises, procedures and capabilities.

The Manager-Nuclear Support presents recommendations to the Superintendent of Plant - Susquehanna for changing, updating and improving the Plan, which may result from exercises, drills, changes in operating procedures or conditions, or changes in regulatory or other requirements. The PORC reviews and submits appropriate changes to the SRC.

Holders of official copies of the Susquehanna SES Emergency Plan shall be apprised of revisions and shall maintain their copies current. Organizations or groups having assigned responsibilities under the Plan, but who are not holders of official copies, shall be apprised of applicable changes in a timely manner by the Manager-Nuclear Support.

NOTE

Revised pages shall be dated and marked to show where changes have been made.

At least annually a status report including a listing of changes will be prepared.

The Manager-Nuclear Support shall ensure that letters of agreement from all participating organizations are updated and renewed at least every two years.

8.3 MAINTENANCE AND INVENTORY OF EMERGENCY EQUIPMENT AND SUPPLIES

The Manager-Nuclear Support is responsible for planning and scheduling the quarterly inventory and inspection of designated emergency equipment and supplies. Telephone numbers listed in the Emergency Plan Implementing Procedures will be reviewed and updated quarterly. He will ensure that personnel are assigned to perform these activities.

Designated emergency equipment and supplies and their storage locations will be listed in Emergency Implementing Procedures. Such equipment and supplies will be maintained in accordance with approved Susquehanna SES procedures. Equipment, supplies, and parts having limited shelf-lives will be checked and replaced as necessary.

Any deficiencies found during the inventory and inspection will be either cleared immediately or documented for corrective action. A report of each inventory and inspection, including documented deficiencies, will be prepared and submitted to the Manager-Nuclear Support. The Manager-Nuclear Support will ensure that identified deficiencies are corrected in a timely manner. In addition to any other requirements relating to communications, the Manager-Nuclear Support shall develop with each agency having dedicated communications links provisions for testing of those links on a monthly basis.

8.4 PUBLIC EDUCATION AND INFORMATION

Under the direction of the Supervisor, Nuclear Emergency Planning, the following methods will be utilized to ensure that emergency planning education and information is provided and transmitted to residents and transients in the Emergency Planning Zone:

- o A full-page ad in the local newspapers, summarizing the actions to be taken by residents, will be published on an annual basis.
- o Printed instructions and evacuation maps will be distributed to EPZ residents on at least an annual basis. These instructions will include educational information on radiation and instructions to contact the Special Assistant to the President - Susquehanna for additional information.
- o In cooperation with PEMA, LCCD and CEMA, attempts will be made to place printed instructions for public alerting and evacuation in local 10-mile EPZ telephone directories.

- o Printed instructions and evacuation maps will be distributed to motels, hotels, and recreation areas on at least an annual basis.
- o Conduct programs annually to acquaint the news media with the emergency plan, information concerning radiation, and points of contact for release of public information in the event of an emergency.
- o Educational training programs on emergency planning will be made available to the general public and groups through the PP&L Nuclear Speakers Bureau.

Under the direction of the Special Assistant to the President-Susquehanna:

In the event of an actual emergency, initial public statements by PP&L will be via pre-drafted news releases contained in the public information implementing procedures. These releases will provide initial information as to the nature of the emergency and the status of the plant. Subsequent news releases will be coordinated with appropriate authorities.

As defined in this Plan and the Public Information Emergency Procedures, the Public Information Manager, during an emergency, is the responsible single point of contact for all media contact concerning the emergency at the plant. The Public Information Manager will at all times have direct communication with the Emergency Director or Recovery Manager, ensuring accurate and pertinent information is available to the media and offsite authorities at all times.

TABLE 8.1
TRAINING OF SUSQUEHANNA SES EMERGENCY RESPONSE PERSONNEL

<u>Personnel Category</u>	<u>Involved Personnel</u>	<u>Initial Training and Periodic Retraining</u>
1. Emergency Directors	Superintendent of Plant; Asst. Supt. of Plant; Supervisor of Operations; Shift Supervisors	<p>Initial training will consist of instruction on the scope and functioning of the Emergency Plan and Implementing Procedures.</p> <p>Retraining will be on an annual basis and will include a review of the basic plan with any changes since the last training period.</p>
2. Personnel responsible for accident assessment and/or accident management	Emergency Director; Emergency Coordinators; and alternates	<p>Initial training will consist of instruction on the Susquehanna SES Emergency Plan and Implementing Procedures germane to their particular assessment/management function.</p> <p>Retraining will be on an annual basis and will include a review of the basic plan with any changes since the last training period.</p>
3. Radiation Monitoring Teams	Health Physics Supervision; Licensed Operations Personnel; Non-Licensed Operators; Chemistry Technicians; Health Physics Technicians; Susquehanna and Central Division Personnel	<p>Licensed personnel, Health Physics Technicians and Division Personnel receive substantial training in radiation monitoring.</p> <p>Initial training for personnel performing radiation monitoring duties will consist of instruction in the on-site and off-site radiation monitoring Implementing Procedures, as appropriate. The Health Physics procedures utilized for normal operating conditions will be reviewed, as appropriate.</p> <p>Retraining will be on an annual basis with hand-on instrumentation usage with emphasis on interpretation of results.</p>

TABLE 8.1
TRAINING OF SUSQUEHANNA SES EMERGENCY RESPONSE PERSONNEL

<u>Personnel Category</u>	<u>Involved Personnel</u>	<u>Initial Training and Periodic Retraining</u>
4. Fire Brigade	Assistant Unit Supervisor; Non-Licensed Operators; Security Officers.	Training and retraining are outlined in the Susquehanna SES FSAR.
5. Damage Control Teams	Non-Licensed Operators; Maintenance Supervision; Maintenance Personnel; Health Physics Technicians; I&C Supervision; I&C Personnel	Repair and Damage Control are considered a normal part of the job functions of the listed personnel. Initial training for emergency planning purposes will include responsibilities during a radiological emergency condition, availability of damage control equipment, use of communications systems, and interfaces with other emergency teams. Retraining will consist of a review of the above topics and will be conducted annually.
6. First Aid and Rescue Teams	Non-Licensed Operators; Health Physics Technicians; Security Officers	Each member of the First Aid and Rescue Team will receive the Standard Red Cross Multimedia First Aid Course. In addition, each team member will also be instructed on the availability of on-site medical treatment supplies and equipment; communication system, radiological hazards; and interfaces and responsibilities with local medical support personnel (e.g., ambulance and hospital personnel).
7. Fire Support Personnel	Local Fire Companies	Training and retraining requirements are outlined in Sections 8.1.1, para. 8), of the Susquehanna SES Emergency Plan.

TABLE 8.1
TRAINING OF SUSQUEHANNA SES EMERGENCY RESPONSE PERSONNEL

<u>Personnel Category</u>	<u>Involved Personnel</u>	<u>Initial Training and Periodic Retraining</u>
8. Medical Support Personnel	Berwick Hospital Staff; Ambulance Companies; Radiation Management Corporation; Geisinger Medical Center Staff	<p>Radiation Management Corporation has extensive experience in the treatment of contaminated/injured personnel. Training shall include individual attendance at appropriate seminars and training courses.</p> <p>Initial training of the Berwick Hospital staff, Geisinger Medical Center staff, and Ambulance Corps shall be conducted by RMC and the Nuclear Emergency Planning Group. This instruction shall include treatment and handling of contaminated/injured personnel, communication systems, radiological hazards and interfaces with Susquehanna Security and Operations Procedures. Retraining shall be conducted on an annual basis.</p>
9. Corporate Support Personnel	Corporate Management Personnel; including Nuclear Fuels, Nuclear Plant Engineering and Nuclear Support	<p>Initial training shall consist of a review of the Emergency Plan and appropriate Implementing Procedures with specific emphasis on PP&L interface with government agencies and methods of communication.</p> <p>Retraining shall be conducted on an annual basis.</p>
10. Security Personnel	Supervisor of Security; Security Training Supervisor; Shift Supervisor-Security; Asst. Shift Supervisor-Security; Security Officers/Controllers	<p>Training and retraining requirements are outlined in the Susquehanna SES Training and Qualification Plan.</p>
11. Public Information Personnel	Special Office of the President; Information Services Personnel	<p>Initial training will consist of instruction of scope, responsibilities and functioning of the Emergency Plan and Public Information Procedures.</p>

9.0 RESTORATION

The Susquehanna SES and PP&L Off-Site Support emergency organizations shall continue to provide appropriate emergency response functions until such time as the emergency has been terminated or the PP&L Corporate Management Committee (CMC) has approved the implementation of a long-range restoration organization. The Vice President-Nuclear Operations shall request that the CMC establish a restoration organization when the following guidelines have been met:

- o In-plant systems are stable, adequate core cooling established and contingency systems and plans available.
- o In-plant radiation levels are stable or are decreasing with time.
- o Releases of radioactive material to the environment are under control or have ceased.
- o Any fire, flooding or similar emergency conditions are under control or have ceased.

Although planning for restoration will vary according to the nature of the specific emergency situation, a long-term restoration organization that is general in nature has been defined. The restoration organization shall be a project-type organization with their major activities conducted from the near-site EOP. This organization is depicted in Figure 9.1 and major responsibilities are defined below.

- o Restoration Manager - A designated officer or senior manager from PP&L who has the requisite authority, management ability, and technical knowledge to manage the Susquehanna SES restoration operations.
- o Plant Operations Manager - A designated manager from PP&L with the requisite authority, plant operating experience, and qualifications to control plant operations including security.
- o Technical Support Manager - A designated manager from PP&L with the requisite authority, nuclear experience, and technical expertise to manage a technical group in support of plant operations and restoration.
- o Manager of Radiological Control and Waste Management - A designated manager who has the requisite authority, nuclear experience and technical expertise to manage the radioactive waste and radiological control aspects of the restoration operations.

- o Construction Manager - A designated manager who has the requisite authority and in-plant nuclear construction management experience to coordinate the activities of PP&L, NSSS supplier and construction forces on proposed plant modifications or other construction support required for restoration
- o Advisory Support Function - Advisory support consists of senior representatives of the NSSS supplier, the NRC, and special consultants as necessary who would meet with the Restoration Manager and his staff as required.
- o Scheduling/Planning Manager - A designated manager to coordinate and expedite plans and schedules for the Restoration Manager.
- o Administration and Logistics Manager - A designated manager who is responsible for providing administrative, logistic, communications and personnel support for the restoration operation.
- o Public Information Manager - A designated manager who has the requisite authority and media operations experience to manage the public relations aspects of restoration operations.

During restoration operations, the radiation exposure limits of 10 CFR 20 shall apply. Compliance with those limits shall be the responsibility of the Restoration Manager via the applicable Health Physics organization at the time of restoration.

At the time of declaring that an emergency has entered the restoration phase, the Restoration Manager shall be responsible for providing notification to all applicable agencies (e.g., Federal, State, and county agencies, etc.) that the emergency has shifted to a restoration phase.

Restoration actions that plan for, or may result in, radioactive release will be evaluated by the Restoration Manager and his staff as far in advance of the event as is possible. Such events and data pertaining to the release will be reported to the appropriate off-site emergency response organizations and agencies prior to initiating release.

Termination from an emergency condition will be through joint evaluation by the organizations involved. In the case of a severe emergency involving off-site consequences, this would include Recovery Manager, DER/BRP, and NRC.

The Offsite Support Organization described in Section 5.3 will remain in control until such time as the CMC approves the long-term restoration operations. All Control Room

activities will be conducted by the normal operating shift. Should events occur during the restoration that are deemed an emergency, all emergency centers and staffs will be reactivated as appropriate.

APPENDIX A
LETTERS OF AGREEMENT

Letters of Agreement

Letters of Agreement have been established with those State and Local agencies as well as local and industry support service groups that are responsible as outlined in this Emergency Plan to ensure a high level of emergency preparedness for the Susquehanna SES. These agreements have been established to assure all parties are aware of their role, responsibility and commitment to Susquehanna SES and the public in the vicinity of the Susquehanna plant during any emergency condition that could arise.

The following list of agencies and support groups have signed letters of agreement that are renewed every two years and are maintained by the agency/support group and Pennsylvania Power and Light Co.:

Agency/Support Group

Pennsylvania Emergency Management Agency

Pennsylvania Department of Environmental Resources/
Bureau of Radiological Protection

Pennsylvania State Police - Wyoming Branch

Pennsylvania State Police - Shickshinny Barracks

Luzerne County Commissioners

Columbia Country Commissioners

Berwick Hospital

Geisinger Medical Center

Shickshinny Volunteer Ambulance Assoc.

Nescopeck Volunteer Ambulance Assoc.

Hobbie Volunteer Fire Co. - Ambulance

Pond Hill-Lily Lake Fire Co. - Ambulance

East Berwick Hose Co. #2

Salem Township Fire Co. #1

Shickshinny Fire Department

Agency/Support_Group

Northwest Area School District - Environmental
Sample Team Personnel

Radiation Management Corporation

Safety Light Corporation

Institute of Nuclear Power Operations

Bechtel Power Corporation

These letters of agreement provide for:

- o Coordination of planning efforts by State and local agencies; industry support groups; fire ambulance and hospital support services; and Pennsylvania Power and Light Co.
- o Appropriate emergency response to assure employee and public safety during an emergency condition at Susquehanna SES.
- o Mutual notification capabilities.
- o Appropriate training and exercising of emergency response capabilities.
- o Fire, first aid and medical support.
- o Environmental monitoring and assessment support.
- o Other emergency support services as deemed necessary by the emergency condition.

Maintenance of these letters of agreement is the responsibility of the Manager-Nuclear Support. Copies are maintained and controlled within the Susquehanna Records Management System to assure appropriate review and updating to insure an effective level of emergency preparedness is maintained by all responsible support agencies and groups.

APPENDIX C

SSES EMERGENCY PLAN
IMPLEMENTING PROCEDURES (TYPICAL)

APPENDIX C

SSES EMERGENCY PLAN IMPLEMENTING PROCEDURES (TYPICAL)

Emergency Classification

Emergency Management Notification

Emergency Management Responsibilities

Search/Rescue/First Aid

Personnel Assembly and Accountability

Natural Occurrences

Emergency Off-Site Dose Calculations

In-Plant, Emergency Monitoring

Security Contingency

On-site Emergency Monitoring

Off-site Emergency Monitoring Teams

Personnel and Vehicle Containment
Surveys

Emergency Access

Damage Control

Toxic Material

Emergency Call-in and Communications

Management of Off-site Emergency
Monitoring

Site Emergency Evacuation

Activation of Restoration Organization

Dowgrade and Termination

Activation of TSC

Activation of Emergency Operations
Facility and Transfer of Control
From the Technical Support Center

Public Information Emergency
Procedures

General Office Activation

Dose Assessment and Protective Actions

Reactor Building Sample Station
Emergency Sampling

Emergency Vent Monitor Sampling

Reconstruction and Accident Close out

Fire Emergencies

Chemistry Lab Emergency Preparation

Pass Small Volume Liquid Sample

Emergency Environmental Sampling

Pass 10-ML Gas Sampling

Pass Iodine/Particulate Sample

Pass large Liquid/Dissolved
Gas Sample

Enclosure Five to Appendix D

Natural Phenomena Monitors

<u>Instrument System</u>	<u>Individual Detectors</u>	<u>Function</u>
Meteorological Instrumentation	wind speed indicators wind direction indicators temperature sensors	monitor wind speed monitor wind direction monitor temperature
Hydrological Instrumentation	rain gauge	monitor precipitation
Seismic Instrumentation	Accelerometers/recorders	Measure and record equipment and building acceleration-Unit 1
	accelerographs	record equipment and piping acceleration-Unit 2
	Seismic Switches	receive signals from accelerometers
	analyzer/recorder	measure and record Unit 1 building acceleration and annunciate location to control room

Enclosure Eight to Appendix D

Environmental Monitoring Systems

<u>Instrument System</u>	<u>Individual Detectors</u>	<u>Purpose</u>
1. Radiological Environ- mental Monitoring System (for details, see the SSES Radio- logical Environmental Monitoring Program)	off-site fixed air sampling stations direct radiation monitor stations	sample particulates sample iodine measure gamma dose
2. Analytical Facilities	near-site radiation chemistry laboratory off-site environ- mental contractor	equipped for radiolog- ical and chemical analysis of environ- mental and bioassay samples equipped as above, and including cap- ability for very low-level activity analysis

Enclosure Ten to Appendix D

Emergency Classification Dependent Instrumentation

Off-gas Pre-Treatment Rad Monitor
Off-gas Post-Treatment Rad Monitor
Containment Post Accident Rad Monitor
Main Steam Line Rad Monitors
Containment Pressure Indicator
Reactor Coolant Isolation Valve Position Indicator
ECCS System Indicator
Rx Water Level Indicator
Drywell Floor drain pump A&B Monitors
Reactor vessel isolation valve position indicator
Neutron Monitoring Instrumentation
Core Display Indicators
Reactor Protection System Trip Indicator
SBCC Pump Pressure Indicator
Value C31-Food Position Indicator
1Foo4 A&B Exposure Value Position Indicators
Rx Coolant Temp. Indicators
Rx Fitted Power Indicators
Vent Stack Monitoring System Indications
Seismic Instrumentation Indicators
River level Indicators
Safety Relief Valve Position Indicator
ADS Indicators
Su xFormer 10 and 20 Indicators
Diesel Generator Indicators
250 VDC Main Distribution Panel Buses
125 VDC Main Distribution Panel Buses
ARM's
High Seal Leak Flow Alarm
RHR Flow Indicator
Turbine Stop and Turbine Bypass Valve Position
Suppression Pool Temp Indicator
Rx Pressure Indicator
MSIV Position Indicator
MSL Flow Indicator
MSL Tunnel Temp Indicator
MSL Rad Monitor
HPCI or RCIC Steamline Temp Indicator
HPCI or RCIC Eqst. Temp Indicator
HPCI or RCIC Turbine Exhaust Diaphragm Pressure Indicator
Steam Isolation Valve HV-F002, HV-F003 Position indicators

Enclosure Seventeen to Appendix D

Typical General Office Nuclear Emergency Support
Center Emergency Equipment and Supplies

Plant Technical Specifications
Final Safety Analysis Report
System Description Manuals
Steam Tables
Steam Tables

APPENDIX F

NUREG 0654 INITIATING Conditions
not Included on Table 4.1

NUREG 0654 Initiating Conditions
Not included on Table 4.1

<u>NUREG 0654 Reference</u>	<u>Initiating Condition</u>	<u>Basis for not including</u>
Example 3C-Unusual Event	Failed Fuel Monitor (PWR) indicates increase greater than 0.1% equivalent fuel failures within 30 minutes	Not Applicable to BWR's
Example 13b-Unusual Event	50 year flood or low Water, Tsunami, hurricane surge, seiche	Susquehanna design precludes flood (see FSAR section 2.4.3) Low Water is first triggered at Alert Level
Example 17-Unusual Event	Rapid depressurization of PWR secondary side	Not applicable to BWR's
Example 1C-Alert	Failed Fuel monitor (PWR) Indicates increase greater 1% fuel failures within 30 minutes or 5% total fuel failures	Not applicable to BWRs
Example 2-Alert	Rapid gross failure of one steam generator tube with loss of offsite power	Not applicable
Example 3-Alert	Rapid failure of steam generator tubes	Not applicable to BWR's
Example 9-Alert	Coolant pump seizure heading to fuel failure	Coolant pump seizure is not a serious enough incident in BWR to be classified as an emergency
Example 3-Site Area Emergency	Rapid failure of steam generator tubes with loss of offsite power	Not applicable to BWRs
Example 5-Site Area Emergency	PWR steam line break greater than 50 gpm primary to secondary leakage and indication of fuel damage	Not Applicable to BWRs

NUREG 0654 Initiating Conditions
Not included on Table 4.1

<u>NUREG 0654 Reference</u>	<u>Initiatin Condition</u>	<u>Basis for not including</u>
Example 2-General Emergency	Loss of containment, clad failure and high potential for loss of primary coolant boundary	Scenario too unlikely because events unrelated
Example 5a through General Emergency	Example PWR sequences	Not applicable to BWRs
Example 7- General Emergency	Any major internal or external events which could cause massive common damage to plant systems resulting in any of the above	Not unique covered by other initiating conditions

