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SECTION 1

DEFINITIONS

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Section 1

DEFINITIONS

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1. DEFINITIONS

The terms defined in this section are those which are used in special context in this document and/or are unique to the Beaver Valley Power Station (BVPS).

.1 **ACCOUNTABILITY** -- Process to ascertain the whereabouts of all personnel within the plant protected area fence. Process is completed through the use of a computerized access security system.

.2 **ALERT** -- See definition 1.13

.3 **ASSESSMENT ACTIONS** -- Those actions taken during or after an accident to obtain and process information that is necessary to make decisions to implement specific emergency measures.

.4 **ASSESSMENT FACILITY** -- A facility for evaluation of information, including instrument data, to assess the severity and scope of an emergency condition.

.5 **BEAVER VALLEY EMERGENCY RESPONSE SYSTEM** -- The Beaver Valley Emergency Response System (BVERS) is a computer aided Voice Mail System with teleconferencing capability to be utilized for ERO activation.

.6 **BEAVER VALLEY SITE** -- The entire owner-controlled area. Includes the BVPS Unit 1, BVPS Unit 2 and the Emergency Response Facility.

.7 **CONTROL ROOM** -- Area from which plant systems are operated and monitored.

.8 **CORRECTIVE ACTIONS** -- Those emergency measures taken to terminate an emergency situation at or near the source of the problem.

.9 **DOSE PROJECTION** -- A calculated estimate of the potential dose to individuals at a given location, normally offsite; as determined from the quantity of radioactive material released and the appropriate meteorological transport and diffusion parameters.

.10 **DRILL** -- A pre-planned training activity in which the participants are "walked" or "talked" through one or more procedures, or aspects of the Emergency Preparedness Plan.

.11 **EMERGENCY ACTIONS** -- A collective term encompassing the Assessment, Corrective, and Protective Actions taken during the course of an emergency.

.12 **EMERGENCY ACTION LEVELS (EAL)** -- Operational, radiological or other parameters which, when exceeded, require the implementation of portions of this Plan. EALs for various emergency conditions are specified in Section 4.

.13 **EMERGENCY CONDITION** -- An occurrence, or a combination of occurrences, which falls into one of the following classifications:

- **UNUSUAL EVENT** -- Unusual events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of systems occurs.

- **ALERT** -- An event is in progress or has occurred which involves an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to a small fraction of the EPA Protective Action Guideline exposure levels.

- **SITE AREA EMERGENCY** -- An event is in progress or has occurred which involves actual or likely major failures of plant functions needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels except near the site boundary.

- **GENERAL EMERGENCY** -- An event is in progress or has occurred which involves actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

.14 **EMERGENCY COORDINATORS** -- Designated BVPS staff members responsible for coordinating specific emergency organization functions. These coordinating positions are:

- (Control Room) Operations Coordinator
- TSC Operations Coordinator
- EOF Operations Coordinator
- Communications and Records Coordinator
- Technical Support Coordinator
- Operations Support Center Coordinator

- Radiological Controls Coordinator
- Maintenance Coordinator
- Environmental Assessment and Dose Projection Coordinator
- Engineering Coordinator
- Security Coordinator
- Chemistry Coordinator
- Environmental Coordinator
- Computer Coordinator
- Operations Support Center Health Physics Coordinator[C15]
- Nuclear Communications/Onsite Coordinator

.15 **EMERGENCY MANAGERS** – Designated BVPS staff members responsible for coordinating specific emergency organization functions. These positions, primarily located in the EOF, are activated upon classification of a Site Area or General Emergency and include:

- Emergency Recovery Manager
- Support Services Manager
- Nuclear Communications Manager
- Offsite Agency Liaison

.16 **EMERGENCY DIRECTOR** -- The BVPS individual responsible for direction of onsite activities during any emergency at BVPS, and both onsite and offsite activities during Unusual Events and Alert Emergencies. The Emergency Director is the only individual authorized to declare an emergency condition, authorize emergency personnel radiation exposures greater than 10CFR20; and/or direct the issuance of KI.

.17 **EMERGENCY IMPLEMENTING PROCEDURES** -- The detailed procedures which carry out the guidance of this Plan.

.18 **EMERGENCY OPERATING PROCEDURES (EOP)** -- Those procedures utilized by the station operations staff in responding to Control Room instrumentation alarms or indications (i.e., assessment and corrective actions).

.19 **EMERGENCY OPERATIONS CENTER (EOC)** -- Designated Federal, State, and County (i.e., Emergency or disaster services/management agencies) headquarters/facilities, especially designed and equipped for the purpose of exercising effective coordination and control for disaster operations carried out within their jurisdiction.

.20 **NEAR-SITE EMERGENCY OPERATIONS FACILITY (EOF)** -- The near-site facility designated for providing overall coordination of the utility's emergency response and coordination with offsite response agencies of the various jurisdictions for the protection of the general public. Space is provided for Federal, State, and local liaison officials. An offsite EOF is provided as an alternate facility.

.21 **EMERGENCY PLANNING ZONE** -- There are two Emergency Planning Zones (EPZ). The first is an area approximately 10 miles in radius around BVPS, for which emergency planning consideration of the plume exposure pathway has been given in order to ensure that prompt and effective actions can and will be taken to protect the public in the event of an accident. The second is an area approximately 50 miles in radius around BVPS for which emergency planning consideration of the ingestion pathway has been given.

.22 **EMERGENCY/RECOVERY MANAGER** -- Upon classification of a Site Area or General Emergency, the Emergency/Recovery Manager assumes responsibility and authority for overall direction and coordination of the BVPS emergency response, with primary responsibility for coordination of offsite activities (monitoring, logistics, interagency liaison). When activated, the Emergency/Recovery Manager is the only individual authorized to make recommendations of offsite protective actions to offsite response agencies.

.23 **EMERGENCY RESPONSE FACILITY (ERF)** -- The near-site facility provided by BVPS. Incorporates the Technical Support Center, the Emergency Operations Facility, the Dosimetry Area, Counting Room and other facilities.

.24 **EXERCISE** -- A realistic, pre-planned simulation of an accident, designed and coordinated in such a manner that the response of the emergency organization and other station personnel closely approximates the response to an actual incident. An exercise may involve participation of offsite organizations.

.25 **GENERAL EMERGENCY** -- See definition 1.13

.26 **GROUND RELEASE** -- Release of radioactive effluents from the facility via the Reactor Building and supplementary leak collection system vent (located on top of the Reactor Building), the ventilation vent (located on top of the Auxiliary Building), the process vent (located on the Cooling Tower), or any other release pathway.

.27 **JOINT PUBLIC INFORMATION CENTER (JPIC)** -- The designated location from which news releases, press conferences, and other media interfacing can be provided.

.28 **LOCAL AREA EVACUATION** -- Evacuation of personnel from localized affected areas within the station.

.29 **OFFSITE** -- Any area outside of the BVPS property boundary surrounding the Beaver Valley site.

.30 **ONSITE** -- See Definition 1.6

.31 **OPERATIONS SUPPORT CENTER (OSC)** -- The designated location for assembly of on-duty and relief operations, health physics and maintenance support personnel.[C15]

.32 **PROCESS VENT** -- The effluent release path by which gaseous radioactive wastes are released following processing. The release point is located at the top of the cooling tower. In dose projection and accident analyses, this release pathway is considered a ground release.

.33 **PRIMARY ASSEMBLY AREA** -- An area designated for the assembly of specific groups of individuals for accountability and/or in preparation for a plant evacuation within the Protected Area Fence.

.34 **PROTECTED AREA** -- The area within the station security fence designated to implement the requirements of 10 CFR 73.

.35 **PROTECTIVE ACTIONS** -- Those emergency measures taken after an uncontrolled release of radioactive material, for the purpose of preventing or minimizing radiological exposures.

.36 **PROTECTIVE ACTION GUIDES (PAG)** -- Projected radiological dose rate or dose commitment values to individuals in the general population that warrant protective action following a release of radioactive material.

.37 **RADIOLOGICAL EMERGENCY RESPONSE PLAN (RERP)** -- Detailed incident response plans developed by the State of Pennsylvania and its agencies and County and Municipal Emergency Management agencies in coordination with the Pennsylvania Emergency Management Agency (PEMA) and the fixed nuclear facility.

.38 **RADIOLOGICALLY RESTRICTED AREA** -- An area within a Restricted Area that is posted and controlled due to the presence or potential presence of radiation, contamination or airborne radioactivity or the presence of radioactive material.

.39 **RECOVERY ACTIONS** -- Those actions taken after the emergency to restore the station as nearly as possible to its pre-emergency conditions.

.40 **REMOTE ASSEMBLY AREA** -- A designated area (or areas), outside the site, for the assembly of evacuated plant personnel during a Site Evacuation.

.41 **SITE ASSEMBLY** -- Process of gathering all personnel from areas within the protected area to primary assembly areas.

.42 **SITE AREA EMERGENCY** -- See definition 1.13.

.43 **SITE EVACUATION** -- Evacuation of all non-essential personnel within the Beaver Valley site.

.44 **TECHNICAL SUPPORT CENTER (TSC)** -- A designated location where plant management coordination of emergency response is performed and where various Licencee, Federal, and vendor engineering disciplines can analyze the conditions within the reactor core during and after an accident to provide technical assessment of the accident and corrective action recommendations to the Emergency Director.

.45 **UNAFFECTED AREA** -- Any area or location which is known to be not significantly affected by radiation levels or other hazardous conditions.

.46 **UNUSUAL EVENT** -- See definition 1.13.

ABBREVIATIONS

AOP	Abnormal Operating Procedure
BCEMA	Beaver County Emergency Management Agency
BVERS	Beaver Valley Emergency Response System
BVPS	Beaver Valley Power Station
CCEMA	Columbiana County Emergency Management Agency
CR	Control Room
CSF	Critical Safety Function
DBA	Design Basis Accident
DEP/BRP	Department of Environmental Protection/Bureau of Radiation Protection (Pennsylvania)
DOE	Department of Energy (US)
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System (ECCS)
ED	Emergency Director
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EOP	Emergency Operating Procedure
EPZ	Emergency Planning Zone
ERDS	Emergency Response Data System
ERF	Emergency Response Facility
ERFCS	Emergency Response Facility Computer System
E/RM	Emergency/Recovery Manager

ESF	Engineered Safety Feature
FENOC	First Energy Nuclear Operating Company
FEMA	Federal Emergency Management Agency
FRMAP	Federal Radiation Monitoring and Assessment Plan
FSAR	Final Safety Analysis Report
HCOES	Hancock County Office of Emergency Services
INPO	Institute for Nuclear Power Operations
IPC	Inplant Process Computer
JPIC	Joint Public Information Center
LEARN	Law Enforcement Activity Radio Network
LCO	Limiting Condition for Operations
LOCA	Loss of Coolant Accident
MIDAS	Meteorological Information and Dose Assessment System
NAWAS	National Warning System
NRC	Nuclear Regulatory Commission (US)
OEMA	Ohio Emergency Management Agency
ORC	Offsite Review Committee
OSC	Operations Support Center, or Onsite Safety Committee
PEMA	Pennsylvania Emergency Management Agency
RCCA	Rod Cluster Control Assembly
RCS	Reactor Coolant System
SPING	Special Particulate, Iodine, Noble Gas Monitoring System (Unit 1)
TOP	Temporary Operating Procedure
T/S	Technical Specification
TSC	Technical Support Center

TID	Technical Information Document
TSC	Technical Support Center
WRGM	Wide Range Gas Monitor (Unit 2)
WVOES	West Virginia Office of Emergency Services

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SECTION 2

SCOPE AND APPLICABILITY

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Section 2

SCOPE AND APPLICABILITY

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2.0 SCOPE AND APPLICABILITY

The Beaver Valley Power Station includes two 880 MWe (Gross) pressurized water reactor electrical generating units. The station is located in Shippingport Borough, Beaver County, in western Pennsylvania, about 25 miles northwest of Pittsburgh, Pennsylvania and approximately 15 miles northwest of The Pittsburgh International Airport. This Emergency Preparedness Plan applies to both BVPS Unit 1 and BVPS Unit 2.

The BVPS Emergency Preparedness Plan provides guidance for coping with both onsite and offsite emergency situations. It ranges in scope from relatively minor occurrences involving small releases of radioactive material, up to and including a major nuclear incident having significant offsite radiological consequences. This Plan, together with the interrelated State and county emergency plans, provides detailed arrangements for taking emergency measures out to a radius of at least 10 miles from BVPS. Interrelationships of this Plan with procedures, and other plans and emergency arrangements include:

.1 BVPS Operating Procedures provide detailed instructions for the recognition and immediate response to abnormal events which are indicated by plant instrumentation. These procedures identify, in particular, initiating events which could lead to a degradation in the level of safety of the plant, and includes action statements referring the operator to the Emergency Preparedness Plan, as appropriate, which provides guidance to activate the Plan, if required. These procedures are periodically reviewed to ensure compatibility with the Emergency Preparedness Plan and Emergency Implementing Procedures.

.2 Emergency Implementing Procedures provide detailed instructions to Site personnel for implementing the provisions of this Plan. These Emergency Implementing Procedures interrelate with the Emergency Operating Procedures and describe subsequent and supplementary actions to be taken in response to emergency conditions. A listing of the Emergency Implementing Procedures is contained in Appendix C.

.3 The BVPS Radiation Protection Manual and the Radiation Protection Procedures establish the radiation protection program at the Beaver Valley Power Station by providing criteria, guidelines, and instructions for maintaining the radiation exposure of Site personnel As Low As Reasonably Achievable (ALARA) and within Federal standards (10CFR20). Specifically, the BVPS Radiation Protection Program provides for exposure control, exposure monitoring, access control, identifying radiological areas and materials, respiratory protection, contamination control, and radioactive material handling. The provisions of this radiation protection program shall be in force during emergency operations except as specifically modified by provisions in this Plan or in Emergency Implementing Procedures.

.4 The elements of response to offsite emergency conditions are contained in the emergency plans and Emergency Operating Procedures of the responsible offsite emergency organizations. The 10-mile Emergency Planning Zone surrounding BVPS encompasses three states -- Pennsylvania, Ohio, and West Virginia -- and three counties -- Beaver County, PA; Columbiana County, OH; and Hancock County, WVA. Each county has developed their own Resource Manual which is updated periodically and referenced as needed. Continuing liaison with the emergency organizations of these jurisdictions ensures compatibility and proper interrelationship with this Plan.

- Pennsylvania Emergency Management Agency (PEMA)
- Commonwealth of Pennsylvania Emergency Operations Plan Annex E, Radiological Emergency Response to Nuclear Power Plant Incidents
- Department of Environmental Protection/Bureau of Radiation Protection (DEP/BRP)
- Bureau of Radiation Protection Plan for Nuclear Generating Station Incidents (Included as part of PEMA Plan.)
- Ohio Emergency Management Agency (OEMA)
- State of Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities
- West Virginia Office of Emergency Services (WVOES)

  West Virginia Emergency Disaster Plan, Volume Four Response/Radiological Beaver Valley Power Station

- Beaver County Emergency Management Agency (BCEMA)

  Beaver County Emergency Operations Plan, Annex E, Beaver Valley Power Station

- Columbiana County Emergency Management Agency (CCEMA)

  Beaver Valley Site Emergency Response Plan

- Hancock County Office of Emergency Services (HCOES)

  Beaver Valley Site Emergency Response Plan

.5 The Coordination and liaison with offsite emergency organizations include formal agreements that individual organizations will perform their respective emergency functions in response to requests from BVPS. These Letters of Agreements will remain in effect until changed by either party. Copies of letters of such agreements are on file in the Emergency Preparedness Section.

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FIG. 2.1
MAP OF BVPS EMERGENCY PLANNING ZONE (EPZ) 0-10 MILES

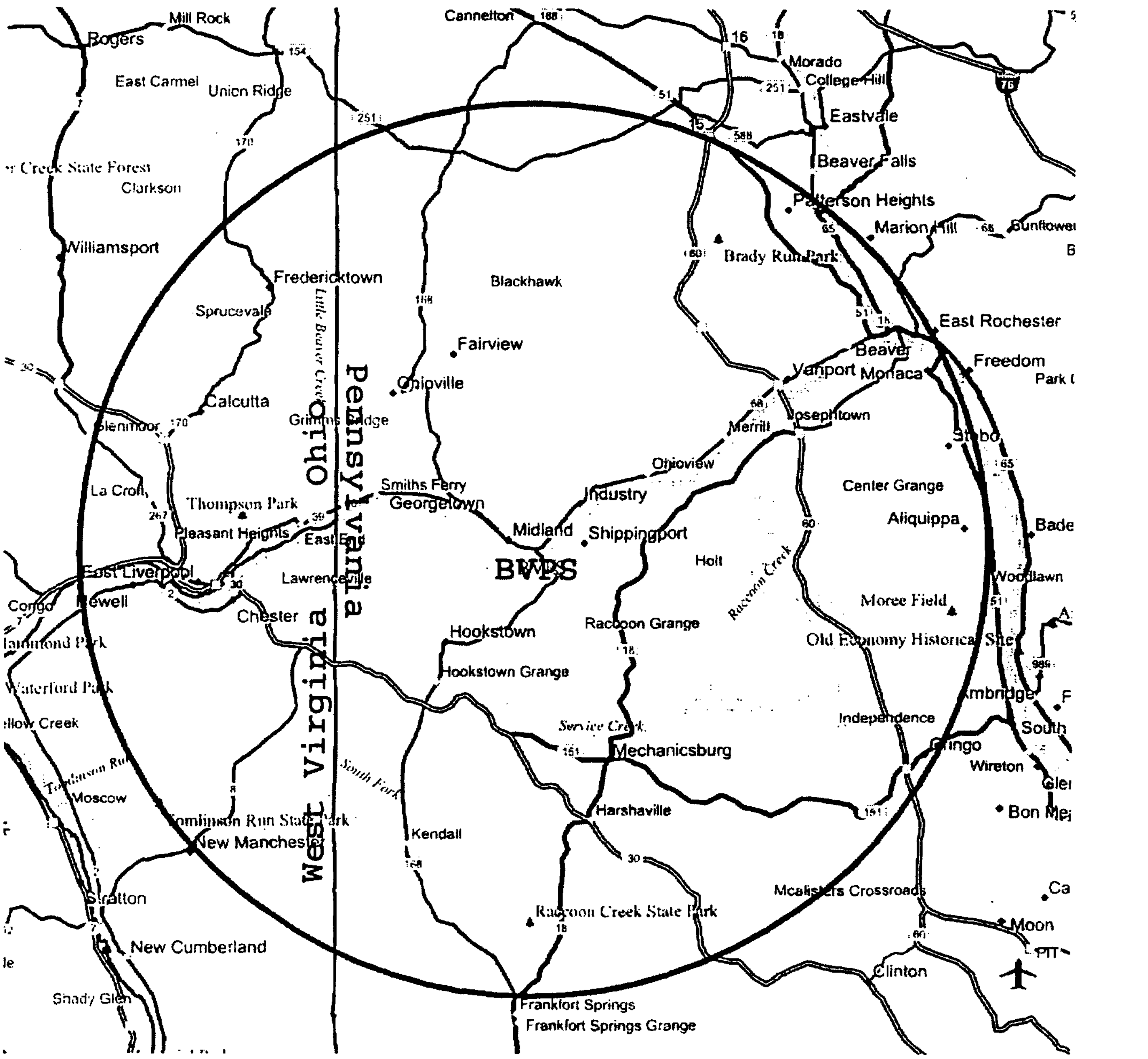
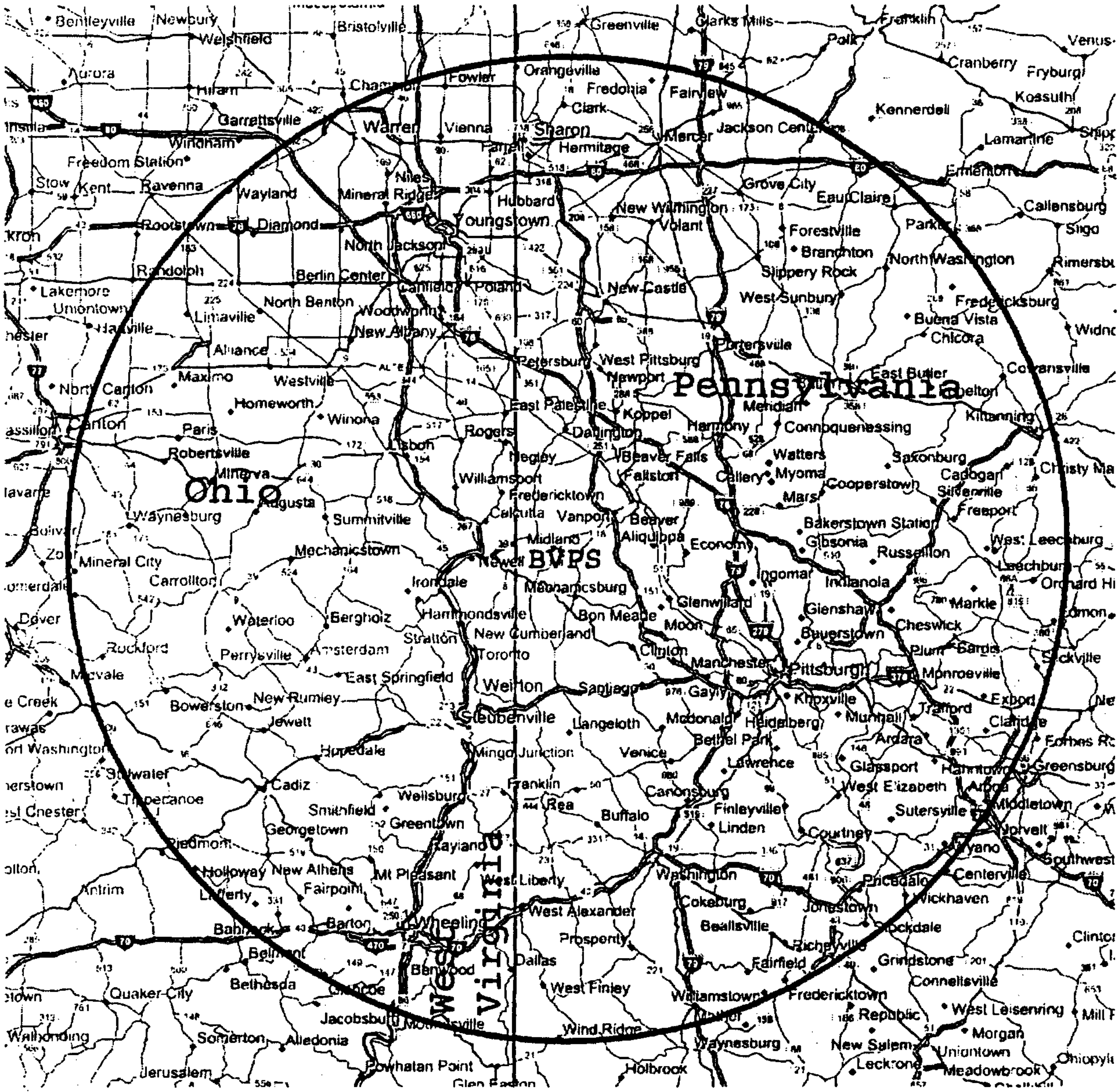


FIG. 2.2
MAP OF BVPS EMERGENCY PLANNING ZONE (EPZ)
0-50 MILES



SECTION 3

SUMMARY

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Section 3

SUMMARY OF EMERGENCY PREPAREDNESS PLAN

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3.0 SUMMARY OF EMERGENCY PREPAREDNESS PLAN

This Beaver Valley Power Station Emergency Preparedness Plan describes the total preparedness program established, implemented, and coordinated to ensure the capability and readiness for coping with and mitigating both onsite and offsite consequences of radiological emergencies. The Plan covers the spectrum of emergencies from minor localized incidents to major emergencies involving protective measures by offsite response organizations. Included are guidelines for immediate response, assessment of emergency situations, defined action criteria, and delineation of support functions. Emergency Implementing Procedures provide detailed information for individuals who may be involved with specific emergency response functions. The Emergency Preparedness Plan and Implementing Procedures shall be reviewed annually.

This Emergency Preparedness Plan provides for a graded scale of response for distinct classifications of emergency conditions, action within those classifications, and criteria for escalation to a more severe classification. This classification system is compatible with the classification scheme used by the emergency response agencies in all three risk Counties and risk States. This Plan uses four categories; Unusual Event, Alert, Site Area Emergency and General Emergency. The categories and the initiating events within each category are described in detail in Section 4 of this Plan.

3.1 ONSITE EMERGENCY ORGANIZATION

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

The BVPS Emergency Director (initially the on-duty Shift Manager, and ultimately designated personnel with Operations background), assisted by designated emergency coordinators, provides control and direction for the response of utility personnel to the emergency. The Emergency Director, as a member of the normal corporate structure, receives guidance and support from First Energy Nuclear Operating Company Management.

The BVPS emergency organization is augmented by personnel from the Nuclear Power Division and other FENOC corporate divisions at the Emergency Operations Facility for Site Area Emergency or General Emergency. BVPS personnel and support personnel are responsible for onsite emergency actions and limited offsite activities, such as offsite radiological surveillance. The Joint Public Information Center (JPIC) begins activation at the Alert level and may be activated, if necessary. The relationship of the BVPS organization to the overall emergency response effort is illustrated in Table 3.1, and explained in more detail in Section 5.

3.2 OFFSITE EMERGENCY ORGANIZATIONS

The total emergency program includes the support of County, State and Federal emergency organizations. Detailed provisions are made for implementing protective measures against direct radiation and inhalation of radioactive material for members of the public within a radius of at least 10 miles from BVPS. Additional preventive measures may be implemented beyond that distance to preclude ingestion pathway exposures. The relationship of each organization to the whole emergency response effort is illustrated in Table 3.1 and explained in more detail in Section 5 of the Plan.

Specific arrangements and agreements are made with local offsite support organizations to provide onsite services including:

- Fire and rescue
- Emergency medical transportation
- Hospital medical treatment

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

.1 Beaver County Emergency Management Agency (BCEMA) -- the lead emergency response coordinating agency within Beaver County, responsible for implementing offsite action upon either direct notification from BVPS or from the Pennsylvania Emergency Management Agency.

.2 Columbiana County Emergency Management Agency (CCEMA) -- the agency having the same emergency response capabilities and responsibilities within Columbiana County, Ohio, as BCEMA does within Beaver County.

.3 Hancock County Office of Emergency Services (HCOES) -- the agency having the same emergency response capabilities and responsibilities within Hancock County, West Virginia, as BCEMA does within Beaver County.

.4 Pennsylvania Emergency Management Agency (PEMA) -- the lead State-level agency responsible for ensuring availability of Commonwealth government emergency services, personnel and equipment. Responsible for ingestion pathway protective measures in the Pennsylvania portion of the ingestion pathway planning zone.

.5 Department of Environmental Protection/Bureau of Radiation Protection (DEP/BRP) -- the State-level agency responsible to provide guidance and recommendations for specific offsite protective measures in Pennsylvania. DEP/BRP interfaces with corresponding agencies in Ohio and West Virginia.

.6 Ohio Emergency Management Agency (OEMA) -- the lead State-level agency responsible for ensuring availability of Ohio state government emergency services, personnel, and equipment. Responsible for ingestion pathway protective measures in the Ohio portion of the ingestion pathway planning zone.

.7 West Virginia Office of Emergency Services (WVOES) -- The lead State-level agency responsible for ensuring availability of West Virginia state government emergency services, personnel, and equipment. Responsible for ingestion pathway protective measures in the West Virginia portion of the ingestion pathway planning zone.

.8 US Nuclear Regulatory Commission (NRC) -- the Federal agency responsible for verifying that appropriate utility emergency plans have been implemented and for conducting investigative activities associated with a radiological emergency.

.9 US Department of Energy (DOE) -- the Federal agency responsible to provide assistance to State and local governments in emergency action essential for the control of immediate hazards to public health and safety. DOE is lead coordinating agency for the Federal Radiation Monitoring and Assessment Plan (FRMAP), which provides the framework through which participating Federal agencies coordinate their emergency radiological monitoring and assessment activities with those of the State and local governments.

.10 Federal Emergency Management Agency (FEMA) -- the Federal agency responsible for reviewing State and local emergency plans and making recommendations to the Nuclear Regulatory Commission.

3.3 EMERGENCY MEASURES

The mechanisms through which this Plan provides for the proper response to emergency conditions at BVPS are described below.

3.3.1 Initiation

The first Site individual who becomes aware of an emergency condition ensures that notification is made and details are provided to the appropriate 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 Emergency Operations Procedures and/or other station operating procedures (such as shutting down or operating certain plant equipment or systems). The Shift Manager assumes the role of BVPS Emergency Director, and continues in that capacity until relieved by a designated alternate. The Unit Supervisor assumes responsibility for plant control functions while the Shift Manager is acting as Emergency Director.

At the declaration of an Alert or at the discretion of the On-shift Emergency Director, the Technical Support Center will be activated. The Emergency Director responsibilities are then transferred to the Technical Support Center Emergency Director.

If the emergency is classified as either a Site Area Emergency or General Emergency, the Emergency Operations Facility (EOF) will be activated. When activated, the responsibility and authority of the Emergency Director is vested in the Emergency/Recovery Manager, who is located at the EOF. Although the Emergency/Recovery Manager has responsibility and authority for the direction and coordination of the overall BVPS response, the functions performed by the Emergency/Recovery Manager are primarily related to offsite activities, while the Emergency Director is primarily concerned with onsite activities.

3.3.2 Assessment

The BVPS Emergency Director performs assessment action relative to the situation in accordance with Section 6 of this Plan and the Emergency Implementing Procedures listed in Appendix C. This assessment and concurrent classification of the emergency are based on available information such as the initial verbal communication, Control Room instrumentation, dose projection data, and follow-up monitoring or other supportive information. The assessment is updated as new information becomes available, with appropriate change in the emergency classification as may be warranted.

3.3.3 Notification

The BVPS Emergency Director ensures the activation and alerting of both onsite and offsite emergency personnel and organizations. Offsite notification methods for various emergency conditions are discussed in Section 6, and are summarized as follows:

- Requests for assistance, such as fire fighting and medical transportation, from local offsite support groups should be made by telephone through the Beaver County Emergency Services Center.

- Notification to offsite 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 an immediate emergency basis. These notifications will be made to BCEMA, HCOES, CCEMA, OEMA, PEMA, WVOES within 15 minutes and to the NRC within one hour.

- Notification to the above listed offsite authorities shall commence immediately upon the declaration of an Unusual Event, an Alert, a Site Area Emergency or a General Emergency. Section 4 describes the time limitations between the first indication of an event and declaration of the applicable emergency condition. Notifications to BCEMA, PEMA, CCEMA, OEMA, HCOES and WVOES are made via regular Bell telephone serving as the primary method of communications. Radio communication links to each of the risk counties provides an alternate method to the telephone connections. Immediate notifications to the NRC are made via the Emergency Telephone System (ETS).

3.3.4 Corrective Actions

Onsite corrective actions may proceed concurrently with assessment, and are described in detail for situations within each emergency classification in the emergency Implementing Procedures listed in Appendix C and in applicable Emergency Operating Procedures.

3.3.5 Onsite Protective Actions

Onsite protective actions, including criteria and methods, are described in Section 6. 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 increasingly larger areas of evacuation commensurate with existing conditions, summarized as follows:

- A Local Evacuation is the immediate response of individuals in an area where a local area radiation monitor and/or continuous air monitor alarms, toxic/flammable gas, or other similar condition exists.
- A Site Assembly may be implemented by the BVPS Emergency Director if the affected area is larger than appropriate for a Local Evacuation, and up to the entire Protected Area.
- A Site Evacuation, when implemented by the BVPS Emergency Director, encompasses the entire Beaver Valley site.

Other onsite protective actions include the use of respiratory protection equipment, anti-contamination clothing, thyroid prophylaxis, and the administration of an effective radiological controls program.

3.3.6 Offsite Protective Actions

Offsite protective actions are addressed in Section 6. Such actions are primarily the responsibility of State and local emergency organizations, but may be based on recommendations by the BVPS Emergency Director (Emergency Recovery Manager for Site Area Emergency or General Emergency). These offsite organizations may invoke any emergency actions which they deem appropriate, according to assessment of the individual situation, and at any level of radioactive material release or projected offsite dose. The key element which ensures compatibility of this Plan and offsite emergency plans is the provision for initial notification and continuing status reports to the State and local agencies, conveying current release and dose projection information. A description of the communications systems which ensure the capability of prompt notification and continuing transmittal of vital information is contained in Section 7.

3.3.7 Recovery

Provisions are made for establishing a recovery organization which is commensurate with the scope and magnitude of an emergency condition. These provisions include the assignment of qualified individuals to fill recovery organization positions as may be appropriate. Termination from a severe emergency involving offsite consequences will be through joint evaluation of the utility, the three States involved and the NRC.

3.4 EMERGENCY FACILITIES

Appropriate emergency facilities and equipment are provided to facilitate implementation of this Plan. These facilities and equipment are described in Section 7, and include, assessment capability, communications capability, provision for a Technical Support Center, Operations Support Center and an Emergency Operations Facility.

3.5 MAINTAINING EMERGENCY PREPAREDNESS

A concept of in-depth preparedness is employed regarding this Plan. This concept is emphasized in the training program and in preparedness drills and exercises. Site personnel are trained to provide an in-depth response capability for required actions in an emergency situation. Similarly, members of the population within the Emergency Planning Zone are informed of their response to an emergency at Beaver Valley. Also, emergency equipment is routinely inspected and inventoried to ensure operability and availability in the event of an emergency. Section 8 describes the provisions to maintain preparedness.

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TABLE 3.1
RESPONSIBILITY MATRIX

	RECO OF EMER.	INIT ASSCS	CLASS EMER	NOT. OFF AUTH	NOT STAT PER	NOT CORP SUPP	ACT ONSTE ERO	NOT AGEN PER	ACT OFF ERO	NOT PUB	PROVD PUB INST	CONT ASSCS	DOSE PROJ	INST OFF MONT	ONSITE MONT	CONT OFF MONT	ONSTE CORR ACTS	ONSTE PROT ACTS	RECM OFF PROT ACTS	IMPL OFF PROT ACTS	CONT DISEM DATA TO PUB	CONT DISEM TO AGNY	COORD FED OFF RESP	REL ONSTE DATA TO PUB	REL OFF DATA TO MED	OFF SEC & TRAF CTNT	CONT OFF RE-ENT
FACILITY	P	P	P	P	P	P	P					P	P	P	P	S	P	P	P		P			S			
CORPORATE						S	S					S					S				S			P			
PEMA								P	P	S	S	V	V			P			P	S		P			P	S	S
BCEMA								P	P	P	P					S				P		P			P	P	P
WVOES								P	P	S	S	V	V			P			P	S		P			P	S	S
HCOES								P	P	P	P					S				P		P			P	P	P
OEMA								P	P	S	S	V	V			P			P	S		P			P	S	S
CCEMA								P	P	P	P					S				P		P			P	P	P
FEMA								P	P											S		P	P		S	S	S
USNRC								P	P			V	V			S			S		S	P	S	S	S		
FRMAP								P	P				S			S			S		S	P	S		S		
LOCAL SERV.																	S	S									

P = PRIMARY RESPONSIBILITY
S = SUPPORT
V = INDEPENDENT VERIFICATION

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SECTION 4

EMERGENCY CONDITIONS

CONTROLLED
BVPS UNIT 1/2

Section 4

EMERGENCY CONDITIONS

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4.0 EMERGENCY ACTION LEVEL BASES

4.1 CLASSIFICATION OF EMERGENCIES

Emergency conditions are classified into one of four categories covering the spectrum of postulated accidents from those events which indicate a potential degradation of the level of plant safety or result in a radiological emergency ranging from a single location in-plant to those involving large numbers of people offsite. Emergency planning is based primarily on the minimization of any potential or resultant radiation exposure to individuals onsite and offsite. Specific criteria are provided for the classification, and[C14] declaration of each of the emergency classes. The scheme provides for notification of appropriate emergency response organizations and for implementation of actions immediately applicable to a specific condition. Provisions are included for a graded scale of response to conditions within each classification, and for upgrading, downgrading, or terminating the emergency classification in the event of a change in the severity of the emergency condition.

This section describes the scope and identifies events which comprise each of the four emergency classifications. Emergency Action Levels "EALs" based on the criteria, and the specific plant parameters to which the EALs refer and the instrument(s) on which that parameter is indicated are specified in EPP/I-1a/b, *Recognition and Classification of Emergencies.* Action statements referring the operator to the Emergency Implementing Procedures are incorporated, where appropriate, in the Beaver Valley Power Station Operating Procedures. To the extent feasible, the EALs are based on readily available information such as Control Room instrumentation readings which, if exceeded, will initiate assessment measures. Immediate actions to be taken in response to conditions involving plant parameters, such as Technical Specification Limiting Conditions for Operation (LCO), are detailed in the Beaver Valley Power Station alarm response procedures, Abnormal Operating Procedures, and Emergency Operating Procedures. Other immediate actions and follow-up actions are identified in Section 6 of this Plan and are described in detail in applicable Emergency Implementing Procedures, listed in Appendix C.

The emergency classification scheme is coordinated with state and local agencies, and was reviewed by the Nuclear Regulatory Commission. Periodic training is conducted (see Section 8 of the Plan) on the classification scheme. These activities ensures that the classification scheme is compatible with the scheme used by those agencies.

4.1.1 Classification Categories

The emergency classification system is described in detail in EPP/I-1a/b, *Recognition and Classification of Emergencies.* The bases of this scheme are addressed in Section 4.2 of the Plan. The classification scheme is based on four emergency classifications:

4.1.1.1 Unusual Event

Events within this classification meet the following definition:

Unusual events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Such events characterize abnormal plant conditions which, by themselves, do not constitute significant emergency conditions, but are considered to be potential precursors to more severe conditions. In this use, a precursor is a condition that could, if appropriate action were not taken, escalate to a more severe condition. The purpose of this classification is to ensure that the plant operating staff, takes appropriate action for the initiating condition, such as [C14] assessment and verification, and comes to a state of readiness to respond in the event that the condition becomes more severe. Offsite authorities are notified of this classification within 15 minutes, however, with the possible assistance by local support groups such as fire companies or medical facilities, no offsite response is expected.

4.1.1.2 Alert

Events within this classification meet the following definition:

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA protective action guideline exposure levels.

Such events characterize plant conditions that warrant activation of the site emergency response organization and augmentation of onsite emergency resources. The purpose of this classification is to ensure that the plant operating staff takes appropriate action for the initiating condition, such as assessment and verification, and [C14] activates the emergency response organization. Offsite authorities are notified of this classification within 15 minutes. Some offsite agencies may place their respective emergency organizations on standby.

4.1.1.3 Site Area Emergency

Events within this classification meet the following definition:

Events are in process or have occurred which involve actual or likely major failures of plant functions needed for the protection of the public. Any releases are NOT expected to result in exposure levels which exceed EPA protective action guideline exposure levels outside the Exclusion Area Boundary

Such events characterize plant conditions that warrant activation of the site emergency response organization, augmentation of onsite emergency resources, and constitute the lowest level where offsite emergency response may be necessary. Offsite emergency response organizations activate in anticipation of the need to implement offsite protective actions should the condition degrade.

4.1.1.4 General Emergency

Events within this classification meet the following definition:

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA protective action guidelines exposure levels outside the Exclusion Area Boundary

At this classification, total activation of the onsite and offsite emergency response organizations is required. The onsite organization shall recommend offsite protective actions to designated offsite agencies. These offsite organizations, following evaluation of the onsite recommendation, will implement appropriate offsite protective actions.

4.1.2 Classification Scheme

The classification scheme is comprised of a number of emergency action levels, arranged by severity of the event and by the type of condition. There are two general types of emergency action levels included in this procedure:

- Barrier-Based EALs: These EALs address conditions that represent potential losses, or losses, of one or more of the Fuel Clad, RCS, or Containment fission product barriers. Indicators of these conditions include Critical safety function status, fundamental indications such as subcooling or reactor vessel water level, or auxiliary indications such as containment radiation monitor readings. Classifications are based on the number of barriers lost or potentially lost.

- Event-Based EALs: These EALs address discrete conditions or events that are generally precursors to fission product barrier degradation, or are otherwise degradations in the level of safety of the plant. Events may be external (*e.g., severe weather, earthquakes, loss of offsite power*) internal (*e.g., fires, explosions, instrumentation failure*) or may involve radioactivity releases.

The EALs are grouped by recognition category as follows:

Section 1	Fission Product Barrier Matrix
Section 2	System Degradation
Section 3	Loss of Power
Section 4	Hazards and ED Judgment
Section 5	Destructive Phenomena
Section 6	Shutdown Systems Degradation
Section 7	Radiological

Each of the EAL sections includes one or more columns, or Tabs, that address one initiating condition (*e.g., fires*). Each tab provides EALs for each of the four emergency classifications, as applicable. A notation adjacent to each EAL identifies the plant operating mode(s) for which the EAL is applicable.

Each EAL is comprised of a Criterion, printed in bold type, and one or more Indicators. The purpose of each is as follows:

- CRITERION: identifies the emergency condition and any numeric values which define that condition (*i.e., the basis of the declaration*) All classifications are based on an assessment *(i.e., determination that the condition is valid)* by the Emergency Director that the criterion has been met or exceeded. Implicit in this protocol is the necessity for these assessments to be completed within 15 minutes (unless otherwise noted) of sufficient indications being available to Control Room operators that an Emergency Action Level (EAL) has been exceeded. [C14]

- INDICATOR: is available via instrumentation, calculations, procedure Entry (AOPs, EOPs, etc.), operator knowledge of plant conditions (pressure, temperatures, etc.) in the Control Room, or reports received from plant personnel, whichever is most limiting, or other evidence that the associated [C14] criterion may be exceeded. Upon occurrence of one or more indicators, the Emergency Director performs an assessment against the criterion. Depending on the particular condition, this assessment may be as simple as a review of the criterion, an instrument channel check, or a detailed calculation as in the case of a radioactivity release. Inherent in this protocol is the necessity for these assessments to be completed within 15 minutes (unless otherwise noted) of indications being available to Control Room operators that an Emergency Action Level (EAL) has been exceeded. [C14]

  The indicators were selected with the objective of providing unambiguous guidance to assist with assessment of the criterion. There may be other indicators not envisioned by the writers of this scheme that, in the judgment of the Emergency Director, correspond to the criterion. In these cases, the Emergency Director should base the declaration on engineering judgment, using the supplied indicators as examples of the severity of the condition.

4.1.3 Implementation of the Classification Scheme

This section addresses how the scheme is implemented. Complete instructions are provided in EPP/I-1a/b, *Recognition and Classification of Emergencies.*

4.1.3.1 Events Affecting Both Units

If an event occurs such that both reactor units are affected, e.g., tornado, toxic gas offsite, etc., the senior Shift Manager makes the appropriate classification and assumes the role of Emergency Director. If the common plant condition results in a higher emergency classification at one reactor unit, the Shift Manager from that unit makes the appropriate classification and assumes the role of Emergency Director.

4.1.3.2 Mode Applicability

The plant operating mode that existed at the time that the event occurred, prior to any protective system or operator action initiated in response to the condition, is compared to the mode applicability of the EALs. If an event occurs, and a lower or higher plant operating mode is reached before the classification can be made, the classification is based on the mode that existed at the time that the event occurred. The fission product barrier matrix is applicable only to those events that occur at mode 4 or higher. An event that occurs in modes 5 or 6 is not classified using the fission product C14 barrier matrix, even if mode 4 is entered due to subsequent heatup. In these cases, Tab 6, Shutdown Systems Degradation, is used for classification.

4.1.3.3 Transient Events

For some EALs the existence of the event, without regard to duration, is sufficient to warrant classification. In these cases, the appropriate emergency classification is declared as soon as the Emergency Director assessment concludes that the criterion is exceeded. However, some EALs specify a duration of occurrence. For these EALs the classification is made when Emergency Director assessment concludes that the specified duration is exceeded or will be exceeded (*i.e., condition can not be reasonably rectified before the duration elapses*), whichever is sooner. In many cases, the plant operating staff will be able to take actions to correct the abnormal condition before a classification is made. These situations are handled as follows:

- If the plant condition exceeding an EAL criterion is rectified before the specified duration time is exceeded, then the event is not classified by that EAL. Lower severity EALs shall be reviewed for applicability.

- If the plant condition exceeding an EAL criterion is not classified at the time of occurrence, but is identified well C14 after the condition has occurred (e.g., as a result of routine log or record review) and the condition no longer exists, an emergency is not declared. However, reporting under 10 CFR 50.72 may be required. Such a condition could occur, for example, if a follow-up evaluation of an abnormal condition was more severe than earlier believed.

- If an emergency classification was warranted, but the plant condition has been rectified (such that the CRITERION is no longer exceeded) prior to declaration and notification, the following guidance applies:

  For transient events that would have been declared as Unusual Events, no emergency is declared. However, the event shall be reported to those local, state, and Federal agencies designated to receive the initial notifications. These agencies shall be told that the Unusual Event condition was rectified upon detection and no emergency is being declared.

  For transient events that would have been declared as an Alert or higher, the event shall be declared and the emergency response organization activated.

4.1.3.4 Declaration Timing and Assessment

Emergency conditions are classified as soon as the Emergency Director assessment of the indicators shows that the criterion is exceeded. The assessment time starts from the indications being available to Control Room operators that an Emergency Action Level (EAL) has been exceeded. [C14] The assessment time is limited to 15 minutes unless the EAL specifies a duration (*e.g., release exceeds T/S for one hour*). In this case, the assessment time runs concurrently with the required duration and is the same length (*e.g., in this example, one hour*). If the assessment cannot be completed within the specified period, then the event is declared on the basis of indicators that cannot be reasonably discounted.

4.2 EAL Bases

The Beaver Valley Power Station emergency action levels were based on the guidance contained in NUMARC/NESP-007, *Methodology for Development of Emergency Action Levels*, Rev 2, 1/92. USNRC Regulatory Guide 1.101, *Emergency Planning and Preparedness for Nuclear Power Reactors,* Rev 3, 8/92. This section identifies the NUMARC/NESP-007 Initiating Condition, the corresponding EAL at BVPS, and the status of implementation. With regard to this latter item, the term "deviation" appears adjacent to the BVPS reference if the BVPS EAL differs in intent from the NUMARC guidance. In this use, a change from the original guidance is considered an intent change if, as a result of difference, the threshold for a classification is modified such that the BVPS EAL will result in a different classification than the NUMARC guidance for the same event. Similarly, omissions of EALs specified by the NUMARC guidance are marked as deviations.

Minor changes from the NUMARC guidance, such as terminology changes, format, re-wording that does not change intent, and other similar site specific adaptation are not considered as intent changes and are not marked as deviations.

Justification for each of the deviations was documented separately and was made available during the regulatory review of these EALs.

4.2.1 Generic Terminology Changes

The table below compares terminology changes from the NUMARC guidance that are generic to all BVPS EALs.

NUMARC TERM	CORRESPONDING BVPS TERM	DISCUSSION
Initiating Condition	CRITERION	In the BVPS EALs, the CRITERION identifies the emergency condition and any numeric values which define that condition *(I.e., the basis of the declaration)* All classifications are based on an assessment (i.e., determination the condition is VALID) by the Emergency Director that the CRITERION has been met or exceeded.
Example EAL	INDICATOR	In the BVPS EALs, the INDICATOR is available via instrumentation, calculations, procedure Entry (AOPs, EOPs, etc.), operator knowledge of plant conditions (pressure, temperatures, etc.) in the Control Room, or reports received from plant personnel, whichever is most C14 limiting, or other evidence that the associated CRITERION may be exceeded. Upon occurrence of one or more INDICATORs, the Emergency Director performs an assessment against the CRITERION.
Recognition Category	Recognition Category	The BVPS EALs are separated into seven recognition categories, each of which is section. There are seven sections: (1) Fission Product Barrier Matrix, (2) System Degradation, (3) Loss of Power, (4) Hazards and ED Judgment, (5) Destructive Phenomena, (6) Shutdown System Degradation, and (7) Radiological. These seven sections are further sub-divided into two or more TABs that address a particular type of event. For example, "Loss of AC", and "Loss of DC" are TABs in the 'Loss of Power' Section. There are 36 TABs.
n/a	EAL	The term EAL refers to the CRITERION and INDICATOR(s) for a particular classification and TAB.

4.3 EAL Matrix

4.3.1 NUMARC/NESP-007 Abnormal Rad Levels/Radiological Effluent

NUMARC/NESP-007 Reference		BVPS Reference	
AU1	Gaseous or Liquid Effluent	7.1.U	Gaseous effluents
		7.2.U	liquid effluents
AU2	Plant Radiation Levels	7.3.U	Addresses example EAL#4
		7.4.U	Addresses example EAL #1,3
		6.5.U	Addresses example EAL #1,3
AA1	Gaseous or Liquid Effluent	7.1.A	Gaseous effluents
		7.2.A	Liquid effluents
AA2	Fuel Damage/Loss of Water Level	7.4.A	
		6.5.A	Addresses example EAL #1,2
AA3	Plant Radiation Levels	7.3.A	
AS1	Gaseous Effluent	7.1.S	Deviation
AG1	Gaseous Effluent	7.1.G	Deviation

4.3.2 NUMARC/NESP-007 Fission Product Barrier Degradation

NUMARC/NESP-007 Reference		BVPS Reference	
FU1	Loss or Potential Loss of CNMT	FPM	
FA1	Loss or Potential Loss of either RCS/Fuel	FPM	
FS1	Loss or Potential Loss of both RCS/Fuel	FPM	Modification
FG1	Loss of Two and Potential Loss of Third	FPM	
Fuel	Indicator 1	1.1.1	
Fuel	Indicator 2	1.1.4	
Fuel	Indicator 3	1.1.2	
Fuel	Indicator 4	1.1.3	
Fuel	Indicator 5	1.1.6	
Fuel	Indicator 6	1.1.5	Addition
Fuel	Indicator 7	1.1.7	
RCS	Indicator 1	1.2.1	
RCS	Indicator 2	1.2.3	
RCS	Indicator 3	1.2.4 1.3.4	Modification
RCS	Indicator 4	1.2.5	
RCS	Indicator 5	1.2.2	Addition
RCS	Indicator 6	1.2.6	
CNMT	Indicator 1	1.3.1	
CNMT	Indicator 2	1.3.2	
CNMT	Indicator 3	1.3.3	
CNMT	Indicator 4	1.3.4	
CNMT	Indicator 5	1.3.5	
CNMT	Indicator 6	1.3.1 2.2.G	 Addition
CNMT	Indicator 7	1.3.4	Modification & Addition
CNMT	Indicator 8	1.3.6	

4.3.3 NUMARC/NESP-007 Hazards and Other Conditions Affecting Plant Safety

NUMARC/NESP-007 Reference		BVPS Reference	
HU1	Destructive Phenomena in Protected Area	5.1.U	(Addresses example EAL #1)
		5.2.U	(Addresses example EAL #2)
		5.3.U	(Addresses example EAL #4)
		4.2.U	(Addresses example EAL #5)
		2.9.U	(Addresses example EAL #6)
		5.6.U	(Addresses example EAL #4)
		5.4.U	(Addresses example EAL #7)
HU2	Fire	4.1.U	
HU3	Flammable or Toxic Gases	4.3.U	(Flammable)
		4.4.U	(Toxic gas)
HU4	Security	4.6.U	
HU5	Emergency Director Judgment	4.7.U	
		2.10. U	(Uncontrolled cooldown)
HA1	Destructive Phenomena in Vital Area	5.1.A	(Addresses example EAL #1)
		5.2 A	(Addresses example EAL #2)
		5.3.A	(Addresses example EAL #5)
		2.9.A	(Addresses example EAL #6)
		5.4.A	(Addresses example EAL #7)
		5.5.A	(Addresses example EAL #7)
HA2	Fire/Explosion Affecting Safety Systems	4.1.A	(Fire)
		4.2.A	(Explosion)
HA3	Toxic/Flammable Jeopardizes	4.3.A	(Flammable Gas)
		4.4.A	(Toxic Gas)
HA4	Security Event in Protected Area	4.6.A	
HA5	Control Room Evacuation	4.5.A	
HA6	ED Judgment	4.7.A	
HS1	Security Event in Plant Vital Area	4.6.S	
HS2	Control Room Evacuation	4.5.S	Also 4.1.S (App. R Procedure)
HS3	ED Judgment	4.7.S	
HG1	Security Event / Loss of Ability to S/D	4.6.G	
HG2	ED Judgment	4.7.G	Also 4.1.G (App. R Procedure w/ failures)

4.3.4 NUMARC/NESP-007 System Malfunction

NUMARC/NESP-007 Reference		BVPS Reference	
SU1	Loss of Offsite Power	3.1.U	(Power Ops)
		3.2.U	Addition - (Shutdown)
		6.3.U	Addition - (Shutdown)
SU2	T/S Shutdown	2.7.U	
		2.8.U	Addition
SU3	Loss of Annunciators	2.1.U	
SU4	Fuel Clad Degradation	2.4.U	
SU5	RCS Leakage	2.5.U	Modification - (Unidentified)
		2.6.U	Addition - (Identified)
SU6	Loss of Communication	2.2.U	
SU7	Loss of Required DC during S/D	3.3.U	Addition
		6.4.U	
SA1	Loss of Offsite and Onsite AC-S/D	3.2.A	
		6.3.A	Addition
SA2	Failure to Scram - Manual Trip Successful	2.3.A	
SA3	Inability to Maintain Cold Shutdown	2.2.A	Modified
		6.1.U	
		6.1.A	
SA4	Loss of Annunciators	2.1.A	
SA5	AC Power Degraded	3.1.A	
SS1	Loss of All AC Power	3.1.S	
SS2	Failure to Trip - Manual Trip Unsuccessful	2.3.S	
SS3	Loss of Vital DC Power	3.3.S	
SS4	Loss of Function to Achieve Hot S/D	2.2.S	
SS5	Loss of Water Level Uncovering Fuel	6.2.S	
SS6	Inability to Monitor Transient	2.1.S	
SG1	Prolonged Loss of All AC Power	3.1.G	
SG2	Failure to Trip/Challenge to Core	2.3.G	

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4.4 Individual EAL Basis Descriptions

In the section that follows, each EAL is described and the bases are provided.

NOTE
This section may be referenced for guidance in understanding an EAL, particularly those events involving ED judgment. However, emergency classifications shall be made from EPP/I-1-1a/b, *Recognition and Classification of Emergencies*, the information in which has precedence over the information in this section.

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4.5 SPECTRUM OF POSTULATED ACCIDENTS

The classification of accidents and corresponding protective actions required relative to off-normal and significant emergency conditions are based on operational conditions and projected dose commitment. Methods are described in this Plan and in Emergency Implementing Procedures for projecting, measuring, and evaluating those dose commitments. In nearly all cases, the proper response to an unusual event or emergency condition requires a considerable degree of judgment by the Emergency Director, based on experience and knowledge of the details pertaining to the condition. This requirement is exemplified in this discussion of specific postulated accidents.

The discrete accidents addressed in this section are described in the Beaver Valley Power Station Unit #1 and Unit #2 Final Safety Analysis Report (FSAR). Discussion of these postulated accidents identifies the instrumentation and other mechanisms which will be employed for prompt detection of an event and continued assessment of the consequences and plant status and describes how each accident is encompassed within the emergency classification system of this Plan.

The postulated offsite doses from these events are documented in the UFSARs for both Units. These analyses are performed using conservative worst case assumptions.

Since the offsite dose from an actual event will likely be different, dose assessments performed at the time of the event are used to classify the event and, as necessary, make Protective Action Recommendations.

The manpower needed to take immediate action to minimize damage to the plant equipment, and to initiate protective measures for onsite and offsite individuals is provided by the normal shift operating crew. The composition of this around-the-clock crew, the emergency assignments for these individuals, and arrangements for augmentation with emergency support personnel, are described in Section 5.

4.5.1 Core and Coolant Boundary Accidents

The Beaver Valley Power Station FSAR identifies several core and coolant boundary accidents primarily related to unintentional changes in plant conditions which lead to changes in core temperature, pressure, and/or reactivity. These accident analyses show that there should be minimal damage to the core and no expected release of radioactivity to the environment. The accidents are accommodated with, at most, a reactor shutdown with the unit being capable of returning to operation after a corrective action. The accidents analyzed are:

.1 Uncontrolled Rod Cluster Control Assembly (RCCA) bank withdrawal from subcritical

.2 Uncontrolled RCCA bank withdrawal from power

.3 RCCA misalignment

.4 Uncontrolled boron dilution

.5 Partial loss of forced reactor coolant flow

.6 Startup of an inactive reactor coolant loop

.7 Loss of external electric load and/or turbine trip

.8 Loss of normal feedwater

.9 Excessive heat removal due to feedwater system malfunctions

.10 Excessive load increase accident

.11 Loss of offsite power (station blackout to the unit auxiliaries)

.12 Turbine-generator accidents

.13 Accidental depressurization of the main steam system

.14 Accidents due to external environmental causes

.15 Accidental depressurization of the reactor coolant system

These conditions, by themselves, do not constitute significant emergency conditions. However, these off-normal conditions do indicate a potential degradation in the level of plant safety and could escalate to a more severe condition if appropriate action is not taken.

4.5.2 Fuel Handling Accident

The fuel handling accident as described in the BV-1 and BV-2 FSAR is postulated to involve dropping a single fuel assembly during handling such that a number of rods are damaged. The noble gas gap inventory and a fraction of the halogen gap inventory would be released to the fuel handling building, and subsequently, to the environment.

Initial assessment of this accident includes the performance of dose projections in accordance with Emergency Implementing Procedures. Dose projections utilize data from the Reactor Containment Building effluent monitors (Reactor Building and SLCRS Vent), area radiation monitors, meteorological instrumentation, and direct environmental radiation measurements.

Protective actions would be based on the projected dose to the public and to plant personnel.

4.5.3 Accidental Release of Waste Liquid

Accidents have been postulated to occur to components and piping that would result in spillage of waste liquids within the facility. Design features are provided to contain and collect spillage such that there are no offsite consequences.

Initial assessment of this type of accident involves determining the source and the extent of the spillage, and determining area dose rates from area radiation monitors or portable survey instruments. As it is unlikely that there would be offsite consequences, protective actions may involve normal radiological controls and, perhaps, local and plant evacuations.

4.5.4 Accidental Release of Waste Gases

The limiting waste gas system failure is a line rupture located prior to the system charcoal delay beds. Radioactive noble gas is released to the building and subsequently, to the environment from the ruptured line and from the charcoal delay beds.

Initial assessment of this accident includes the performance of dose projections in accordance with Emergency Implementing Procedures. Dose projections utilize data from the Reactor Containment Building effluent monitors (Reactor Building and SLCRS Vent), meteorological instrumentation, and direct environmental radiation measurements.

4.5.5 Steam Generator Tube Rupture

The steam generator tube rupture accident is postulated as the complete severance of a single steam generator tube. The accident is assumed to take place at power with the reactor coolant contaminated with fission products corresponding to continuous operation with a limited number of defective fuel rods. For Unit #1/Unit #2, in the event of a coincident loss of offsite power, or failure of the Condenser Steam Dump System, discharge of radioactivity to the atmosphere takes place via the steam generator atmospheric steam dump valves (and safety valves if their setpoint is reached).

In the event of an SGTR, the plant operators must diagnose the SGTR and perform the required recovery actions to stabilize the plant and terminate the primary to secondary leakage. The operator actions for SGTR recovery are provided in the plant Emergency Operating Procedures.

Initial assessment of this accident includes the performance of dose projections in accordance with Emergency Implementing Procedure. Dose projections utilize data from the condenser air ejector monitor and meteorological instrumentation, and/or direct environmental radiation measurements.

4.5.6 Main Steam Line Break Within Containment

The main steam line break accident, within the containment, is postulated to involve the rupture of a main steam line upstream of the main steam isolation valves. It is assumed that there would be a primary to secondary leak, per the FSAR. It is postulated that the release would continue for 8 hours, the period of time necessary for the primary system to reach atmospheric pressure, thereby halting the primary to secondary leak.

Initial assessment of this accident includes the performance of dose projections in accordance with Emergency Implementing Procedures. Dose projections utilize data from Reactor Building and supplementary leak collection and release system vent effluent monitor (atop Reactor Containment Building), meteorological instrumentation, and/or direct environmental radiation measurements.

4.5.7 Main Steam Line Break Outside Containment

This accident is postulated under the same conditions as the main steam line break within containment, except that the steam break occurs downstream of the Main Steam Isolation Valves (MSIV). It is postulated that a release of activity would continue the time required for the MSIVs to close.

Due to the short duration and the direct release to the environment, there would be no feasible mechanism to monitor the actual release. An estimate of the resultant doses can be made, however, by comparison of the actual primary to secondary leak rate and actual percentage of the failed fuel to the values of these parameters used in the accident analysis (Tech. Spec. Activity) and ratioing the postulated dose accordingly. Dose estimates and corresponding protective actions could be projected on the basis of measurements made in the plant environs. It should be noted that under most meteorological conditions, the short duration of the release would preclude measurements in the environs necessary for implementing protective actions. Because of this, the emergency condition classification system provides action criteria based on plant process parameters rather than radioactive effluent monitors.

4.5.8 Major Rupture of a Main Feedwater Pipe

This accident is postulated to involve the rupture of a main feedwater pipe such that it impairs the ability to supply main feedwater to the steam generator. The accident analysis indicates that the auxiliary feedwater system capacity is sufficient to remove decay heat, to prevent primary system over pressure, and prevent uncovering the core.

4.5.9 Rod Cluster Control Assembly Ejection

This accident postulates the effects of a mechanical failure of a control rod drive mechanism (CRDM) housing resulting in the ejection of a rod cluster control assembly and drive shaft. The consequence of this accident is a rapid reactivity insertion and a small LOCA. The accident analysis postulates that there would be less than 10% fuel failure in the hot channel and that there is no danger of sudden fuel dispersal into the coolant. The accident analysis is limited to the effects of a reactivity insertion. Because of the small LOCA, there is a possibility for an offsite release. See paragraph 4.2.13.

Initial assessment of this accident includes the performance of dose projections in accordance with Emergency Implementing Procedures. Dose projections utilize data from the Reactor Building and supplementary leak collection and Release System Vent effluent monitors (atop Reactor Containment Building), containment area radiation monitors, meteorological instrumentation, and/or direct environmental radiation measurements.

4.5.10 Single Reactor Coolant Pump Locked Rotor

This accident analysis postulates the effects of a rapid reduction in reactor coolant flow resulting in a reactor trip, and core pressure and temperature transient. The accident analysis assumes that the peak reactor coolant pressure and temperature do not result in damage to the fuel or primary coolant boundary.

4.5.11 Complete Loss of Forced Reactor Coolant Flow (pumps coast down)

This accident analysis postulates a complete loss of flow from a loss of all power supplies to all reactor coolant pumps, and which would result in an increase in coolant temperature. Reactor trips would occur on reactor coolant pump power busses, low reactor coolant loop flow, or a pump circuit breaker opening, which would prevent core damage or a release of fission products.

4.5.12 Single RCCA Withdrawal at Full Power

A single RCCA withdrawal may occur in the unlikely event of simultaneous electrical failures, or as a result of operator error. Rod deviation, rod control failure, and rod position indicators and alarms would provide warning to the operator. Because of the localized nature of this condition, the ensuing reactor trip (high temperature) may not occur fast enough to prevent damage in these core location. It is postulated that 5% of the total number of core fuel rods would be subjected to high temperatures.

4.5.13 Loss of Coolant Accident

The loss of coolant accident (LOCA) is defined as a rupture of the reactor coolant system piping. The reactor coolant make-up system is capable of maintaining pressurizer level against an 0.375 inch diameter hole. In the case of breaks up to 1.0 square feet, Safety Injection Systems (SIS), initiated by the decreasing pressurizer pressure, would be capable of maintaining core clad temperature within limits. These two conditions are considered as small LOCAs.

The double ended rupture of the largest pipe in the reactor coolant system, although not expected to take place, is postulated because its consequence would include the potential for the release of significant amounts of radioactive material to the environment. The double ended rupture concurrent with a loss of offsite power and/or failure of one train of the Engineered Safeguards System is the design basis accident (DBA) upon which the engineered safeguards system and the containment were designed.

Initial assessment of this accident includes the performance of dose projections in accordance with Emergency Implementing Procedures. Dose projections utilize data from Reactor Containment Building and Supplementary Leak Collection and Release System Vent effluent monitors (atop Reactor Containment Building), containment area radiation monitors, meteorological instrumentation, or direct radiation measurements in the environment.

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
Tab	Not Applicable
EAL	Not Applicable
Mode	1,2,3,4
Indicator(s)	Not Applicable
Basis	In the section to follow, the bases of the Fission Product Barrier Matrix are presented. The section is divided into two sub-sections. The first provides the bases for each of the 'Potential Loss' and 'Loss' INDICATORs. In this section Unit 1 INDICATORs are provided then followed by the Unit 2 INDICATORs in parentheses. The second sub-section provides the bases for the four CRITERION that apply to the Fission Product Barrier Matrix. (Since the use of the terms INDICATOR and CRITERION will be obvious from the context, the terms will not be capitalized herein.) In reviewing these bases, and in using the matrix for classification, it is important to keep in mind that the indicators should not be viewed as discrete events. There is extensive synergy between the indicators for the three barriers. Some of this is obvious, some is not. For example, consider indicator 1.3.1: "Actions of FR-C.1 (RED PATH) are INEFFECTIVE". One could conclude that such an event represented an Unusual Event (i.e., Potential Loss of Containment Barrier). This would appear to be inconsistent with the similarly worded first indicator for EAL 2.2.G, a General Emergency. However, indicator 1.1.1 considers a Core Cooling CSF RED PATH to be a loss of the Fuel Clad Barrier. This is now two barriers challenged -- a Site Area Emergency. Under the RCS Barrier, indicators address loss of subcooling and reactor vessel level. In as much as a Core Cooling CSF RED PATH could not exist without a loss of subcooling or reduced inventory, we would conclude that all three barriers were challenged.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 per USNRC Regulatory Guide 1.101

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
Tab 1.1	**FUEL CLAD BARRIER**
EAL 1.1.1	**Critical Safety Function Status**
Mode	1,2,3,4
Indicator(s)	**<u>LOSS:</u>** Core Cooling CSF RED PATH **<u>Potential LOSS</u>** Core Cooling CSF ORANGE PATH <u>OR</u> Heat Sink CSF RED PATH
Basis	**<u>LOSS</u>** The 'Loss' Indicator addresses the condition of inadequate Core Cooling. If the Emergency Operating Procedure CSF status trees indicate a RED PATH the condition must be considered to be an extreme challenge to the safety function needed to ensure protection of the public. A RED PATH terminus for Core Cooling indicates significant superheating and core uncovery and is considered to indicate a 'Loss' of the Fuel Clad Barrier. Clad failure is probable in a very short time period after core uncovery. Core melting will follow if level cannot be restored. **<u>Potential LOSS:</u>** The "Potential Loss" Indicator addresses the condition where an inadequate Core Cooling situation can develop. If the Emergency Operating Procedure status trees indicate an orange path, the conditions must be considered to be a severe challenge to the safety function. Core Cooling CSF ORANGE PATH indicates subcooling has been lost and that some clad damage may occur. Heat Sink CSF RED PATH indicates the heat sink function is under extreme challenge and thus either of these two items indicate a "Potential Loss" of the Fuel Clad Barrier. Either condition would escalate to a 'Loss' if function restoration procedures do not correct the condition.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 per USNRC Regulatory Guide 1.101 FR-C.1 Inadequate Core Cooling FR-C.2 Degraded Core Cooling FR-H.1 Loss of Heat Sink

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.1	**FUEL CLAD BARRIER**
EAL 1.1.2	**Five Hottest CETCs (Three Max CETCs)**
Mode	1,2,3,4
Indicator(s)	**LOSS**: Greater Than 1200°F (1200°F) **Potential LOSS** Greater Than 719°F (729°F)
Basis	**LOSS** The "Loss" Indicator uses a reading of 1200°F (1200°F) which corresponds to a Core Cooling CSF RED PATH condition on the EOP status trees. A reading of this magnitude corresponds to significant superheating of the reactor coolant and clad heating which results in a "Loss" of Fuel Clad Barrier. This indicator is intentionally redundant to Indicator 1.1.1 and is included to cover situations in which status tree monitoring has not yet been started. **Potential LOSS**: The "Potential Loss" Indicator uses a reading of 719°F (729°F) which (in conjunction with Indicator 1.1.3) corresponds to a Core cooling CSF ORANGE PATH Condition on the EOP status trees. A reading of this magnitude corresponds to a loss of RCS subcooling. This indicator is intentionally redundant to Indicator 1.1.1 and is included to cover situations in which status tree monitoring has not yet been started. This condition will escalate to a 'Loss' if temperature continues to rise.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 per USNRC Regulatory Guide 1.101 FR-C.1 Inadequate Core Cooling FR-C.2 Degraded Core Cooling

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.1	**FUEL CLAD BARRIER**
EAL 1.1.3	**Reactor Vessel Water Level**
Mode	1,2,3,4
Indicator(s)	**<u>LOSS</u>:** Not Applicable **<u>Potential LOSS</u>** VALID RVLIS Full Range Level <40% (40%) (No RCP running)
Basis	**<u>LOSS</u>** There is no "Loss" Indicator corresponding to this item because it is covered by the other Fuel Clad Barrier "Loss" indicators. **<u>Potential LOSS</u>** The "Potential Loss" Indicator is defined by a RVLIS full range indication less than <40% (40%) level with no reactor Coolant pumps running. This corresponds (in conjunction with Indicator 1.1.2) to an Core Cooling CSF RED PATH terminus. This condition indicates that considerable Clad heating and loss of RCS subcooling has occurred. This indicator is intentionally redundant to Indicator 1.1.1 and 1.2.2 and is included to cover situations in which status tree monitoring has not yet been started.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 FR-C.2 Degraded Core Cooling

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.1	**FUEL CLAD BARRIER**
EAL 1.1.4	**Primary Coolant Activity Level**
Mode	1,2,3,4
Indicator(s)	**LOSS:** RCS sample activity is Greater Than 300 μCi/gm dose equivalent Iodine-131 **Potential LOSS** Not Applicable
Basis	**LOSS** The "Loss" Indicator addresses the condition of high RCS activity. RCS activity >300 μCi/gm is above expected iodine spikes limited by T/S to 6 μCi/gm (21 uCi/gm), and well above steady state iodine concentrations limited by T/S to 0.1 μCi/gm (0.35 uCi/gm). RCS sample activities greater than this indicate failure of some (approximately 2-5%) fuel cladding. **Potential LOSS** There is no "Potential Loss" Indicator associated with this item. TAB 2.4, 'Fuel Clad Degradation' serves as a precursor to the 'Loss' indicator.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 U1 Technical Specification Amendment #244 U2 Technical Specification Amendment #101

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.1	**FUEL CLAD BARRIER**
EAL 1.1.5	**Letdown Monitor Indication**
Mode	1,2,3,4
Indicator(s)	**LOSS:** RM-CH101 A or B (2CHS-RQ101 A/B) VALID reading greater than 3.5E5 cpm (300 uCi/ml) with unisolated letdown. **Potential LOSS** Not Applicable
Basis	**LOSS** The "Loss" Indicator addresses the condition of high RCS activity. The reading specified equates to an RCS activity of 300 μCi/gm. This concentration is above expected iodine spikes limited by T/S to 6 μCi/gm (21 μCi/gm), and well above steady state iodine concentrations limited by T/S to 0.1 μ Ci/gm (.35 μCi/gm). RCS sample activities greater than this indicate failure of some (approximately 2-5%) fuel cladding. This indicator is not applicable if letdown is isolated since the monitor isolates with letdown. As such, this indicator would be useful only in those events (e.g., RCP locked rotor) in which safety injection and containment isolation do not actuate. **Potential LOSS** There is no "Potential Loss" Indicator associated with this item. TAB 2.4, 'Fuel Clad Degradation' serves as a precursor to the 'Loss' indicator.
Escalation	Not Applicable
References	NUMARC/NESP-007, (addition) Rev 2, 1/92 U1 Technical Specification Amendment #244 U2 Technical Specification Amendment #101

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.1	**FUEL CLAD BARRIER**
EAL 1.1.6	**Containment Radiation Monitors**
Mode	1,2,3,4
Indicator(s)	**LOSS**: VALID reading exceeds: (table of RM-219A/B and RM-201 readings versus time since S/D) 2RMR-RQ202 A/B, 2RMR-RQ206 or 207) **Potential LOSS** Not Applicable
Basis	**LOSS** The monitor readings listed in the table for this indicator are intended to indicate the release of reactor coolant, with elevated activity indicative of fuel damage, into the containment. Thus, this indicator indicates a 'Loss' of the Fuel Clad Barrier and the RCS Barrier. The reading assumes the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 μCi/gm dose equivalent I-131 into the containment atmosphere. Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage (approximately 2 - 5% clad failure depending on core inventory and RCS volume). For the specified concentration, these are worst case assumptions. The existence of VALID monitor readings of these magnitudes is a certain indicator of fuel clad damage. There could, however, be conditions (e.g., high RCS activity with a small RCS leak, gas stratification in CNMT) for which a lower monitor reading would equate to the same amount of fuel damage. Thus, the absence of monitor readings of these magnitudes should not be taken as evidence of Fuel Clad integrity if other indicators of damage are present. **Potential LOSS**: There is no "Potential Loss" Indicator associated with this item. The uncertainties in determining the monitor readings would render the distinction between 'Loss' and 'Potential Loss' meaningless.
Escalation	If the radiation level increases further, indicating about 20% clad damage, the CNMT barrier is considered potentially lost. Since this will result in the loss of two barriers, and the potential loss of the third, a General Emergency is declared.
References	NUMARC/NESP-007, Rev 2, 1/92

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.1	**FUEL CLAD BARRIER**
EAL 1.1.7	**Emergency Director Judgment**
Mode	1,2,3,4
Indicator(s)	Any condition that, in the judgment of the SM/ED, indicates Loss or Potential Loss of the Fuel Clad Barrier comparable to the conditions listed above.
Basis	This Indicator gives the ED the latitude to use his judgment in determining if the Fuel Clad Barrier is or will be in a "Loss" or "Potential Loss" condition. This situation is usually considered when plant conditions are present that require the monitoring of CSFs or performance of EOP corrective actions. Specific cases where ED judgment may be required are the loss of instrumentation needed to monitor the CSFs and the loss of all AC power. Although the majority of the Indicators provide very specific thresholds, the Emergency Director must remain alert to events or conditions that lead to the conclusion that exceeding the Indicator threshold is imminent. If, in the judgment of the Emergency Director, an imminent situation is at hand with no viable success path available, the classification should be made as if the thresholds have been exceeded. While this is particularly prudent at the higher emergency classes (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all emergency classes.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.2	**RCS BARRIER**
EAL 1.2.1	**Critical Safety Function Status**
Mode	1,2,3,4
Indicator(s)	**LOSS** Not Applicable **Potential LOSS** RCS Integrity CSF RED PATH OR Heat Sink CSF RED PATH
Basis	**LOSS** There is no "Loss" Indicator associated with this item. The CSFs related to RCS Barrier, while appropriate as 'Potential Losses', are deemed long-term with regard to an actual loss of the barrier. **Potential LOSS:** The "Potential Loss" Indicator is defined by a RCS Integrity CSF RED PATH or a Heat Sink CSF RED PATH terminus. In the case of RCS Integrity (PTS), consideration is given to a failure of the reactor vessel resulting in a loss of coolant accident (LOCA). Heat Sink is identified since an inability to remove core heat could lead to a vessel or RCS failure. Also, in the case of loss of heat sink, it may become necessary to cool the core by bleed and feed with safety injection. Although this is deliberate action, the open PORV is a breech of the RCS Barrier that would allow fission products to be released to containment.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 FR-P.1 Pressurized Thermal Shock FR-H.1 Loss of Heat Sink

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.2	**RCS BARRIER**
EAL 1.2.2	**Reactor Vessel Water Level**
Mode	1,2,3,4
Indicator(s)	**LOSS** VALID RVLIS Full Range level < 40% (40%) (No RCP Running) **Potential LOSS** Not Applicable
Basis	**LOSS** The "Loss" Indicator is defined by RVLIS Full Range level less than 40% (40%) with no RCP's running. A reduction in RCS volume of this magnitude during modes 1, 2, 3, and 4, indicates a significant breech in the RCS Barrier since no intentional valving configuration would result in such a decrease. The inability to maintain reactor vessel water level is the fundamental indication that the RCS Barrier has been lost. **Potential LOSS** There is no "Potential Loss" Indicator associated with this item.
Escalation	Not Applicable
References	NUMARC/NESP-007, (addition) Rev 2, 1/92 FR-C.2 Degraded Core Cooling

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.2	**RCS BARRIER**
EAL *1.2.3*	**RCS Leak Rate**
Mode	1,2,3,4
Indicator(s)	**LOSS** RCS Leak results in Loss of RCS subcooling **Potential LOSS** Unisolatable RCS leak that requires an additional charging pump be started with letdown isolated. OR RCS leak causes safety injection actuation indicated by direct entry into EOP E-1 required by EOP E-0.
Basis	**LOSS** The "Loss" Indicator addresses conditions where leakage from the RCS is greater than available makeup capacity such that a loss of subcooling has occurred. The loss of subcooling is the fundamental indication that the makeup systems are inadequate in maintaining RCS pressure and inventory against the mass loss through the leak. Such a situation would involve a significant breech of the RCS Barrier. **Potential LOSS:** The "Potential Loss" Indicator is based on the inability to maintain normal liquid inventory within the Reactor Coolant System (RCS) by operation of one centrifugal charging pump discharging to the charging header with letdown isolated. This condition would be exceeded by an operator manually starting a second charging pump in response to decreasing RCS volume. It is important to note that the indicator involves an unisolable RCS leak. Starting a second charging pump in response to a RCS volume decrease associated with a main steam line break would not be classified by this indicator (refer to 2.10 Steam/Feed Line Break). The second 'Potential Loss' indicator is similar to the first indicator, but addresses automatic safety injection actuation. The reference to the direct transition from E-0 to E-1 discounts safety injection actuations associated with non-LOCA events.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 E-1 Loss of Reactor or Secondary Coolant

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.2	**RCS BARRIER**
EAL 1.2.4	**Primary-to-Secondary Leak**
Mode	1,2,3,4
Indicator(s)	**<u>LOSS</u>** SGTR that results in a safety injection actuation OR Entry into E-3 required by EOPs **<u>Potential LOSS</u>** Not Applicable
Basis	**<u>LOSS</u>** The "Loss" Indicator addresses conditions where a steam generator tube rupture (SGTR) exists and the RCS flow into the steam generator is such that pressurizer level and pressure cannot be maintained. This results in a safety injection actuation. For redundancy, entry into EOP E-3 as required by EOPs is provided as a alternate indicator. This wording precludes a classification if E-3 is optionally referenced during a tube leak. The activation of safety injection represents the threshold rupture size. Smaller leaks will be classified on the basis of Tab 2.6. This "Loss" Indicator in conjunction with the CNMT Barrier "Loss" Indicator #4 addresses the situation where the S/G that is ruptured and also Faulted. This "Loss" of two barriers requires an event classification of Site Area Emergency. This structure inherently recognizes that a SGTR can lead to a failure of two fission product barriers. **<u>Potential LOSS</u>:** There is no "Potential Loss" Indicator associated with this item.
Escalation	Not Applicable
References	NUMARC/NESP-007, (addition) Rev 2, 1/92 E-3 Steam Generator Tube Rupture

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.2	**RCS BARRIER**
EAL 1.2.5	**Containment Radiation Monitors**
Mode	1,2,3,4
Indicator(s)	**<u>LOSS</u>:** VALID reading exceeds: (table of RM-202 and RM-201 (2RMR-RQ201 or 202) readings versus time since S/D **<u>Potential LOSS</u>** Not Applicable
Basis	**<u>LOSS</u>** The monitor readings listed in the table for this indicator are intended to indicate the release of reactor coolant, with normal RCS activity, into the containment. This indicator indicates a 'Loss' of the RCS Barrier. The reading assumes the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with concentration of 0.1 μCi/gm (0.35 μCi/gm) dose equivalent I-131 (i.e., U1/U2 [C6] T/S RCS activities) into a containment atmosphere. The release and dispersal assumptions are worst case. The existence of VALID monitor readings of these magnitudes is a certain indicator of RCS leakage. There could, however, be conditions (e.g., high RCS activity with a small RCS leak, gas stratification in CNMT) for which a lower monitor reading would equate to the same amount of leakage. Thus, the absence of monitor readings of these magnitudes should not be taken as evidence of RCS Barrier integrity if other indicators of leakage are present. **<u>Potential LOSS</u>:** There is no "Potential Loss" Indicator associated with this item. The uncertainties in determining the monitor readings would render the distinction between 'Loss' and 'Potential Loss' meaningless.
Escalation	The numeric values for this indicator are less than those specified for the Fuel Clad Barrier in indicator 1.1.6. If the readings increase to the levels specified in indicator 1.1.6, then the Fuel Clad Barrier is also affected.
References	NUMARC/NESP-007, Rev 2, 1/92 Unit 1 Technical Specification Amendment 244 Unit 2 Technical Specification Amendment 101 [C6]

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.2	**RCS BARRIER**
EAL 1.2.6	**Emergency Director Judgment**
Mode	1,2,3,4
Indicator(s)	Any Condition that, in the Judgment of the SM/ED, indicates Loss or Potential Loss of the RCS Barrier comparable to the conditions Listed Above.
Basis	This Indicator gives the ED the latitude to use his judgment in determining if the RCS Barrier is or will be in a "Loss or Potential Loss" condition. This situation is usually considered when plant conditions are present that require the monitoring of CSFs or performance of EOP corrective actions. Specific cases where ED judgment may be required are the loss of instrumentation needed to monitor the CSFs and the loss of all AC power. Although the majority of the EALs provide very specific threshold, the ED must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the ED, an imminent situation is at hand with no viable success path available, the classification should be made as if the thresholds have been exceeded. While this is particularly prudent at the higher emergency classes (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all emergency classes.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.3	**CNMT BARRIER**
EAL 1.3.1	**Critical Safety Function Status**
Mode	1,2,3,4
Indicator(s)	**LOSS**: Not Applicable **POTENTIAL LOSS**: Containment CSF RED PATH OR Actions of FR-C.1 (RED PATH) are INEFFECTIVE
Basis	**LOSS**: There is no "Loss" Indicator associated with this item since CSF containment monitoring is designed to detect conditions that would fail containment, rather than conditions that indicate that containment has failed. **Potential LOSS**: The first "Potential Loss" Indicator is defined by a RED PATH on the Containment status tree. A RED PATH indicates an extreme challenge to the safety function derived from appropriate instrument readings and/or sampling results, and thus represents a potential loss of CNMT Barrier. Conditions leading to a containment RED PATH result from RCS Barrier and/or Fuel Clad Barrier Loss. Thus, this Indicator is primarily a discriminator between the Site Area Emergency and General Emergency representing a potential loss of the third barrier. The second "Potential Loss" Indicator is defined by a RED PATH on the core cooling status tree with FR-C.1 INEFFECTIVE. In this Indicator, the functional restoration procedures are those emergency operating procedures that address the recovery of the core cooling critical safety functions. The procedure is considered INEFFECTIVE if the temperature is not decreasing or if the vessel water level is not increasing within 15 minutes of implementation. The conditions identified in this potential loss Indicator represent an imminent melt sequence which, if not corrected, could lead to vessel failure and an increased potential for containment failure. In conjunction with the core exit thermocouple Indicators in the Fuel barrier column and the loss of subcooling indicators in RCS Barrier column, this Indicator would result in the declaration of a General Emergency -- loss of two barriers and the potential loss of a third. If the functional restoration procedures are INEFFECTIVE, there is no "success" path.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 FR-Z.1 High Containment Pressure FR-C.1 Inadequate Core Cooling

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.3	**CNMT BARRIER**
EAL 1.3.2	**Containment Pressure/Hydrogen Concentration**
Mode	1,2,3,4
Indicator(s)	**LOSS**: Rapid unexplained decrease in pressure following initial increase OR Containment pressure or sump level response NOT consistent with LOCA conditions **Potential LOSS** Pressure greater than 45 PSIG OR Containment Hydrogen increases to >4% OR Pressure greater than 8 PSIG (8 PSIG U-2) with less than one full train of containment sprays
Basis	**LOSS** The first "Loss" Indicator addresses a rapid unexplained loss of pressure (i.e., not attributable to containment spray effects) following an initial pressure increase indicating a loss of containment integrity as a result of the event. The second 'Loss' indicator addresses the condition in which containment pressure and sump levels do not increase as a result of the mass and energy release into containment from a LOCA. The lack of pressure increase indicates a pre-incident failure of containment integrity, or a LOCA outside of containment. **Potential LOSS**: The first "Potential Loss" Indicator is identical to the first 'Potential Loss' in indicator 1.3.1, and is included to address situations in which CSF status tree monitoring has not yet begun. The second 'Potential Loss' indicator addresses the existence of an explosive mixture of hydrogen and oxygen in the containment, which if ignited, would be a challenge to the CNMT Barrier. The third "Potential Loss" Indicator represents a potential loss of CNMT Barrier in that the containment heat removal/depressurization system is either lost or performing in a degraded manner, as indicated by containment pressure greater than the cnmt depressurization equipment actuation setpoint, 8 PSIG, (8 PSIG U-2) at which the equipment should have actuated. (Con't)

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.3	**CNMT BARRIER**
EAL 1.3.2	**Containment Pressure/Hydrogen Concentration (Con't)**
Basis: (Con't)	These "Potential Loss" Indicators are primarily discriminators between the Site Area Emergency and General Emergency representing a potential loss of the third barrier.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 FR-Z.1 High Containment Pressure

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.3	**CNMT BARRIER**
EAL 1.3.3	**Containment Isolation Status**
Mode	1,2,3,4
Indicator(s)	**<u>LOSS</u>:** Containment Isolation is Incomplete creating a direct release path to the environment when required. [C6] **<u>Potential LOSS</u>** Not Applicable
Basis	**<u>LOSS</u>** The 'Loss' Indicator is intended to address incomplete containment isolation that allows a direct release to the [C6] environment when required. It represents a loss of the CNMT Barrier. **<u>Potential LOSS</u>:** There is no "Potential Loss" indicator associated with this item.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.3	**CNMT BARRIER**
EAL 1.3.4	**Containment Bypass**
Mode	1,2,3,4
Indicator(s)	**LOSS:** RUPTURED S/G is also FAULTED outside of CNMT OR P-S leakrate >T/S with approx. 4 to 8 hours steam release from affected S/G via-nonisolable MSSV, SGADV, or MSLB outside of CNMT **Potential LOSS:** Unexplained VALID increase in area or ventilation monitors in contiguous areas with known LOCA OR Hi-Hi Alarm on RM-RW-100 A, B, C, or D (HIGH 2SWS-RQ100 A,B,C,D) and affected HX is NOT isolated
Basis	**LOSS:** The first "Loss" Indicator addresses a non-isolable secondary side release from a ruptured steam generator. This allows a direct release of radioactive fission and activation products to the environment, a containment bypass. Note that this condition also meets RCS Barrier indicator 1.2.4. Thus, such an event would be classified as a Site Area Emergency at a minimum. The UFSAR postulates doses exceeding the General Emergency threshold for such an event. However, the UFSAR analysis incorporates several conservative assumptions that are not deemed appropriate in an EAL. Nonetheless, needed escalation to a General Emergency would occur if fuel damage is indicated, or on the basis of dose assessments. The second "Loss" Indicator addresses a prolonged steam release from the secondary side outside of the containment from a steam generator having primary to secondary leakage greater than T/S. This indicator addresses main steam line breaks (MSLB), feedwater line breaks, and failed open relief valves or atmospheric dump valves. The duration of 'prolonged' is left to Emergency Director judgment but should typically be on the order of 4 to 8 hours in duration. It is not the intent of this indicator to address MSLBs downstream of the MSIVs if the MSIVs isolate the break within a short period, or for other similar transient events. Steam releases via the main condenser air ejectors should be declared on the basis of dose assessments rather than the Fission Product Barrier Matrix. The air ejectors should not be considered a prolonged steam release path. (Con't)

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.3	**CNMT BARRIER**
EAL 1.3.4	**Containment Bypass (continued)**
Mode	1,2,3,4
Basis (continued)	**Potential LOSS**: The first "Potential Loss" Indicator addresses an increase in area or ventilation radiation monitors located in areas contiguous to the containment. With a LOCA in progress, such increases could be due to penetration leakage. Other causes for increases could be interfacing system LOCAs involving systems (e.g., LHSI) located in these areas, and leakage from systems recirculating containment sump water. All of these conditions are associated with a 'known LOCA' and are indicative of a potential loss of the CNMT Barrier. Increases in monitor readings without a LOCA should be classified in accordance with TAB 7. The second "Potential Loss" Indicator addresses the situation of a leak in one of the recirculation spray heat exchangers. Such a leak would allow containment sump water to be released to the environment. At Unit 1 background radiation can increase the monitor response. Due to the location of these monitors adjacent to the outer containment wall, background can be expected to increase significantly post-LOCA with core melt. The *Difference* between readings on the four monitors is more significant than the *absolute reading* on any one monitor.
Escalation	Not Applicable
References	NUMARC/NESP-007, (Modification) Rev 2, 1/92 E-2 Faulted Steam Generator Isolation

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.3	**CNMT BARRIER**
EAL 1.3.5	**Significant Radioactivity in Containment**
Mode	1,2,3,4
Indicator(s)	**<u>LOSS</u>:** Not Applicable **<u>Potential LOSS</u>** VALID reading exceeds: (table of RM-219A/B and RM-201 readings versus time since S/D) (2RMR-RQ202, 206, or 207)
Basis	**<u>LOSS</u>** There is no "Loss" Indicator associated with this item. The uncertainties in determining the monitor readings would render the distinction between 'Loss' and 'Potential Loss' meaningless. **<u>Potential LOSS</u>** This reading indicates significant fuel damage well in excess of the indicators associated with both loss of Fuel Clad and loss of RCS Barriers. Thus, if this indicator is met, the indicators for the other two barriers are also met, resulting in a General Emergency declaration. The reading assumes the instantaneous release and dispersal of 20% of the clad inventory of noble gas and iodine into the containment atmosphere. This amount of activity in containment, if released, could have such severe consequences that it is prudent to treat this as a potential loss of CNMT Barrier, such that a General Emergency declaration is warranted. The 20% clad inventory threshold is based on NUREG-1228, "Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents", which indicates that a major release of radioactivity requiring offsite protective actions from core damage is not likely at fuel failures releasing less than 20% clad inventory from the core into the reactor coolant. It is important to note that containment failures may not be necessary to achieve offsite doses exceeding protective action guides. Depending on meteorological conditions, the amount of core damage, and the containment pressure transient, leakage comparable to the T/S containment leak rate may be sufficient to cause offsite protective actions.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92

Section 1.0	**FISSION PRODUCT BARRIER MATRIX**
TAB 1.3	**CNMT BARRIER**
EAL 1.3.6	**Emergency Director Judgment**
Mode	1,2,3,4
Indicator(s)	Any condition that, in the judgment of the SM/ED, indicates Loss or Potential Loss of the CNMT Barrier comparable to the conditions listed above.
Basis	This Indicator gives the ED the latitude to use his/her judgment in determining if the CNMT Barrier is a "Potential Loss" or "Loss". This situation is usually considered when plant conditions are present that require the monitoring of CSFs or performance of EOP corrective actions. Specific cases where ED judgment may be required are the loss of instrumentation needed to monitor the CSFs and the loss of all AC power. Although the majority of the Indicators provide very specific thresholds, the ED must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the ED, an imminent situation is at hand with no viable success path available, the classification should be made as if the thresholds have been exceeded. While this is particularly prudent at the higher emergency classes (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all emergency classes.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92

Section	**FISSION PRODUCT BARRIER MATRIX**
TAB	**Not Applicable**
Classification	**GENERAL EMERGENCY**
Mode	1,2,3,4
Criterion(s)	LOSS of any two barriers and Potential LOSS of third barrier OR LOSS of all three barriers
Basis	Definition: Events are in process or have occurred which involve Actual or Imminent Substantial Core Degradation or Melting with Potential for Loss of Containment integrity. Releases can be reasonably expected to exceed EPA Plume Protective Action Guidelines Exposure Levels outside the EXCLUSION AREA BOUNDARY. The main differentiation between the Site Area and General Emergency classification is whether or not the EPA PAG plume exposure levels are expected to be exceeded outside the site boundary. This threshold, in addition to dynamic dose assessment considerations, addresses NRC and offsite emergency response agency concerns as to timely declaration of a General Emergency. The main objective of the General Emergency is to determine whether evacuation or sheltering of the general public is indicated based on EPA PAGs, and therefore should be interpreted to include radionuclide release regardless of cause. Consideration must be given to failures of systems and or structures that provide fission product barrier integrity which is the primary method of preventing uncontrolled radionuclide releases. In terms of fission product barriers, the loss of two barriers with potential loss of the third barrier constitutes a General Emergency.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92

Section	**FISSION PRODUCT BARRIER MATRIX**
TAB	**Not Applicable**
Classification	**SITE AREA EMERGENCY**
Mode	1,2,3,4
Criterion(s)	LOSS or Potential LOSS of any two barriers OR LOSS of one barrier and a Potential LOSS of a second barrier
Basis	Definition: Events are in process or have occurred which involve Actual or Likely Major Failures of Plant Functions needed for the Protection of the Public. Any releases are not expected to result in Exposure Levels which Exceed EPA Plume Protective Action Guideline Exposure Levels outside the Exclusion Area Boundary. It is considered to be a challenge to plant functions necessary for the protection of the public if the integrity of any two of the three fission product barriers has or has the potential of being degraded. This approach is more conservative than USNRC Regulatory Guide 1.101 in that the CNMT Barrier is not weighted less significant than the other two barriers. Thus a "Loss" or "Potential Loss" of any two barriers is a Site Area Emergency. This approach also simplifies the Site Area Emergency classification from the fission product barrier matrix.
Escalation	Escalation would be based on Actual or Imminent Substantial Core Degradation
References	NUMARC/NESP-007, (modified) Rev 2, 1/92

Section	**FISSION PRODUCT BARRIER MATRIX**
TAB	**Not Applicable**
Classification	**ALERT**
Mode	1,2,3,4
Criterion(s)	Any LOSS or Potential LOSS of Fuel Clad Barrier OR Any LOSS or Potential LOSS of RCS Barrier
Basis	Definition Events are in process or have occurred which involve an Actual or Potential Substantial Degradation of the Level of Safety of the Plant. Any releases are expected to be limited to small fractions of the EPA Plume Protective Action Guideline Exposure Levels. The "Loss" or "Potential Loss" of either the Fuel Clad Barrier or RCS Barrier is considered to be an actual or potential substantial degradation of the level of safety of the plant. The Alert classification resulting from potential degradation of the fuel clad or RCS integrity also addresses the operation staff's need for help by staffing the Technical Support Center (TSC), independent of whether an actual decrease in plant safety is determined. This increased monitoring can then be used to better determine the actual plant safety state, whether escalation to a higher emergency class is warranted, or whether de-escalation or termination of the emergency class declaration is warranted. Dose consequences from these events are small fractions of the EPA PAG plume exposure levels, i.e., about 10 millirem to 100 millirem. The CNMT Barrier is not addressed at the Alert classification. A challenge of the CNMT Barrier, without a concurrent challenge to either the Fuel Clad or RCS Barriers, is not deemed as significant as a challenge to innermost barriers. A challenge to the CNMT Barrier is addressed as an Unusual Event.
Escalation	Escalation would be based on Actual or Likely Major Failures of Plant Functions needed to Protect the Public.
References	NUMARC/NESP-007, Rev 2, 1/92

Section	**FISSION PRODUCT BARRIER MATRIX**
TAB	**Not Applicable**
Classification	**UNUSUAL EVENT**
Mode	1,2,3,4
Criterion(s)	LOSS or Potential LOSS of Containment Barrier See also EALs 2.4, 2.5, 2.6
Basis	Definition: Unusual Events are in process or have occurred which indicate a Potential Degradation of the Level of Safety of the Plant. No releases of Radioactive Material requiring Offsite Responses or Monitoring are expected unless further degradation of Safety Systems occurs. In these EALs, Unusual Events are treated as precursors to more significant events. TABs 2.4, 2.5, and 2.6 address events that are precursors to the Fuel Clad and RCS Barrier challenges. The 'Potential Loss' or 'Loss' of either the Fuel Clad or RCS Barriers individually is an ALERT. The "Loss or "Potential Loss" of the CNMT Barrier alone is not considered to be substantial degradation of the level of safety of the plant (i.e., ALERT) when the other two fission product barriers are intact. However, since there is a potential for substantial degradation if another condition develops, hence, the Unusual Event classification.
Escalation	Escalation would be based on Actual or Potential Substantial Degradation of the Level of Safety of the Plant.
References	NUMARC/NESP-007, Rev 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.1	**LOSS OF INSTRUMENTATION**
EAL 2.1.S	**SITE AREA EMERGENCY**
Mode	1,2,3,4
Description	**Inability to monitor a SIGNIFICANT TRANSIENT in progress** *[1 and 2 and 3 and 4]* 1. Loss of most (>75%) of annunciators or indications for >15 Minutes 2. **SIGNIFICANT TRANSIENT** in progress 3. Loss of SER and SPDS (deleted for Unit 2) 4. Inability to directly monitor any of the following CSFs: Subcriticality Vessel Integrity Core Cooling Containment Heat Sink
Basis	This EAL is intended to recognize the inability of the control room staff to monitor the plant response to a transient. When the loss of annunciators or Control Room indications is complicated with a significant unplanned power change as well as loss of non-alarming compensatory indications, such as, SPDS and SER (for Unit 1 only), and those Control Room indications needed to monitor Plant Critical Safety Functions, a Site Area Emergency exists. This declaration is prudent since the control room staff cannot monitor safety functions needed for protection of the public. No discrimination between "safety system" and "non-safety system" annunciators is immediately practical. All annunciators are powered from uninterruptable and redundant power supplies. Additionally, the "safety system" annunciators are interspersed throughout the annunciator panels. For these reasons, no separation of annunciator types is made in the EAL. For the purposes of quantification "most" is approximated as greater than 75%. Losses in excess of this indicates an increased risk that a degraded plant condition could go undetected. It is not intended that a detailed count of the instrumentation be performed but only a rough approximation be used to determine the severity of the condition. SIGNIFICANT TRANSIENT involves an UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 25% thermal reactor power; (2) Electrical load rejection >25% full electrical load; (3) Reactor Trip; or (4) Safety Injection System Activation. Due to the limited number of safety systems in operation during cold shutdown and refueling modes, no initiating conditions are indicated during these modes of operation. The (15 minute) time duration was selected to exclude transient or momentary power losses.
Escalation	Escalation will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (SS6), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.1	**LOSS OF INSTRUMENTATION**
EAL 2.1.A	**ALERT**
Mode	1,2,3,4
Description	**UNPLANNED loss of most annunciators or indications for >15 Minutes with either a SIGNIFICANT TRANSIENT in progress or a loss of non-alarming compensatory indications** *[1 and 2 and 3]* 1. **UNPLANNED** loss of most (>75%) annunciators or indications for >15 Minutes 2. SM judgment that additional personnel (beyond normal shift complement) are required to monitor the safe operation of the unit. 3. *(a or b)* a. SIGNIFICANT TRANSIENT in progress b. Loss of SER and SPDS (delete SER for Unit 2)
Basis	This EAL indicates that a loss of annunciators complicated with either the loss of SPDS and SER (if applicable) or a plant transient indicates a deterioration of the level of plant safety has occurred and an Alert should be declared. Fifteen minutes was selected as a threshold value to exclude momentary power losses or transients. No discrimination between "safety system" and "non-safety system" annunciators is immediately practical. All annunciators are powered from uninterruptable and redundant power supplies. Additionally, the "safety system" annunciators are interspersed throughout the annunciator panels. For these reasons, no separation of annunciator types is made in the EAL. SM judgment is intended to recognize the need for additional resources and ensure adequate resources are available. SIGNIFICANT TRANSIENT involves an UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 25% thermal reactor power; (2) Electrical load rejection >25% full electrical load; (3) Reactor Trip; or (4) Safety Injection System Activation. Unplanned loss of annunciators excludes scheduled maintenance and testing activities. For the purposes of quantification "most" is approximated as greater than 75%. Losses in excess of this indicates an increased risk that a degraded plant condition could go undetected. It is not intended that a detailed count of the instrumentation be performed but only a rough approximation be used to determine the severity of the condition. Due to the limited number of safety systems in operation during cold shutdown and refueling modes, no initiating conditions are indicated during these modes of operation
Escalation	Escalation of this event will be based on the inability of the operating crew to monitor a transient in progress.
References	NUMARC/NESP-007, (SA4), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.1	**LOSS OF INSTRUMENTATION**
EAL 2.1.U	**UNUSUAL EVENT**
Mode	1,2,3,4
Description	**UNPLANNED loss of most annunciators or indications for >15 Minutes** *[1 and 2]* 1. Unplanned loss of most (>75%) annunciators or indications for >15 Minutes 2. SM judgment that additional personnel (beyond normal shift complement) are required to monitor the safe operation of the unit.
Basis	For this EAL, if annunciators or indications are partially or completely lost it is still possible to use other systems to indicate plant conditions (e.g., SER or SPDS). However, it is prudent to declare an Unusual Event since there is a greater risk that a degraded condition could go undetected. Fifteen minutes was selected as a threshold value to exclude momentary power losses or transients. For the purposes of quantification "most" is approximated as greater than 75%. Losses in excess of this indicates and increased risk that a degraded plant condition could go undetected. It is not intended that a detailed count of the instrumentation be performed but only a rough approximation be used to determine the severity of the condition. No discrimination between "safety system" and "non-safety system" annunciators is immediately practical. All annunciators are powered from uninterruptable and redundant power supplies. Additionally, the "safety system" annunciators are interspersed throughout the annunciator panels. For these reasons, no separation of annunciator types is made in the EAL. Unplanned loss of annunciators excludes scheduled maintenance and testing activities. SM judgment is intended to recognize the need for additional resources and ensure adequate resources are available. Due to the limited number of safety system in operation during cold shutdown, refueling and defueled modes, no initiating conditions are indicated during these modes of operation.
Escalation	Escalation of this event would be based on loss of annunciators complicated by the loss of SPDS and plant computer or a transient in progress.
References	NUMARC/NESP-007, (SU3), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.2	**LOSS OF FUNCTION**
EAL 2.2.G	**GENERAL EMERGENCY**
Mode	1,2,3,4
Description	**Inability to cool the core** *[1 or 2]* 1. Actions of FR-C.1 (RED PATH) are **INEFFECTIVE** 2. *[a and b]* a. Five hottest CETCs (three max CETCs) >1200°F (>1200°F); or CETCs >719°F (>729°F) with no RCPs running and RVLIS full range <40% (<40%). b. Actions taken have NOT resulted in a rising trend in RVLIS level or a dropping trend in core exit thermocouple temperatures within 15 minutes of initiation of restoration actions
Basis	The basis for a General Emergency is redundant to the declaration using the fission product barrier matrix. It is included here to permit rapid assessment of a predominant path through the matrix. Refer to the Fission Product Barrier Matrix basis for additional detail.
Escalation	Not Applicable
References	NUMARC/NESP-007, (FPM-addition),Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.2	**LOSS OF FUNCTION**
EAL 2.2.S	**SITE AREA EMERGENCY**
Mode	1,2,3,4
Description	**Loss of function needed to achieve or maintain hot shutdown** *[1 or 2]* 1. Ops personnel report a CSF status tree RED PATH terminus for core cooling or heat sink exists 2. Five hottest (three max) core exit thermocouples >1200 F; (>1200°F) or core exit thermocouples >719°F (>729°F) with NO RCPs running and RVLIS full range <40% (40%)
Basis	This EAL addresses loss of functions, including core cooling and heat removal required for hot shutdown with the reactor at pressure and temperature. Concerns for reactivity control are appropriately addressed in EAL 2.3 "Failure of Reactor Protection." Under these conditions, there is an actual major failure of a functions intended for protection of the public. Thus, declaration of a Site Area Emergency is warranted. This is also consistent with the Fission Product Barrier Matrix.
Escalation	Escalation will be based on "Fission Product Barrier Matrix" or 2.2.G.
References	NUMARC/NESP-007, (SS4), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.2	**LOSS OF FUNCTION**
EAL 2.2.A	**ALERT**
Mode	1,2,3,4
Description	**Complete loss of function needed to achieve Cold Shutdown when Shutdown required by Tech Specs** *[1 and 2 and 3]* 1. Loss of decay heat removal capability (RHR, CCR, or RPRW) / (RHS, CCP, SWS) 2. Inability to remove heat via the condenser 3. Shutdown to mode 5 required by T/S
Basis	For this EAL the inability to achieve Cold Shutdown when it is required, refers to unplanned actions, equipment malfunctions or operator error that prevents achievement of Cold Shutdown This condition could result from a loss of RHR capability, service water to the RHR, heat exchange or equipment failure with the RHR system or AC/DC power loss to the RHR and or reactor plant river water components (i.e., CCR, RPRW) The combination of this and the loss of ;the secondary heat sink to the condenser for cooldown indicates a degradation of the level of plant safety and warrants the declaration of an Alert. This is more serious than the concern expressed for a shutdown in excess of shutdown action statement time requirements within 2.7.U. In this situation attainment of cold shutdown (Mode 5) is more than delayed, it is currently not obtainable.
Escalation	Escalation of this event would be based on complete loss of functions needed to achieve or maintain Hot Shutdown.
References	NUMARC/NESP-007, (SA3-modified)

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.2	**LOSS OF FUNCTION**
EAL 2.2.U	**UNUSUAL EVENT**
Mode	All
Description	**UNPLANNED loss of communication** *[1 or 2]* 1. In-plant *[a and b and c]* a. **UNPLANNED** loss of all PAX phones b. **UNPLANNED** loss of all Gaitronics (Page/Party) c. **UNPLANNED** loss of all Radios (handie-Talkies) 2. Offsite *[a and b and c]* a. **UNPLANNED** loss of ENS b. **UNPLANNED** loss of Bell Lines c. **UNPLANNED** loss of Radios to Offsite
Basis	The purpose of this EAL is to recognize a loss of communications capability that either defeats the plant operations staff's ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities. Onsite communications loss must encompass the loss of all means of routine communications (i.e., phones, page party system and radio/walkie talkies). The loss of offsite communications ability is expected to be significantly more comprehensive than those addressed by 10 CFR 50.72. Offsite communications loss must encompass the loss of all means of communications with offsite authorities. This EAL is intended to be used only when extraordinary means are being utilized to make communications possible (i.e., individuals being sent to offsite locations to establish communications).
Escalation	Escalation of this event will involve the loss of other plant functions.
References	NUMARC/NESP-007, (SU6), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.3	**FAILURE OF RX PROTECTION**
EAL 2.3.G	**GENERAL EMERGENCY**
Mode	1,2
Description	**Rx power >5% after VALID trip signal(s) and loss of core cooling capability** *[1 and 2]* 1. Ops personnel report FR-S.1 has been entered and subsequent actions do NOT result in a reduction of power to <5% and decreasing 2. *[a or b]* a. Ops personnel report CSF status tree **RED PATH** terminus exists for core cooling or heat sink b. Five hottest core exit thermocouples (three max) >1200 F (>1200 F); or five hottest core exit thermocouples (three max) >719°F (729°F) with NO RCPs running and RVLIS full range <40% (40%)
Basis	Under the conditions of this EAL, the efforts to bring the reactor to less than five percent power have been unsuccessful and, as a result, the reactor is producing more heat than the maximum decay heat load for which the safety systems were designed. FR-S.1 lists actions intended to shutdown the reactor. This includes actions in the control room and in other areas of the plant. FR-S.1 is utilized within the EAL to discriminate between those situations in which immediate manual reactor trip was not possible from the control room. The BVPS Unit 1 control room has two trip control locations on the main control board. Both are within immediate access for the reactor operator. If both fail to result in a reactor trip EOP E-0 directs the operator to FR-S.1. There are additional capabilities (i.e., emergency boration) to bring the plant under control. The indication of a Core Cooling Red is used to indicate these capabilities are not effective. The existence of inadequate core cooling thus indicates that sufficient heat is not being removed from the core., which is a core melt sequence. Similarly, the challenge to the Steam Generators in the early stages of the event (i.e., RED PATH terminus for Heat Sink) indicates insufficient feed water flow to remove heat and is a precursor for a core melt sequence. In either situation, if these challenges exist at a time that the reactor has not been brought below 5% power, core degradation can occur rapidly and a core melt sequence is considered to exist. For this reason, the General Emergency declaration is intended to be consistent with the Fission Product Barrier Matrix declaration to permit maximum offsite intervention time.
Escalation	Not Applicable
References	NUMARC/NESP-007, SG2, Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.3	**FAILURE OF RX PROTECTION**
EAL 2.3.S	**SITE AREA EMERGENCY**
Mode	1,2
Description	**Reactor trip failure after VALID Trip signal(s) with reactor power >5% and attempts to cause a manual trip from the control room are unsuccessful.** *[1]* 1. Ops personnel report FR-S.1 has been entered and manual reactor trip from the control room did not result in reduction of power to <5% and decreasing
Basis	This EAL indicates a failure of the automatic and control room manual signals to trip the reactor with reactor power above 5%. Under these conditions, the reactor is producing more heat than the maximum decay heat load for which the safety systems are designed. A Site Area Emergency is indicated because conditions exist that lead to imminent loss or potential loss of both fuel clad and RCS. Although this EAL may be viewed as anticipatory to the Fission Product Barrier Degradation EAL, its inclusion is necessary to better assure timely recognition and emergency response. FR-S.1 lists actions intended to shutdown the reactor. This includes actions in the control room and in other areas of the plant. FR-S.1 is utilized within the EAL to discriminate between those situations in which immediate manual reactor trip was not possible from the control room. The BVPS Unit 1 control room has two trip control locations on the main control board. Both are within immediate access for the reactor operator. If both fail to result in a reactor trip EOP E-0 directs the operator to FR-S.1.
Escalation	Escalation of this event would be based on the inability to trip the RX and indications of Heat Sink Red or Core Cooling Red.
References	NUMARC/NESP-007, (SS2), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.3	**FAILURE OF RX PROTECTION**
EAL 2.3.A	**ALERT**
Mode	1,2
Description	**Automatic reactor trip did not occur after VALID trip signal and manual trip from the control room was successful** *[1 and 2* 1. **VALID** reactor trip signal received or required 2. Manual reactor trip from the control room was successful and power is <5% and decreasing
Basis	This EAL indicates failure of the Reactor Protection System (RPS) to automatically trip the reactor. This condition is a potential degradation of a safety system in that a primary front line automatic protection system did not function in response to a plant transient or condition requiring system actuation. This is an immediate threat to the fuel clad barrier. The declaration of an Alert will increase plant staff awareness of an RPS failure and expedite the post trip review which ensures a comprehensive and systematic investigation of the cause of the failure, verification of fuel clad status, and subsequent equipment repairs. This is consistent with the definition of an Alert.
Escalation	Escalation of this event would be based on the reactor power not being reduced to less than five percent by actions of FR-S.1 or via the Fission Product Barrier Matrix.
References	NUMARC/NESP-007, (SA2 - Deviation), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.3	**FAILURE OF RX PROTECTION**
EAL 2.3.U	**UNUSUAL EVENT**
Mode	1,2
Description	Not Applicable
Basis	Not Applicable
Escalation	Not Applicable.
References	Not Applicable

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.4	**FUEL CLAD DEGRADATION**
EAL 2.4.U	**UNUSUAL EVENT**
Mode	1,2,3,4,5
Description	**Reactor Coolant System specific activity exceeds LCO (Refer to BVPS technical specification 3.4.8)** *[1 or 2* 1. **VALID** high alarm on RM-CH-101A or B (2CHS-RQ101 A/B) reactor coolant letdown monitor 2. Radiochemistry analysis exceeds Technical Specification 3.4.8
Basis	This EAL is included as an Unusual Event since it indicates a potential degradation in the level of safety of the plant and a potential precursor to more serious problems. This level of cladding degradation is escalated via the Fission Product Barrier Matrix, so no escalation exists within TAB 2.4. INDICATOR #1 addresses the high alarm on CVCS letdown liquid which would provide indication of the loss of fuel clad integrity. This permits rapid indication of the need for additional assessment/confirmation of the monitors validity. It is not intended to require full sample analysis. INDICATOR #2 addresses the results of coolant sample analysis that may not be preceded by a high alarm. In both cases, the level is intended to be higher than the activity expected as the result of an Iodine spike resulting from a routine transient. The RCS specific activity LCO limits the allowable concentration level of radionuclides in the reactor coolant. The LCO limits are established to minimize the offsite radioactivity dose consequences in the event of a steam generator tube rupture (SGTR) accident. The LCO contains specific activity limits for both Dose Equivalent I-131 and gross specific activity. The allowable levels are intended to limit the 2-hour dose at the site boundary to a small fraction of the 10 CFR 100 dose guideline values.
Escalation	Escalation will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (SU4), Rev. 2, 1/92 T.S. 3.4.8 RCS Specific Activity Unit 1 Technical Specification Amendment 244 Unit 2 Technical Specification Amendment 101 C6

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.5	**RCS UNIDENTIFIED LEAKAGE**
EAL 2.5.U	**UNUSUAL EVENT**
Mode	1,2,3,4,5 (Applies to Mode 5 if RCS Pressurized)
Description	**Unidentified or pressure boundary RCS leakage >10 GPM** 1. Unidentified or pressure boundary leakage (per T/S) >10 GPM as indicated below *[a or b]* a. OST 1.6.2 results (2.6.2A) b. With RCS temp. and PZR level stable, VCT level dropping at a Rate >10 GPM (>1%/min indicated on LI-CH-115 (2CHS-LI115) with no VCT makeup in progress)
Basis	This EAL is included as an Unusual Event because it may be a precursor of more serious conditions and, as a result, is considered to be a potential degradation of the level of safety of the plant. The 10 gpm value for the unidentified and pressure boundary leakage was selected as it is observable with normal control room indications and it is above the value associated with the Technical Specification required shutdown. This is consistent with the definition of the Unusual Event. . Only operating modes in which there is fuel in the reactor coolant system and the system is pressurized are specified. An additional annotation is included for Mode 5 to clarify this consideration.
Escalation	Escalation will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (SU5 - Modification), Rev. 2, 1/92 T.S. 3.4.6.2 RCS Operational Leakage T.S. Definition 1.14b is Unidentified Leakage T.S. Definition 1.14c is Pressure Boundary Leakage OST-1.62

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.6	**RCS IDENTIFIED LEAKAGE**
EAL 2.6.U	**UNUSUAL EVENT**
Mode	1,2,3,4,5 Applies to Mode 5 if RCS Pressurized
Description	**Identified RCS leakage >25 GPM** 1. Identified RCS leakage (as defined by Technical Specifications) >25 GPM *[a or b or c]*[c26] a. OST 1.6.2 or 1.6.2.A (2.6.2 or 2.6.2A) results b. **UNPLANNED** level rise in excess of 25 GPM total into PRT, DG-TK-1, and DG-TK-2 / (PRT, 2DGS-TK-21 and 2DGS-TK-22) c. Indication of Steam Generator tube leakage >25 GPM[c26]
Basis	This EAL is included as an Unusual Event because it may be a precursor of more serious conditions and, as a result, is considered to be a potential degradation of the level of safety of the plant. The 25 gpm value for the identified leakage was selected as it is observable with normal control room indications and it is above the value associated with the Technical Specification required shutdown. A clarification is added for steam generator tube leakage in that S/G leakage is defined as identified leakage by Technical Specification. The threshold for this EAL is set at a higher value than unidentified leakage due to the reduced significance of identified leakage. This is true since the leakage is collected and of known quantity.[c26] Only operating modes in which there is fuel in the reactor coolant system and the system is pressurized are specified. An additional annotation is included for Mode 5 to clarify this consideration.
Escalation	Escalation will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (SU5 - Modified), Rev. 2, 1/92 T.S. 3.4.6.2 RCS Operational Leakage T.S. Definitions 1.14a

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.7	**TECHNICAL SPECIFICATION**
EAL 2.7.U	**UNUSUAL EVENT**
Mode	1,2,3,4
Description	**Inability to reach required Shutdown within Technical Specification limits** *[1 and 2]* 1. A Technical Specification action statement, requiring a mode reduction, has been entered 2. The unit has NOT been placed in the required mode within the time prescribed by the action statement
Basis	Limiting Conditions of Operation (LCO) action statements require the plant to be brought to a required shutdown mode when the Technical Specification required configuration cannot be restored within an appropriate time frame. Specific time durations are included to permit an orderly shutdown of the unit to progress in these circumstances. The initiation of plant shutdown required by the site Technical Specifications requires a four hour report under 10 CFR 50.72 (b) (2): Non-emergency events. The plant is within its safety envelope when being shut down within the allowable action statement time in the Technical Specifications. An immediate declaration of an Unusual Event is required when the plant is not or will not, for whatever reason, be brought to the required operating mode within the allowable action statement time in the Technical Specifications.
Escalation	Not Applicable
References	NUMARC/NESP-007, (SU2), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.8	**SAFETY LIMIT**
EAL 2.8.U	**UNUSUAL EVENT**
Mode	1,2,3,4,5
Description	**Safety Limit has been Exceeded** *[1 or 2]* 1. Technical Specification 2.1.1 specifies the safety limits for the reactor core which are applicable in Modes 1 and 2. 2. Technical Specification 2.1.2 specifies the safety limit for the Reactor Coolant System pressure which is applicable in Modes 1, 2, 3, 4, and 5.
Basis	This EAL considers concerns with exceeding specified safety limits. The restrictions of these safety limits prevent overheating of the fuel and cladding, as well as possible cladding perforation that would result in the release of fission products to the reactor coolant. Overheating of the fuel is prevented by maintaining the steady-state peak linear heat rate (LHR) below the level at which centerline fuel melting occurs. Overheating of the fuel cladding is prevented by restricting fuel operation to within the nucleate boiling regime, where the heat transfer coefficient is large and the cladding-surface temperature is slightly above the coolant-saturation temperature. Operation above the boundary of the nucleate boiling regime could result in excessive cladding temperature because of the onset of DNB and the resultant sharp reduction in heat-transfer coefficient. Inside the steam film, high cladding temperatures are reached, and a cladding-water (zirconium-water) reaction may take place. This chemical reaction results in oxidation of the fuel cladding to a structurally weaker form. This weaker form may lose its integrity, resulting in an uncontrolled release of activity to the reactor coolant. It is intended that this escalation be recognized via the Fission Product Barrier Matrix. This EAL is consistent with the definition of an Unusual Event as a potential precursor to fission product barrier degradation and thus warrants the classification.
Escalation	Not Applicable
References	NUMARC/NESP-007, (SU2 - Addition), Rev 2 1/92 U1 Technical Specification Amendment #239 U2 Technical Specification Amendment #120

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.9	**TURBINE FAILURE**
EAL 2.9.A	**ALERT**
Mode	1,2,3
Description	**Turbine failure generated missiles cause penetration of a missile shield wall of any area containing safety related equipment** 1. Plant personnel report missiles generated by turbine failure with casing penetration also results in a through-wall penetration of a missile shield wall listed in Table 5-2
Basis	This EAL is intended to address the threat to safety related equipment imposed by missiles generated by main turbine rotating component failures. Shield walls are incorporated into the design of the areas of concern. To permit a rapid assessment of the potential for damage to safety related equipment, an assessment of these shield walls is appropriate. If no through wall penetration is observed, equipment should not be jeopardized. The list of areas provided includes all areas containing safety-related equipment, their controls, and their power supplies. This EAL is, therefore, consistent with the definition of an ALERT. Unit 1 Table 5-2 Plant Areas Associated With Shield Wall Penetration EAL Control Room / Electrical Switchgear / Safeguards 1WT-TK-10 / Diesel Generator Bldg / Cable Tray Mezz Containment / Primary Aux. Building Unit 2 Plant Areas Associated With Shield Wall Penetration EAL Main Steam Valve Room / 2FWE-TK210 Diesel Generator Bldg / Containment Service Bldg. 745' and 760' / Primary Aux. Building Emergency Switchgear 730
Escalation	Escalation of this event will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (HA1 example #6), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.9	**TURBINE FAILURE**
EAL 2.9.U	**UNUSUAL EVENT**
Mode	1,2,3
Description	**Turbine failure results in casing penetration** 1. Plant personnel report a turbine failure which results in penetration of the turbine casing or damage to main generator seals (with evidence of significant hydrogen or seal oil leakage)
Basis	This EAL is intended to address main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the main turbine generator. Of major concern is the potential for damage to non-safety related equipment or the leakage of combustible fluids, lubricating oils and gases (hydrogen) to the plant environs. Actual fires and flammable gas build up are appropriately classified via other events. This EAL is consistent with the definition of an Unusual Event while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment.
Escalation	Escalation of this event would be based on potential damage done by turbine PROJECTILES to safety related equipment.
References	NUMARC/NESP-007, (HU1 example # 6), Rev. 2, 1/92

Section 2.0	**SYSTEM DEGRADATION**
TAB 2.10	**STEAM/FEED LINE BREAK**
EAL 2.10.U	**UNUSUAL EVENT**
Mode	1,2,3,4
Description	**UNPLANNED rapid depressurization of the Main Steam System resulting in a rapid RCS cooldown and Safety Injection initiation** *[1 and 2]* 1. Ops personnel report rapid depressurization of Main Steam System that causes SLI (<510 psig) (SLI <500 PSIG) 2. Ops personnel report Safety injection has actuated
Basis	For this EAL a rapid depressurization could be caused by a Main Steam line break or feed line break which results in rapid RCS cool down and safety injection. This EAL is therefore consistent with the definition of an Unusual Event and warrants declaration whether SLI and/or SI are initiated by automatic or manual initiation in response to the depressurization. UNPLANNED is included in the EAL to preclude the declaration of an emergency as a result of planned maintenance activities.
Escalation	Escalation of this event will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (HU5), Rev. 2, 1/92

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Section 3.0	**LOSS OF POWER**
Tab 3.1	**LOSS OF AC (Power Ops)**
EAL 3.1.G	**GENERAL EMERGENCY**
Mode	1,2,3,4
Description	**Prolonged loss of offsite and onsite AC Power** *[1 and 2]* 1. AE and DF 4KV buses not energized from Unit 1 (2) source for >15 minutes 2. *[a or b or c]* a. Ops personnel report CSF status tree **RED PATH** or **ORANGE PATH** terminus exists for core cooling b. Restoration of either AE or DF 4KV bus is not likely from any source within 3 hours of loss c. Five hottest core exit thermocouples (three max) >1200 F (>1200 F); or five hottest core exit thermocouples (three max) >719°F (>729 F) with NO RCPs running and RVLIS full range<40% (<40%)
Basis	Loss of all AC power compromises all plant safety systems requiring electric power including ECCS, Containment Depressurization, and Containment Heat Removal. Prolonged loss of all AC power will lead to loss of fuel clad, RCS, and containment. This is due to the inability to add inventory to the RCS. Additionally, inventory is lost from the RCS at an increasing rate via the reactor coolant pump seals. Loss of AC is defined in INDICATOR #1 identically to ECA 0.0, as both emergency buses de-energized. This permits achieving this EAL even though offsite power may be available to the normal 4KV buses. This is appropriate, since the charging pumps are powered only from the emergency buses. The 15 minute time duration, selected to exclude transient or momentary power losses, allows for re-energization within a timely manner if the normal buses remain energized. INDICATOR #2 considers three indications of event degradation. Both a. and c. include concern for actual indication of degrading core cooling capability. This is placed at the CSF RED or ORANGE PATH terminus for Core Cooling. This is appropriate and consistent with the Fission Product Barrier Matrix, without an allowance for 15 minutes of response in FR-C.1. This too, is appropriate since no AC power exists in this event to take actions in FR-C.1. The three hours to restore AC power allotted by INDICATOR #2.b., was based on a site blackout coping analysis of 4 hours performed in conformance with 10 CFR 50.63 and Regulatory Guide 1.155, "Station Blackout." An appropriate allowance of one hour is included for the initiation of offsite emergency response. It is intended that the 4 hour time designation be used as a default value. While analysis indicates there is reason to believe that core cooling can be adequately maintained for several (3) hours, real time indications may indicate that this is not true. Although this EAL is redundant to the Fission Product Barrier Degradation it is specified to assure that in the unlikely event of a prolonged station blackout, timely recognition of the seriousness of the event occurs and that declaration of a General Emergency occurs as early as is appropriate, based on a (Con't)

Section 3.0	**LOSS OF POWER**
TAB 3.1	**LOSS OF AC (Power Ops)**
EAL 3.1.G	**GENERAL EMERGENCY (continued)**
Mode	1,2,3,4
Basis (Con't)	reasonable assessment of the event trajectory. This permits time to initiate offsite intervention actions. It is also noteworthy, that under these conditions, fission product barrier monitoring capability may be degraded. Manual electrical cross-tie capability should be considered to constitute restoration of a single emergency power supply and eliminate the necessity to declare a General Emergency due to the 3 hour time allotment in 2.b. Monitoring for and manual operation of equipment is necessary to avoid inadequate core cooling situations. This, too, prevents the necessity to declare a General Emergency due to the constraints of 2a. and 2c.
Escalation	Not Applicable
Reference	NUMARC/NESP-007, (SG1), Rev 2, 1/92

Section 3.0	**LOSS OF POWER**
TAB 3.1	**LOSS OF AC (Power Ops)**
EAL 3.1.S	**SITE AREA EMERGENCY**
Mode	1,2,3,4
Description	**Loss of offsite and onsite AC power for >15 Minutes** 1. AE and DF 4KV buses not energized from Unit 1 (2) source for >15 minutes
Basis	The Loss of all AC power compromises all plant safety systems requiring electric power including ECCS, Containment Depressurization, and Containment Heat Removal. Prolonged loss of all AC power will cause core uncovering and loss of containment integrity. This is due to the inability to add inventory to the RCS. Additionally, inventory is lost from the RCS at an increasing rate via the reactor coolant pump seals. Loss of AC is defined in INDICATOR #1 identically to ECA 0.0, as both emergency buses de-energized. This permits achieving this EAL even though offsite power may be available to the normal 4KV buses. This is appropriate, since the charging pumps are powered only from the emergency buses. The 15 minute time duration, selected to exclude transient or momentary power losses, allows for re-energization within a timely manner if the normal buses remain energized. The AC power tie-line between Unit 1 and Unit 2 is not credited as a source of onsite power in this EAL as the need to power the safety systems in the affected unit from the companion unit is deemed to represent major failures of functions necessary for the protection of the public -- a Site Area Emergency. The configuration of the tie-line is such that it cannot be placed in operation within 15 minutes. The tie-line could, however, maintain CSFs and prevent an escalation to a General Emergency.
Escalation	Prolonged loss of all offsite power and prolonged loss of all onsite power will, when combined with inadequate core cooling, result in an escalation of this event.
References	NUMARC/NESP-007 (SS1), Rev. 2, 1/92

Section 3.0	**LOSS OF POWER**
TAB 3.1	**LOSS OF AC (Power Ops)**
EAL 3.1.A	**ALERT**
Mode	1,2,3,4
Description	**AC power to emergency buses reduced to a single source of power such that any additional failure will result in the de-energization of both buses** *[1 and 2]* 1. Either AE or DF 4KV bus is de-energized for >15 minutes 2. The energized AE or DF 4KV bus has only one source of power *[a or b]* a. Emergency diesel generator b. 1A or 1D 4KV normal bus (2A or 2D)
Basis	The condition indicated by this EAL is the degradation of the offsite and onsite power systems such that any additional single failure would result in a station blackout. This condition could occur due to a loss of offsite power with a concurrent failure of one emergency diesel generator to supply power to its emergency busses. The (15 minute) time duration was selected to exclude transient or momentary power losses. INDICATOR #2 includes the four normal means of supplying power to the two emergency buses. The loss of any three of the four constitutes this INDICATOR and thus the Alert declaration.
Escalation	Prolonged Loss of all offsite power and prolonged Loss of all onsite power will escalate this event.
References	NUMARC/NESP-007,(SA5), Rev. 2, 1/92

Section 3.0	**LOSS OF POWER**
TAB 3.1	**LOSS OF AC (Power Ops)**
EAL 3.1.U	**UNUSUAL EVENT**
Mode	1,2,3,4
Description	**Loss of Offsite Power Supply for >15 Minutes** *[1 and 2]* c26 1. Offsite power supply to AE and DF 4KV buses unavailable for >15 minutes. c26 2. Each diesel generator is supplying power to its respective emergency bus
Basis	Prolonged loss of offsite AC power availability reduces required redundancy to the class 1E electrical distribution system and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete Loss of AC Power (Station Blackout). This is consistent with the definition of an Unusual Event. c26 Each emergency bus receives its normal power from offsite supply via a normal bus and two series-connected circuit breakers. Loss of the offsite supply, or tripping of either breaker, results in a loss of the normal power source. The bus would then be powered by its associated emergency diesel generator. c26 Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.
Escalation	Loss of one additional power supply to the shutdown boards will escalate this event.
References	NUMARC/NESP-007 (SU1), Rev. 2, 1/92

Section 3.0	**LOSS OF POWER**
TAB 3.2	**LOSS OF AC (Shutdown)**
EAL 3.2.A	**Alert**
Mode	5,6, defuel
Description	**UNPLANNED loss of offsite and onsite AC power for >15 minutes** 1. AE and DF 4KV buses not energized from Unit 1 (2) source for >15 minutes
Basis	A loss of all AC power compromises all plant safety systems that require AC power including RHR, spent fuel pool cooling, and the river water systems. At modes 1-4, this event would be classified as Site Area Emergency. A lower classification is justified here due to the reduced decay heat. 15 minutes is specified so as to exclude momentary power losses. Note however, that this event is bounded by EAL 6.2.S if the loss continues such that core boiling has or will uncover fuel in the reactor vessel, a Site Area Emergency would be declared. INDICATOR #1 encompasses the CRITERION in that the AE and DF buses are fed from either offsite or onsite sources. Thus, having both buses de-energized indicates a failure of both sources. This EAL is intentionally redundant to 6.3 Loss of AC (Shutdown).
Escalation	Escalation would occur if the RCS temperature increased above 200°F due to a loss of RHR caused by the loss of power
References	NUMARC/NESP-007 (SA1), Rev 2, 1/92,

Section 3.0	**LOSS OF POWER**
TAB 3.2	**LOSS OF AC (Shutdown)**
EAL 3.2.U	**Unusual Event**
Mode	5,6, defuel
Description	**UNPLANNED loss of offsite AC power supply for >15 minutes** *(1 and 2)* [c26] 1. Offsite power supply to AE and DF 4KV buses unavailable for >15 minutes. [c26] 2. Either diesel generator is supplying power to its respective emergency bus
Basis	A prolonged loss of offsite AC power availability reduces power source redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete loss of AC power. 15 minutes is specified so as to exclude momentary power losses. [c26] This EAL is similar to EAL 6.3.U, except that the phrase UNPLANNED was added to exclude classifications that could result from offsite power bus outages scheduled and controlled by maintenance work activities. [c26] Each emergency bus receives its normal power from offsite supply via a normal bus and two series-connected circuit breakers. Loss of the offsite supply, or tripping of either breaker, results in a loss of the normal power source. The bus would then be powered by its associated emergency diesel generator. [c26] INDICATOR #1 the emergency busses that are supplied by offsite power. INDICATOR #2 establishes that at least one train of onsite power is available. [c26] This EAL is intentionally redundant to 6.3 Loss of AC (Shutdown).
Escalation	Escalation would occur if onsite AC power was lost.
References	NUMARC/NESP-007 (SU1), Rev 2, 1/92

Section 3.0	**LOSS OF POWER**
TAB 3.3	**LOSS OF DC**
EAL 3.3.S	**SITE AREA EMERGENCY**
Mode	1,2,3,4
Description	**Loss of all vital DC Power for >15 minutes** 1. Voltage <110.4 VDC on DC buses 1-1 and 1-2 and 1-3 and 1-4 (2-1 and 2-2 and 2-3 and 2-4) for >15 minutes Also Refer to the "Fission Product Barrier Matrix", "Loss of Function", and "Loss of Instrumentation" and "Loss of Shutdown Systems"
Basis	Loss of all DC power compromises the ability to monitor and control plant safety functions. Prolonged loss of all DC power will cause core uncovering and loss of containment integrity when there is significant decay heat and sensible heat in the reactor system. Fifteen minutes is specified to exclude momentary power losses. In INDICATOR #1, the specified voltage is the minimum voltage specified in the UFSAR at which DC loads will perform reliably.
Escalation	Escalation would occur through the Fission Product Barrier Matrix Degradation or Loss or Function
References	NUMARC/NESP-007, (SS3), Rev. 2, 1/92

Section 3.0	**LOSS OF POWER**
TAB 3.3	**LOSS OF DC**
EAL 3.3.U	**UNUSUAL EVENT**
Mode	1,2,3,4
Description	**UNPLANNED Loss of one Train of DC power for >15 Minutes** *[1 or 2]* 1. Voltage <110.4 VDC on DC Buses 1-1 and 1-3 (2-1 and 2-3) for >15 Minutes 2. Voltage <110.4 VDC on DC Buses 1-2 and 1-4 (2-2 and 2-4) for >15 Minutes
Basis	The purpose of this EAL is to recognize a loss of DC power compromising the ability to monitor and control the plant. This EAL is in addition to the concerns for loss of annunciation or indication identified in EAL 2.1. The loss of one train of DC power while operating in modes 1,2,3 or 4 is consistent with the definition of an Unusual Event for BVPS. The 110.4 volt Bus Voltage is the minimum bus voltage necessary for the operation of safety related equipment. This voltage value should incorporate a margin of at least 15 minutes of operation before the onset of inability to operate those loads. The fifteen minute threshold is utilized to exclude a transient or momentary power losses.
Escalation	The event will escalate if indications are lost and a transient occurs per 2.1.S
References	NUMARC/NESP-007, (SU7 - addition), Rev. 2, 1/92

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Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB	**ALL**
EAL	Not applicable
Mode	Not applicable
Description	Not applicable
Basis	*This discussion applies generically to all EALs in Section 4* TAB 4.7 provides the generic definitions for the four emergency classifications. All of the specific EALs were developed to correspond to these four definitions. The Emergency Director may find these definition useful in classifying an event that isn't adequately addressed by a specific EAL. The other TABs in this section address events that have the potential to affect plant operations. In this section, generally it is the event and its potential for impact on the operation of the plant that is addressed. As a general protocol, UNUSUAL EVENTS are categorized on the basis of the <u>occurrence</u> of an event of <u>sufficient magnitude</u> to be of concern. Areas identified in the EALs define the <u>location</u> of the event based on the potential for damage of equipment contained therein. Depending on the event, the magnitude is established on the basis of the duration of the event (*e.g., FIRE lasting longer than 15 minutes*) or on other definable values (*e.g., flammable gas greater than explosive concentrations*).[C17] Escalation to an ALERT generally occurs when the magnitude of the event is sufficient to result in damage to the equipment contained in the specified location. In these cases, the reference to damage of systems is used to identify the <u>magnitude</u> of the event. References to areas and systems are used to <u>locate</u> the event in areas where the event could lead to a substantial degradation in the level of safety of the plant. The significance here is not that a particular system was degraded, but rather, the event was of sufficient magnitude to cause this degradation. The system malfunction that might have occurred is addressed by EALs in other sections Escalation to a SITE AREA EMERGENCY occurs when the system damage is sufficient enough to represent a loss of a function necessary for the protection of the public. This typically occurs based on EALs in other sections (e.g., fission product matrix, system malfunction). EALs for SITE AREA EMERGENCY are provided in this section for some events deemed significant enough to warrant an anticipatory declaration. There are two GENERAL EMERGENCY EALs provided in this section. These address events significant enough to cause concern regarding core melt sequences or loss of control of the plant. They are classified in this section to provide for an anticipatory declaration and offsite protective actions.
Escalation	Not applicable
References	Not applicable

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.1	**FIRE**
EAL 4.1.G	**GENERAL EMERGENCY**
Mode	1,2,3,4

Description

FIRE in the Instrument and Relay Room (CB-1), Cable Spreading Room (CB-2), Control Room (CB-3), West [C6] Communications Room (CB-6), or Cable Tunnel (CT-1) [C32] resulting in an evacuation of the control room per 1.56C.4 (2.56C.A) *"Alternate Safe Shutdown"* and loss of any required equipment resulting in an uncontrolled RCS heatup. *[1 and 2 and 3]*

1. 1.56C.4 (2.56C.4) *"Alternate Safe Shutdown"* entered

2. Ops personnel report inability to operate at least one of each (any) of the following components of the available train (equipment required by 2.56C.4):

Unit 1

Charging Pump	AFW pump	Diesel generator
RPRW pump	BIP	Steam relief path

Unit 2

2CHS-P21A	2CCP-P21A
EGS-EG2-1	2FWE-P23A & 2FWE-P22
2SAS-C21A	Alternate S/D Panel
2SWS-P21A	2RHS-P21A
Black D/G	

3. Uncontrolled RCS heatup lasting longer than 15 minutes.

(Cont.)

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.1	**FIRE**
EAL 4.1.G	**GENERAL EMERGENCY (Con't)**
Mode	1,2,3,4
Basis	See generic bases at the beginning of this section. The EAL considers the degradation associated with the implementation of OM 1(2).56C.4 "Alternate Safe Shutdown". The procedure is designed to permit a small operating crew to shutdown and cooldown the unit without the use of the control room or alternate shutdown panel (Unit 2 Areas: Instrument and Relay Room (CB-1), Cable Spreading Room [C6] (CB-2), Control Room (CB-3), West Communications Room (CB-6), or Cable tunnel (CT-1)) [C32]. The procedure is entered when there is a fire in the control room, cable tray mezzanine, or process control room. These areas carry cabling and equipment controls that can affect safety systems significantly. The cable separation is such that a fire in any one of these areas will not eliminate both trains of equipment capability. To achieve unit shutdown and cooldown without fire induced spurious activations and failures, only select components of a single available train are utilized. This intentionally reduces the normal redundancy of safety related equipment and thus necessitates that all equipment identified operate as required. INDICATOR #2 recognizes that if one of the components performing each of the identified functions is not operating properly, plant control cannot be ensured. For the Unit 1 charging and reactor plant river water systems this can be accomplished with the available train pump or the swing "C" pump. For the AFW (FWE) system this can be accomplished by the use of the available motor driven pump or the turbine driven pump. Any available steam path is acceptable, (atmospheric dump valves or residual heat release valve). The loss of this equipment under these conditions will lead to a core melt sequence. INDICATOR #3 is included to recognize the RCS heatup toward a core melt sequence and prevent an overly conservative declaration due to momentary losses of equipment functions. When the loss of functions leads to an uncontrolled heatup the situation constitutes a General Emergency.
Escalation	Not Applicable
References	NUMARC/NESP-007 (addition consistent w/ HG2) Rev. 2, 1/92 OM 1.56C.4

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.1	**FIRE**
EAL 4.1.S	**SITE AREA EMERGENCY**
Mode	1,2,3,4
Description	**FIRE in the Instrument and Relay Room (CB-1), Cable Spreading Room (CB-2), Control Room (CB-3), West [C6] Communications Room (CB-6), or Cable Tunnel (CT-1) [C32] resulting in an evacuation of the control room per 1.56C.4 (2.56C.4)"Alternate Safe Shutdown"** 1. 1.56C.4 (2.56C.4) "Alternate Safe Shutdown" entered
Basis	See generic bases at the beginning of this section. The EAL considers the degradation associated with the implementation of OM 1.56C.4 "Alternate Safe Shutdown". The procedure is designed to permit a small operating crew to shutdown and cooldown the unit without the use of the control room or alternate shutdown panel (Unit 2 Areas: Instrument and Relay Room (CB-1), Cable Spreading Room (CB-2), Control Room (CB-3), West Communications Room (CB-6), or Cable tunnel (CT-1)) [C32]. The procedure is entered when there is a fire in the control room, cable tray mezzanine, or process control room. These areas carry cabling and equipment controls that can affect safety systems significantly. The cable separation is such that a fire in any one of these areas will not eliminate both trains of equipment capability. To achieve this unit shutdown and cooldown without fire induced spurious activations and failures, only select components of a single available train are utilized. This intentionally reduces the normal redundancy of safety related equipment. This reduction in available equipment coupled with the fire in progress and the limitations associated with instrumentation constitutes a Site Area Emergency.
Escalation	Escalation would be based on 4.1.G due to loss of necessary equipment to perform OM 1.56C.4
References	NUMARC/NESP-007 (addition consistent w/ HS2) Rev. 2, 1/92 OM 1.56C.4

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.1	**FIRE**
EAL 4.1.A	**ALERT**
Mode	All
Description	**FIRE in any of the areas listed in Table 4-1 that is affecting safety related equipment** *[1 and 2]* 1. **FIRE** in any of the areas listed in Table 4-1 2. *[a or b]* a. Ops personnel report **VISIBLE DAMAGE** to permanent structure or equipment in specified area due to **FIRE** b. Control Room indication of degraded system or component (within specified areas) response due to **FIRE**
Basis	See generic bases at the beginning of this section. Fires that are likely to affect the plant's safety systems represent a degraded plant condition. The fire may have damaged equipment or damage is likely due to the proximity of heat, or flame to the systems required for safe shutdown. The likelihood of damage is subjective but is based on fire location, intensity and duration without performance of a detailed damage assessment prior to classification. The determination of the safety and supporting systems necessary for safe shutdown during the applicable operating mode and the assessment of the impact of the fire on the performance of those systems will be determined by the Emergency Director. For this reason, no time duration is designated to quantify the fire. This EAL is predicated on the existence and magnitude of the fire, not on the loss of equipment due to the fire. This is due to a desire to avoid reliance on an extensive damage assessment and to recognize the timely concern for hidden damage. Verification of the fire requires evidence of VISIBLE DAMAGE or degradation of system or component performance. This is included in INDICATORs #2a. and b. This acts to quantify the fire. In all cases, verification should be accomplished within 15 minutes. The verification of a containment fire alarm (with containment subatmospheric) should be through the reset of the alarm at the local panel. If this fails, the use of equipment response degradation addition to redundant area fire alarms and/or containment temperature indications should be used. Unit 1 Table 4-1 Plant Structures Associated with Fire and Explosion EALs Control Room / AE/DF Switchgear / U1/U2 Cable Tunnel (CV3) Cable Tray Mezzanine / Demin Water (1WT-TK-10) / D/G Fuel Oil (Con't)

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.1	**FIRE**
EAL 4.1.A	**ALERT (Con't)**
Mode	All

Basis (con't)

Process Control Room	RW Valve Pit	Diesel Generator Room
Relay Room	Containment Building	Fuel Building
Rod Drive/MG set Room	Primary Auxiliary Building	Intake Structure Cubicles
RWST (1QS-TK-1)	Safeguards Building	CO2 Stor./PG Pump Room

Unit 2

Control Room	Relay Room	Inst. and Relay Rm. 707'
Emer. Switchgear	Cbl Spreading Room 725'	Safeguards Bldg.
W. Comm. Rm 707'	Service Bldg.	Cable Tunnel 712'.
Penetrations Area	Cable Tunnel 735'	Main Stm Valve Rm.
Diesel Gen. Bldgs.	PAB	Fuel Bldg.
Intake Structure Cub.	Containment Bldg.	U1/U2 Cable Tunnel (CV-3)
Rod Control Cable Vault Bldg.		ERF Substation & ERF Diesel Bldg.

FIRE is combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.
VISIBLE DAMAGE is damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included.

Escalation	Escalation would be based on Fission Product Barrier Matrix or Control Room Evacuation
References	NUMARC/NESP-007, (HA2), Rev. 2, 1/92 Figure 4-A Protected Area and Site Perimeter

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.1	**FIRE**
EAL 4.1.U	**UNUSUAL EVENT**
Mode	All
Description	**FIRE in or adjacent to those areas listed in Table 4-1 not extinguished within the 15 minutes from the time of control room notification or verification of control room alarm**

Basis

See generic bases at the beginning of this section.

This EAL addresses confirmed fires that occur in selected areas of the plant that house safety systems It also covers verified fires outside of these areas that may impact structures that contain safety systems due to the proximity of the fire. In either case these fires may be potentially significant precursors to damage of safety systems or may impact structures that contain safety systems. The initiating condition excludes fires that occur outside these key buildings, such as the warehouses, or other small fires that do not potentially affect safety systems. The 15 minute time limit has been established to exclude small fires that can be controlled by the Emergency Squad resources. This EAL is predicated on the existence and magnitude of the fire, not on the loss of equipment due to the fire. This is due to a desire to avoid reliance on an extensive damage assessment and to recognize the timely concern for hidden damage.

Verification of the fire in this EAL is either by direct communication with plant personnel confirming that a fire exists or the action taken by the Control Room personnel to determine that a fire annunciator received in the Control Room is not due to a spurious signal. Implicit in this is the need for timely verification of the alarm. In all cases, verification should be accomplished within 15 minutes. The verification of a containment fire alarm (with containment subatmospheric) should be through the reset of the alarm at the local panel. If this fails, additional area fire alarms and/or containment temperature indications should be used.

Unit 1

Table 4-1 Plant Structures Associated with Fire and Explosion EALs

Control Room	AE/DF Switchgear	U1/U2 Cable Tunnel (CV3)
Cable Tray Mezzanine	Demin Water (1WT-TK-10)	D/G Fuel Oil
Process Control Room	RW Valve Pit	Diesel Generator Room

(Con't)

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.1	**FIRE**
EAL 4.1.U	**UNUSUAL EVENT**
Mode	All
Basis (con't)	Relay Room Rod Drive/MG set Room RWST (1QS-TK-1) Containment Building Primary Auxiliary Building Safeguards Building Fuel Building Intake Structure Cubicles CO2 Stor./PG Pump Room Unit 2 Control Room Emer. Switchgear W. Comm. Rm 707' Penetrations Area Diesel Gen. Bldgs. Intake Structure Cub. Rod Control Cable Vault Bldg. Relay Room Cbl Spreading Room 725' Service Bldg. Cable Tunnel 735' PAB Containment Bldg. Inst. and Relay Rm. 707' Safeguards Bldg. Cable Tunnel 712'. Main Stm Valve Rm. Fuel Bldg. U1/U2 Cable Tunnel (CV3) ERF Substation & ERF Diesel Bldg. FIRE is combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.
Escalation	Escalation of this event is based on the Fire affecting plant safety related equipment required to establish or maintain safe shutdown.
References	NUMARC/NESP-007, (HU2-addition), Rev. 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.2	**EXPLOSIONS**
EAL 4.2.A	**ALERT**
Mode	All
Description	**EXPLOSION in any of the areas listed in Table 4-1 that is affecting safety related equipment** *[1 and 2]* 1. **EXPLOSION** in any of the areas listed in Table 4-1 2. *[a or b]* a. Ops personnel report **VISIBLE DAMAGE** to permanent structure or equipment in specified area b. Control Room indication of degraded system or component (within listed areas) response due to the **EXPLOSION**
Basis	See generic bases at the beginning of this section. EXPLOSIONS include those that are of sufficient magnitude to damage permanent structures or equipment within the plant vital area. As used here, an EXPLOSION is a rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment, that potentially imparts significant energy to near-by structures and material. VISIBLE DAMAGE is damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included. The "Report of VISIBLE DAMAGE" should not be interpreted as requiring a lengthy damage assessment prior to classification. The observation of damage to a structure is sufficient to make a declaration. The declaration of the Alert and the activation of the TSC is warranted and will provide the Emergency Director with resources necessary to perform damage assessment. Unit 1 Table 4-1 Plant Structures Associated with Fire and Explosion EALs Control Room — AE/DF Switchgear — U1/U2 Cable Tunnel (CV3) Cable Tray Mezzanine — Demin Water (1WT-TK-10) — D/G Fuel Oil Process Control Room — RW Valve Pit — Diesel Generator Room
Escalation	Escalation will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (HA2), Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.2	**EXPLOSIONS**
EAL 4.2.A	**ALERT (Con't)**
Mode	All
Description	**EXPLOSION in any of the areas listed in Table 4-1 that is affecting safety related equipment** *[1 and 2]* 1. **EXPLOSION** in any of the areas listed in Table 4-1 2. *[a or b]* a. Ops personnel report **VISIBLE DAMAGE** to permanent structure or equipment in specified area b. Control Room indication of degraded system or component (within specified areas) response due to the **EXPLOSION**

Basis (Con't)

Relay Room	Containment Building	Fuel Building
Rod Drive/MG set Room	Primary Auxiliary Building	Intake Structure Cubicles
RWST (1QS-TK-1)	Safeguards Building	CO2 Stor./PG Pump Room

Unit 2

Control Room	Relay Room	Inst. and Relay Rm. 707'
Emer. Switchgear	Cbl Spreading Room 725'	Safeguards Bldg.
W. Comm. Rm 707'	Service Bldg.	Cable Tunnel 712'.
Penetrations Area	Cable Tunnel 735'	Main Stm Valve Rm.
Diesel Gen. Bldgs.	PAB	Fuel Bldg.
Intake Structure Cub.	Containment Bldg.	U1/U2 Cable Tunnel (CV3)
Rod Control Cable Vault Bldg.		ERF Substation & ERF Diesel Bldg.

Escalation	Escalation will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (HA2), Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.2	**EXPLOSIONS**
EAL 4.2.U	**UNUSUAL EVENT**
Mode	All
Description	**UNPLANNED EXPLOSION in areas adjacent to those areas listed in Table 4-1** 1. **UNPLANNED EXPLOSION** in or adjacent to those areas listed in Table 4-1
Basis	See generic bases at the beginning of this section. This EAL considers explosions in areas adjacent to the areas listed in Table 4-1. This is consistent with the Unusual Event definition.

Unit 1

Table 4-1 Plant Structures Associated with Fire and Explosion EALs

Control Room	AE/DF Switchgear	U1/U2 Cable Tunnel (CV3)
Cable Tray Mezzanine	Demin Water (1WT-TK-10)	D/G Fuel Oil
Process Control Room	RW Valve Pit	Diesel Generator Room
Relay Room	Containment Building	Fuel Building
Rod Drive/MG set Room	Primary Auxiliary Building	Intake Structure Cubicles
RWST (1QS-TK-1)	Safeguards Building	CO2 Stor/PG Pump Room

Unit 2

Control Room	Relay Room	Inst. and Relay Rm. 707'
Emer. Switchgear	Cbl Spreading Room 725'	Safeguards Bldg.
W. Comm. Rm 707'	Service Bldg.	Cable Tunnel 712'.
Penetrations Area	Cable Tunnel 735'	Main Stm Valve Rm.
Diesel Gen. Bldgs.	PAB	Fuel Bldg.
Intake Structure Cub.	Containment Bldg.	U1/U2 Cable Tunnel (CV3)
Rod Control Cable Vault Bldg.		ERF Substation & ERF Diesel Bldg.

(Con't)

Escalation	Escalation of this event would be based on EXPLOSION damage to a structure or equipment causing a degradation in the performance of equipment.
References	NUMARC/NESP-007, (HU2), Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.2	**EXPLOSIONS**
EAL 4.2.U	**UNUSUAL EVENT (Con't)**
Mode	All
Description	**UNPLANNED EXPLOSION in areas adjacent to those areas listed in Table 4-1** 1. **UNPLANNED EXPLOSION** in or adjacent to those areas listed in Table 4-1
Basis (Con't)	See generic bases at the beginning of this section. As used here, an EXPLOSION is a rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment, that potentially imparts significant energy to near-by structures and material. For this event classification, the occurrence of the EXPLOSION is sufficient to make the declaration without making a lengthy assessment of the damage. UNPLANNED is included in the IC to preclude the declaration of an emergency as a result of planned maintenance activities.
Escalation	Escalation of this event would be based on EXPLOSION damage to a structure or equipment causing a degradation in the performance of equipment.
References	NUMARC/NESP-007, (HU2), Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.3	**FLAMMABLE GAS**
EAL 4.3.A	**ALERT**
Mode	All

Description

Release of flammable gas within a facility structure containing safety related equipment or associated with power production. [C17, C33]

1. Plant personnel report the average of three readings taken in an approximately 10ft triangular area is > 25% LEL (Lower Explosive Limit) within any building listed in Table 4-2

Basis

See generic bases at the beginning of this section.

Report or detection of flammable gases within plant vital structures in concentrations that are approaching the lower explosive limit is a degradation of the level of safety of the plant and warrants the declaration of an Alert. The potential for substantial equipment damage exists with the ignition of such a gas concentration. [C17, C33]

Table 4-2 Plant Structures Associated with Toxic or Flammable Gas EALs

Unit 1

Containment Bldg	Gaseous Waste Valve Rm	Main Intake Structure
Safeguards Bldg	CO2 Storage/PG Pump Rm	Diesel Generator Building
Primary Aux. Bldg	Turbine Building	Service Bldg. (incl FW Reg Vlv Rm)
Fuel Handling Bldg	Demin. Water Sto. (WT-TK-10)	
Water Treatment Bldg		

Unit 2

Control Building*	Fuel Handling Bldg.	Turbine Bldg.
Emer. Switchgear	Safeguards Bldg.	WST (QSS-TK21)
Service Bldg.	PAB	Penetrations Area
Containment Bldg.	Diesel Gen. Bldgs.	Demin. Water Sto (FWE-TK210)
Pri Intake Structure	CV-3 (Unit1/2 Cable Tunnel	
Cable Vault & Rod Control Bldg.	(incl. MSVR)	

A 10ft triangular area was chosen to ensure any reading obtained was representative of the general area concentration. This prevents a declaration due to a reading very near the source of a minor gas leak

Escalation

Escalation will be based on "Fission Product Barrier Matrix".

References

NUMARC/NESP-007, HA3, Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.3	**FLAMMABLE GAS**
EAL 4.3.U	**UNUSUAL EVENT**
Mode	All
Description	*[A or B]* [C17,C33] **A. UNPLANNED release of flammable gas within the SITE PERIMETER.** 1. Plant personnel report the average of three readings taken in an approximately 10ft triangular area is > 25% **LEL** (Lower Explosive Limit) within the **SITE PERIMETER** (Refer to Figure 4-A) **B. Confirmed report by local, county, or state officials That an offsite flammable gas release has occurred within one mile of the site with potential to enter the SITE PERIMETER in concentrations >25% of LEL (Refer to Figure 4-A & 4-B)**
Basis	See generic bases at the beginning of this section. [C17,C33] Two EALs are specified to account for the potential source of flammable gas being either onsite or offsite. Report or detection of flammable gases in concentrations within the site or near the site that will affect the health of plant personnel or affect the safe operation of the plant (i.e., tanker truck accident releasing flammable gases, etc.) constitutes an Unusual Event. EAL A. acts to support EAL B. in the event that an offsite situation is not reported as having the capacity to affect conditions onsite. Unplanned is included in the IC to preclude the declaration of an emergency as a result of planned maintenance activities. SITE PERIMETER encompasses all owner controlled areas in the immediate site environs as shown on Figure 4-B. Additionally, a one mile radius is included with distinctive landmarks to aid in determining location relative to the site.
Escalation	Escalation is based on flammable gases entering a plant area that jeopardizes safety related equipment or power production.
References	NUMARC/NESP-007, (HU3), Rev 2, 1/92 Figure 4-B One Mile Radius/Site Perimeter

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.4	**TOXIC GAS**
EAL 4.4.A	**ALERT**
Mode	All
Description	**Release of TOXIC GAS within a facility structure which prohibits safe operation of systems required to establish or maintain cold S/D** [C17, C33] (1 and 2) 1. Plant personnel report **TOXIC GAS** within any building listed in Table 4-2 2. Plant personnel would be unable to perform actions necessary to establish and maintain cold shutdown while utilizing appropriate personnel protection . equipment
Basis	See generic bases at the beginning of this section. [C17, C33] Report or detection of toxic gases within plant vital structures in concentrations that are life threatening to plant personnel and affect the ability to achieve or maintain the plant in a cold shutdown condition is a degradation of the level of safety of the plant and warrants the declaration of an Alert. Allowance is made for the use of protective equipment in INDICATOR #2. If such equipment is unavailable or ineffective and access to the area is required for station shutdown to mode 5, the declaration should be made. Table 4-2 Plant Structures Associated with Toxic or Flammable Gas EALs Unit 1 Containment Bldg — Gaseous Waste Valve Room — Main Intake Structure Safeguards Bldg — CO2 Storage/PG Pump Room — Diesel Generator Building Primary Aux. Bldg — Turbine Building Service Bldg. (incl FW Reg Vlv Rm) Fuel Handling Bldg — Demin. Water Sto. (WT-TK-10) — Water Treatment Building Unit 2 Control Bldg* — Fuel Handling Bldg. — Turbine Bldg. Emer. Swgr — Safeguards Bldg. — RWST (QSS-TK21) Service Bldg. — PAB Penetrations Area — Containment Bldg. Diesel Gen. Bldgs. — Demin. Water Sto (FWE-TK210) Pri Intake Structure — CV-3 (Unit1/2 Cable Tunnel) Cable Vault & Rod Control Bldg. (incl. MSVR) TOXIC GAS is a gas that is dangerous to life or health by reason of inhalation or skin contact (e.g., chlorine).
Escalation	Escalation will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (HA2), Rev 2, 1/92 Figure 4-B One Mile Radius/Site Perimeter

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.4	**TOXIC GAS**
EAL 4.4.U	**UNUSUAL EVENT**
Mode	All
Description	(A or B) [C17, C33] **A. Normal operation of the plant impeded due to access restrictions caused by UNPLANNED TOXIC GAS concentrations within a facility structure listed in Table 4-2** OR **B. Confirmed report by local, county, or state officials that an offsite TOXIC GAS release has occurred within one mile of the site with potential to enter the SITE PERIMETER in concentrations > than the Lower Toxicity Limit (LTL) (Refer to Figure 4-A & 4-B)** *Refer to AOP 1/2.44A.1 "Toxic Gas Release", Attachment 3 for a list of chemicals stored, produced, or transported near BVPS and their toxicity limits*
Basis	See generic bases at the beginning of this section. [C17, C33] Report or detection of a release of toxic gases in concentrations within the site or near the site perimeter that will affect the health of plant personnel or that could lead to an effect on the safe operation of the plant (i.e., tanker truck accident releasing toxic gases, etc.) constitutes an Unusual Event. TOXIC GAS is a gas that is dangerous to life or health by reason of inhalation or skin contact (e.g., chlorine). SITE PERIMETER encompasses all owner controlled areas in the immediate site environs as shown on Figure 4-A. Additionally, a one mile radius is included with distinctive landmarks to aid in determining location relative to the site. Table 4-2 Plant Structures Associated with Toxic or Flammable Gas EALs Unit 1 Containment Bldg — Gaseous Waste Valve Room — Main Intake Structure Safeguards Bldg — CO2 Storage/PG Pump Room — Diesel Generator Building
Escalation	Escalation to this event will be based on toxic gases entering a plant area that jeopardizes life or impacts cold shutdown capability
References	NUMARC/NESP-007, HU3, Rev 2, 1/92 DOT Emergency Response Guide for Hazardous Materials Figure 4-B One Mile Radius/Site Perimeter

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.4	**TOXIC GAS**
EAL 4.4.U	**UNUSUAL EVENT (Con't)**
Mode	All
Description	(A or B) [C17, C33] A. **Normal operation of the plant impeded due to access restrictions caused by UNPLANNED TOXIC GAS concentrations within a facility structure listed in Table 4-2** OR B. **Confirmed report by local, county, or state officials that an offsite TOXIC GAS release has occurred within one mile of the site with potential to enter the SITE PERIMETER in concentrations > than the Lower Toxicity Limit (LTL) (Refer to Figure 4-A & 4-B)** *Refer to AOP 1/2.44A.1 "Toxic Gas Release", Attachment 3 for a list of chemicals stored, produced, or transported near BVPS and their toxicity limits*
Basis (Con't)	Primary Aux. Bldg; Service Bldg. (incl FW Reg Vlv Rm); Demin. Water Sto. (WT-TK-10); Turbine Building; Fuel Handling Bldg; Water Treatment Building Unit 2 Control Bldg*; Emer. Swgr; Service Bldg.; Containment Bldg.; Pri Intake Structure; Fuel Handling Bldg.; Safeguards Bldg.; PAB; Diesel Gen. Bldgs.; CV-3 (Unit1/2 Cable Tunnel); Turbine Bldg.; RWST (QSS-TK21); Penetrations Area; Demin. Water Sto (FWE-TK210) Cable Vault & Rod Control Bldg. (incl. MSVR) [C17, C33]
Escalation	Escalation to this event will be based on toxic gases entering a plant area that jeopardizes life or impacts cold shutdown capability
References	NUMARC/NESP-007, HU3, Rev 2, 1/92 DOT Emergency Response Guide for Hazardous Materials Figure 4-B One Mile Radius/Site Perimeter

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.5	**CONTROL ROOM EVACUATION**
EAL 4.5.S	**SITE AREA EMERGENCY**
Mode	All
Description	**Evacuation of the control room has been initiated and control of all necessary equipment has not been established within 15 minutes of manning the Shutdown Panel** *(1 and 2)* 1. AOP-1.33.1 (2.33.1A)*"Control Room Inaccessibility"* has been entered 2. Inability to transfer any single component listed in Table 4-3 within 15 minutes of manning the shutdown panel
Basis	Evacuation of the control room and relocation to the shutdown panel results in a significant reduction in available instrumentation and control. INDICATOR #1 considers the evacuation of the control room through the entry into AOP 1.33.1 (2.33.1A) "Control Room Inaccessibility". INDICATOR #2 further considers the inability to control specified pieces of equipment that are intended to protect the Critical Safety Functions and fission product barriers. Each of these equipment items is redundant, with the exception of FCV-1CH-122, (2CHS*FCV122) and it is only intended that one of the redundant train pieces of equipment be transferred and under operator control to meet the requirement for the INDICATOR. If transfer of these safety system components has not been performed in an expeditious manner protection of the CSFs and fission product barriers is reduced. This condition warrants the declaration of a Site Area Emergency. Table 4-3 Equipment Required at Shutdown Panel includes: One Auxiliary Feedwater Pump — One Boric Acid Pump(and boration valve) One Atmospheric Steam Dump — FCV-1CH-122 One Charging Pump — (2CHS*FCV122) The 15 minute time limit for transfer of control is based on a reasonable time period for personnel to leave the control room, arrive at the Shutdown Panel area, and reestablish plant control to preclude core uncovery and/or core damage per AOP 1.33.1 (2.33.1A) "Control Room Inaccessibility".
Escalation	Escalation will be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (HS2), Rev 2, 1/92 AOP 1.33.1 "Control Room Inaccessibility"

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.5	**CONTROL ROOM EVACUATION**
EAL 4.5.A	**ALERT**
Mode	All
Description	**Evacuation of the control room is required** 1. AOP 1.33.1 (2.33.1A) "Control Room Inaccessibility" has been entered
Basis	Evacuation of the control room and relocation to the shutdown panel results in a significant reduction in available instrumentation and control. INDICATOR #1 considers the evacuation of the control room through the entry into AOP 1.33.1 (2.33.1A) "Control Room Inaccessibility". This is consistent with the definition of an Alert. Additionally, support from the Technical Support Center is advisable.
Escalation	Escalation of this event would be based on the inability to establish plant control from outside the Control Room within 15 minutes.
References	NUMARC/NESP-007, (HA5), Rev 2, 1/92 AOP 1.33.1 "Control Room Inaccessibility

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.6	**SECURITY**
EAL 4.6.G	**GENERAL EMERGENCY**
Mode	All
Description	**Security event resulting in loss of control of the systems necessary to establish or maintain cold shutdown** *[1 or 2]* 1. Hostile armed force has taken control of the control room or the remote shutdown panel 2. Hostile armed force has taken control of plant equipment such that Ops personnel report the inability to operate equipment necessary to maintain the following functions *[a or b or c]:* a. Subcriticality b. Core Cooling c. Heat Sink
Basis	This event represents a condition where a hostile force has taken control of the Control Room or vital areas within the plant that are required to reach and maintain a cold shutdown. This loss could be due to physical loss of control or by the damage of essential equipment. This situation leaves the plant in a very unstable condition with a high potential of multiple barrier failures. Further degradation remains a possibility and can lead rapidly to a core melt sequence. The declaration permits time for offsite intervention as deemed appropriate and permits additional resources to be focused on the site problems. No separation is afforded to permit avoiding the declaration of a General emergency based on the location of the transfer switches at the shutdown panel.
Escalation	Not Applicable
References	NUMARC/NESP-007, (HG1), Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.6	**SECURITY**
EAL 4.6.S	**SITE AREA EMERGENCY**
Mode	All
Description	**Security event has or is occurring which results in actual or likely failures of plant functions needed to protect the public** *[1 or 2]* 1. **VITAL AREA**, other than the control room, has been penetrated by a hostile armed force 2. Suspected **BOMB** detonates within a **VITAL AREA**.
Basis	This event represents a significant threat to the safety of the plant since there has been a hostile intrusion into the areas of the plant that contain equipment important to maintaining the plant in a safe condition. A credible security event is satisfied when physical evidence of a hostile intrusion exist. VITAL AREA is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.
Escalation	Escalation of this event would be based on loss of plant control, (control room or remote shutdown panel).
References	NUMARC/NESP-007, (HS1), Rev 2, 1/92 2/4/02 NRC Letter to NEI for Security EAL acceptance

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.6	**SECURITY**
EAL 4.6.A	**ALERT**
Mode	All
Description	**Security event which indicates an actual or potential substantial degradation in the level of safety of the plant** *(1 or 2 or 3)* 1. **BOMB** discovered within a **VITAL AREA** 2. **CIVIL DISTURBANCE** ongoing within the **PROTECTED AREA** 3. **PROTECTED AREA** has been penetrated By a hostile armed force Refer to Figure 4-A for a drawing of PROTECTED AREA
Basis	These class of Security events represent a threat to the level of safety of the plant. A credible threat is satisfied if physical evidence supporting the hostile intrusion or Bomb is discovered in the specified area. The identification of a bomb within a VITAL AREA is designated as an Alert. This is consistent with the explosion EAL, in that the BOMB creates a potential for safety degradation. This should escalate to a Site Area Emergency if the BOMB detonates within a VITAL AREA. BOMB refers to an explosive device. A CIVIL DISTURBANCE exists when there is a group of ten (10) or more persons violently protesting station operations or activities at the site. PROTECTED AREA encompasses all owner controlled areas within the security protected area fence as shown on Figure 4-A.
Escalation	Escalation of this event would be based on hostile intrusion into plant vital areas.
References	NUMARC/NESP-007, (HA4), Rev 2, 1/92 Figure 4-A PROTECTED AREA/SITE PERIMETER *2/4/02 NRC Letter to NEI for Security EAL acceptance*

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.6	**SECURITY**
EAL 4.6.U	**UNUSUAL EVENT**
Mode	All
Description	**Security event which indicates a potential degradation in the level of safety of the plant** *[1 or 2]* 1. **BOMB** discovered within the **PROTECTED AREA** 2. Security Shift Supervisor reports one or more of the events listed in Table 4-4
Basis	A security threat that is identified as being directed towards the Station which represents a potential degradation in the level of safety of the plant warrants declaration of an Unusual Event. A credible threat is satisfied if physical evidence supporting the threat exists, information independent from the actual threat message exists or a specific group claims responsibility for the threat. Examples of security events are provided in Table 4-4 Security Events a. SABOTAGE/INTRUSION has or is occurring within the PROTECTED AREA b. HOSTAGE/EXTORTION Situation that threatens to interrupt Plant Operations c. CIVIL DISTURBANCE ongoing between the SITE PERIMETER and PROTECTED AREA d. Hostile STRIKE ACTION within the PROTECTED AREA which threatens to interrupt Normal Plant Operations (judgment based on behavior of Strikers and/or intelligence received) e. A credible site-specific security threat notification. The intent of "e" above is to ensure that appropriate notifications for the security threat are made in a timely manner. Only if a specific threat to BVPS is made would an Unusual Event be declared. The determination of credible is made through the use of information in the BVPS Safeguards Contingency Plan. A higher initial classification could be made based upon the nature and timing of the threat and potential consequences. In addition, BVPS uses a trained security organization and an approved physical security plan and procedures. External events which may result in a security threat would be reported to the duty Shift Manager (SM) by the Security Shift Supervisor. If in the SM's judgment these events constitute an actual threat, they would be reported and a declaration made. BOMB refers to an explosive device. A HOSTAGE is a person(s) held as leverage against the station to ensure that demands will be met by the station. PROTECTED AREA encompasses all owner controlled areas within the security protected area fence as shown on Figure 4-A. (Con't)

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.6	**SECURITY**
EAL 4.6.U	**UNUSUAL EVENT**
Mode	All
Basis (continued)	SABOTAGE is deliberate damage, mis-alignment, or mis-operation of plant equipment with the intent to render the equipment inoperable. A CIVIL DISTURBANCE exists when there is a group of ten (10) or more persons violently protesting station operations or activities at the site. A STRIKE ACTION is a work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on BVPS. The STRIKE ACTION must threaten to interrupt normal plant operations. EXTORTION is an attempt to cause an action at the station by threat of force. An INTRUSION/INTRUDER is a suspected hostile individual(s) present in a protected area without authorization.
Escalation	Escalation of this event would be based on hostile intrusion into the plant Protected Area.
References	NUMARC/NESP-007, (HU4), Rev 2, 1/92 *2/4/02 NRC Letter to NEI for Security EAL acceptance*

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.7	**EMERGENCY DIRECTOR JUDGMENT**
EAL 4.7.G	**GENERAL EMERGENCY**
Mode	All
Description	**Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Plume Protective Action Guidelines exposure levels outside the EXCLUSION AREA BOUNDARY. Refer to Figure 4-C**
Basis	This event classification provides the Shift Manager/Emergency Director, the flexibility to declare a General Emergency if in their judgment unanticipated conditions not explicitly covered elsewhere warrant declaration of an emergency. The declaration of a General Emergency indicates that there is a very high probability that the fuel has been damaged and the loss of containment integrity is possible or other conditions exist that may result in a release to the environment that may be greater than the EPA Protective Action Guides.
Escalation	Not Applicable
References	NUMARC/NESP-007, (HG2), Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.7	**EMERGENCY DIRECTOR JUDGMENT**
EAL 4.7.S	**SITE AREA EMERGENCY**
Mode	All
Description	**Events are in process or have occurred which involve actual or likely major failures of plant functions needed for the protection of the public. Any releases are NOT expected to result in exposure levels which exceed EPA Plume Protective Action Guideline exposure levels outside the EXCLUSION AREA BOUNDARY. Refer to Figure 4-C**
Basis	This event classification provides the Shift Manager/Emergency Director, the flexibility to declare a Site Area Emergency if in their judgment unanticipated conditions not explicitly covered elsewhere warrant declaration. The declaration of a Site Area Emergency indicates high probability of major failures of plant functions needed to protect the public.
Escalation	Escalation of this event would be based on actual or imminent substantial core degradation.
References	NUMARC/NESP-007, (HS2), Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.7	**EMERGENCY DIRECTOR JUDGMENT**
EAL 4.7.A	**ALERT**
Mode	All
Description	**Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Plume Protective Action Guideline exposure levels.**
Basis	This event classification provides the Shift Manager/Emergency Director, the flexibility to declare an Alert if, in their judgment, unanticipated conditions not explicitly covered elsewhere warrant declaration of an Alert emergency.
Escalation	Escalation of this event would be based on actual or likely failures in plant functions needed to protect the public.
References	NUMARC/NESP-007, (HA6), Rev 2, 1/92

Section 4.0	**HAZARDS AND ED JUDGMENT**
TAB 4.7	**EMERGENCY DIRECTOR JUDGMENT**
EAL 4.7.U	**UNUSUAL EVENT**
Mode	All
Description	**Unusual events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.**
Basis	This event classification provides the Shift Manager/Emergency Director the flexibility to declare an Unusual Event if, in his judgment, unanticipated conditions not explicitly covered elsewhere warrant declaration of an emergency.
Escalation	Escalation of this event would be based on actual or potential degradation of plant safety systems.
References	NUMARC/NESP-007,(HU5), Rev 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.1	**EARTHQUAKE**
EAL 5.1.A	**ALERT**
Mode	All
Description	**Earthquake greater than 0.06g acceleration occurs ([1 and 2] for Unit 2)** 1. Analysis of Accelelorgraph Recording System data indicate ground acceleration > 0.06g in accordance with AOP 1/2.75.3 "*Acts of Nature - Earthquake*" *Unit 2 only* 2. [a and b] a. One or more alarm lamps and horn energized on the Seismic Warning panel [2ERS-ANN-1 b. Review of the printout on 2ERS-RSA-1 Response Spectrum Analyzer reveals an acceleration > 0.06g has occurred (see OM 2.45.4F) "Seismic Instrumentation Central Control Cabinet [2ERS-CCC-1] Running").
Basis	A seismic event of this level can cause damage to safety related systems. Plant seismic instrumentation ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and evaluate the response of those features important to safety. This capability is required to permit comparison of the measured response to that used in the design basis for the facility to determine if plant shutdown is required. This magnitude of acceleration is therefore consistent with the definition of an Alert.
Escalation	Escalation of this event will be based on " Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (HA1), Rev. 2, 1/92 AOP 1/2.75.3 "Acts of Nature - Earthquake"

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.1	**EARTHQUAKE**
EAL 5.1.U	**UNUSUAL EVENT**
Mode	All
Description	**Earthquake detected by site seismic instrumentation, >0.01g acceleration** *[1 and 2]* 1. Ann. A11-59 (A10-5h) "Seismic Accelerograph Operation" indicates initiation of the Accelerograph Recording System 2. *[a or b]* a. Ground motion sensed by plant personnel b. Unit 2 (Unit 1) reports seismic event detected on unit instrumentation
Basis	A seismic event of this level can cause some minor damage to plant structures or systems but it is not expected to have any impact on overall plant safety functions. There is a potential for degradation, however, and this is consistent with the definition of an Unusual Event. Plant seismic instrumentation ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and evaluate the response of those features important to safety. This capability is required to permit comparison of the measured response to that used in the design basis for the facility to determine if plant shutdown is required.
Escalation	Escalation of this event will be based on the magnitude of the ground acceleration.
References	NUMARC/NESP-007, (HU1), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.2	**TORNADO**
EAL 5.2.A	**ALERT**
Mode	All
Description	**Tornado or high wind strikes any structure listed in Table 5-1 and results in structural damage** *[1 and 2]* 1. Tornado or high winds strikes any structure listed in Table 5-1 2. *[a or b]* a. Confirmed report of any **VISIBLE DAMAGE** to specified structures b. Control room indications of degraded safety system or component response within listed structures due to event
Basis	Tornados or high winds striking the structures listed in Table 5-1 can cause damage to plant structures or systems needed for Safe Shutdown of the Plant. Tornadoes are a phenomena whose occurrence cannot be specifically predicted. INDICATOR #1 includes both tornados and high wind. No magnitude or duration is specified to define high wind. This is due to the current limitation of the met instrumentation (50 mph) and the reliance on the observation of VISIBLE DAMAGE. Winds of sufficient magnitude and duration to cause damage to safety structures are of concern. The presence of VISIBLE DAMAGE to the specified structures identified in INDICATOR #2, indicates a potential for damage to the equipment contained within that structure. A second INDICATOR is used to avoid a missed declaration when actual equipment degradation is noted. In these cases, the damage is consistent with the declaration of an Alert. A magnitude and duration for high winds is not specified since the resultant damage and its impact or potential impact on safety systems is addressed. Unit 1 Table 5-1 Plant Structures Associated With Tornado/Hi Wind and Aircraft EALs Containment Building — RWST (1QS-TK-1) — Diesel Generator Building Safeguards Building — CO2 Storage/PG Pp Rm — Main Intake Structure Primary Aux. Building — Service Bldg (incl. FW Reg Vlv Rm) Fuel Handling Building — Demin. Water Sto. (1WT-TK-10)
Escalation	Escalation of this event will be based on Fission Product Barriers.
References	NUMARC/NESP-007, (HA1), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.2	**TORNADO**
EAL 5.2.A	**ALERT (Con't)**
Mode	All
Description	**Tornado or high wind strikes any structure listed in Table 5-1 and results in structural damage** *[1 and 2]* 1. Tornado or high winds strikes any structure listed in Table 5-1 2. *[a or b]* a. Confirmed report of any **VISIBLE DAMAGE** to specified structures b. Control room indications of degraded safety system or component response within listed structures due to event
Basis (Con't)	Unit 2 Table 5-1 Plant Structures Associated With Tornado/Hi Wind and Aircraft EALs Main Stm Vlv Rm. — Containment Building — Safeguards Bldg. RWST (2QSS-TK21) — Diesel Generator Building — 24 Ton CO2 Unit Main Intake Structure Primary Aux. Building Service Bldg (incl. FW Reg Vlv Rm) — Fuel Handling Building Demin. Water Sto. (2FWE-TK210) — Control Bldg. Rod Control Cable Vault Bldg. VISIBLE DAMAGE is intended to be indicative of observed physical degradation. This damage has to affect plant safety systems or functions required to establish or maintain cold shutdown.
Escalation	Escalation of this event will be based on Fission Product Barriers.
References	NUMARC/NESP-007, (HA1), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.2	**TORNADO**
EAL 5.2.U	**UNUSUAL EVENT**
Mode	All
Description	**Tornado within the SITE PERIMETER** 1. Plant personnel report a tornado has been sighted within the **SITE PERIMETER** (Refer to Figure 5-A)
Basis	A tornado touchdown within the Site Protected Area may have the potential to damage plant structures containing systems required for Safe Shutdown of the plant. This is consistent with the definition of an Unusual Event. SITE PERIMETER encompasses all owner controlled areas in the immediate site environs as shown on Figure 5-A.
Escalation	Escalation of this event will be based on the tornado striking plant structures or high sustained winds within the protected area.
References	NUMARC/NESP-007, (HUI), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.3	**AIRCRAFT CRASH/PROJECTILE**
EAL 5.3.A	**ALERT**
Mode	All
Description	**Aircraft or PROJECTILE impacts (strikes) any plant structure listed in Table 5-1 resulting in structural damage** *[1 and 2]* 1. Plant personnel report aircraft or **PROJECTILE** has impacted any structure listed in Table 5-1 on previous page 2. *(a or b)* a. Confirmed report of any **VISIBLE DAMAGE** to specified structures b. Control Room indications of degraded safety system or component response(within listed area) due to event.
Basis	Aircraft or PROJECTILEs striking the structures listed in Table 5-1 can cause damage to plant structures or systems needed for Safe Shutdown of the Plant. The presence of VISIBLE DAMAGE to the specified structures identified in INDICATOR #2, indicates a potential for damage to the equipment contained within that structure. A second INDICATOR is used to avoid a missed declaration when actual equipment degradation is noted. In these cases, the damage is consistent with the declaration of an Alert. Unit 1 Table 5-1 Plant Structures Associated With Tornado/Hi Wind and Aircraft EALs Containment Building; RWST (1QS-TK-1); Diesel Generator Building Safeguards Building; CO2 Storage/PG Pp Rm; Main Intake Structure Primary Aux. Building; Service Bldg (incl. FW Reg Vlv Rm) Fuel Handling Building; Demin. Water Sto. (1WT-TK-10) Unit 2 Table 5-1 Plant Structures Associated With Tornado/Hi Wind and Aircraft EALs Main Stm Vlv Rm.; Containment Building; Safeguards Bldg. RWST (2QSS-TK21); Diesel Generator Building; 24 Ton CO2 Unit Main Intake Structure; Primary Aux. Building Service Bldg (incl. FW Reg Vlv Rm); Fuel Handling Building Demin. Water Sto. (2FWE-TK210); Control Bldg Rod Control Cable Vault Bldg.
Escalation	Escalation to this event will be based on "Fission Product Barriers Matrix".
References	NUMARC/NESP-007, (HA1, HA2), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.3	**AIRCRAFT CRASH/PROJECTILE**
EAL 5.3.A	**ALERT (Con't)**
Mode	All
Description	**Aircraft or PROJECTILE impacts (Strikes) any plant structure listed in Table 5-1 resulting in structural damage** *[1 and 2]* 1. Plant personnel report aircraft or **PROJECTILE** has impacted any structure listed in Table 5-1 2. *(a or b)* a. Confirmed report of any **VISIBLE DAMAGE** to specified structures b. Control Room indications of degraded safety system or component response within listed structures due to event.
Basis (Con't)	VISIBLE DAMAGE is intended to be indicative of observed physical degradation. This damage has to affect plant safety systems or functions required to establish or maintain cold shutdown. PROJECTILE is intended to include any object that is ejected, thrown, or launched towards a plant structure. The object must be of sufficient size or mass to potentially inflict damage sufficient to cause concern regarding the integrity of the affected structure or the operability of the safety equipment contained within the structure.
Escalation	Escalation to this event will be based on "Fission Product Barriers Matrix".
References	NUMARC/NESP-007, (HA1, HA2), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.3	**AIRCRAFT CRASH/PROJECTILE**
EAL 5.3.U	**UNUSUAL EVENT**
Mode	All
Description	**Aircraft crash or PROJECTILE impact within the SITE PERIMETER** 1. Plant personnel report aircraft crash or **PROJECTILE** impact within the **SITE PERIMETER** (Refer to Figure 5-A)
Basis	Aircraft or PROJECTILE Impacts within the SITE PERIMETER are off normal events that can indicate a potential degradation of the level of safety of the plant. This is consistent with the definition of an Unusual Event. SITE PERIMETER encompasses all owner controlled areas in the immediate site environs as shown on Figure 5-A. PROJECTILE is intended to include any object that is ejected, thrown, or launched towards a plant structure. The object must be of sufficient size or mass to potentially inflict damage sufficient to cause concern regarding the integrity of the affected structure or the operability of the safety equipment contained within the structure.
Escalation	Escalation to this event will be based on an Impact on plant structures.
References	NUMARC/NESP-007, (HU1), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.4	**RIVER LEVEL HIGH**
EAL 5.4.A	**ALERT**
Mode	All
Description	**River water level > 705 mean sea level** *[1 or 2]* 1. 1LR-CW-101, if accessible, indicates >705 mean sea level 2. National Weather Bureau (412-644-2882) or Montgomery Lock (724-643-8400) reports Montgomery Lower Pool Lower Gauge Reading >52.48 Ft. [c26] *Note: Mean Sea Level = Lower Gauge Reading + 652.52 Ft* [c26]
Basis	The requirements for flood protection ensures that facility protective actions will be taken and operation will be terminated in the event of flood conditions. A river level of >705 mean sea level is consistent with the elevation of the main transformer pad. This river level will permit flooding to occur within the turbine building. While no safety related equipment is expected to be affected at this elevation, the height is sufficient to warrant declaration of an Alert.
Escalation	Escalation of this event will be based on "Fission Product Barriers Matrix".
References	NUMARC/NESP-007, (HA1), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.4	**RIVER LEVEL HIGH**
EAL 5.4.U	**UNUSUAL EVENT**
Mode	All
Description	**River water level > 700 mean sea level** *[1 or 2]* 1. 1LR-CW-101, if accessible, indicates >700 mean sea level 2. National Weather Bureau (412-644-2882) or Montgomery Lock (724-643-8400) reports Montgomery Lower Pool Lower Gauge Reading >47.48 Ft. [c26] *Note: Mean Sea Level* = Lower Gauge Reading + *652.52 Ft* [c26]
Basis	The requirements for flood protection ensures that facility protective actions will be taken and operation will be terminated in the event of flood conditions. A river level of >700 mean sea level is below the level of the main transformer pad but above the level requiring shutdown per Licensing Requirements Manual. This is indicative of a potential degradation in the level of safety of the plant and thus is consistent with the definition of an Unusual Event.
Escalation	Escalation of this event will be based on "Fission Product Barriers Matrix".
References	NUMARC/NESP-007, (HU1), Rev. 2, 1/92 U1 Technical Specification Amendment #246 U2 Technical Specification Amendment #124

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.5	**RIVER LEVEL LOW**
EAL 5.5.A	**ALERT**
Mode	All
Description	**River water level <650 Ft Mean Sea Level** *[1 or 2]* [c26] 1. 1LR-CW-101, if accessible, indicates <650 Ft mean sea level [c26] 2. National Weather Bureau (412-644-2882) or Montgomery Lock (724-643-8400) reports Montgomery Lower Pool Lower Gauge Reading < -2.52 Ft. [c26] *Note: Mean Sea Level* = Lower Gauge Reading + *652.52 Ft* [c26]
Basis	A level of < 650 Ft mean sea level was selected for this EAL. A level of < 650' msl will result in requiring additional plant actions to be taken to avoid a reduction/loss of suction to the safety related River Water System pumps for Unit 1 and the Service Water System pumps for Unit 2 in the Intake Structure. These actions to avoid a reduction/loss of suction to the intake structure pumps would be enhanced with Emergency Response Organization personnel support. Two methods of obtaining the information is included in the EAL. This precludes reliance on a single instrument. [c26]
Escalation	Escalation to this event will be based on "Fission Product Barrier Matrix."
References	NUMARC/NESP-007, (HA1 example #7), Rev. 2, 1/92

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.5	**RIVER LEVEL LOW**
EAL 5.5.U	**UNUSUAL EVENT**
Mode	All
Description	**River water level <654 Ft Mean Sea Level** *[1 or 2]* [c26] 1. 1LR-CW-101, if accessible, indicates < 654 Ft mean sea level 2. National Weather Bureau (412-644-2882) or Montgomery Lock (724-643-8400) reports Montgomery Lower Pool Lower Gauge Reading <+1.48 Ft. [c26] *Note: Mean Sea Level = Lower Gauge Reading + 652.52 Ft* [c26]
Basis	The Unit 1 Raw Water System pumps which cool the secondary (non-safety related) systems become susceptible to losing their Net Positive Suction Head (NPSH) at a river elevation of 654' msl (depending upon plant conditions). When the raw water pumps stop providing sufficient flow, Unit 1 will be forced to shutdown due to inadequate cooling of its secondary systems. In addition, the bottom of the Alternate Intake bay is at elevation of 654' msl. Thus, the suction of the Auxiliary River Water System pumps for Unit 1 and the Standby Service Water System pumps for Unit 2 in the Alternate Intake Structure will become uncovered at 654' msl. A river water level of 654' msl will result in the loss of the Raw Water System, Auxiliary River Water System and the Standby Service Water System pumps. Although the safety related River Water System pumps at Unit 1 and the safety related Service Water System pumps at Unit 2 will continue to be fully operable at 654' msl, this condition will result in degradation of non-safety related systems which provide cooling to the station. This is indicative of a potential degradation in the level of safety of the plant through a reduction in the defense in depth and thus is consistent with the definition of an Unusual Event. Two methods of obtaining the information is included in the EAL. This precludes reliance on a single instrument. [c26]
Escalation	Escalation to this event will be based on additional loss of river water or "Fission Product Barrier Matrix."
References	NUMARC/NESP-007, (HA1 example #7), Rev. 2, 1/92 CR 02-08649

Section 5.0	**DESTRUCTIVE PHENOMENA**
TAB 5.6	**WATERCRAFT CRASH**
EAL 5.6.U	**UNUSUAL EVENT**
Mode	All
Description	**Watercraft strikes primary intake structure and results in a flow reduction of Reactor Plant or Turbine Plant River Water flow** *[1 and 2]* 1. Plant personnel report a watercraft has struck the primary intake structure 2. *[a or b* a. RPRW (SWS)flow reduction indicated by sustained pressure reduction <20 (<30) psig on PI-1RW-113A and/or 113B. (2SWS-PI113A and/or B) b. TPRW flow reduction indicated by sustained pressure reduction (Ann A6-118 "RAW Water Pump Disch Press Low" <15 psig) / (n/a for Unit 2)
Basis	This EAL is included to consider the potential degradation of plant safety due to a large watercraft striking the main intake structure. Actual degradation in flow is included as INDICATOR #2. Sustained pressure reduction is intended to allow the starting of the standby pump. Actual flow degradation is used at the Unusual Event level since the intake structure is supported by a redundant structure. The Alternate intake structure is located upstream of the main intake structure and has capability of replacing the Reactor Plant River Water pumps. The absence of active rail spurs and rail traffic within the Beaver Valley Power Station property eliminates the need to consider structural damage resulting from a train derailment.
Escalation	Escalation would be based on "Fission Product Barrier Matrix".
References	NUMARC/NESP-007, (SU4), Rev. 2, 1/92

Section 6.0	**SHUTDOWN SYSTEMS DEGRADATION**
TAB 6.1	**LOSS OF SHUTDOWN SYSTEMS**
EAL	**All**
Mode	5,6
Description	Not applicable
Basis	*This discussion applies generically to all EALs in TAB 6.1:* The EALs in this TAB address concerns raised by Generic Letter 88-17, "*Loss of Decay Heat Removal* ", SECY-91-283, "*Evaluation of Shutdown and Low Power Risk Issues.*", NUREG-1449, *"Shutdown and Low Power Operation at Commercial Nuclear Power Plants in the United States'*, and NUMARC 91-06, *"Guidelines for Industry Actions to Assess Shutdown Management*". A number of plant conditions such as initial vessel level (e.g., mid-loop, reduced level/flange level, normal, or cavity filled), RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining, and level instrumentation problems can have a significant impact in causing a loss of decay heat removal, or acerbating the consequences of such a loss. NRC analyses show that some specific sequences shortly after shutdown can result in core uncovery in 15 to 20 minutes and severe core damage within an hour after decay heat removal is lost. The progression and severity of shutdown events, and the magnitude of potential radioactivity releases that result, depends on numerous factors. The primary factors affecting progression and severity are (1) time since shutdown (i.e., magnitude of decay heat), (2) RCS inventory (including flooded cavity as applicable), and (3) availability of heat sink. For radioactivity releases, the primary factors are (1) time since shutdown, and (2) integrity of fission product barriers. All of these factors are variables in shutdown events. Unlike events which occur at power, the "starting point' for shutdown events can vary significantly, as can the availability of redundant means of heat removal, release mitigation features, and instrumentation. This situation makes assessment difficult. The EALs in this TAB are a compromise between potential over-conservatism in declarations for events that occur under the best of circumstances (e.g., late in outage, RCS and containment intact), and the need for anticipatory action for events that occur under the worst of circumstances (e.g., mid-loop operations early in outage). *This discussion applies generically to all EALs in TAB 6.1:* The ability to assess shutdown events is contingent on the availability of RCS temperature indication. There may be, during certain phases of an outage (e.g., head lifts), extended periods during which the core exit temperature instrumentation is totally dependent on RTDs exposed to RHR forced flow. If RHR is lost, so is the ability to monitor the parameter most significant to assessment. In order to address this, the EALs refer first to temperature increases on instrumentation and then, as an backup, to fixed time frames or other physical evidence reported by plant personnel.
Escalation	Not applicable
References	Generic Letter 88-17, "*Loss of Decay Heat Removal* SECY-91-283, "*Evaluation of Shutdown and Low Power Risk Issues.*" NUREG-1449, *'Shutdown and Low Power Operation at Commercial Nuclear Power Plants in the United States'* NUMARC 91-06, *"Guidelines for Industry Actions to Assess Shutdown Management*".

Section 6.0	**SHUTDOWN SYSTEMS DEGRADATION**
TAB 6.1	**LOSS OF SHUTDOWN SYSTEMS**
EAL 6.1.S	**Site Area Emergency**
Mode	Not applicable
Description	Not applicable"
Basis	Not applicable
Escalation	Not applicable
References	Pending (NUMARC SS7P)

Section 6.0	**SHUTDOWN SYSTEMS DEGRADATION**
TAB 6.1	**LOSS OF SHUTDOWN SYSTEMS**
EAL 6.1.A	**ALERT**
Mode	5,6
Description	**Inability to maintain unit in cold shutdown** *(1 and 2)* 1. **UNPLANNED** Loss of RHR <u>or</u> CCR <u>or</u> RPRW (RHS or CCP or SWS) 2. *(a or b or c)* a. Core exit thermocouples (CETCs)(if available) indicate the temperature has increased >10°F <u>and</u> has exceeded 200°F b. (w/ RHR (RHS) in service) RHR (RHS) inlet temp has increased >10°F and has exceeded 200°F. c. (w/o CETCs or RHR (RHS)) Loss has exceeded 30 minutes or there is evidence of boiling in the Rx vessel
Basis	See generic basis for this Tab. This EAL is intended to establish the escalation threshold for the declaration of a Alert Emergency. This Alert Emergency declaration is consistent with the need to rapidly correct the problem through the augmentation of onsite personnel and the need to inform offsite authorities. Continued degradation can result in fuel uncovery and severe damage with resultant releases of a significant fraction of the gap activity. This event escalates to a Site Area Emergency via 6.2 RCS Inventory (Shutdown) or 7.1 Gaseous Effluents. The specification of a 10°F temperature increase precludes Alert Emergency declaration for a momentary controllable loss that occurs at a temperature very near 200°F. The 10°F increase also ensures that the declaration is made prior to the onset of boiling where temperature may temporarily stabilize. The EAL provides for classification based on core exit temperature indication. To address conditions in which core exit temperature indication is not available (e.g., CETCs disconnected, loss of RHR flow past RTDs), 30 minutes is allotted. Physical evidence of boiling is also included. The 30 minute time duration is expected to conservatively encompass nearly all initial conditions.
Escalation	Escalation to Site Area Emergency would occur via 6.2 RCS Inventory (Shutdown), or as indicated by Tab 7.1 Gaseous Effluent EALs
References	Pending (NUMARC SA3P)

Section 6.0	**SHUTDOWN SYSTEMS DEGRADATION**
TAB 6.1	**LOSS OF SHUTDOWN SYSTEMS**
EAL 6.1.U	**UNUSUAL EVENT**
Mode	5,6
Description	**UNPLANNED loss of any function needed for cold shutdown that results in a core exit temperature increase of more than 10°F** *(1 and 2)* 1. **UNPLANNED** Loss of RHR <u>or</u> CCR <u>or</u> RPRW (RHS or CCP or SWS) 2. *(a or b or c)* a. Core exit thermocouples (CETCs)(if available) indicate the temperature has increased >10°F b. (w/ RHR (RHS) in service) RHR (RHS) inlet temp has increased >10°F. c. (w/o CETCs or RHR (RHS)) Loss has exceeded 15 minutes.
Basis	See generic basis for this Tab. This EAL addresses events in which there is an unplanned loss of any function needed for maintaining cold shutdown. In this EAL, the fundamental parameter of RCS exit temperature is used as a basis for classification. This EAL keys on function, rather than specific pieces of equipment. This EAL establishes the classification threshold at a temperature rise of 10°F. A temperature rise of this magnitude is not expected as a result of normal operation and is beyond normal instrument fluctuations. The phrase 'unplanned' is specified to preclude the declaration of an emergency for circumstances in which decay heat removal is intentionally placed out-of-service and is controlled within the requirements of the T/S. Continued degradation can result in fuel uncovery and severe damage with resultant releases of a significant fraction of the gap activity. The EAL provides for classification based on core exit temperature indication. To address conditions in which core exit temperature indication is not available (e.g., CETCs disconnected, loss of RHR flow past RTDs), 15 minutes is allotted. This time duration is expected to be a conservative default value for nearly all initial conditions.
Escalation	Escalation to Alert Emergency would occur if temperature increased to above 200°F as a result of the 10°F increase, or as indicated by Tab 7.1 Gaseous Effluent EALs
References	Pending (NUMARC SU9P)

Section 6.0	**SHUTDOWN SYSTEMS DEGRADATION**
TAB 6.2	**RCS INVENTORY - SHUTDOWN**
EAL	**All**
Mode	5,6
Description	Not applicable
Basis	*This discussion applies generically to all EALs in TAB 6.2:* The EALs in this TAB address concerns raised by Generic Letter 88-17, "*Loss of Decay Heat Removal* ", SECY-91-283, "*Evaluation of Shutdown and Low Power Risk Issues.*", NUREG-1449, *"Shutdown and Low Power Operation at Commercial Nuclear Power Plants in the United States'*, and NUMARC 91-06, *"Guidelines for Industry Actions to Assess Shutdown Management*". A number of plant conditions such as initial vessel level (e.g., mid-loop, reduced level/flange level, normal, or cavity filled), RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining, and level instrumentation problems can have a significant impact in causing a loss of decay heat removal, or acerbating the consequences of such a loss. NRC analyses show that some specific sequences shortly after shutdown can result in core uncovery in 15 to 20 minutes and severe core damage within an hour after decay heat removal is lost. The progression and severity of shutdown events, and the magnitude of potential radioactivity releases that result, depends on numerous factors. The primary factors affecting progression and severity are (1) time since shutdown (i.e., magnitude of decay heat), (2) RCS inventory (including flooded cavity as applicable), and (3) availability of heat sink. For radioactivity releases, the primary factors are (1) time since shutdown, and (2) integrity of fission product barriers. All of these factors are variables in shutdown events. Unlike events which occur at power, the "starting point' for shutdown events can vary significantly, as can the availability of redundant means of heat removal, release mitigation features, and instrumentation. This situation makes assessment difficult. Similarly, the development of EALs is made difficult. The EALs in this TAB are a compromise between potential over-conservatism in declarations for events that occur under the best of circumstances (e.g., late in outage, RCS and containment intact), and the need for anticipatory action for events that occur under the worst of circumstances (e.g., mid-loop operations early in outage). Note that BVPS administrative controls ensure containment closure prior to mid-loop operation. The ability to assess the shutdown events in this TAB is contingent on the availability of reactor vessel level indication. There may be, during certain phases of an outage, extended periods during which the level instrumentation is not available. In order to address this, the EALs refer first to level indications on instrumentation and then, as an backup, to other confirmed indications of fuel uncovery.
Escalation	Not applicable
References	Generic Letter 88-17, "*Loss of Decay Heat Removal* SECY-91-283, "*Evaluation of Shutdown and Low Power Risk Issues.*" NUREG-1449, *'Shutdown and Low Power Operation at Commercial Nuclear Power Plants in the United States'* NUMARC 91-06, *"Guidelines for Industry Actions to Assess Shutdown Management*".

Section 6.0	**SHUTDOWN SYSTEMS DEGRADATION**
TAB 6.2	**RCS INVENTORY - SHUTDOWN**
EAL 6.2.G	**GENERAL EMERGENCY**
Mode	Not applicable
Description	**Not applicable**
Basis	Not applicable
Escalation	Not applicable
References	Pending (NUMARC SG3P)

Section 6.0	**SHUTDOWN SYSTEMS DEGRADATION**
TAB 6.2	**RCS INVENTORY - SHUTDOWN**
EAL 6.2.S	**SITE AREA EMERGENCY**
Mode	5,6
Description	**Loss of water level in the reactor vessel that has or will uncover fuel in the reactor vessel with containment closure established** *(1 and 2)* 1. (a or b) a. Loss of RHR or CCR or RPRW (RHS or CCP or SWS) b. Loss of RCS Inventory with inadequate makeup 2. *(a and b)* a. Ops personnel report LI-1RC-480, 482C (2RCS-LI-102, LR-102) RCS level instrumentation in the Control Room indicates a level drop to 0 inches (if available) b. Other confirmed indications of fuel uncovery
Basis	See generic bases for this TAB This EAL is intended to establish the escalation threshold for the declaration of a Site Area Emergency. This declaration is consistent with the need to rapidly correct the problem through the augmentation of onsite personnel and the need to inform offsite authorities. This event progresses from a loss of RHR event such that bulk boiling occurs in the reactor vessel. If RCS inventory cannot be maintained, for whatever cause, the boiling will result in fuel uncovery. Clad damage will occur prior to the onset of core melt due to stresses on the clad. The potential for significant releases from the fuel exists. A Site Area Emergency classification is warranted in that there have been failures of systems necessary for the protection of the public. The EAL provides for classification based on reactor vessel level indication. To address conditions in which reactor vessel level indication is not available, other confirmed indications of fuel uncovery is utilized. This should include local observation, indication of bulk boiling, or significant radiation level increases associated with an inventory loss.
Escalation	Escalation to General Emergency would occur if containment closure was not established with the RCS not intact resulting in direct release to the environs as indicated by Tab 7.1 Gaseous Effluent EALs
References	NUMARC/NESP-007 (SS5), Rev 2, 1/92

Section 6.0	**SHUTDOWN SYSTEMS DEGRADATION**
TAB 6.2	**RCS INVENTORY - SHUTDOWN**
EAL 6.2.U	**UNUSUAL EVENT**
Mode	5,6
Description	**Loss of Reactor Coolant System Inventory with inadequate make-up** *(1 and 2)* 1. Ops personnel report LI-1RC-480 or LI-1RC-482C (2RCS-LI-102, LR-102) RCS level instrumentation in the Control Room indicates a level drop to less than 14.5 inches 2. Ops personnel report inability to make-up RCS inventory
Basis	See generic bases for this TAB This EAL is intended to serve as a precursor to loss of RHR (RHS). The loss of RCS inventory could be the result of failure of temporary piping or temporary barriers (e.g., steam generator dams, freeze seals). The potential for such events increases during shutdown due to the accelerated maintenance activity that occurs during these periods. In addition to creating the potential for loss of inventory, this maintenance activity, removes equipment from service that could restore inventory to mitigate the consequences of the loss. A sudden loss of inventory could result in a loss of decay heat removal due to RHR (RHS) pump suction vortexing or preemptory operator pump manual shutdowns, as could a smaller leak that cannot be isolated. TABs 2.5 and 2.6 address RCS leakage. Although the mode applicability includes mode 5, it is limited to mode 5 with the RCS pressurized. There are no EALs that address RCS leakage in mode 5 with the RCS depressurized, or in mode 6. Further, those EALs identify a specific numeric leak rate, which is not appropriate to shutdown conditions. This EAL does not specify a numeric leak rate in that the conditions surrounding the leak and the systems available to make-up losses can depend on ongoing maintenance activities. There are no make-up systems required by T/S or Licensing Requirements Manual in shutdown modes.
Escalation	Escalation to higher classifications would occur if (1) the core becomes uncovered, or (2) if the RHR (RHS) loss results in core exit temperature increase in excess of 10 F and exceeds 200 F
References	Pending (NUMARC Shutdown EALs consistent w/ NUMARC/NESP-007 HU5)

Section 6.0	**SHUTDOWN SYSTEM DEGRADATION**
TAB 6.3	**LOSS OF AC (Shutdown)**
EAL 6.3.A	**ALERT**
Mode	5,6, defuel
Description	**UNPLANNED loss of offsite and onsite AC power for >15 minutes** 1. AE and DF 4KV buses not energized from Unit 1 (2) source for >15 minutes
Basis	A loss of all AC power compromises all plant safety systems that require AC power including RHR, spent fuel pool cooling, and the river water systems. At modes 1-4, this event would be classified as Site Area Emergency. A lower classification is justified here due to the reduced decay heat. 15 minutes is specified so as to exclude momentary power losses. Note however, that this event is bounded by EAL 6.2.S if the loss of AC results in fuel uncovery. INDICATOR #1 encompasses the CRITERION in that the AE and DF buses are fed from either offsite or onsite sources. Thus, having both buses de-energized indicates a failure of both sources.
Escalation	Escalation would occur if the loss of power results in fuel uncovery per 6.2.S.
References	NUMARC/NESP-007 (SA1 - addition), Rev 2, 1/92

Section 6.0	**SHUTDOWN SYSTEM DEGRADATION**
TAB 6.3	**LOSS OF AC (Shutdown)**
EAL 6.3.U	**UNUSUAL EVENT**
Mode	5,6, defuel
Description	**UNPLANNED loss of offsite AC power supply for >15 minutes** *(1 and 2)* [c26] 1. Offsite power supply to AE and DF 4KV buses unavailable for >15 minutes. [c26] 2. Either diesel generator is supplying power to its respective emergency bus
Basis	A prolonged loss of offsite AC power availability reduces power source redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete loss of AC power. 15 minutes is specified so as to exclude momentary power losses. [c26] This EAL is similar to EAL 3.2.U, except that the phrase UNPLANNED was added to exclude classifications that could result from offsite power bus outages scheduled and controlled by maintenance work activities. INDICATOR #1 the emergency busses that are supplied by offsite power. INDICATOR #2 establishes that at least one train of onsite power is available. [c26]
Escalation	Escalation would occur if onsite AC power was lost.
References	NUMARC/NESP-007 (SU1 - addition), Rev 2, 1/92

Section 6.0	**SHUTDOWN SYSTEM DEGRADATION**
TAB 6.4	**LOSS OF DC (Shutdown)**
EAL 6.4.U	**UNUSUAL EVENT**
Mode	5,6, defueled
Description	**UNPLANNED loss of the required train of DC power for >15 minutes** *(1 or 2)* 1. Voltage <110.4 VDC on DC buses 1-1 and 1-3 (2-1 and 2-3) for >15 minutes if train A is the priority train 2. Voltage <110.4 VDC on DC buses 1-2 and 1-4 (2-2 and 2-4) for >15 minutes if train B is the priority train
Basis	The significance of this EAL rests with the impact that a loss of DC power could have on monitoring and controlling decay heat removal during shut down modes. At modes 1-4, this event would be classified as Site Area Emergency if both trains were lost. A lower classification is justified here due to the reduced decay heat. 15 minutes is specified so as to exclude momentary power losses. In INDICATOR #1 and INDICATOR #2, the specified voltage is the minimum voltage specified in the UFSAR at which DC loads will perform reliably.
Escalation	Escalation would occur if RHR loss occurs.
References	NUMARC/NESP-007 (SU7 - addition), Rev 2, 1/92

Section 6.0	**SHUTDOWN SYSTEM DEGRADATION**
TAB 6.5	**FUEL HANDLING**
EAL 6.5.A	**ALERT**
Mode	All
Description	**Major damage to irradiated fuel; or loss of water level that has or will uncover irradiated fuel outside the reactor vessel** *(1 and 2)* 1. **VALID** Hi-Hi Alarm on RM-RM-203 or RM-RM-207 or RM-VS-103 A/B or RM-VS-104A/B (High on 2RMF-RQ202[1031], 301A/B [1032/2032], 2HVR-RQ104A/B [1024/1028], or 2RMR-RQ203[1025]) 2. (a or b) a Plant personnel report damage of irradiated fuel sufficient to rupture fuel rods b. Plant personnel report water Level drop has or will exceed makeup capacity such that irradiated fuel will be uncovered
Basis	The major concern of the EAL is a fuel handling accident or loss of water covering spent fuel. Events away from the reactor vessel (e.g., in the cavity, transfer tube, or spent fuel pool) are addressed. Events within the vessel are classified in accordance with TABs 6.1 and 6.2. Events of this type could cause an increase in radioactivity readings and potentially a release to the environment. The magnitude of these releases is dependent on the amount of damage, depth of water above damage, and available filtration systems. Design basis fuel handling accident doses could exceed the EPA PAG, warranting a General Emergency classification. However, as with all UFSAR analyses, there is extensive conservatism in the analysis. Thus, an Alert Emergency is deemed justified. This declaration would result in augmentation of onsite personnel to support assessment of the release and restorative actions to stabilize the condition. With regard to the loss of water level, design features and administrative controls limit the possible fuel uncovery to a single element. Analyses performed in response to IE Bulletin 84-03, showed that the clad on a fuel assembly suspended in air would begin to melt at about 60 minutes, assuming an ambient air temperature of 105 °F, which is conservative. This time period provides for event-specific assessments. Escalation of the classification would be based on the results of these assessments. INDICATOR #1 verifies the reports discussed in INDICATOR #2 by noting the increase in radiation levels, and/or airborne activity in the affected areas. An increase on the ventilation monitors signifies the release of radioactivity in the fuel gap, whereas, an increase on area radiation monitors is indicative of reduced shielding due to the decrease in water level.
Escalation	Escalation would on the basis of TAB 7.1, Gaseous Effluents
References	NUMARC/NESP-007 (AA2 example # 1,3), Rev 2, 1/92 ltr dtd 10/24/84, JJCarey to TEMurley USNRC RI ltr ND1SCA:0095 dtd 9/17/84, MYLee to KDGrada

Section 6.0	**SHUTDOWN SYSTEM DEGRADATION**
TAB 6.5	**FUEL HANDLING**
EAL 6.5.U	**UNUSUAL EVENT**
Mode	All
Description	**UNPLANNED loss of water level in spent fuel pool or reactor cavity or transfer canal with fuel remaining covered** *(1 and 2 and 3)* 1. Plant personnel report water level drop in spent fuel pool or reactor cavity or transfer canal 2. **VALID** Hi-Hi Alarm on RM-RM-203 or RM-RM-207 (2RMR-RQ203 [1025] or 2RMF-RQ202 [1031]) 3. Fuel remains covered with water.
Basis	The major concern of the EAL is a loss of water covering spent fuel. Events away from the reactor vessel (e.g., in the cavity, transfer tube, or spent fuel pool) are addressed. Events within the vessel are classified in accordance with TABs 6.1 and 6.2. Events of this type could cause an increase in radioactivity readings and potentially a release to the environment. The magnitude of these releases is dependent on the amount of damage, depth of water above damage, and available filtration systems. However, even without a release, elevated dose rates in adjacent areas could create access limitations. (See TAB 7.3) The design of fuel handling equipment and administrative controls on activities involving spent fuel maintains water above the fuel during normal handling. Should there be a loss of water level, such as that associated with a failure of the reactor cavity seal, fuel elements could be exposed to air in three locations: (1) in the manipulator mast, in the RCCA change fixture, and suspended from the fuel pool bridge crane. Analyses performed in response to IE Bulletin 84-03, showed that the clad on a fuel assembly suspended in air would begin to melt at about 60 minutes, assuming an ambient air temperature of 105 °F, which is conservative. The additional heat transfer afforded by the water assumed in this EAL would extend this time to several hours. This time period provides for event-specific assessments. Escalation of the classification would be based on the results of these assessments. INDICATOR #2 verifies the reports discussed in INDICATOR #1 by noting the increase in radiation levels in the affected areas. An increase on area radiation monitors is indicative of reduced shielding due to the decrease in water level. INDICATOR #3 is the discriminator between the Unusual Event and the Alert.
Escalation	Escalation would on the basis of TAB 7.1, Gaseous Effluents, or TAB 7.3, Radiation Levels
References	NUMARC/NESP-007 (AU2 example # 1,2), Rev 2, 1/92 ltr dtd 10/24/84, JJCarey to TEMurley USNRC RI ltr ND1SCA:0095 dtd 9/17/84, MYLee to KDGrada

Section 6.0	**SHUTDOWN SYSTEM DEGRADATION**
TAB 6.6	**INADVERTENT CRITICALITY**
EAL 6.6.A	**ALERT**
Mode	3, 4, 5, 6
Description	**Inadvertent reactor criticality** 1. Nuclear instrumentation indicates unanticipated sustained positive startup rate
Basis	This EAL addresses situations in which inadvertent criticalities occur. Improper rod withdrawals are included but limited in application to Modes 3,4,5, and 6. It is not intended that this Alert apply to a premature criticality during a planned reactor startup. In this situation the plant has been prepared for the reactor to be brought critical and procedural control dictate appropriate action. This situation is therefore not consistent with the declaration of an emergency. This EAL also addresses events (e.g., inadvertent dilution, failure of loop dams) that result in dilution of RCS boron concentration. It has been postulated that localized criticality could occur in the reactor vessel due to such a failure with RCS temperature cold. Such a criticality would cease once in-vessel mixing re-established negative reactivity in the affected region of the core. Since this sequence would likely be less than the recognition and assessment time, the INDICATOR calls for a sustained positive startup rate.
Escalation	Escalation would on the basis of the failure of RHR to remove the heat of fission, resulting in a heat-up.
References	Pending (NUMARC Shutdown EALs consistent w/ NUMARC/NESP-007 HA6)

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.1	**GASEOUS EFFLUENTS**
EAL	**All**
Mode	All
Description	*The following apply generically to the gaseous effluent Tab:* The Radiological / Fuel Handling TAB is structured with CRITERION and INDICATORs as with the previous tabs (except Tab 1). The CRITERION establishes the numeric values for the offsite dose (General, Site Area), or release rate (Alert, UE). The INDICATORs specify monitor readings that serve as thresholds for performing particular dose assessments -- the results from which are then compared to the CRITERION, and appropriate declarations made. Declarations are not made on the basis of exceeding the INDICATOR threshold alone unless the specified assessment cannot be completed within 15 minutes (60 minutes for UE) of recognition. The radiation monitor readings that serve as INDICATORs for the General Emergency and the Site Area Emergency were calculated using accident source terms based on the UFSAR of Unit 2, design release flow rates, and annual average meteorology. As such, these INDICATORs are expected to provide an upper boundary on the offsite consequences associated with the INDICATOR. However, in an actual accident situation, the actual values of the above parameters (particularly meteorology) are likely to be different, potentially resulting in an over-classification or under-classification. It is for this reason that these EALs are based on the results of timely assessments rather than on the monitor reading itself. Assessments are performed using ARERAS or the EPP/IP-2.6.x series hand procedures. Note that while the monitor thresholds are based on annual average meteorology, the dose projections/assessments are performed with actual meteorology. For the Alert and Unusual Events, a similar protocol is used. In these cases the INDICATORs are based on the methodology of the Offsite Dose Calculation Manual (ODCM) which utilizes an expected nuclide mix and annual average meteorology. The use of the ODCM as a basis provides a desirable linkage to the Technical Specification 6.8.6a and the Radioactive Waste Discharge Authorizations (RWDA). Assessments are performed using the abnormal gaseous assessment procedures in the Health Physics Manual (HPM) for an Unusual Event and ARERAS or the EPP/IP-2.6.x series hand procedures for an Alert. Assessment using actual meteorology is not required for the Unusual Event due to the several orders of magnitude difference between the UE CRITERION and the EPA PAG. The EXCLUSION AREA BOUNDARY (EAB) referred to in these EALs are shown on EAL Figure 7-A. The EAB is shown as a 2000' circle centered on the Unit 1 RBC. This is consistent with the Unit 1 UFSAR. The Unit 2 UFSAR shows the Unit 2 EAB as being encompassed by the Unit 1 EAB except for areas over the Ohio River. For these EALs, the two EABs are shown as one as the dose projection methods determine X/Q at the EAB radius in all directions.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 U1 Technical Specification Amendment 188 U2 Technical Specification Amendment 70

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.1	**GASEOUS EFFLUENTS**
EAL 7.1.G	**GENERAL EMERGENCY**
Mode	All
Description	**EAB dose resulting from an actual or imminent release of gaseous radioactivity that exceeds 1000 mR TEDE or 5000 mR child thyroid CDE for the actual or projected duration of the release** *(1 or 2 or 3)* 1. A **VALID** rad monitor reading exceeds the values in Column 4 of Table 7-1 for >15 minutes, unless dose projections within this period confirms that the **CRITERION** is NOT exceeded 2. Field survey results indicate EAB dose >1000 mR β-γ for the actual or projected duration of the release 3. EPP dose projection results indicate EAB dose >1000 mR TEDE or >5000 mR child thyroid CDE for the actual or projected duration of the release
Basis	See generic bases for this Tab The CRITERION is based on the current EPA Protective Action Guidelines (PAG) for the plume exposure pathway, which call for offsite evacuations if the projected dose exceeds 1 rem TEDE or 5 rem child thyroid CDE. As such, the CRITERION is consistent with the fundamental definition of a General Emergency. The child thyroid is specified here for consistency with the PAG protocol agreed upon by the states within the BVPS EPZ INDICATOR #1 refers to a set of monitor readings that, based on annual average meteorology and assumed default source terms, correspond to the CRITERION. The time duration is included to discount momentary monitor reading spikes. This time duration runs concurrently with the maximum assessment period. INDICATOR #2 addresses field survey results at the EAB. This INDICATOR is included to address reports received from field surveys initiated at lower emergency classifications. The INDICATOR is specified in terms of dose, i.e., the observed dose rate multiplied by the actual or projected release duration. INDICATOR #3 addresses results obtained from dose assessments performed with ARERAS or EPP/IP-2.6.x hand procedures. These assessments are initiated at lower classifications in response to elevated monitor readings. If the actual meteorology is more restrictive than that used to establish the monitor readings in Table 7-1, INDICATORs for lesser classifications could result in a classification under this EAL.
Escalation	Not Applicable
References	NUMARC/NESP-007, (AG1-Deviation) Rev 2, 1/92

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.1	**GASEOUS EFFLUENTS**
EAL 7.1.S	**SITE AREA EMERGENCY**
Mode	All
Description	**EAB dose resulting from an actual or imminent release of gaseous radioactivity that exceeds 100 mR TEDE <u>or</u> 500 mR child thyroid CDE for the actual or projected duration of the release** *(1 or 2 or 3)* 1. A **VALID** rad monitor reading exceeds the values in Column 3 of Table 7-1 for >15 minutes, unless dose projections within this period confirms that the **CRITERION** is NOT exceeded 2. Field survey results indicate EAB dose >100 mR β-γ for the actual or projected duration of the release 3. EPP dose projection results indicate EAB dose >100 mR TEDE or >500 mR child thyroid CDE for the actual or projected duration of the release
Basis	See generic bases for this TAB The 100 mR integrated dose in the CRITERION is consistent with the 10 CFR 20.1301(a)(1) limit on the total effective dose equivalent to individual members of the public. The value is also one order of magnitude less than the CRITERION for the General Emergency which is an appropriate fraction of the EPA PAG and is consistent with the order of magnitude gradient between the General Emergency, Site Area Emergency, and Alert (i.e., 10-100-1000 mR). The 500 mR value for the thyroid was established in consideration of the 1:5 ratio of the EPA PAGs for whole body and thyroid. The child thyroid is specified here for consistency with the PAG protocol agreed upon by the states within the BVPS EPZ. INDICATOR #1 refers to a set of monitor readings that, based on annual average meteorology and assumed default source terms, correspond to the CRITERION. The time duration is included to discount momentary monitor reading spikes. INDICATOR #2 addresses field survey results at the EAB. This INDICATOR is included to address reports received from field surveys initiated at lower emergency classifications. The INDICATOR is specified in terms of dose, i.e., the observed dose rate multiplied by the actual or projected release duration INDICATOR #3 addresses results obtained from dose assessments performed with ARERAS or EPP/IP-2.6.x hand procedures. These assessments are initiated at lower classifications in response to elevated monitor readings. If the actual meteorology is more restrictive than that used to establish the monitor readings in Table 7-1, this INDICATOR could result in a higher classification than the monitor reading would otherwise indicate.
Escalation	Increases in release rate, or increases in X/Q, by a factor of 10 would escalate event.
References	NUMARC/NESP-007, (AS1-Deviation) Rev 2, 1/92

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.1	**GASEOUS EFFLUENTS**
EAL 7.1.A	**ALERT**
Mode	All
Description	**Any UNPLANNED release of gaseous radioactivity that exceeds 200 times the Technical Specification 6.8.6a/Offsite Dose Calculation Manual Limit for 15 minutes** *(1 or 2 or 3)* 1. A **VALID** rad monitor reading exceeds the values in Column 2 of Table 7-1 for >15 minutes, unless dose projections within this period confirms that the **CRITERION** is NOT exceeded 2. Field survey results indicate >10 mR/hr β-γ at the EAB for 15 minutes 3. EPP dose projection results indicate EAB dose >10 mR TEDE for the actual or projected duration of the release
Basis	See generic bases for this TAB The significance of this CRITERION is primarily related to loss of control of radioactive material that has allowed the release to continue unabated for 15 minutes. It is this aspect rather that the magnitude of the release that establishes *"...a potential substantial degradation in the level of safety of the plant..."* -- the fundamental definition of an Alert. The numeric value in the CRITERION is based on the Offsite Dose Calculation Manual (ODCM) and/or Technical Specification. 6.8.6a. For the Alert, the threshold is 200 times the ODCM Limit. The instantaneous dose rate limit (ODCM Control 3.11.2.1a) is 500 mR/year (0.057 mR/hr). This CRITERION equates to 200 x 0.057, or about 10 mR/hr. This value is one order of magnitude less than the CRITERION for the Site Area Emergency. INDICATOR #1 refers to monitor readings that exceed 200 times (200x) the HHSP identified on the Radioactive Waste Discharge Authorization. In order to address releases not controlled by an RWDA, column 2 Table 7-1 provides values representing 200 times the default HHSPs established in the ODCM. INDICATOR #2 addresses field survey results at the EAB. This INDICATOR is included to address reports received from field surveys initiated at lower emergency classifications. The INDICATOR is specified in terms of dose rate for the specified duration. INDICATOR #3 addresses results obtained from dose projections/assessments performed with ARERAS or EPP/IP-2.6.x hand procedures. These assessments are initiated at lower classifications in response to elevated monitor readings. If the actual meteorology is more restrictive than that used to establish the monitor readings in Table 7-1, this INDICATOR could result in a higher classification than the monitor reading would otherwise indicate.
Escalation	Increases in release rate, or increases in X/Q, would escalate event.
References	NUMARC/NESP-007, (AA1) Rev 2, 1/92 U1 Technical Specification Amendment 188 U2 Technical Specification Amendment 70

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.1	**GASEOUS EFFLUENTS**
EAL 7.1.U	**UNUSUAL EVENT**
Mode	All
Description	**Any UNPLANNED release of gaseous radioactivity that exceeds 2 times the Technical Specification 6.8.6a/Offsite Dose Calculation Manual Limit for 60 minutes** *(1 or 2 or 3)* 1. A **VALID** rad monitor reading exceeds the values in Column 1 of Table 7-1 for >60 minutes, unless dose projections within this period confirms that the **CRITERION** is NOT exceeded 2. Field survey results indicate >0.1 mR/hr β-γ at the EAB for >60 minutes 3. EPP dose projection results indicate EAB dose >0.1 mR TEDE for the actual or projected duration of the release
Basis	See generic bases for this TAB The significance of this CRITERION is primarily related to loss of control of radioactive material that has allowed the release to continue unabated for 60 minutes. It is this aspect rather that the magnitude of the release that establishes *"...a potential degradation in the level of safety of the plant..."* -- the fundamental definition of an Unusual Event. The numeric value in the CRITERION is based on the Offsite Dose Calculation Manual (ODCM) and/or Technical Specification 6.8.6a. The threshold is 2 times the ODCM Limit. The instantaneous dose rate limit (ODCM Control 3.11.2.1a) is 500 mR/year (0.057 mR/hr). This CRITERION equates to 2 x 0.057, or about 0.1 mR/hr. Releases less than 2x T/S are not reportable under 10 CFR 50.72. INDICATOR #1 refers to monitor readings that exceed 2 times (2x) the HHSP identified on the Radioactive Waste Discharge Authorization. In order to address releases not controlled by an RWDA, column 1 Table 7-1 provides values representing 2 times the default HHSPs established in the ODCM. INDICATOR #2 addresses field survey results at the EAB. This INDICATOR is included to address reports received from field surveys initiated at lower emergency classifications. The INDICATOR is specified in terms of dose rate for the specified duration. INDICATOR #3 addresses results obtained from dose projections/assessments performed with ARERAS or EPP/IP-2.6.x hand procedures. If the actual meteorology is more restrictive than that used to establish the monitor readings in Table 7-1, this INDICATOR could result in a higher classification than the monitor reading would otherwise indicate.
Escalation	Increases in release rate, or increases in X/Q, would escalate event.
References	NUMARC/NESP-007 (AU1), Rev 2, 1/92 U1 Technical Specification Amendment 188 U2 Technical Specification Amendment 70

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.2	**LIQUID EFFLUENTS**
EAL	**All**
Mode	All
Description	*The following apply generically to the liquid effluent Tab:* The Radiological / Fuel Handling TAB is structured with CRITERION and INDICATORs as with the previous tabs (except Tab 1). The CRITERION establishes the numeric values for the release rate. The INDICATORs specify monitor readings that serve as thresholds for performing particular release assessments -- the results from which are then compared to the CRITERION, and appropriate declarations made. Declarations are not made on the basis of exceeding the INDICATOR threshold alone unless the specified assessment cannot be completed within 15 minutes (60 minutes for UE) of recognition. The radiation monitor readings that serve as INDICATORs for the Alert and Unusual Events, were calculated using the methodology of the Offsite Dose Calculation Manual (ODCM) which utilizes an expected nuclide mix. The use of the ODCM as a basis provides a desirable linkage to Technical Specification 6.8.6a and the Radioactive Waste Discharge Authorizations (RWDA). Assessments are performed using the liquid release assessment procedures the EPP.
Escalation	Not Applicable
References	NUMARC/NESP-007, Rev 2, 1/92 U1 Technical Specification Amendment 188 U2 Technical Specification Amendment 70

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.2	**LIQUID EFFLUENTS**
EAL 7.2.A	**ALERT**
Mode	All
Description	**Any UNPLANNED release of liquid radioactivity that exceeds 200 times the Technical Specification 6.8.6a/Offsite Dose Calculation Manual Limit for 15 minutes** *(1 or 2)* 1. A **VALID** rad monitor reading exceeds the values in Column 2 of Table 7-1 for >15 minutes, unless assessment within this period confirms that the **CRITERION** is NOT exceeded 2. Sample results exceed 200 times Technical Specification 6.8.6a/Offsite Dose Calculation Manual Limit for an unmonitored release of liquid radioactivity >15 minutes in duration
Basis	See generic bases for this TAB The significance of this CRITERION is primarily related to loss of control of radioactive material that has allowed the release to continue unabated for 15 minutes. It is this aspect rather that the magnitude of the release that establishes "...a potential substantial degradation in the level of safety of the plant..." -- the fundamental definition of an Alert. The numeric value in the CRITERION is based on the Offsite Dose Calculation Manual (ODCM) and/or Technical Specification 6.8.6a. INDICATOR #1 refers to monitor readings that exceed 200 times (200x) the HHSP identified on the Radioactive Waste Discharge Authorization. In order to address releases not controlled by an RWDA, column 2 Table 7-1 provides values representing 200 times the default HHSPs established in the ODCM. INDICATOR #2 addresses results of analyses performed on samples taken in response to unmonitored releases of liquid radioactivity. Classification in these cases will generally have to await sample results due to the lack of effluent monitoring.
Escalation	Not applicable
References	NUMARC/NESP-007, (AA1) Rev 2, 1/92 U1 Technical Specification Amendment 188 U2 Technical Specification Amendment 70

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.2	**LIQUID EFFLUENTS**
EAL 7.2.U	**UNUSUAL EVENT**
Mode	All
Description	**Any UNPLANNED release of liquid radioactivity that exceeds 2 times Technical Specification 6.8.6a/Offsite Dose Calculation Manual Limit for 60 minutes** *(1 or 2)* 1. A **VALID** rad monitor reading exceeds the values in Column 2 of Table 7-1 for >60 minutes, unless assessment within this period confirms that the **CRITERION** is NOT exceeded 2. Sample results exceed 2 times Technical Specification 6.8.6a/Offsite Dose Calculation Manual Limit for an unmonitored release of liquid radioactivity >60 minutes in duration
Basis	See generic bases for this TAB The significance of this CRITERION is primarily related to loss of control of radioactive material that has allowed the release to continue unabated for 60 minutes. It is this aspect rather that the magnitude of the release that establishes "...a potential degradation in the level of safety of the plant..." -- the fundamental definition of an Unusual Event. The numeric value in the CRITERION is based on the Offsite Dose Calculation Manual (ODCM) and/or T.S. 6.8.6a. INDICATOR #1 refers to monitor readings that exceed 2 times (2x) the HHSP identified on the Radioactive Waste Discharge Authorization. In order to address releases not controlled by an RWDA, column 1 Table 7-1 provides values representing 2 times the default HHSPs established in the ODCM. INDICATOR #2 addresses results of analyses performed on samples taken in response to unmonitored releases of liquid radioactivity. Classification in these cases will generally have to await sample results due to the lack of effluent monitoring.
Escalation	Increases in release rate would escalate event.
References	NUMARC/NESP-007, (AA1), Rev 2, 1/92 U1 Technical Specification Amendment 188 U2 Technical Specification Amendment 70

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.3	**RADIATION LEVELS**
EAL 7.3.A	**ALERT**
Mode	All
Description	**UNPLANNED increases in radiation levels within the facility that impedes safe operations or establishment or maintenance of cold shutdown (1 or 2)** Unit 1 1. VALID area radiation monitor readings or survey results exceed 15 mR/hr in the Control Room or PAF (on U2 DRMS) for >15 minutes 2. (a and b) a. VALID area radiation monitor readings or survey results exceed values listed in Table 7-2 for >15 minutes b. Access restrictions impede operation of systems necessary for safe operation or the ability to establish or maintain cold shutdown. Unit 2 1. VALID area radiation monitor readings or survey results exceed 15 mR/hr in the Control Room 2RMC-RQ201/202 [1069/1072] or PAF 2RMS-RQ223 [1071] for >15 minutes 2. (a and b) a. VALID area radiation monitor readings or survey results exceed values listed in Table 7-2 for >15 minutes b. Access restrictions impede operation of systems necessary for safe operation or the ability to establish or maintain cold shutdown.
Basis	This EAL addresses conditions in which elevated radiation levels impede necessary access to operating stations, or other areas containing equipment that must be operated manually, in order to maintain safe operation or perform a safe shutdown. The significance of this EAL is with the impaired ability to operate the plant that results in the actual or potential substantial degradation of the level of safety of the plant. The cause and/or magnitude of the increase in radiation levels is not a concern of this EAL. However, the Emergency Director must consider the source or cause of the increased radiation levels and determine if any other EAL may be involved. As used here "impede" includes hindering or interfering provided that the interference or delay is sufficient to significantly threaten the safe operation of the plant. Thus, for necessary actions that need to be taken within a few minutes, the need to process a radiation work permit and/or wear protective clothing would be considered as "impeding". The phrase "UNPLANNED" is specified in order to exclude anticipated, transient increases due to planned events (e.g., incore detector movement, radwaste container movement, depleted resin transfers, etc.). Con't

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.3	**RADIATION LEVELS**
EAL 7.3.A	**ALERT**
Mode	All
Basis (Con't)	In INDICATOR #1, the 15 mR/hr value for the control room is derived from the General Design Criterion 19 value of 5 rem in 30 days with adjustment for expected occupancy times. In INDICATOR #2, the monitor readings were selected on the following basis (1) Only areas that contain systems that must be operated manually, or require local surveillances to assure reliable support of safe plant operation, are addressed. Areas having equipment that must be operated locally during an accident, and areas along the pre-designated access routes (REOPs) to those areas are specifically included. (2) For areas not normally High Radiation Areas, the threshold is 100 mR/hour. This change in dose rate designates the area as a High Radiation Area. As such, low rad area general inspection RWPs are no longer applicable. Increased survey and/or dosimetry requirements apply to High Radiation Areas. (3) For areas that are normally High Radiation Areas, the threshold is 5 R/hr. Access to areas with dose rates of this magnitude will be limited due to stay time controls.
Escalation	Not applicable
References	NUMARC/NESP-007 (AA3), Rev 2, 1/92

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.3	**RADIATION LEVELS**
EAL 7.3.U	**UNUSUAL EVENT**
Mode	All
Description	**UNPLANNED increases in radiation levels within the facility** 1. **VALID** area radiation monitor readings increase by a factor of 1000 over normal levels for >15 minutes
Basis	This EAL addresses conditions in which there has been a degradation in the control of radioactive material, and hence, a reduction in the level of safety of the plant. The cause and/or magnitude of the increase in radiation levels is not a concern of this EAL. However, the Emergency Director must consider the source or cause of the increased radiation levels and determine if any other EAL may be involved. The phrase "UNPLANNED" is specified in order to exclude anticipated, transient increases due to planned events (e.g., incore detector movement, radwaste container movement, depleted resin transfers, etc.).
Escalation	Escalation would occur per EAL 7.3.A if the increase in radiation level results in impeded operations of equipment necessary for safe operation.
References	NUMARC/NESP-007 (AU2), Rev 2, 1/92

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.4	**FUEL HANDLING**
EAL 7.4.A	**ALERT**
Mode	All
Description	**Major damage to irradiated fuel; or loss of water level that has or will uncover irradiated fuel outside the reactor vessel** *(1 and 2)* Unit 1 1. **VALID** HI-HI Alarm on RM-RM-203 or RM-RM-207 or RM-VS-103 A/B or RM-VS- 105A/B 2. (a or b) a Plant personnel report damage of irradiated fuel sufficient to rupture fuel rods b. Plant personnel report water Level drop has or will exceed makeup capacity such that irradiated fuel will be uncovered Unit 2 1. **VALID** HI-HI Alarm on 2RMR-RQ203 [1025] or 2RMF-RQ202 [1031] or 2RMF-RQ301A/B [1032/2032] or 2HVR-RQ104A/B [1024/1028] 2. (a or b) a Plant personnel report damage of irradiated fuel sufficient to rupture fuel rods b. Plant personnel report water Level drop has or will exceed makeup capacity such that irradiated fuel will be uncovered
Basis	The major concern of the EAL is a fuel handling accident or loss of water covering spent fuel. Events away from the reactor vessel (e.g., in the cavity, transfer tube, or spent fuel pool) are addressed. Events within the vessel are classified in accordance with TABs 6.1 and 6.2, or the Fission Product Barrier Matrix. Events of this type could cause an increase in radioactivity readings and potentially a release to the environment. The magnitude of these releases is dependent on the amount of damage, depth of water above damage, and available filtration systems. Design basis fuel handling accident doses could exceed the EPA PAG, warranting a General Emergency classification. However, as with all UFSAR analyses, there is extensive conservatism in the analysis. Thus, an Alert Emergency is deemed justified. This declaration would result in augmentation of onsite personnel to support assessment of the release and restorative actions to stabilize the condition. Con't

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.4	**FUEL HANDLING**
EAL 7.4.A	**ALERT**
Mode	All
Basis (Con't)	With regard to the loss of water level, design features and administrative controls limit the possible fuel uncovery to a single element. Analyses performed in response to IE Bulletin 84-03, showed that the clad on a fuel assembly suspended in air would begin to melt at about 60 minutes, assuming an ambient air temperature of 105 °F, which is conservative. This time period provides for event-specific assessments. Escalation of the classification would be based on the results of these assessments. INDICATOR #1 verifies the reports discussed in INDICATOR #2 by noting the increase in radiation levels, and/or airborne activity in the affected areas. An increase on the ventilation monitors signifies the release of radioactivity in the fuel gap, whereas, an increase on area radiation monitors is indicative of reduced shielding due to the decrease in water level.
Escalation	Escalation would on the basis of TAB 7.1, Gaseous Effluents
References	NUMARC/NESP-007 (AA2), Rev 2, 1/92

Section 7.0	**RADIOLOGICAL / FUEL HANDLING**
TAB 7.4	**FUEL HANDLING**
EAL 7.4.U	**UNUSUAL EVENT**
Mode	All
Description	**UNPLANNED loss of water level in spent fuel pool or reactor cavity or transfer canal with fuel remaining covered** *(1 and 2 and 3)* Unit 1 1. Plant personnel report water level drop in spent fuel pool or reactor cavity or transfer canal 2. **VALID** Hi-Hi Alarm on RM-RM-203 or RM-RM-207 3. Fuel remains covered with water. Unit 2 1. Plant personnel report water level drop in spent fuel pool or reactor cavity or transfer canal 2. **VALID** Hi-Hi Alarm on 2RMR-RQ203 [1025] or 2RMF-RQ202 [1031] 3. Fuel remains covered with water.
Basis	The major concern of the EAL is a loss of water covering spent fuel. Events away from the reactor vessel (e.g., in the cavity, transfer tube, or spent fuel pool) are addressed. Events within the vessel are classified in accordance with TABs 6.1 and 6.2. Events of this type could cause an increase in radioactivity readings and potentially a release to the environment. The magnitude of these releases is dependent on the amount of damage, depth of water above damage, and available filtration systems. However, even without a release, elevated dose rates in adjacent areas could create access limitations. (See TAB 7.3) The design of fuel handling equipment and administrative controls on activities involving spent fuel maintains water above the fuel during normal handling. Should there be a loss of water level, such as that associated with a failure of the reactor cavity seal, fuel elements could be exposed to air in three locations: (1) in the manipulator mast, in the RCCA change fixture, and suspended from the fuel pool bridge crane. Analyses performed in response to IE Bulletin 84-03, showed that the clad on a fuel assembly suspended in air would begin to melt at about 60 minutes, assuming an ambient air temperature of 105 °F, which is conservative. The additional heat transfer afforded by the water assumed in this EAL would extend this time to several hours. This time period provides for event-specific assessments. Escalation of the classification would be based on the results of these assessments. INDICATOR #2 verifies the reports discussed in INDICATOR #1 by noting the increase in radiation levels in the affected areas. An increase on area radiation monitors is indicative of reduced shielding due to the decrease in water level. INDICATOR #3 is the discriminator between the Unusual Event and the Alert.
Escalation	Escalation would on the basis of TAB 7.1, Gaseous Effluents, or TAB 7.3, Radiation Levels
References	NUMARC/NESP-007 (AU2), Rev 2, 1/92

SECTION 5

EMERGENCY ORGANIZATION

CONTROLLED
BVPS UNIT 1/2

Section 5

EMERGENCY ORGANIZATION

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5.0 EMERGENCY ORGANIZATION

The First Energy Nuclear Operating Company emergency organization for the Beaver Valley Power Station is 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. The emergency organization described in this section, which encompasses both the operating elements and support elements of the Beaver Valley Power Station [C16], provides for a timely, staged response consistent with the emergency classification. The emergency organization will remain in effect until such a time as conditions have been stabilized at the Beaver Valley Power Station and normal operations have resumed or, if necessary, recovery operations are ready to begin.

The Beaver Valley Power Station (BVPS) Emergency Response Organization is supplemented by the emergency organizations of the various governmental agencies having an emergency response role within the Beaver Valley Power Station emergency planning zones. These offsite organizations are discussed in Section 5.4.

5.1 NORMAL OPERATING ORGANIZATION

The Beaver Valley Power Station [C16] organization for normal operations is shown in Figure 5.1. The organization integrates the major elements and disciplines necessary for the safe operation of the facilities into the five major areas – Plant Operations, Plant Engineering, Plant Maintenance, Projects and Scheduling and Nuclear Services. The organization reports to a Vice President and operates from facilities located on the BVPS site.

The Beaver Valley Power Station[C16]on-shift emergency organization for normal conditions is shown in Figure 5.2 [c8]. This organization is applicable to the operation of both Units. This figure shows the levels of responsibility within the station and indicates the typical categories of personnel present onsite.

5.2 BVPS EMERGENCY ORGANIZATION

For Unusual Event emergencies, the Beaver Valley Power Station emergency organization is initially comprised of the on-duty shift with the Shift Manager serving as Emergency Director. BVPS Unit 1 and Unit 2 minimum onshift crew compositions are identified in Table 5.2. Figure 5.2 illustrates the on-shift Emergency Organization shown in all capitals. For most initiating events within the Unusual Event category, this organization would be capable of adequately providing necessary assessment and corrective actions without augmentation. However, the Emergency Director, based on his evaluation of the situation, may activate part or all of the emergency organization described below. Table 5.1 identifies the staffing requirements and capabilities for additions of the Emergency Response Organization.

Personnel assigned to the various positions in the BVPS Emergency Organization are detailed in the bi-monthly issue of the Emergency Response Organization Call List. This list provides names and phone numbers for personnel assigned to each emergency position.

The Beaver Valley Power Station onsite emergency organization for Alert emergencies is illustrated in Figure 5.3. This organization would be activated for all Alert emergencies or, at the discretion of the Emergency Director, for Unusual Events. When completely activated, this organization would operate from the Technical Support Center (TSC), except where noted.

For emergencies classified as Site Area or General Emergencies, the emergency organization would be expanded (as illustrated in Figure 5.4) to provide for the more extensive emergency operations that would be necessary to respond to these higher classification emergencies. The additional personnel assigned to the organization would staff the Emergency Operations Facility (EOF), and would be responsible for direction and coordination of the overall response with primary emphasis on the offsite aspects (monitoring, dose projection, recommendation of offsite protection actions, etc.) of that response thus allowing the Technical Support Center to concentrate on the onsite implementation of assessment, corrective, and damage control actions.

Regardless of the emergency classification, time of day, or status of emergency organization activation, the authorities and responsibilities for implementation of the Beaver Valley Power Station Emergency Preparedness Plan are unambiguously vested in a designated individual. Section 6.2 describes the activation of the emergency organization.

This section describes the positions, functions and responsibilities of the BVPS emergency organization. In addition to the individuals and alternates designated in the following sections for key positions, the Vice President and/or the Site Directors may designate other individuals, based on personnel availability, to make the most advantageous use of personnel qualifications. Section 8 of the Plan describes the training of the BVPS emergency organization personnel.

For a longer-term emergency condition, a duty rotation system will be established using the designated alternates and/or other appropriately qualified personnel from the BVPS staff. [C16]

5.2.1 Emergency Director

The Shift Manager shall assume the role of the Beaver Valley Power Station Emergency Director until such time as he is relieved of that responsibility by a designated alternate.

The Shift Manager shall ensure that the designated alternate is promptly notified of an emergency condition. The designated alternate will receive a turnover from the SM and report to the Technical Support Center (conditions permitting).

The Beaver Valley Power Station Emergency Director shall assume full responsibility and authority for the implementation and administration of the BVPS Emergency Preparedness Plan, as set forth in 10CFR50 Appendix E and this section, until relieved of this responsibility by a more senior alternate; or by the designated Emergency/Recovery Manager upon activation of the Emergency Operations Facility.

Functional responsibilities of the Emergency Director include:

.1 Immediately upon notification of an existing or potential emergency, contact the Control Room and initiate assessment activities, including classification of the emergency, implementation of protective and corrective actions, and projection of offsite doses, as appropriate to the emergency condition.

.2 Initiate appropriate notifications and recommendations to offsite organizations (until EOF is activated). When the EOF is activated, the Emergency/Recovery Manager assumes the responsibility for offsite protective actions and should be consulted when Initial and Follow-up Notification Forms are being completed.

.3 Appoint emergency coordinators from qualified personnel on-shift, for assistance with current and continuing emergency control; but assume those responsibilities until the positions are filled.

.4 Augment the BVPS emergency organization with emergency call-list personnel and other available staff members, as appropriate.

.5 Continue assessment of emergency status and make appropriate recommendations to offsite organizations (until EOF is activated).

.6 Ensure that information to be released is accurate and released through the proper channels.

.7 Request assistance from Federal agencies, if applicable.

.8 Activate other emergency facilities as described in Section 6.2, as appropriate.

.9 Remain alert to radiological conditions and other hazards having the potential for significant effect on the health and/or safety of onsite BVPS personnel and other individuals having emergency assignments onsite (OSC[C15], CR, emergency squads, etc.) and, where necessary, implement appropriate protective measures including emergency exposure limits and/or thyroid prophylaxis.

.10 Until such time as the Emergency Operations Facility is activated, assume the responsibilities and authorities of the Emergency/Recovery Manager set forth in Section 5.2.2.

.11 When the Emergency Operations Facility is activated, provide technical updates to the Emergency/Recovery Manager on plant systems status, radiological effluent assessment activities, and implementation of onsite protective and corrective actions and, when appropriate, make recommendations on possible offsite protective actions based on plant status to the Emergency/Recovery Manager.

.12 When the Emergency Operations Facility is activated and, as necessary, request additional technical, engineering, material, or manpower assistance from the Emergency/Recovery Manager to supplement the resources of the onsite organization.

.13 Upon implementation of the Severe Accident Management Guidelines (SAMG's), the Emergency Director assumes the role and responsibilities of the Decision Maker in addition to his/her Emergency Preparedness duties. The Emergency Director should base his/her decision upon information received from the TSC OPS Coordinator and/or the Engineering Coordinator.

The BVPS Emergency Director may delegate some of his assigned functional responsibilities to appropriately qualified FENOC personnel. However, the BVPS Emergency Director is the only individual authorized to declare an emergency condition, authorize emergency personnel radiation exposures greater than 10 CFR 20; and/or direct the issuance of thyroid prophylaxis, pursuant to Section 6.7.1.8. Until the Emergency Operations Facility is activated, the Emergency Director is the only individual authorized to recommend offsite protective actions to state, local, and county governmental authorities on behalf of First Energy Operating Company and shall retain overall responsibility for the implementation and administration of the Emergency Preparedness Plan.

For Unusual Event and Alert emergencies, the Emergency Director reports to the Vice President. All designated emergency coordinators report directly to the Emergency Director. All other BVPS personnel report to the Emergency Director via the appropriate Emergency Coordinator who is responsible for the functions to which those personnel are assigned.

5.2.2 Emergency/Recovery Manager

Upon classification of abnormal condition as a Site Area or General Emergency, the Emergency Operations Facility will be activated and manned. For Site Area or General Emergencies, the Emergency Director shall ensure that the Emergency/Recovery Manager or a designated alternate is available.

When the Emergency Operations Facility is activated and staffed, the responsibilities and authorities of the Emergency Director, related to overall coordination of the BVPS response and to offsite response activities, are assumed by the Emergency/Recovery Manager.

The functional responsibilities of the Emergency/Recovery Manager include:

.1 Immediately upon notification of an existing or potential emergency condition classified as a Site Area or General Emergency, report to the Emergency Operations Facility; relieve the Emergency Director located in the TSC; and assume primary responsibility for offsite emergency response activities by FENOC personnel.

.2 Appoint interim emergency managers/coordinators from available qualified personnel, for assistance with current and continuing emergency control until such time as the designated managers/coordinators are available; but assume these responsibilities until the positions are filled.

.3 Direct and coordinate the activities of the designated emergency managers, the Emergency Director, the emergency coordinators, and other BVPS personnel in the assessment of plant status and radiological effluent releases, implementation of protective and corrective actions onsite, assessment, monitoring, or projection of offsite radiological conditions, the recommendation of offsite protective actions, and the exchange of technical and operational information within the FENOC emergency organizations and with offsite emergency response organizations.

NOTE

When activated, the Emergency/Recovery Manager is the only BVPS individual authorized to make recommendations of offsite protective actions to offsite response agencies. For instantaneous General Emergencies, the Emergency Director has the authority to recommend offsite protective actions to offsite response agencies.

.4 Respond to requests for assistance from the Emergency Director, with additional technical, engineering, material, or manpower resources as necessary; arrange for this assistance from outside sources if such requests cannot be met with the resources of the Beaver Valley Power Station. [C16]

.5 Remain alert via the Emergency Director, of radiological conditions or other hazards having the potential for significant effect on the health and/or safety of personnel and other individuals assigned to BVPS emergency response facilities; and, where necessary, coordinate with the Emergency Director appropriate protective measures including emergency exposure limits and/or thyroid prophylaxis for Emergency Operations Facility and other offsite FENOC personnel.

.6 Request assistance from Federal agencies should the situation warrant.

.7 Through the Offsite Agency Liaison, coordinate the response of the BVPS Emergency Response Organization with that of the local, county, state, and Federal response organizations located at the Site.

.8 When appropriate and necessary, implement the recovery organization as provided in Section 9 of this Plan.

For a Site Area or General Emergency, the Emergency/Recovery Manager reports directly to the Vice President. The designated Emergency Managers, including the Emergency Director, report directly to the Emergency/Recovery Manager. All other personnel report to the Emergency/Recovery Manager via the Emergency Director (TSC) or the Emergency Manager/Coordinator (EOF) responsible for the functions to which they are assigned.

5.2.3 Assistant to the Emergency Director and Assistant to the Emergency/Recovery Manager

These positions are filled by individuals who are cognizant of the Emergency Plan and Procedures. The primary responsibility of the Assistant to the Emergency Director is to assist the Emergency Director in the performance of his activities and, in particular, to advise him with regard to the provisions of this plan and the supporting implementing procedures. This individual is assigned to the Technical Support Center. The Assistant to the Emergency/Recovery Manager is located in the Emergency Operations Facility upon activation and reports to the Emergency/Recovery Manager performing similar functions as the Assistant to the Emergency Director.

The Assistant to the Emergency Director and Assistant to the Emergency Recovery Manager have similar experience/backgrounds and receive the same training as the Emergency Director and Emergency Recovery Manager, respectively. Therefore, the respective Assistant may assume the functional responsibilities of the Emergency Director or Emergency Recovery Manager.[C23]

5.2.4 Operations Coordinator

This ERO position is located in the Control Room, TSC and the EOF. Initially, the Control Room position is filled by an opposite unit Senior Reactor Operator, as available. At the Alert or greater stage, it will be filled by designated emergency response organization personnel.

Primary responsibilities of the Operations Coordinator are:

.1 In the Control Room, remains cognizant of Control Room and in-plant activities through the on-duty shift supervision and provide operational information to the TSC.

.2 In the TSC/EOF, report to, and advise the Emergency Director and/or Emergency/Recovery Manager on matters concerning plant operations.

.3 Upon implementation of the Severe Accident Management Guidelines (SAMG's), the TSC OPS Coordinator assumes the role and responsibilities of an Evaluator in addition to his/her Emergency Preparedness duties. Appropriate ERO personnel should aid the TSC OPS Coordinator in this evaluation process. The TSC OPS Coordinator shall provide the evaluation results to the Emergency Director.

The Control Room and TSC Operations Coordinator reports directly to the Emergency Director. The EOF Operations Coordinator reports directly to the Emergency/Recovery Manager. The operating personnel report to the Control Room Operations Coordinator through the on-duty SM. The TSC Operations Communicator reports to the TSC Operations Coordinator, and the EOF Operations Communicator reports to the EOF Operations Coordinator.

5.2.5 Communication and Records Coordinator

A designated qualified communicator will fill this position for Unusual Event emergencies or until the TSC is activated. For an Alert or higher emergency, this position will be filled by a designated emergency response organization member.

Responsibilities of the Communication and Records Coordinator include:

.1 Coordinate and ensure proper notification to key Emergency Coordinators and offsite organizations.

.2 Function as liaison for emergency-related communications between the Emergency Director and onsite and offsite emergency groups.

.3 Maintain records concerning the emergency.

The Communication and Records Coordinator reports directly to the Emergency Director. The communications assistants report to the Communications and Records Coordinator. Appropriate emergency response personnel will assist communications personnel with obtaining appropriate information for off-site agencies notifications.

5.2.6 Operations Support Center (OSC) Health Physics Coordinator

The OSC H.P. Coordinator will be located at the Operations Support Center and will report directly to the Radiological Controls Coordinator in the TSC. This position will be filled by designated emergency response organization personnel. Responsibilities to be assumed by the Operations Support Center H.P. Coordinator are[C15]:

.1 Maintain appropriate in-plant radiation control.

.2 Provide onsite radiation control personnel for in-plant, onsite and offsite monitoring teams.

.3 Coordinate radiological habitability surveys for assembly areas and response facilities.

.4 Maintain accountability of personnel in the OSC and those personnel deployed in monitoring teams.

5.2.7 Radiological Controls Coordinator

The Radiation Technician or Health Physics Supervisor, when available, will fill this position for the Unusual Event or until the TSC is activated. This TSC position will be filled by the Manager of Health Physics or designee. Alternates for the position of Radiological Controls Coordinator are designated emergency response organization personnel. Responsibilities to be assumed by the Radiological Controls Coordinator are primarily related to in-plant radiation control and include:

.1 Provide onsite radiation control personnel for monitoring teams, as requested by the Environmental Assessment and Dose Projection Coordinator, consistent with maintaining appropriate radiation controls in-plant.

.2 Relay technical data to the Emergency Director and/or the Operations Coordinator on radiological aspects of onsite emergency activities.

.3 Provides radiation control personnel and other radiological coverage for emergency team efforts.

.4 Coordinate and direct personnel decontamination efforts, as necessary.

.5 Oversee the operation of the personnel dosimetry program for on-site personnel and personnel assigned to the BVPS emergency response facilities.

.6 Provide onsite bioassay services such as whole body counting for designated personnel.

.7 Ensure access is restricted or controlled to areas where radiological hazards exist.

The Radiological Controls Coordinator reports directly to the Emergency Director and interfaces onsite and offsite radiological activities with the Environmental Assessment and Dose Projection Coordinator. Radiological Controls personnel (not assigned to offsite monitoring activities) report to the Radiological Controls Coordinator through the normal radiological controls supervision. Radiological conditions permitting, the Radiological Controls Coordinator will normally operate from the Technical Support Center.

5.2.8 Environmental Assessment and Dose Projection Coordinator

During the early stages of an accident, where environmental and/or radiological situations warrant, radiological dose projections will be performed under the cognizance of the onshift Radiological Controls Coordinator. The EA & DP Coordinator position will be officially activated at the Alert level or upon activation of the TSC.

Upon activation of the Emergency Organization, this TSC/EOF position will be filled by designated emergency response organization personnel.

Once this position has been filled, an assistant is assigned from the available alternates or from the Health Physics Support Group.

Responsibilities of the Environmental Assessment and Dose Projection Coordinator are as follows:

.1 Direct the activities of the offsite radiation monitoring teams.

.2 Coordinate offsite monitoring activities and the exchange of results and other technical data with Federal and State agencies.

.3 Provide the Emergency Director (Emergency/Recovery Manager) with dose projections and evaluations.

.4 Provide technical advice to the Emergency Director (Emergency/Recovery Manager) concerning radiological assessment and recommendations for offsite protective actions.

.5 Coordinate environmental sampling and analyses, and evaluation of results.

The EA & DP Coordinator reports to the Emergency Director for Unusual Events (if deemed necessary) and Alert Emergencies, and subsequently to the Emergency/Recovery Manager for Site Area or General Emergencies. Assigned Environmental and Radiological monitoring personnel will report to the EA & DP Coordinator.

5.2.9 Environmental Coordinator

This ERO position is filled by designated emergency response organization personnel. Responsibilities to be assumed by the Environmental Coordinator include:

.1 Adapt the existing environmental monitoring procedures to emergency environmental monitoring.

.2 Determine the locations and type of sample media based on the type of activity released and the wind direction.

.3 Direct personnel in any additional sampling, other than those in the ongoing program.

.4 Review and evaluate sample results received from a designated low-level laboratory and forward result to proper personnel.

.5 Assignment of EA & DP Assistants to specific tasks as required.

The Environmental Coordinator reports to the Environmental Assessment and Dose Projections Coordinator during emergency situations.

5.2.10 Engineering Coordinator

This TSC position is activated at an Alert and is filled by designated emergency response organization personnel. Responsibilities to be assumed by the Engineering Coordinator include:

.1 Direct and coordinate engineering efforts related to the emergency response.

.2 Advise the Emergency Director on matters related to the engineering of short-term modifications to plant systems necessary to mitigate the consequences of the accident and/or recover the plant.

.3 Supervise the Technical Support Coordinator and those ERO personnel directly reporting to the TS Coordinator.

.4 Upon implementation of the Severe Accident Management Guidelines (SAMG's), the Engineering Coordinator assumes the role and responsibilities of an Evaluator in addition to his/her Emergency Preparedness duties. Appropriate ERO personnel should aid the Engineering Coordinator in this evaluation process. The Engineering Coordinator shall provide the evaluation results to the Emergency Director.

The Engineering Coordinator reports directly to the Emergency Director.

5.2.11 <u>Technical Support Coordinator</u>

This position is initially filled by the Staff Nuclear Advisor. This individual, or his relief, will remain in the Control Room throughout the emergency. For Alert and higher emergencies, the onsite Technical Support Center (TSC) will be activated and the position of Technical Support Coordinator will be filled by designated emergency response organization personnel.

The Technical Support Coordinator reports to the Engineering Coordinator and is responsible for the coordination and direction of engineering personnel in the Technical Support Center. The Technical Support Coordinator may assign technical support personnel, as appropriate, to activities such as:

.1 Analyzing mechanical, electrical, instrument and control, effluent control, and radiation dose rate problems; determining alternate solutions, design and coordination of short-term modifications installation.

.2 Analyzing thermohydraulic and thermodynamic problems and developing resolutions.

.3 Assisting in the development of Emergency Operating Procedures or other procedures, as necessary, for conducting emergency operations.

.4 Analyzing conditions and developing guidance for the Emergency Director and operations personnel.

Reporting to the Technical Support Coordinator is a Document Support Group. These personnel are available to retrieve requested documents, which will aid in the emergency response.

The Technical Support Coordinator reports directly to the Engineering Coordinator. All technical and engineering personnel assigned to the Technical Support Center report to the Engineering Coordinator through the Technical Support Coordinator.

5.2.12 Computer Coordinator

The Computer Coordinator will be located in the TSC and will supervise the operation of the Inplant Process Computer, Safety Parameter Display System, Emergency Response Facility Computer System (ERFCS) and the NRC Emergency Response Data System computer equipment. This position will be filled by designated emergency response organization personnel.

Responsibilities of the Computer Coordinator will include:

.1 Assignment of computer operators to specific tasks as requested by the TSC Operations Coordinator.

.2 Alert the TSC Operations Coordinator and other emergency personnel to changing conditions as indicated by the computer system.

.3 At an Alert or higher Emergency, activate the Emergency Response Data System (ERDS) within 1 (one) hour of the declaration of the emergency.

.4 Assist the TSC Operations Coordinator and other coordinators in interpreting plant data supplied by the computer systems.

.5 Obtaining the required historical data (HDSR).

.6 Upon termination, restoring the computer systems to normal operating modes.

.7 Direction as necessary to Computer Maintenance personnel in corrective actions to non-functioning equipment.

.8 Assign Computer Operator personnel to support EOF functions.

The Computer Coordinator reports to the TSC Operations Coordinator.

5.2.13 Operations Support Center Coordinator

This OSC position will be filled by designated emergency response organization personnel. Responsibilities to be assumed by the Operations Support Center Coordinator are: [C35]

.1 Direct the activities of in-plant supplemental emergency team(s).

NOTE

The on-shift Emergency Squad has an Emergency Squad Chief who actually directs the efforts of the Emergency Squad in accordance with the Beaver Valley Fire Protection Plan, Emergency Implementing Procedures, and other applicable station procedures. In a long-term emergency, additional emergency teams may be activated, as appropriate, to supplement the on-shift Emergency Squad. The coordination of the various additional emergency teams will be the responsibility of the Operations Support Center Coordinator.

.2 Coordinate the assignment of personnel from the onsite pool of available persons in response to requests from the Maintenance Coordinator.

.3 Maintain accountability of personnel in the Operations Support Center (OSC) and those personnel deployed in emergency teams.

.4 Provide direction to Operations Support Center assistants in completing the facility functions.

The Operations Support Center Coordinator (located in the OSC) reports to the Emergency Director, via the Maintenance Coordinator (located in the TSC). All personnel assigned to or directed to the OSC will report to the OSC Coordinator except the Emergency Squad, which reports directly to the Shift Manager.

5.2.14 Maintenance Coordinator

This TSC position is filled by designated emergency response organization personnel. Responsibilities to be assumed by the Maintenance Coordinator are:

.1 Direct and coordinate the activities of mechanical, electrical, and instrumentation personnel in the performance of emergency corrective actions, and or damage control activities.

.2 Advise the Emergency Director on the status of plant systems.

.3 Direct and coordinate the installation of short-term emergency systems modifications.

The Maintenance Coordinator reports directly to the Emergency Director. All station maintenance forces (electrical, mechanical, and instrumentation) will report to the Maintenance Coordinator via the OSC Coordinator, through their normal supervisory chain.

5.2.15 Security Coordinator

The Security Coordinator position is initially filled by the Supervisor, Nuclear Shift Security. This position is located in the Central Alarm Station (CAS) and will be relieved by the senior member of the security organization who may be located in the TSC.

Responsibilities to be assumed by the Security Coordinator include:

.1 Maintain an appropriate plant security posture and institute appropriate contingency measures as necessary.

.2 For Site Assemblies/Accountabilities and/or Site Evacuations, receive reports from assembly areas; determine the identity of unaccounted personnel; advise Emergency Director of personnel accountability status; and maintain accountability of onsite personnel during an emergency.

.3 Expeditiously provide Site access for emergency response personnel who do not have current security badging at BVPS.

.4 Ensure Security personnel are changed-out consistent with any exposure received depending upon the severity of the accident.

5. Oversee the Security portion of the ERF access sign-in.

6. Interface with the Emergency Director and the TSC staff concerning Security support.

7. Relay Assembly/Accountability instructions from the TSC and CAS and the status of Accountability or Search and Rescue from the CAS to the TSC.

All Site Security personnel will report to the Security Coordinator.

The Security Coordinator reports directly to the Emergency Director.[C12]

5.2.16 Chemistry Coordinator

This TSC position will be filled by designated emergency response organization personnel.

Responsibilities to be assumed by the Chemistry Coordinator include:

.1 Provide technical information to the Emergency Director and other key Emergency Coordinators concerning chemistry.

.2 Provide chemistry personnel for analysis of onsite/offsite environmental samples.

.3 Coordinate chemistry personnel for in-plant chemistry sampling and analysis.

The Chemistry Coordinator will report directly to the Emergency Director. Chemistry technicians will report to the Chemistry Coordinator.

5.2.17 Operations Communicator

This Control Room and ERF position will be filled by designated emergency response organization personnel. Although this individual may be physically located in the Control Room, the Operations Communicator is part of the TSC staff. Responsibilities to be assumed by the Operations Communicator:

.1 Serve as liaison between operations personnel and personnel in other Emergency Centers (TSC-EOF-CAS and OSC[C15]). The Operations Communicators will report to the Control Room, and ERF upon activation of the Alert emergency response organization.

.2 Assist the appropriate Operations Coordinator in communications to other response centers.

.3 Alert their immediate supervisor of vital data relayed over the Operations Circuit. The TSC Operations Communicator reports to the TSC Operations Coordinator and the EOF Operations Communicator reports to the EOF Operations Coordinator.

.4 Maintain a log of information pertaining to the Operations Circuit communications.

.5 Serve as a back-up to the IPC, SPDS and ERFCS for retrieval of control board data.

.6 Serve as the primary communicator for the NRC-ENS phone upon activation of the Alert Emergency Response Organization. This position will be manned regardless of the operability of the Emergency Response Data System (ERDS).

5.2.18 Support Services Manager

This EOF position is staffed at the Alert and activated at Site Area or General Emergency classification, and is filled by designated Emergency Response Organization personnel.

Responsibilities to be assumed by the Support Services Manager include:

.1 Coordinate personnel and work schedules for shift relief emergency personnel.

.2 Coordinate with outside groups in procuring and purchasing additional resources such as manpower, equipment, supplies and transportation.

.3 Coordinate provisions for transportation, food and other logistical support for emergency personnel.

.4 Coordinate with Nuclear Training for plant specific training for outside emergency support groups during an emergency condition, as appropriate.

.5 Provide clerical support to the Emergency Response Organization, as necessary.

.6 Serve as interface with the FirstEnergy Supply Chain for augmentation of onsite material and personnel resources.

The Support Services Manager reports directly to the Emergency/Recovery Manager. Assistants reporting to the Support Services Manager should include a Procurement Coordinator, Purchasing Coordinator and an Administrative Services Coordinator. These coordinators may have additional assistants.

5.2.19 Offsite Agency Liaison

This EOF position is staffed at the Alert and activated for Site Area or General Emergencies and will be filled by designated emergency response organization personnel. Responsibilities to be assumed by the Offsite Agency Liaison are:

.1 Resolving questions concerning Operating License requirements with Nuclear Regulatory Commission representatives.

.2 Serving as liaison between representatives of the state and local governments present in the Emergency Operations Facility and the Beaver Valley Power Station emergency organization. This liaison is primarily for the exchange of operational information (less radiological assessment) and coordination of offsite activities with those of the Beaver Valley Power Station. The Offsite Agency Liaison reports directly to the Emergency/Recovery Manager.

5.3 NUCLEAR COMMUNICATIONS

5.3.1 Chief Company Spokesperson

The Chief Company Spokesperson is responsible for establishing corporate credibility and is designated by Senior Management.[C36] Makes announcements to the media regarding significant changes in plant conditions and on-site status of the power station. Consults with both the Manager-Joint Public Information Center and the Emergency Recovery Manager to assure consistent and timely response on behalf of the Company. Chief Company Spokesperson, or designee, reviews all news announcements prior to issuance to the news media.

5.3.2 JPIC Manager

The JPIC Manager is responsible for the activation and overall operation of the Joint Public Information Center. The JPIC Manager presides over news briefings at the JPIC. The JPIC Manager will introduce spokespersons and oversee the conduct of the briefings and may review news announcements in the absence of the Chief Company Spokesperson. The JPIC Manager will compile a list of follow-up items from briefings and coordinate information between First Energy and off-site agencies spokespersons.

5.3.3 Media Relations Coordinator

The Media Relations Coordinator is the liaison between First Energy and the Media. When the JPIC Manager is unavailable, the Media Relations Coordinator will introduce spokespersons and oversee the conduct of the briefings. In addition, the Media Relations Coordinator will work with the news media to meet special requests such as arranging interviews of company officials and directing media photographers and camera crews to designated locations to obtain requested photos and film footage. The Media Relations Coordinator ensures operability of the media briefing area and provides biographies of spokespersons upon request.

5.3.3.1 Technical Briefer

Under the general supervision of the Media Relations Coordinator, is responsible for providing, interpreting and clarifying as requested by the media, all generic technical information concerning the operation of plant systems. Attends all news briefings, assists the Chief Company Spokesperson during news briefings to explain events as requested, answers media questions between news briefings concerning descriptions of plant systems and operating characteristics of these systems using plant pictures and schematics as available and appropriate, and serves as a technical advisor to all JPIC staff on any technical matter.

5.3.4 Information Manager

The Information Manger is responsible for managing and coordinating the flow of verbal and written information for the nuclear communications organization. The Information Manager is located at the Joint Public Information Center (JPIC). While the JPIC is in operation, this individual participates in the telephone discussions between the technical advisors at the EOF and JPIC, and the Chief Company Spokesperson to ensure that verbal and written information issued from the organization is accurate and timely. The Information Manager may also review news releases if the JPIC Manager or Chief Company Spokesperson is unavailable. This individual also works closely with State and County Public Information Officers.

5.3.4.1 Information Coordinator

Under the general supervision of the Information Manager at the Joint Public Information Center, is responsible for notifying the JPIC staff of the emergency situation, coordinating the activities of the staff, directing rumor control activities and ensuring the distribution of news announcements. The Information Coordinator maintains continual communications with Corporate and EOF staffs and informs them of current updates to the emergency situation. The Information Coordinator continually consults with the Information Manager and fulfills requests as needed.

- Information Coordinator Assistant

  Under the general supervision of the Information Coordinator - JPIC, is responsible for assisting the Information Coordinator with maintaining logs, status boards, etc.

- Rumor Control Coordinator JPIC

  Under the general supervision of the Information Coordinator - JPIC. Rumor Control Coordinator JPIC is responsible for establishing and maintaining telephone communications with Customer Account Services Department for the purpose of coordinating rumor information.

- Media Monitor

  Under the general supervision of the Information Coordinator - JPIC. Responsible for monitoring local radio and TV broadcasts to ensure accuracy of information reported.

- Media Contact

  Under the general supervision of the Information Coordinator - JPIC. Responsible for answering telephone inquires received at the Joint Public Information Center from members of the news media.

5.3.5 Logistics Coordinator (JPIC)

Under the general supervision of the JPIC Manager, is responsible for supervising and directing the activities associated with fulfilling the Emergency Public Information Response Team's equipment, and other logistical needs. Serves as the primary source for locating, acquiring and ensuring the timely acquisition and set-up of all equipment to be used at the JPIC to carry out the emergency response.

5.3.5.1 Engineering Communications Representative

Under the general supervision of the Logistics Coordinator, is responsible for providing the technical expertise required for the set-up and maintenance of all communications equipment needed to support emergency response operations. Serves as the primary source for resolving telecommunications problems.

5.3.5.2 Administrative Support

Under the general supervision of the Logistics Coordinator, is responsible for coordinating all administrative activities associated with the reproduction and facsimile equipment located in the Joint Public Information Center. Serves as the primary Emergency Public Information Response Team contact with BVPS in obtaining necessary administrative support for emergency response operations at the JPIC office.

5.3.5.3 Security Coordinator

Under the general supervision of the Logistics Coordinator, is responsible for establishing and implementing the security system at the Joint Public Information Center. Serves as the primary liaison between the Emergency Public Information Response Team and security personnel.

5.3.6 JPIC Technical Advisor

Under the general supervision of the Information Manager, is responsible for maintaining frequent contact with the EOF Technical Advisor to obtain up-to-the-minute information on plant status. This information is relayed to the Chief Company Spokesperson, the JPIC Manager and the Information Manager. This position also consults with the JPIC staff in the interpretation and clarification of plant status and actions being taken to achieve plant stability and recovery.[c8]

5.3.7 Customer Services

Under the general supervision of the Information Manager, the Customer Services Department is responsible for addressing incoming phone calls to the Company Services Board regarding an emergency condition at BVPS. The Department assures that there is adequate staffing and directs callers to the appropriate organization (i.e., JPIC, Local Emergency Management Agency Public Information, etc.).

5.3.8 Nuclear Communications Manager - EOF

Under the general supervision of the Emergency Recovery Manager, [C36] is responsible for supervising and directing the activities of the Emergency Public Information Response Team assigned to the EOF. Ensures a continuous flow of essential information for developing news announcements regarding plant conditions and serves as the JPIC's primary information resource.

5.3.8.1 Nuclear Communications Writer

Under the general supervision of the EOF Nuclear Communications Manager, and in consultation with the Nuclear Communications Technical Advisor is responsible for developing and writing all news announcements in accordance with news announcement guidelines.

5.3.8.2 Nuclear Communications Coordinator

Under the general supervision of the EOF Nuclear Communications Manager, is responsible for assisting in the direction of the activities of the Emergency Public Information Response Team assigned to the EOF. Aids in ensuring a continuous flow of essential information for developing news announcements regarding plant conditions.

5.3.8.3 Nuclear Communications Technical Advisor - EOF

Under the general supervision of the EOF Nuclear Communications Manager, is responsible for providing, interpreting and clarifying, as requested, all technical information for EOF Nuclear Communications Writer. Also provides verbal information to the JPIC Technical Advisor for news briefings.

5.3.9 EMA Contact Representative

Under the general supervision of the Information Manager, is the liaison between the Public Information Officers for the three States in the EPZ and Nuclear Communications at the JPIC.

5.4 EMERGENCY ORGANIZATION STAFFING

This section describes the staffing of the Emergency Squad, radiological monitoring, other emergency teams, and the emergency centers. Specific personnel assignments to these teams and centers are made by title or job classification in an Emergency Organization Call-Out List. Section 8 describes the training requirements for these personnel.

.1 The BVPS normal operations organization provides for an Emergency Squad comprised of on-duty shift personnel. This Emergency Squad provides for rapid response to emergency conditions at all times. This response includes fire fighting, first aid, search and rescue, and damage control. The on-shift Emergency Organization is illustrated in Figure 5.2 in all capitals.

.2 The Emergency Squad may be supplemented by emergency teams comprised of other off-duty personnel onsite, or personnel called in during off-hours. Functions assigned to these emergency teams may include fire fighting, onsite radiological monitoring, offsite radiological monitoring, first aid, search and rescue, personnel decontamination, and/or damage control, as appropriate to the emergency.

.3 Table 5.1 describes the typical availability of station personnel for emergency activity assignments.

.4 The TSC, OSC[C15], and the EOF, when activated, will be staffed with personnel from the BVPS emergency response organization, personnel from other FirstEnergy organizations, vendor/contractor personnel, and Federal, State and county agency personnel, depending on the severity of the emergency condition. The TSC, EOF, and Nuclear Communications Emergency Organization staffing is illustrated in Figure 5.3, Figure 5.4, and Figure 5.5 respectively.

.5 The on-duty Staff Nuclear Advisor will continue to serve in an advisory role to the operating personnel from the Control Room. The Operations Coordinator will serve as the Control Room contact for the Technical Support Center, relaying questions and responses between operations personnel and the Technical Support Center.

5.4.1 <u>Relationship Between Normal and Emergency Organizations</u>

In the event of an Alert or more severe emergency, personnel in the normal Beaver Valley Power Station[C16] organization will assume their assigned positions within the Beaver Valley Power Station emergency organization. This emergency organization is operational in nature. Administrative reporting will continue as established in the normal Group and Station organization as described in the administration manuals, to the extent it does not conflict with timely emergency response in accordance with this Emergency Preparedness Plan and the Emergency Implementing Procedures. All other non-assigned personnel are available as a resource pool to support the activities of the various emergency coordinators.

Regulatory, Corporate, and other Station supervisory personnel without a specific supervisory assignment pursuant to this Plan shall not provide directions or instructions directly to plant personnel. All such directions and instructions shall be made to the designated emergency coordinators responsible for the activity in question.

In the course of the emergency, it may become necessary for Technical Support Center personnel to recommend a course of action which is in conflict with approved procedures. Normal procedure change approval requirements should be met, consistent with timely implementation of the required action. However, in the event of an emergency or casualty not covered by an approved procedure, operating personnel have the responsibility and authority to take whatever action they consider required to prevent injury to personnel or damage to the plant or to equipment and to place the plant and equipment in a safe condition.

5.5 AUGMENTATION OF THE ONSITE EMERGENCY ORGANIZATION

5.5.1 Corporate Level Support

The Beaver Valley Power Station[C16] is comprised of the major elements and disciplines necessary to adequately respond to emergency situations. For this reason, a distinct Corporate emergency response organization is not defined. Legal, Financial and Security support shall be provided by Corporate personnel as requested by various BVPS Emergency Response Coordinators/Managers.

Personnel may be drawn from the following corporate groups:

- Legal and Public Affairs
- Corporate Services
- Finance
- Customer Operations
- Generation Group

Personnel from these groups can be activated from call-lists developed by onsite response personnel.

5.5.2 Institute for Nuclear Power Operations (INPO) Support

The Institute for Nuclear Power Operation's (INPO) will be a clearinghouse organization for maintaining a roster of individuals and skills available to each utility for augmenting onsite and corporate emergency organizations in the event of an emergency. INPO will also serve as a clearinghouse for maintaining an inventory of material, equipment, and services, which may be used to supplement onsite resources. First Energy Nuclear Operating Company participates in the INPO program. The FENOC INPO Administrative Point of Contact is the liaison with INPO during normal operations [C36]. In an emergency, this individual will coordinate all requests for assistance from INPO and will coordinate INPO activities in response to these requests, as appropriate to the nature and severity of the emergency.

5.5.3 NSSS Support

The Westinghouse Water Reactor Division, designer of the BVPS Nuclear Steam Supply System (NSSS), has developed an emergency response plan which provides for emergency engineering assistance to facilities having a NSSS designed by Westinghouse. This assistance is available on a 24-hour/day, 7-day/week basis. Section 6.3.3 describes activation of this organization. The Westinghouse WRD can supply a site response team if deemed appropriate. These personnel, if activated, could be directed to the Technical Support Center.

5.5.4 Industry Support

The Beaver Valley Power Station is operated by the FirstEnergy Operating Company (FENOC). FENOC also operates the Perry Nuclear Power Plant and the Davis Besse Nuclear Power Plant which may be a source of assistance in the event of an emergency at Beaver Valley Power Station.[c8] Assistance from other nuclear facilities may be accessed through the Institute of Nuclear Power Operations, as described in Section 5.5.2.

5.5.5 Local Services Support

The nature of an emergency may require augmenting onsite response groups with local services, personnel and equipment. These local agencies will be contacted for support in response to specific emergency conditions. The expected response of the medical treatment and transportation agencies is described in Section 6.8. The response of the fire organizations is described in detail in the Mutual Aid Fire Plan and in the BVPS Operating Manual. Support may be obtained as necessary from the following local organizations:

- The Medical Center, Beaver
- University of Pittsburgh Medical Center
- Offsite fire departments
- Offsite ambulance services
- Pennsylvania State Police

Specific methods for notifying these organizations and their expected assistance are described in Emergency Implementing Procedures and are summarized in Section 6 of this Plan. Letters of Agreement from each organization to provide their respective emergency assistance to the Beaver Valley Power Station are on file in the Emergency Preparedness Section. Local fire services personnel performing emergency measures onsite shall coordinate activities onsite with the Emergency Squad Chief or other designated station supervisory personnel since each of these agencies possess specific capabilities as described in the Mutual Aid Fire Plan. Police functions to be performed by the Pennsylvania State Police in support of BVPS are contained within the BVPS Security Plan.

5.5.6 Other Support Services

Emergency conditions may require long-term or extensive support from organizations such as contractors, other utilities, support agencies or Federal and State agencies. Space is available, near the Emergency Response Facility, for trailers or other temporary facilities. Various facilities may be established for the following activities: security, training, instrument repair and calibration, food preparation, etc. If necessary, these functions would be considered an extension of the Emergency Response Organization.

5.6 COORDINATION WITH PARTICIPATING GOVERNMENT AGENCIES

5.6.1 State and Local Agencies

This section identifies the principal State and local governmental agencies in Pennsylvania, Ohio, and West Virginia having action responsibilities for radiological emergencies in the vicinity of the Beaver Valley Power Station. The radiological emergency response plans of these agencies describe their respective responsibilities, authorities, capabilities and emergency functions; and although not included as part of this Plan, are intrinsic parts of the emergency planning for the Beaver Valley Power Station. The emergency organizational interfacing between BVPS, local and state agencies and Federal government groups is outlined in Figure 5.6. The following sections provide 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. Table 5.3 identifies the governmental agencies, their mailing address and the individual (by position) accountable for planning, ordering and controlling emergency actions.[c9]

The Beaver Valley Power Station has made available in the near-site Emergency Operations Facility space for liaison personnel from each of the jurisdictions within the BVPS Emergency Planning Zone. The Offsite Agency Liaison will be assigned to this location to serve as an interface between First Energy and the governmental groups. Liaison personnel at the EOF will serve to provide for coordination among the Federal agencies, primary State and local agencies within the EPZ, and BVPS. Upon request, BVPS will provide liaison personnel to the primary governmental Emergency Operations Centers (EOC).

.1 Beaver County Emergency Management Agency (BCEMA) -- is the lead governmental agency for offsite coordination and response in Beaver County. The BCEMA emergency plan is entitled "Beaver County Emergency Operations Plan Annex "E" Beaver Valley Power Station", and the plan includes provisions for:

- Planning and coordination with local and State authorities
- Initial response to notification by Beaver Valley Power Station
- Alert and warning of local populations
- Evacuation and other protective measures for local populations
- Emergency services

The primary method of notification to BCEMA is the commercial phone system. The alternate method is radio. A copy of the agreement letter from the BCEMA is on file in the Emergency Preparedness Section.

.2 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 "Commonwealth of Pennsylvania Emergency Operations Plan Annex "E" Radiological Emergency Response to Nuclear Power Plant Incidents". The PEMA plan includes provisions for:

- Issuance of planning guidance
- Coordination of State and Federal response to nuclear incidents
- Establishment of an emergency operations center
- Provision for emergency public information
- Coordination of State agencies and departments
- Notification and provision of technical information to affected contiguous states

The primary method of notification to PEMA is the commercial phone system. The alternate method is radio via BCEMA. A copy of the agreement letter from PEMA is on file in the Emergency Preparedness Section.

.3 Department of Environmental Protection/Bureau of Radiation Protection (DEP/BRP) -- is the lead governmental agency for providing technical advice and consultation to State and local organizations in evaluation of appropriate offsite preventive and protective measures. The DEP/BRP emergency plan is incorporated into the PEMA response plan. The DEP/BRP plan provides for:

- Technical consultation
- Accident assessment
- Recommendations for protective actions
- Recommendations for protection of potable water and food
- Recommendations for recovery and re-entry (off-site)

The initial notification to DEP/BRP will be made by PEMA. Direct telephone "hot-lines" have been installed between the Beaver Valley Power Station and DEP/BRP for transmitting radiological information.

.4 Columbiana County Emergency Management Agency (CCEMA) -- is the lead governmental agency for offsite coordination and response in Columbiana County, Ohio. The CCEMA emergency plan is entitled "Columbiana County Radiological Emergency Response Plan for Beaver Valley Power Station".

The CCEMA plan includes provisions for:

- Planning and coordination with local and State authorities
- Initial response to notification by Beaver Valley Power Station
- Alert and warning of local populations
- Evacuation and other protective measures for local populations
- Emergency Services

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

The primary method of notification to CCEMA is the commercial phone system. The alternate method is radio. A copy of the agreement letter from the CCEMA is on file in the Emergency Preparedness Section. CCEMA will not be requested to provide onsite local support, such as fire fighting.

.5 Ohio Emergency Management Agency (OEMA) -- is the lead governmental agency for coordination and response of emergency activities at the State level. The OEMA emergency plan is entitled "The Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities". The OEMA plan includes provisions for:

- Issuance of planning guidance
- Coordination of State response to nuclear incidents
- Accident Assessment
- Recommendations for protective actions
- Recommendations for recovery and re-entry (offsite)
- Operation of the emergency operations center
- Provision for emergency public information
- Coordination of response with Federal agencies and applicable agencies in the contiguous states.

The primary method of notification to OEMA is the commercial phone system. The alternate method is radio via CCEMA. Additionally, backup notification of OEMA can be made by PEMA via the commercial phone system, or as an alternate the National Warning Systems (NAWAS) interconnection. A copy of the Letter of Agreement with OEMA is on file in the Emergency Preparedness Section.

.6 Hancock County Office of Emergency Services (HCOES) -- is the lead governmental agency for offsite coordination and response in Hancock County, West Virginia. The HCOES emergency plan is entitled "Hancock County Radiological Emergency Response Plan Beaver Valley Power Station".

The HCOES plan includes provisions for:

- Planning and coordination with local and State authorities
- Initial response to notification by Beaver Valley Power Station
- Alert and warning of local populations
- Evacuation and other protective measures for local populations
- Emergency services

The HCOES plan also contains emergency procedures for local organizations, which are assigned action and/or support responsibilities under that plan.

The primary method of notification to HCOES is the commercial phone system. The alternate method is radio. A copy of the agreement letter from the HCOES is on file in the Emergency Preparedness Section. HCOES will not be requested to provide onsite local support, such as fire fighting.

.7 West Virginia Office of Emergency Services (WVOES) -- is the lead governmental agency for coordination and response of emergency activities at the State level. The WVOES emergency plan is entitled "West Virginia Emergency/Disaster Plan Volume Four Response/Radiological Beaver Valley Power Station". The WVOES plan includes provisions for:

- Issuance of planning guidance
- Coordination of State response to nuclear incidents
- Accident Assessment
- Recommendations for protective actions
- Recommendations for protection of potable water and food
- Recommendations for recovery and re-entry (offsite)
- Operation of the Emergency Operations Center
- Provision for emergency public information
- Coordination of response with Federal Agencies, and with applicable agencies in the contiguous States

The primary method of notification to WVOES is the commercial phone system. The alternate method is radio via HCOES. Additionally, backup notification of WVOES can be made by PEMA via the commercial phone system, or as an alternate, the National Warning System (NAWAS) interconnection. Copies of the agreement letters between WVOES and Beaver Valley Power Station are on file in the Emergency Preparedness Section.

5.6.2 Federal Agencies

The principal Federal government agencies having emergency responsibilities relative to the Beaver Valley Power Station, and a summary of those responsibilities are:

.1 US Nuclear Regulatory Commission (NRC), -- 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 NRC and the Federal Emergency Management Agency (FEMA) share responsibility for coordinating Federal response to emergencies. Specific responsibilities assigned to the NRC include:

- Notification of FEMA whenever a radiological event occurs or whenever there is high potential for such an event.
- Monitoring operational data and assuring that adequate information and recommendations are being provided to offsite agencies.
- As a back-up to the licensee, providing a technical assessment of onsite radiological and plant conditions to FEMA and other Federal agencies and keeping offsite agencies apprised of any operational decisions that may effect offsite protective actions.
- Dissemination of onsite data to FEMA and Federal agencies, the news media, and the general public.

.2 US Department of Energy (DOE), Brookhaven Area Office -- will respond to requests from the Beaver Valley Power Station and provide offsite assistance which is limited to advice and emergency action essential for the control of the immediate hazards to public health and safety.

DOE coordinates the activities of the Federal Radiological Monitoring and Assessment Plan (FRMAP). The FRMAP plan provides the framework through which the Federal agencies participating in the FRMAP program will coordinate their emergency radiological monitoring and assessment activities with those of State and local governments. The Beaver Valley Power Station will perform necessary onsite and in-plant radiological monitoring with Station personnel, augmented as necessary with personnel from other nuclear utilities, and from contractor organizations. FRMAP personnel will not be used for onsite or in-plant monitoring at Beaver Valley. Since FRMAP resources are to be used for offsite response, the emergency plans of Pennsylvania, West Virginia, and Ohio have made provisions for the use of FRMAP resources. To provide means for FRMAP access to plant release and meteorological data, space will be made available for a liaison from FRMAP in the Emergency Operations Facility.

The primary method of notification to DOE is by the commercial phone system, in accordance with the provisions of the agreement letter, on file in the Emergency Preparedness Section. Notifications may also be made through NRC.

.3 National Weather Service (NWS) (Pittsburgh, PA) -- will respond to requests from the Beaver Valley Power Station for routine and special weather advisories and meteorological data, and through the River Forecasting Section, hydrologic data for the Ohio River.

The primary method of notification to NWS is by the commercial phone system, in accordance with the provisions of the agreement letter, on file in the Emergency Preparedness Section.

.4 Federal Emergency Management Agency (FEMA) -- The responsibility of FEMA in the event of an emergency at a nuclear power facility is to coordinate the response of the various Federal agencies. The NRC and FEMA share responsibility for coordinating Federal response to emergencies. Specific responsibilities assigned to FEMA include:

- Coordination of Federal support to state and local officials
- Dissemination of data on offsite support actions to the White House, other Federal agencies, and news media, and the general public.

TABLE 5.1 MINIMUM STAFFING REQUIREMENTS

Major Functional Area	Major Tasks	Position Title/ Expertise	On-Shift	Capability for Additions[3] 30 Min	60 Min
Plant Operations and Assessment of Operational Aspects		Shift Manager[2] Unit Supervisor[2] Reactor Operator Nuclear Operator Staff Nuclear Advisor	1 1 2 2 1[1]	-----	-----
Emergency Direction and Control[C37]		Shift Manager or Designated Emergency Response Facility Manager	1[1]	------	------
Notification/ Communication	Notify Licensee, State, Local and Federal personnel and maintain communication	Control Room Nuclear Technician or designated Communicators	1	1	2
Radiological Accident Assessment[C38, C39, C40, C41]	Offsite Dose Assessment	Sr HP expertise EA & DP Coord.		1	------
	Offsite Surveys	HP Technicians[4]		1	1
	Offsite Surveys	HP Support[5]		1	1
	Onsite Surveys (out-of-plant)	HP Technicians[4]		1	1
	Inplant Surveys	HP Technicians[4]	1	1	1

TABLE 5.1 MINIMUM STAFFING REQUIREMENTS

Major Functional Area	Major Tasks	Position Title/ Expertise	On-Shift	Capability for Additions[3] 30 Min	60 Min
	Chemistry/Radiochemistry	Chemistry[C13]	1	------	1
Support of Operational Accident Assessment	EOF Director	Emergency/Recovery Manager		------	1
Plant System Engineering	Technical Support	Staff Nuclear Advisor	1	------	------
		Core/Thermal Hydraulics	------	1	------
		Electrical	------	------	1
		Mechanical	------	------	1
Repair and Corrective Actions	Repair and Corrective Actions	Mechanical Maintenance/ Rad Waste Operator	1[1]	------	1 1
		Electrical Maintenance/ Instrument & Control	1[1] ------	1 1	1 ------
Protective Actions (In-Plant)	Radiation Protection - Access Control - HP coverage - Personnel monitoring - Dosimetry	[C38] HP Technicians[4]	2[1]	2	2

TABLE 5.1 MINIMUM STAFFING REQUIREMENTS

Major Functional Area	Major Tasks	Position Title/ Expertise	On-Shift	Capability for Additions[3] 30 Min	60 Min
C42 Firefighting		Fire Brigade	Per Tech Spec.	Local Support	Local Support
C42 Rescue Operations and First Aid		Per Technical Specifications	2[1]	Local Support	Local Support
Site Access Control and Personnel Accountability	Security Personnel Accountability	Security Personnel	Per Security Plan	Per Security Plan	Per Security Plan
			10	11	15

NOTES:

1 May be provided by Shift Personnel assigned other functions.

2 At least one of these must be a Senior Reactor Operator

3 BVPS will continue to maintain an ERO and notification system, which will have the objective of meeting the 30/60 minute response time criteria specified in NUREG-0654. It is recognized that 100% staff augmentation, within 30 minutes, may not be achievable under all circumstances. The Onsite staff shall be augmented as soon as reasonably achievable.

4 Includes Radiation Technicians, HP Supervisors, or other personnel qualified to perform the functions listed. C38

5 Individuals designated as drivers for offsite Field Monitoring Team support. C38

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TABLE 5.2
MINIMUM BVPS UNIT 1 and UNIT 2 CREW COMPOSITION[a]

License Category Qualification	Applicable Modes[c] Both Units 1,2,3,4	One Unit 1,2,3,4	One Unit 5,6	Both Units 5,6
Senior Reactor Operator (SRO) (SRO)[b][e]	2[f]		2[d][f]	1[d][h]
Reactor Operator (RO)	3[g]		3[g]	2
Plant Operator	3[g]		3[g]	3[g]
Staff Nuclear Advisor (SNA)	1		1[h][i]	0
Individual Qualified in Radiation Protection Procedures	1[h]		1[h]	1[h]
Rad/Chem Technician	1[h]		1[h]	1[h]

NOTES:

(a) Except for the Shift Manager, the shift crew composition may be one less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crewman being late or absent.

(b) Includes the licensed SRO serving as the Shift Manager.

(c) Operational Mode Definitions:

MODE 1 - Power Operation
MODE 2 - Start-up
MODE 3 - Hot Standby
MODE 4 - Hot Shutdown
MODE 5 - Cold Shutdown
MODE 6 - Refueling

(d) Does not include the SRO assigned during Mode 6 to directly supervise operations.

TABLE 5.2
MINIMUM BVPS UNIT 1 and UNIT 2 CREW COMPOSITION[a]
(Continued)

(e) During any absence of the Shift Manager from the Control Room while the unit is in Mode 1, 2, 3 or 4, an individual (other than the Staff Nuclear Advisor) with a valid SRO license shall be designated to assume the Control Room command function. During any absence of the Shift Manager from the Control Room while the unit is in Mode 5 or 6, an individual with a valid SRO or RO license shall be designated to assume the Control Room command function.

(f) Minimum of 2 individuals for each unit; each individual may fill the same position on both units if qualified on both units.

(g) Minimum of 2 individuals for each unit; one of two individuals may fill the same position on both units if qualified on both units.

(h) Minimum of 1 individual for each unit; one individual may fill the same position on both units if qualified on both units.

(i) One of two required individuals filling the SRO positions may also fill the STA position, if qualified.

FIGURE 5.1

FIRST ENERGY NUCLEAR OPERATING COMPANY
BEAVER VALLEY POWER STATION

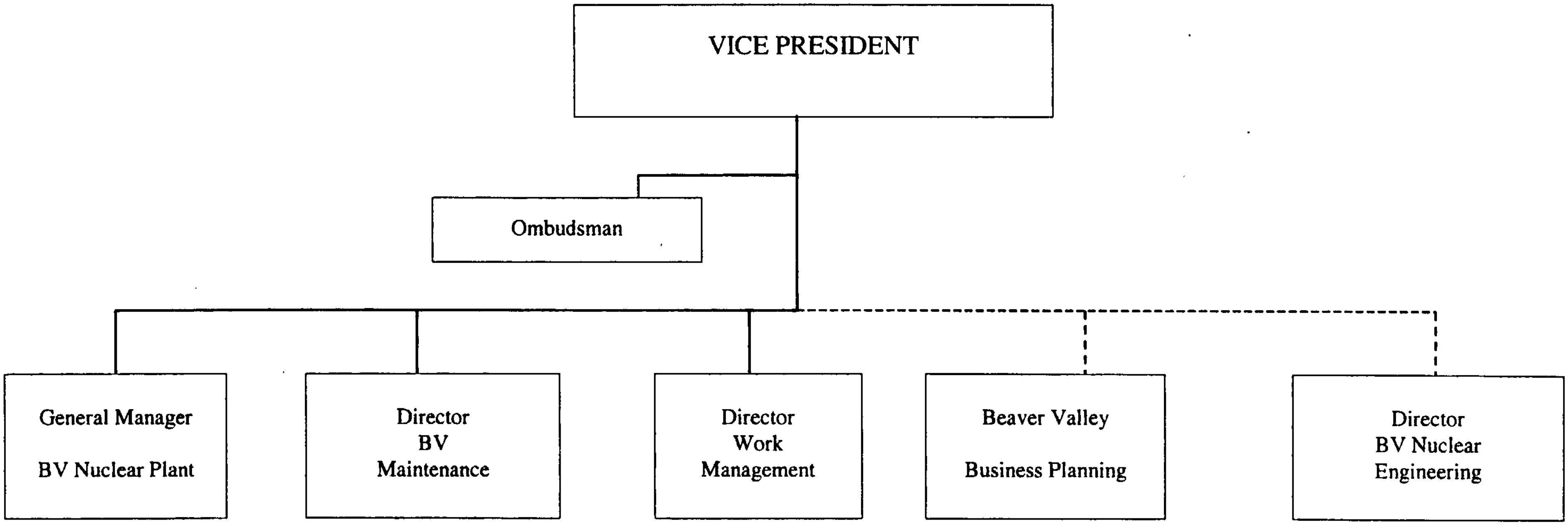

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FIGURE 5.2

ONSHIFT EMERGENCY ORGANIZATION

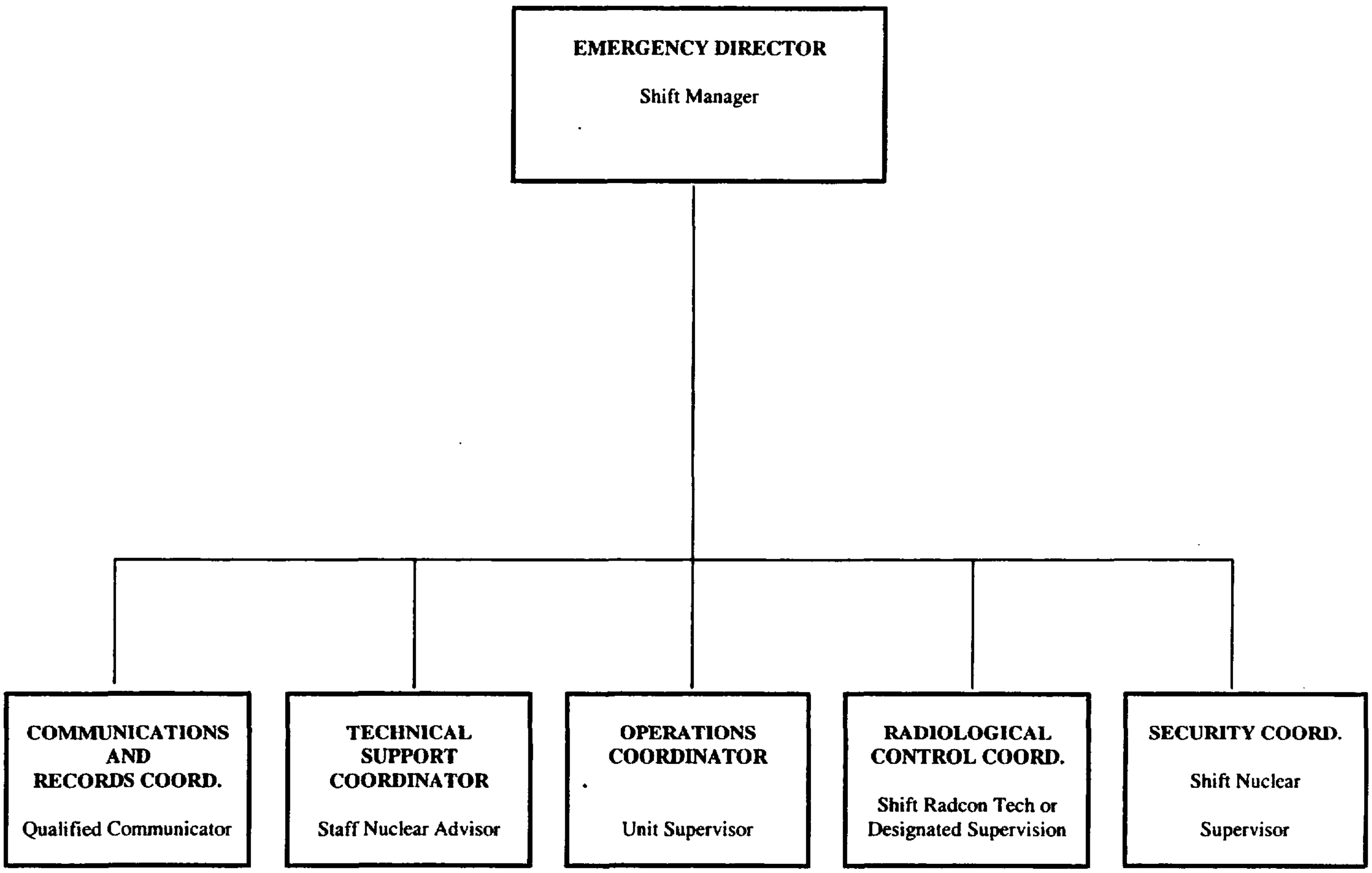

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FIGURE 5.3

TECHNICAL SUPPORT CENTER ORGANIZATION [c8]

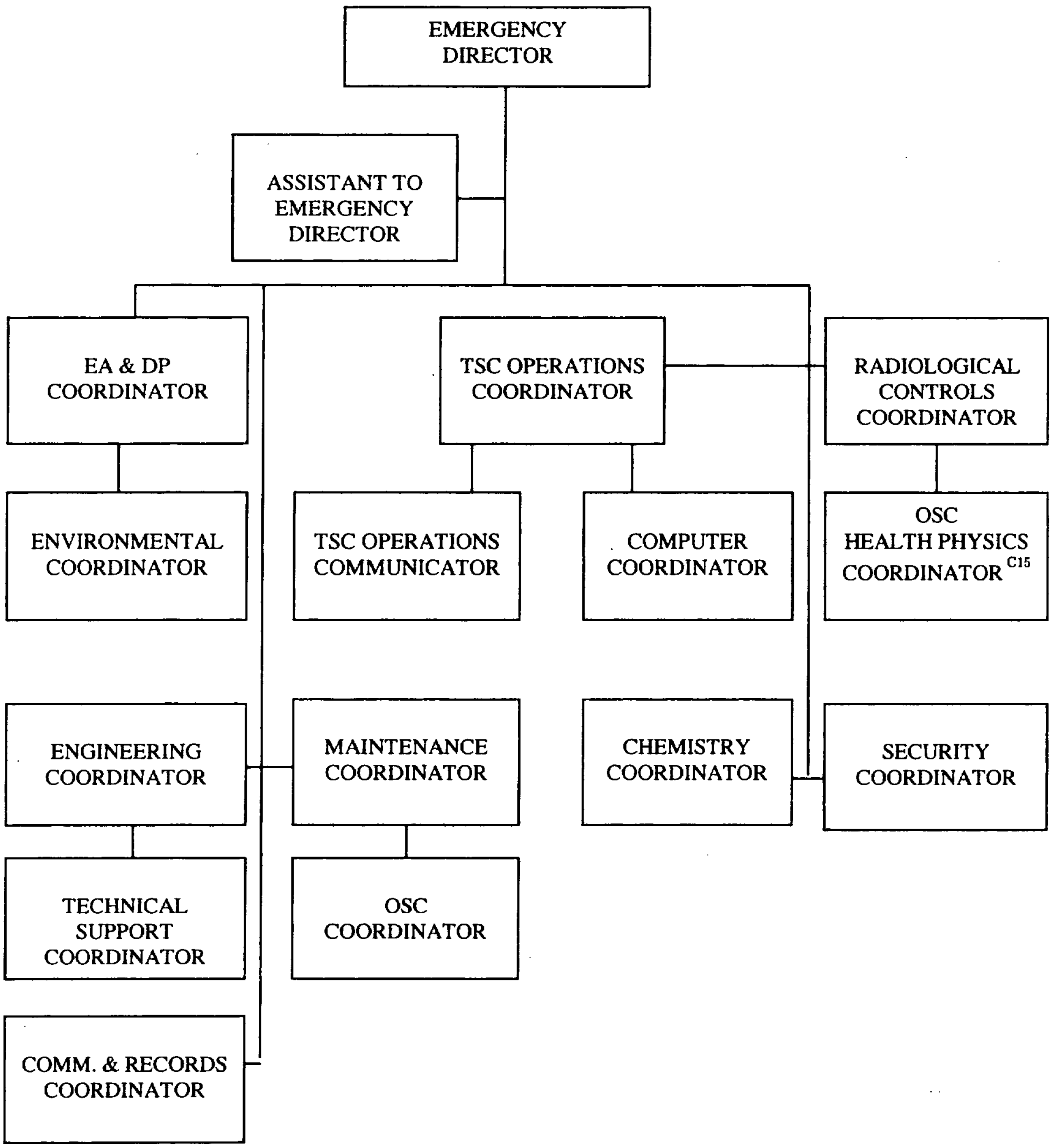

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FIGURE 5.4

EMERGENCY OPERATIONS FACILITY ORGANIZATION

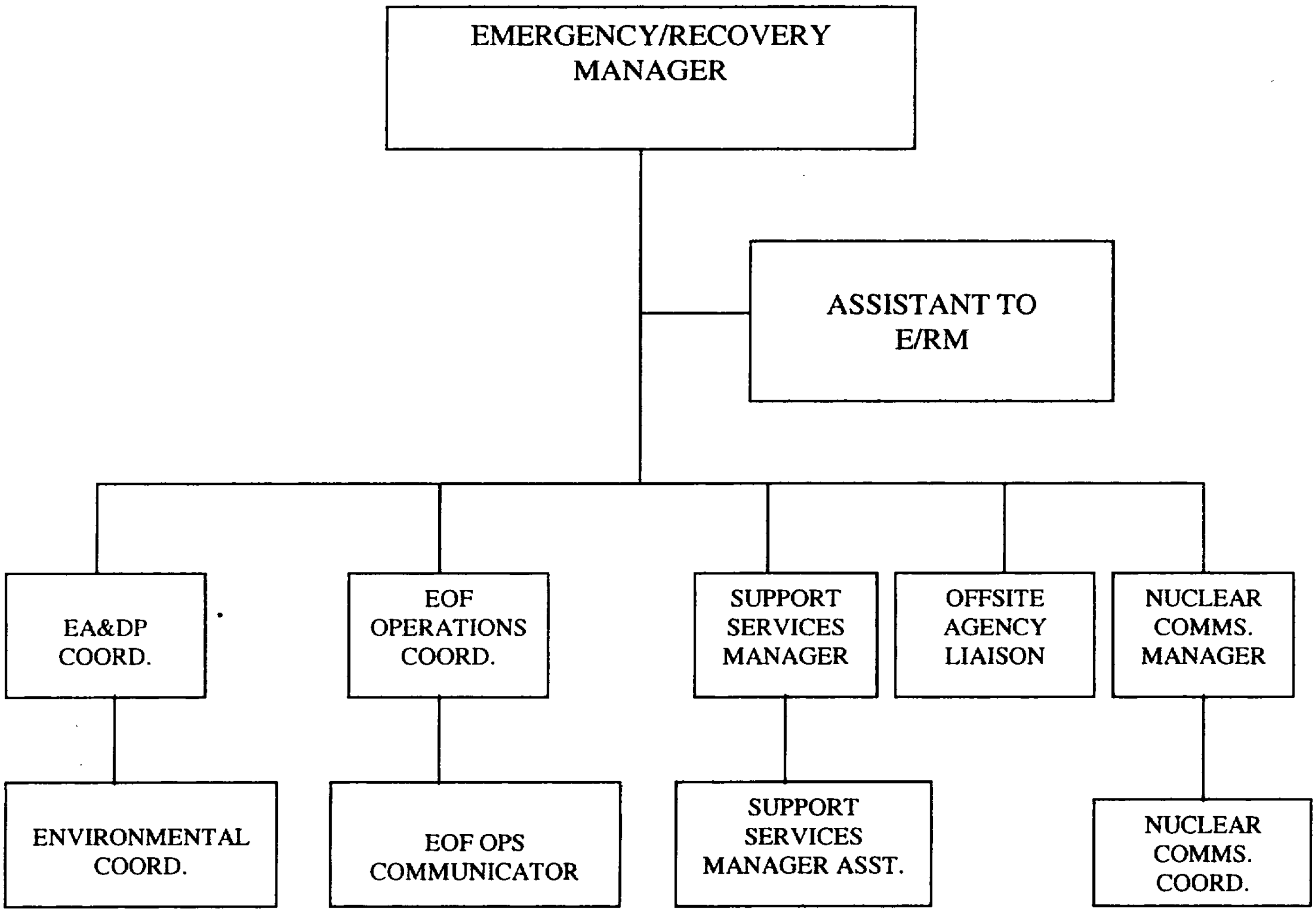

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FIGURE 5.5

EMERGENCY PUBLIC INFORMATION RESPONSE ORGANIZATION c8

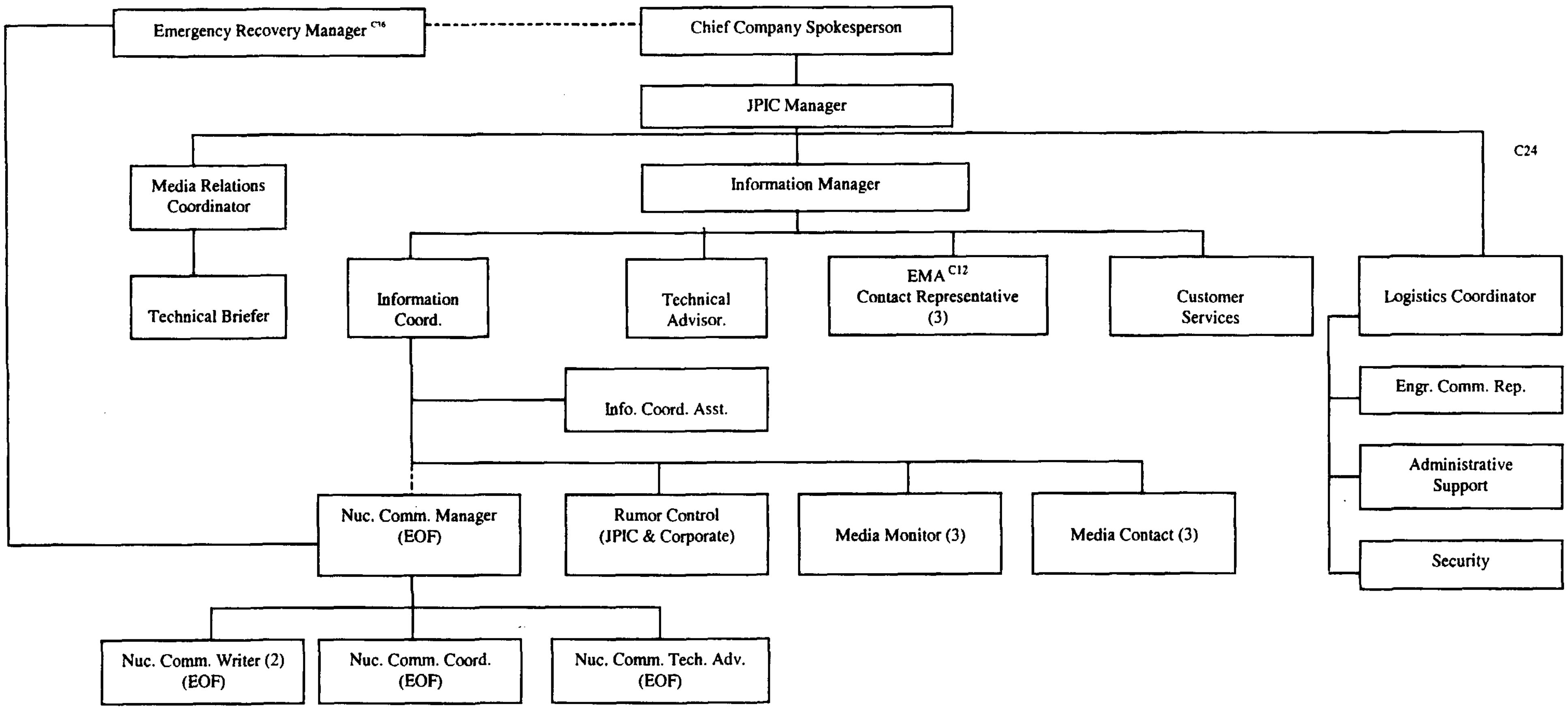

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FIGURE 5.6

C36

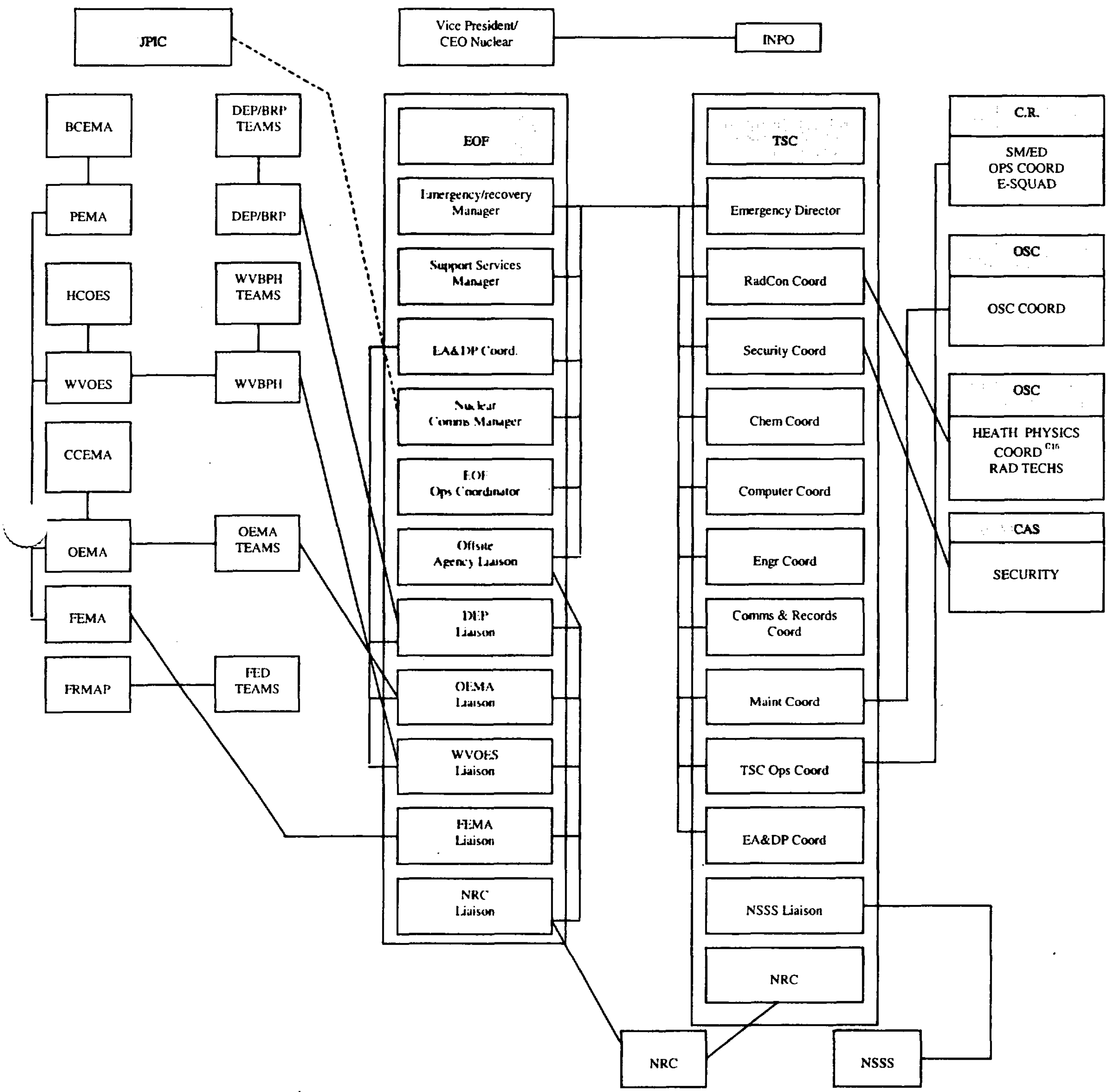

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TABLE 5.3 c9

OFFSITE ORGANIZATIONS
COUNTY

(Page 1 of 2)

ORGANIZATION	ADDRESS	RESPONSIBLE INDIVIDUAL
BCEMA	Beaver County EMA 250 E. End Avenue Beaver, PA 15009	Director, Beaver Co. Emer. Services Center
CCEMA	Columbiana County EMA 7301 Lisbon/Canfield Rd. Box 414 Lisbon, OH 44432	Coordinator, Columbiana Co. EMA
HCOES	Hancock County Office of Emer. Services P.O. Box 884 New Cumberland, WV 26047	Director, Hancock Co. OES

STATE

ORGANIZATION	ADDRESS	RESPONSIBLE INDIVIDUAL
Ohio Department of Health	Ohio Dept. of Health Radiological Health Program 246 N. High Street Columbus, OH 43266-0588	Director, Ohio Dept. of Health Radiological Health Branch
OEMA	Ohio Emergency Management Agency Adjutant General's Dept. 2855 West Granville Road Columbus, OH 43235-2206	Chief, Radiological Branch

TABLE 5.3 [c9]
OFFSITE ORGANIZATIONS

(Page 2 of 2)

STATE (Continued)

ORGANIZATION	ADDRESS	RESPONSIBLE INDIVIDUAL
PA DEP/BRP	PA Dept. of Environmental Protection Bureau of Radiation Protection 16th Floor, M.S.S.O.B P.O. Box 8469 Harrisburg, PA 17105-8469	Section Chief of Division of Licensing and Registration
PEMA	PA Emergency Management Agency P.O. Box 3321 Harrisburg, PA 17105-3321	Director, Pennsylvania Emergency Management Agency
WV Bureau of Public Health	WV Bureau For Public Health Radiological Health Program 815 Quarrier Street, Suite 418 Charleston, WV 25301	Chief, Radiological Health Division
WVOES	West Virginia Office of Emer. Services Capitol Building Room EB-80 Charleston, WV 25305	Division Director

SECTION 6

EMERGENCY MEASURES

CONTROLLED
BVPS UNIT 1/2

Section 6

EMERGENCY MEASURES

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6.0 EMERGENCY MEASURES

Emergency Measures are actions taken to ensure that an emergency situation is assessed and that proper corrective and/or protective actions are taken. These actions include activation of the appropriate components of the emergency organizations, both onsite and offsite; assessment of plant systems status and radiological conditions; corrective actions to ameliorate or terminate an emergency situation; protective actions to minimize the consequences of the emergency to Site personnel and to the general public in the Site environs; decontamination and medical treatment for Site personnel; and other supporting actions such as timely and accurate emergency news releases to the public.

6.1 EMERGENCY INITIATION

Emergency actions are initiated primarily in response to alarmed instrumentation, but may be initiated through notification to the Control Room by the first individual at the Beaver Valley Power Station to become aware of an apparent emergency situation. The Reactor Operator (RO) performs the necessary immediate actions to contend with the off-normal situation in accordance with Abnormal Operating Procedures, instrument alarm response procedures and/or Operating Procedures (BVPS Op Manual). The RO promptly notifies Shift Supervision of the potential emergency situation. The Shift Manager assesses the situation and, if necessary, declares the emergency. The Shift Manager assumes the role of Beaver Valley Power Station Emergency Director until he is relieved of that responsibility by the On-call Emergency Director. The Emergency Director continues to assess and classify the condition and initiates the appropriate corrective and protective actions and ensures activation of the necessary segments of the total emergency organization.

The Emergency Operating Procedures contain appropriate action statements, which refer the operator to this Emergency Preparedness Plan when specified plant parameter values are exceeded or equipment status warrants such response.

6.2 ACTIVATION OF THE ONSITE EMERGENCY ORGANIZATION

This section describes the provisions for notifying or activating personnel in the onsite Emergency Response Organization for response to emergency events at the Beaver Valley Power Station. Action levels and recognition criteria, which dictate the appropriate emergency classifications, are described in Section 4. The composition of the onsite emergency organization and the assigned responsibilities and authorities of each member of the organization is described in Section 5. The activation process for each emergency classification is described in more detail in the Emergency Implementing Procedures.

Table 6.1 summarizes the notification/activation of both the onsite and the offsite emergency response organizations and designates immediate action requirements for each emergency classification. Table 6.2 tabulates the organizations notified, the point of notification, provision for 24-hour coverage, and the communications equipment used, for each notification made.

6.2.1 Activation for Unusual Events

Upon being informed of an emergency event, which corresponds to an Unusual Event, as defined in Section 4, the Shift Manager will immediately begin to assess and evaluate the situation. He will ensure that appropriate actions have been initiated to maintain the safe and proper operation of the Site. As Emergency Director, the Shift Manager, will concern himself with the emergency response activities, delegating responsibility for corrective actions to return the plant to a safe mode and other plant operations to the Unit Supervisor.

For most Unusual Event emergencies, the emergency response functions can be performed by the on-shift emergency response organization without augmentation by called-in personnel. In these cases, the Shift Manager will ensure that the appropriate emergency functions are performed in a timely manner consistent with the nature of the emergency. The Shift Manager may designate one or more individuals from the on-duty shift to assist in this effort.

6.2.2 Activation for Alert Emergencies

Once an off-normal condition has been classified as an Alert, either initially or as an escalation from Unusual Event, the entire onsite Emergency Response Organization (as illustrated in Figure 5.3), will begin activation. The Shift Manager will:

.1 Classify the condition as an Alert.

.2 Implement immediate actions in accordance with this Plan and the applicable Emergency Implementing Procedures.

.3 Ensure the following key Emergency Coordinators are notified, as needed, using the Beeper paging system or telephone communications:

- Emergency Director
- Assistant to the Emergency Director
- TSC and EOF Operations Coordinator
- Operations Communicator
- Communication and Records Coordinator
- Radiological Controls Coordinator
- Technical Support Coordinator
- Maintenance Coordinator
- Engineering Coordinator
- Operations Support Center Coordinator
- Operations Support Center Health Physics Coordinator
- Environmental Assessment and Dose Projection Coordinator
- Security Coordinator
- Chemistry Coordinator
- Computer Coordinator
- Environmental Coordinator

NOTE

These Emergency Coordinators will initiate additional call-out of personnel, as needed.

.4 Once the designated Emergency Director, or alternate, arrives and assumes the position, the Shift Manager will re-assume control of the operation of the plant from the Unit Supervisor.

NOTE

The Emergency Director will ensure that the designated Emergency Recovery Manager, or alternate, is notified and placed on standby.

6.2.3 Activation for Site Area Emergency or General Emergency

Once an off-normal condition has been classified as a Site Area Emergency or General Emergency, either initially or as an escalation from a lower classification, the entire offsite emergency response organization (as illustrated in Figure 5.4), will be activated. The Emergency Director (Shift Manager, until relieved) will:

.1 Classify the condition as a Site Area or General Emergency, as appropriate.

.2 Implement immediate actions in accordance with this Plan and the applicable Emergency Implementing Procedures.

NOTE

The Shift Manager retains the authority and responsibility of the Emergency Director until properly relieved.

.3 Ensure the following key Emergency Managers are notified, as needed, using the Beeper Paging System or telephone communications, if not already completed.

- Assistant to the Emergency Recovery Manager
- Offsite Agency Liaison
- Support Services Manager
- Senior, Nuclear Communications Representative
- Joint Public Information Center Manager
- Chief Company Spokesperson

NOTE

These Emergency Managers will initiate additional call-out of personnel, as needed.

.4 When the Emergency Operations Facility is operational, transfer Environmental Assessment and Dose Projection activities to the EOF.

6.2.4 Activation of the Emergency Facilities

In the event of any off-normal event requiring implementation of the Emergency Preparedness Plan, the emergency response commences within the Control Room and emergency response functions are transferred to the designated emergency facilities as the incident escalates in severity and/or as the emergency response organization is activated. Beaver Valley Power Station will maintain an emergency organization and notification system, which will have the objective of meeting the response times in Table B-1 of NUREG-0654. It is recognized that 100% staff augmentation, within 30 minutes, may not be achievable under all circumstances. The onsite staff shall be augmented as soon as reasonably achievable. Section 7 describes the function, responsibilities, equipment, and communications of these emergency facilities. Emergency facilities are not usually activated for Unusual Events, but the Technical Support Center is activated for Alert and higher emergency conditions, and the Emergency Operations Facility is activated for Site Area Emergency or General Emergency. This section describes the activation of these facilities. Emergency Implementing Procedures provide other detailed information on the activation of these facilities.

.1 Control Room

The Control Room is initially the primary location of plant management control of emergencies and would under most circumstances provide sufficient capabilities to contend with emergencies classified as Unusual Events.

If an Alert or higher emergency occurs, the plant management functions would be transferred from the Control Room to the Technical Support Center. Upon arrival of the designated Emergency Director, Emergency Coordinators, and satisfactory energization of instrumentation and communications equipment activation will occur.

.2 Technical Support Center (TSC)

The Technical Support Center serves two functions, the first being plant management control of the emergency, and second, engineering and technical support of the emergency response. The first function is satisfied by the BVPS Emergency Response Organization illustrated in Figure 5.3. These personnel are activated by a call out initiated by the Shift Manager. The second function is served in the Technical Support position of the TSC and is manned by qualified technical and engineering personnel. The TSC staff calls upon other BVPS engineering personnel, as necessary, to contend with then-existing conditions.

.3 Operations Support Center (OSC)

The Operations Support Center (OSC) is primarily an assembly area for emergency response personnel and shift personnel needed for supplemental emergency maintenance team responses. An OSC Coordinator maintains accountability and interfaces with the TSC and the Control Room.

The Radiological Controls Coordinator is stationed at the Technical Support Center, and would direct Health Physics activities through the OSC-Health Physics Coordinator in the OSC. The OSC H.P. Coordinator, would call-in Radcon Technicians, as necessary. If the nature of the emergency renders the OSC unusable due to radiological conditions, OSC operations are transferred to the Alternate OSC. No other formal assignments are made to the OSC.[C15]

.4 Emergency Operations Facility (EOF)

The Emergency Operations Facility is activated for any emergency classified as Site Area or General. Personnel to staff the EOF are notified simultaneously with the TSC emergency organization. Offsite agencies may supply a liaison to the EOF as part of the activation of their individual emergency response organizations.

.5 Joint Public Information Center (JPIC)

In the event of any emergency condition at the Beaver Valley Power Station, First Energy Communications is notified as part of the initial notification process for offsite agencies and following completion of notifications to local and state emergency response organizations. The Joint Public Information Center (JPIC) is not activated for Unusual Events. For Alert emergencies, the JPIC is placed on standby. For Unusual Events or Alerts, Company news announcements will be distributed from the Corporate Offices or from the JPIC upon its activation. For Alert emergencies, Communications Representatives will report to the Emergency Operations Facility to initiate development of news announcements and to anticipate the activation of the JPIC should the incident escalate.

For Site Area Emergency or General Emergency, the Communications Emergency Response Team will activate the JPIC, located adjacent to the Alternate EOF in Coraopolis, PA.

6.3 ACTIVATION OF THE EMERGENCY SUPPORT GROUPS

6.3.1 Offsite Emergency Response Groups

The Emergency Director shall ensure that appropriate offsite emergency response groups are contacted to provide the type and level of emergency assistance which may be required 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 and message relay through the Beaver County Emergency Services Center. Each of these agencies can be notified and can respond on a 24-hour-per-day basis.

- The Medical Center, Beaver
- University of Pittsburgh Medical Center-Presbyterian University Hospital
- Offsite fire departments
- Offsite ambulance services

- Pennsylvania State Police (security assistance)
- Beaver County Sheriff's Department (security assistance)

6.3.2 First Energy Operating Company (FENOC) Corporate Organization

Notifications will be made to FENOC Headquarters as appropriate to the type and severity of conditions at the Beaver Valley Power Station. The method for alerting the corporate organization from BVPS is a graded system of notifications, which, to the extent possible, follows normal organizational lines of communications. Once the emergency has been declared, the Shift Manager shall notify the designated Emergency Director, and other personnel, by the appropriate notification method in the Implementing procedures. [C36] Additional notifications to FENOC management will be made, consistent with the nature and severity of the emergency. Communications personnel are activated as part of the Onsite Emergency Response Organization.

6.3.3 Other Organizations Providing Onsite Support

The Westinghouse (W) Water Reactors Division provides emergency assistance to the Beaver Valley Power Station under the provisions of the W Emergency Response Plan. In the event of an Alert or higher Emergency, the Communications & Records Coordinator or designee notifies the W Water Reactors Division. Upon receipt of this notification, the W plan is initiated and the W emergency organization is activated. If appropriate, Site Response Personnel will be dispatched to the onsite Technical Support Center. The W plan provides for 24-hour-per-day notification and response capability.

Assistance from contractor groups and other utilities is not considered to be an immediate action. Thus, these groups will be contacted by TSC and/or EOF personnel as necessary to augment onsite personnel.

The FENOC Institute for Nuclear Power Operations (INPO) administrative point of contact coordinates all requests for emergency assistance.

6.4 ACTIVATION OF OFFSITE EMERGENCY RESPONSE ORGANIZATIONS

The Emergency Director shall ensure that offsite authorities are notified and apprised of emergency events at the Beaver Valley Power Station. Notifications are either initial or follow-up. Initial notifications inform offsite agencies that an event has occurred and, as applicable, the emergency response actions necessary. Follow-up notifications provide technical information on the incident on a periodic basis. For Site Area or General Emergencies, the offsite agencies in the Emergency Operations Facility will interface with the BVPS emergency organization through the Offsite Agency Liaison, as necessary.

Detailed notification procedures, call-lists, and notification forms are provided in Emergency Implementing Procedures. Procedures include the use of a code word for authenticating notifications[C2]. The communications systems used for notification are described in Section 7 of this Emergency Preparedness Plan.

6.4.1 Initial Notifications

Notifications are made to the offsite authorities listed below:

- Beaver County Emergency Management Agency (host county)
- Pennsylvania Emergency Management Agency (host state)
- Columbiana County Emergency Management Agency (Ohio)
- Hancock County Office of Emergency Services (West Virginia)
- Ohio Emergency Management Agency
- West Virginia Office of Emergency Services
- US Nuclear Regulatory Commission

The Pennsylvania Emergency Management Agency (PEMA) notifies the Pennsylvania Department of Environmental Protection/Bureau of Radiation Protection (DEP/BRP).

CCEMA and HCOES both notify their respective state organizations. Each organization notified performs notifications in addition to those specified in accordance with their respective emergency response plans and procedures.

Since the initial contact with offsite authorities is generally made to a communications operator or other similarly qualified individual, the initial notification will be simple, brief, and factual. To facilitate notification, Initial Notification message forms are supplied to all appropriate offsite agencies. These forms contain pre-printed text with blanks for incident specific information. Where feasible, the blanks contain a choice of words and/or phrases which, when circled, complete the message text. The message provides information that an emergency condition exists, the classification of that emergency, whether or not a release of radioactive material is occurring or could occur, and recommendations for offsite protective actions.

Upon receipt of an initial notification the individual contacted at each agency notifies the Director of that agency, or other designated personnel and relays the message provided in the initial notification. The cognizant individual then contacts the facility for additional follow-up technical information. In Pennsylvania, DEP/BRP performs the call-back for PEMA.

The process described above provides necessary notifications in a manner, which facilitates accuracy and provides for verification of the notification.

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

Primary means of notification is by regular telephone. A Emergency Telephone System (ETS) connection onsite for contacting the USNRC, and "hot-line" exists between the Site and DEP/BRP. Back-up radio communications capability exists between the Control Room and each of the risk county Emergency Operations Centers (EOCs). See Table 6.2.

6.4.2 Follow-up Notifications

The follow-up notification form serves two purposes: The first is to provide technical information on the emergency directly to those individuals qualified to use the data. The second is to provide a means for offsite authorities to verify the authenticity of any emergency notification.

A Follow-up Notification Form has been developed and supplied to all appropriate offsite agencies. Similar in format to the Initial Notification Form, the Follow-up Notification Form contains data blanks which, when filled in, provide the following information:

- Location of incident and name and telephone number of caller
- Date/time of incident
- Class of emergency
- Type of actual or projected release and estimated duration/impact times
- Estimate of quantity of radioactive material released or being released and the points and height of releases
- Chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodines and particulates
- Meteorological conditions and stability
- Actual or projected dose rates at site boundary; projected integrated dose at site boundary
- Projected and integrated dose at peak for 2, 5 and 10 miles
- Estimate of any surface radioactive contamination inplant, onsite and offsite
- Licensee response actions underway
- Recommended emergency actions, including protective measures
- Request for any needed onsite support by offsite organizations
- Prognosis for worsening or termination of event based on plant information

Unlike the Initial Notification Form, the Follow-up Form is not intended to be relayed word-for-word. The objective of the form is to standardize the information provided to offsite agencies by different communications personnel.

Following activation of the Emergency Operations Facility (EOF), technical data will be provided directly to state, local, and Federal liaison personnel at the EOF, providing additional information in conjunction with the Follow-up Notification Form.

6.4.3 Subsequent Notifications

In the event it becomes necessary to escalate an emergency classification, the Initial Notification Form will be used, in the manner described for initial notification, to notify offsite agencies of the escalation of the emergency.

6.5 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 Implementing Procedures. Assessment facilities and equipment are described in Section 7 of this Plan. The assessment functions, the general methodology, and the techniques utilized are identified in this section.

6.5.1 General Assessment Actions

.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 observations of an off-normal condition by an individual at the site.

For events which require dispatching the Emergency Squad (or additional emergency teams), the initial and continuing assessment will be performed by the Emergency Squad Chief. His training and experience enable him to evaluate the condition and implement the proper corrective actions.

Offsite dose projections may be performed if the event involves radiological effluent releases. These dose projections are continually repeated throughout the duration of the release to reflect any significant changes. If warranted, the emergency classification will be upgraded to an Alert or higher. Methods for performing rapid dose projections are described in detail in Emergency Implementing Procedures, and are summarized in Section 6.5.3.

.2 Alert

Assessment action for an Alert include upgrading of the functions performed for an Unusual Event as appropriate for the condition. Examples are:

- Increased surveillance of in-plant instrumentation
- Additional assistance obtained from off-duty personnel and/or offsite support groups
- Extended radiological monitoring
- Intensified dose projection activities

.3 Site Area Emergency

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

- Increased surveillance of instrumentation, which may provide information on the status of the core and reactor coolant system.
- Increased offsite monitoring efforts.
- Coordination of offsite dose assessment activities with DEP/BRP.
- Increased reactor coolant sampling and analysis frequency.

.4 General Emergency

The emphasis of assessment actions for a General Emergency will be placed on the likelihood of substantial core degradation, potential loss of containment integrity and release of significant 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 offsite monitoring efforts will be further intensified and communications will be maintained with DEP/BRP and corresponding agencies in Ohio and West Virginia to ensure that offsite dose assessments are based on the best available information.

Recommendations for protective actions will be provided, as applicable, to PEMA, BCEMA, OEMA, CCEMA, WVOES and HCOES.

6.5.2 Plant Systems Status

Process and effluent parameter monitoring instrumentation has been installed to provide a capability to identify that an off-normal condition exists, to determine the extent and nature of the off-normal condition, to assess the radioactivity in effluent paths, and to determine the effectiveness of corrective and mitigative measures such as safety injection or containment isolation. This equipment is described in Section 7 of this Plan and in the BVPS Updated Final Safety Analysis Report (FSAR) and Operating Manual.

The Reactor Operator has primary responsibility for monitoring and assessing plant systems status, reporting such status to shift supervision, and taking appropriate corrective action in a timely manner.

The Staff Nuclear Advisor supports the shift operations personnel in assessing off-normal conditions and in recommending appropriate corrective action.

When activated, the Technical Support Center (TSC) will augment the Staff Nuclear Advisor in performing accident assessment activities and in recommending corrective actions to place the plant in a safe configuration and to mitigate the consequences of the event. The TSC staff has access to all plant parameter indications through analog/digital data and voice communication links.

6.5.3 Dose Projection

.1 General

Dose projection is the assessment of the radiological consequences of an accidental release of radioactive material from the Site. The primary objective of these consequence assessments is to support decisions regarding the need for protective actions for members of the general public. A multi-component capability for performing dose projections for both gaseous and liquid radioactivity releases from the Site has been established. Necessary radiological, process, and meteorological information to support this assessment activity have been provided in the Control Room and in the TSC/EOF, and are described in Section 7 of this Plan.

There are several principles that are reflected in the dose projection methodology and implementing procedures at the Beaver Valley Power Station. These principles are:

- Dose projections are primarily performed to support decisions on offsite protective action recommendations in slowly developing emergency situations. Protective action decisions for quickly developing situations are based on pre-calculated Emergency Action Levels and plant systems status assessments.

- Time permitting, dose projection results may be considered in conjunction with results from plant systems status assessments in protective action decisions. In the event of a significant discrepancy between a protective action indicated by dose projection results and that indicated by plant systems status assessments, the most conservative (i.e., leading to the lower population dose) recommendation that cannot be readily discounted shall be relayed to appropriate offsite agencies.

- Compatibility in the dose assessment methodologies used by BVPS and the offsite agencies is largely an unachievable goal. The level of technical sophistication varies greatly from agency to agency. Technical information regarding the BVPS methodologies is routinely made available to these agencies and periodic comparison exercises are conducted.

- BVPS personnel will make every reasonable effort to resolve differences that may arise between onsite dose projection results and those results generated by the various offsite response agencies. However, in the absence of a resolution of the differences, the BVPS protective action recommendations shall be based on the onsite dose projection results, and/or plant systems status assessments.

.2 Dose Projection Capabilities

The dose projection capabilities and the implementing procedures provide methods for performing dose projections under a wide range of circumstances. There are four major components to the BVPS dose projection capability: (1) Computer-assisted Class A Model, (2)

Computer-assisted Class B Model, (3) Class A Model Hand Calculational Methods, and (4) Liquid Release Computer assisted and hand calculational models. These models are described in detail in supporting technical documentation, and procedures for their use are included in the Emergency Implementing Procedures EPP/IP-2.xx series. In brief summary:

- Computer-Assisted Class A Model

  The dose assessment capabilities at BVPS are centered around the Atmospheric Radioactivity Effluent Release Assessment System (ARERAS). ARERAS is a data collection and analysis system comprised of two (2) computers, associated data storage, display terminals, and communication hardware, configured in two (2) redundant nodes. Each node is independently powered from one of two battery-supplied uninterruptable power distribution systems in the Emergency Response Facility. Meteorological and effluent radiological information is continuously collected and stored by ARERAS.

  ARERAS runs the proprietary MIDAS (Meteorological Information and Dose Assessment System, Pickard, Lowe and Garrick, Washington, DC) software. The BVPS implementation of MIDAS contains the generic MIDAS code modules adapted to the BVPS site through extensive site adaptation parameter files.

  NAEXEC (Variable Trajectory Plume Segment Model) is the Class A model in the BVPS implementation. This model provides the user with a variable trajectory plume segmented model dose projection capability. Flexible run time option choices provide for varying combinations of data sources, accident source terms, decay periods, report types, and other parameters. Reports available include X/Q, gamma dose, inhalation thyroid, and projected TEDE and CDE/thyroid dose.

- Computer-Assisted Class B Model

  In addition to the Class A model, the BVPS implementation of MIDAS incorporates an advanced Class B model. This model employs modified potential field with tracker particle technology ("particle-in-cell"). The wind field is a 25 x 25 rectangular grid matrix covering the 50 mile environs of the site. There can be up to six (6) vertical layers. To enable addressing the wind shear that may

occur in the valley, the model can generate two (2) independent wind fields -- one on top of the other. A three-dimensional digitized grid map of the surrounding terrain supplements the wind field grid, and makes the model specific to BVPS. A new wind field is generated every simulated 15 minute period, as necessary, using actual or forecast meteorological information.

Into this wind field, the model injects tracker particles that carry source term data. Every simulated 15 minutes, the model injects 240 particles into the field. These particles, along with the particles from prior time steps, are allowed to disperse through the wind field. Each time step, the dispersion halts, and the model counts the particles in each cell, transposing the data into a polar coordinate grid of 64 angular sectors and 15 radial sectors. Ground deposition, if applicable to the source term mix, is applied as a vector quantity. This model operates within the same user interface as the Class A model, with many of the same run-time options. The model is operated by qualified Environment Assessment and Dose Projection personnel in the EOF, and is used primarily to verify the results of the initial Class A model runs and in post-accident assessments.

- Class A Hand Calculation Methods

  There are several hand calculational procedures in the emergency preparedness plan implementing procedure series 2.6x. Prior to the implementation of the computer assisted methods identified above, these procedures were the primary means of performing dose projections at BVPS. These procedures are now retained as a backup methodology should the computer-assisted methods become unavailable. Each procedure addresses a particular dose projection calculation. Of these procedures, EPP/IP-2.6.1, "Dose Projection -- Backup Methods," is the most important, providing means to calculate X/Q, calculate doses using actual monitor data and selected accident type, and to calculate doses using default accident releases. Other procedures in this series address:

  - Using Alternate Sources of Meteorological Data.
  - Determining Plume Width, Plume Height, and Transit Time.
  - Dose Projection with Known Isotopic Release Rate or Known Isotopic Quantity.

- Dose Projection with Source Term Based on Field Measurements.

- Estimation of Ingestion/Inhalation Dose Commitments.

- Integrated Dose Assessment.

- Liquid Release Hand Calculational Methods

  Procedure EPP/IP-2.7 and EPP/IP-2.7.1 provides a series of methods of assessing the radiological consequences of liquid releases to the Ohio River. The objective of these methods is to assess whether or not the release has exceeded the Emergency Action Levels listed in TAB 7 of the BVPS Classification Procedure. This method determines the liquid concentration and dose at the entrance of the Ohio River and whether or not the release will result in activity at the Midland Water Treatment Plant intake that exceeds EPA drinking water standards. The procedure provides methods to address releases via normal monitored pathways and unmonitored releases.

.3 Technical Basis Summary

The atmospheric dispersion and dose projection methodologies are based on recognized national and international standards. The primary documentation for each method describes the technical bases for each method in detail. The paragraphs that follow summarize some significant basis.

- For the Class A models, the value of the atmospheric dispersion factor, X/Q, is based on the guidance of Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants." In the hand methods, all releases are treated as ground level releases. The MIDAS Class A model algorithm addresses ground level and elevated releases, plume rise, virtual source building wake correction, and other similar considerations. Plume direction is based on the 150' wind direction sensors due to terrain interference on the 35' sensors.

- The dose projection methodology is based on Regulatory Guide 1.109, "Calculation of Annual Dose to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50, Appendix I," and TID-21490, "Meteorology and Atomic Energy." The Class A models are based on semi-infinite submergence dose and on ICRP 30 intake models. The MIDAS Class B dose is based on the sum of three (3) components: finite cloud plume shine, whole body inhalation dose, and whole body ground shine dose.

- Source term processing is performed with default source term mixes associated with the FSAR - analyzed accidents, or with input isotopic sample data. These source term mixes are used to normalize both the monitor efficiency and the dose conversion factors for energy-dependent variations. The MIDAS Class A and Class B model software decays the source term mixes for the period between plant shutdown and start of release, and applies decay corrections in route.

.4 Meteorological Considerations

Because of the complex terrain surrounding the Beaver Valley Site, it is not always possible to accurately determine the plume trajectory from the site meteorological instrumentation alone. This situation creates uncertainty in the identification of the affected area. The ARERAS Class B model can more accurately predict plume transport as a digitized three-dimensional terrain map as an input database for the model. The technical sophistication of this model, the resulting complexity, and the required computer run-time makes it unlikely that the model results would be immediately available in a rapidly developing situation. As a result of these terrain impacts, it will be necessary to apply conservative compensatory factors to the observed site meteorological conditions.

A meteorological study performed in 1982 determined that there were three (3) meteorological regimes that characterized the dispersion meteorology at the BVPS site. The paragraphs below identify these three regimes, and the likely affect on plume transport.

A. Night-time conditions (G, F, E stability) with 500' wind speeds lower than 4.0 mph.

Under these conditions, the regional wind flows will create a valley floor flow that is de-coupled from the regional wind flow. Upriver of the site (towards Beaver) the valley wind flow is

towards the site. Downriver from the site, the wind flows are also towards the site. A heat island at the site of the J&L Specialty Steel plant creates a "chimney" effect that circulates these converging flows. If there is an inversion layer (as there is most likely), the upward chimney flow is recirculated back into the valley. This circulation will continue in the site area. If there is no inversion, the outlet flows from this chimney are injected into the regional wind flow.

Releases during these conditions will tend to "puddle" in the site area and will be generally contained within the valley walls. Releases that break through the inversion layer (if there is one) would follow the 500' winds.

B. Night-time or day-time conditions with 500' wind speeds greater than 4.0 mph.

Under these conditions, the regional wind flow creates eddies as the flow breaks over the leading edge (wind passes this first) of the valley and as it strikes the opposite valley wall. However, due to the regional wind velocity, these eddies and swirls continue to circulate and mix with the regional wind flow. This creates a scrubbing action that flushes the valley. A similar scrubbing effect will occur if the regional wind direction aligns with the valley.

A release under these conditions will follow the 500' wind direction.

C. Day-time with 500' wind speeds lower than 4.0 mph.

Under these conditions, the regional wind flow creates eddies as described above. However, since the wind velocity is low, the scrubbing action is not as strong, and the regional wind flow will create a de-coupled flow in the valley. This valley flow will tend to flow downriver in the absence of any other forces (i.e., regional wind direction aligns with valley).

Releases during these conditions could result in two (2) plumes, depending on wind direction, or a plume that starts in one direction and then changes direction as it leaves the valley area.

.5 Initiation and Performance of Dose Projection Functions

In the event of a known or projected release of radioactive material, immediate and continuous assessment, including dose projection, is performed by on-duty shift personnel. Following activation of the Technical Support Center, dose projection activities are performed by the Environmental Assessment and Dose Projection Coordinator and assigned assistants at the TSC. Upon declaration of a Site Area or General Emergency, this function transfers to the Emergency Operations Facility (EOF). Responsibilities and functions assigned to these personnel are identified in Section 5 of this Plan. Activation of the emergency facilities is described in Section 6.2.3. The training of personnel assigned dose projection functions is identified in Section 8.

6.5.4 Field Radiological Monitoring

Radiological monitoring following a release of radioactive materials to the environment is an intrinsic part of the Beaver Valley Power Site Emergency Preparedness Plan. Emergency radiological monitoring includes actions such as dose rate surveys, sampling and analysis of airborne and liquid activity, and collection and analysis of environmental media, both onsite and offsite. The extent and degree of radiological monitoring following a release of radioactive material will depend on the nature, the severity, the physical/chemical form, and the radioisotopic composition of the release.

Emergency Implementing Procedures provide guidance to the EA and DP Coordinator and monitoring team personnel in the performance of this radiological monitoring. These procedures identify criteria and guidelines, instrumentation to be used, monitoring team protective actions, communications protocol, data handling methods, and predesignated survey routes and survey points. Environmental monitoring procedures identify the location of environmental monitors, the use of the monitors, the sampling techniques and analysis methods to be used.

The Beaver Valley Power Station offsite monitoring teams may be supplemented or supplanted by monitoring teams from local, state, and Federal agencies. The Environmental Assessment and Dose Projection Coordinator will interface the activities of the BVPS offsite monitoring teams with the monitoring teams of the governmental agencies.

Initially in radioactive release situations, the Beaver Valley Power Station is in the best position to dispatch qualified monitoring personnel, and therefore has short-term responsibility of all offsite emergency radiological monitoring. However, following activation of the offsite emergency organizations and the deployment of governmental monitoring personnel, primary responsibility for offsite monitoring will revert to the state governments in the affected area. The state governments are assisted in this effort by personnel and equipment from the Federal Radiological Monitoring Assistance Program.

The types of emergency radiological monitoring performed and the methods for performing this monitoring are discussed below.

.1 In-Plant Radiological Surveys

Procedures for performing radiological surveys and the use of survey equipment are incorporated in the Beaver Valley Power Station Health Physics Manual. The methods and techniques are essentially the same as those used for emergency surveys.

.2 Onsite Radiological Monitoring

In the event of a radioactive release, one or more onsite radiation monitoring teams may be dispatched to assess radiological conditions onsite and at the site boundary in order to verify dose projection results and to determine the need for onsite protective actions.

Monitoring teams are normally comprised of one radcon technician and one other individual. Since there is a radcon technician on shift at all times, at least one monitoring team can be dispatched soon after the release has occurred, with additional teams dispatched using available personnel onsite or called-in personnel as they arrive onsite. Onsite monitoring teams maintain communications with the Control Room/OSC via portable radio transceivers. Survey equipment is provided for air sampling, direct radiation measurements, and for field-checking air sampling media. All sampling media is returned to the Site or to another designated location for laboratory analysis, as appropriate.

.3 Offsite Radiological Monitoring--Gaseous Release

In the event that dose projection results or onsite monitoring results indicate the potential for radioactivity release to offsite areas, offsite radiation monitoring teams will be dispatched. Initially, at least one monitoring team will be sent in the direction of the plume movement.

The onsite monitoring team may be diverted from onsite monitoring to perform offsite monitoring. As additional radcon personnel assemble, additional monitoring teams will be deployed at the discretion of the Environmental Assessment and Dose Projection Coordinator.

Offsite monitoring team personnel take direct radiation readings with appropriate survey instruments and take air samples for analysis of airborne radioactivity. Air sample media are field-checked and significant results reported immediately to the EA and DP Coordinator. The field analysis provides for a minimum sensitivity for radioiodine detection of less than 1 x 10-7 uCi/cc, in the presence of radioactive noble gases. All monitoring results are recorded on data sheets by the monitoring teams and reported to the EA and DP Coordinator. Vehicles for monitoring teams are available on BVPS controlled property. Instructions for securing FMT vehicles are provided in the Implementing Procedures.

.4 Offsite Radiological Monitoring--Liquid Release

In the event of a release of radioactivity to the Ohio River, a monitoring team is sent to the Midland Water Treatment Plant (closest treatment plant) to collect samples of drinking water. Installed environmental monitoring sample pumps routinely draw samples of drinking water for subsequent laboratory analysis. Upon arrival at the treatment plant, monitoring personnel will take the on-line sample for analysis and will collect additional samples as directed by the EA and DP Coordinator. Sampling may be extended to downriver treatment plants if preliminary sampling results at Midland indicates the need. Vehicles for monitoring teams are available on BVPS controlled property. Instructions for securing FMT vehicles are provided in the Implementing Procedures.

.5 Emergency Environmental Monitoring

The Beaver Valley Power Station has made provisions for required post-accident environmental monitoring. Additional samples may be taken, or samples may be taken ahead of schedule, if deemed warranted by the Environmental Assessment and Dose Projection Coordinator. Qualified personnel perform all environmental sampling and analysis. [C31]

6.6 CORRECTIVE ACTIONS

Detailed Operating Procedures, Abnormal Operating Procedures, and Emergency Operating Procedures are utilized by the site 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 Implementing Procedures, as listed in Appendix C, describe subsequent and supplemental corrective actions for the scope

of potential situations within each of the emergency classifications. These procedures are designed to provide general guidance to personnel for correcting or mitigating the condition as early and as near to the source of the problem as feasible. Actions are specified, for example, which may prevent or significantly reduce a potential release of radioactive material, provide for prompt fire control, and ensure timely damage control and repair. The Emergency Implementing Procedures are also utilized in emergency training and are the basis for periodic emergency drills, and emergency equipment operational checks.

6.7 PROTECTIVE ACTIONS

Protective actions are implemented to prevent or mitigate consequences to individuals during or after a radiological incident. Protective actions within the Beaver Valley Power Station site boundary, in response to an emergency originating at BVPS, are the responsibility of the BVPS Emergency Director. However, such protective actions may require coordination with other onsite organizations or the unaffected BVPS Unit, and may include assistance by offsite organizations. Protective actions outside the Beaver Valley Power Station site boundary are primarily the responsibility of state and local emergency organizations, but may require coordination of activities, dissemination of appropriate data, and recommendations by the BVPS Emergency Director.

6.7.1 Onsite Protective Actions

.1 Evacuations

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

Significant aspects of the various classes of evacuations are described in sections 6.7.1.2 through 6.7.1.4. General provisions applicable to all evacuations are:

- In addition to the normal site complement, there are often visitors, construction workers, and nonconstruction contractors and vendors onsite. These construction personnel and contractors receive training, which addresses their responsibilities during an evacuation, prior to being issued a site badge. All other persons onsite, other than FENOC personnel assigned to BVPS, will be treated as visitors during evacuations. As such, these visitors will follow all instructions provided with regard to evacuations in site paging system announcements.

- Protective Action Guides (PAGs) for evacuations are provided in the Emergency Implementing Procedures. Although the primary reason for evacuation is likely to be a radiological condition, evacuations may be indicated for other conditions, which create habitability problems, such as toxic gases, and/or fire. Appropriate PAGs are provided for these hazards in the Emergency Implementing Procedures.

.2 Local Evacuation

This category refers to evacuation of localized areas within the site. Evacuation of personnel from localized areas is initiated primarily by local area radiation monitors (ARM) and/or continuous air monitors (CAM). The alarm setpoints are based on normal levels of radiation and airborne radioactivity and expected fluctuations within the specific areas. The immediate response by individuals in the vicinity of such an alarm is evacuation to an unaffected area, possibly within the same building, but away from the localized condition, and reporting the situation to the appropriate Control Room. In the absence of readily available radiological surveillance information or other logical assessment of conditions, those individuals will evacuate at least to a point where other radiological monitors show that the area is unaffected. Applicable instructions to personnel, based on evaluation of Control Room instrumentation or other supporting information, may be transmitted over the site paging system.

Strategic location of the radiological monitors and the requirement for immediate evacuation in response to alarms from these monitors provides reasonable assurance that radiological consequences of a localized incident will be minimized. Frequent radiological surveys throughout the site provide continuing verification of levels and trends indicated by these monitors. These surveys, as well as any other detection methods, can also serve to initiate the evacuation of personnel for conditions, which may not otherwise be identified by these monitors.

.3 Site Assembly

The declaration of a Site Assembly (as ordered by the Emergency Director/Shift Manager until properly relieved) requires all non-emergency response personnel to assemble at Primary or Near-Site Assembly Areas. Personnel within the protected area shall report to their designated Primary Assembly Area. These Primary Assembly Areas are identified below:

- BV-1 Service Building - Locker Room
- SOSB - 3rd Floor - Locker Room
- C28
- Nuclear Construction Office and Shops (NCOS) 2nd Floor
- NCOS - 3rd Floor

Personnel located outside the protected area but within the owner controlled property shall report to their designated Near-Site Assembly Area. These areas are listed below: C25

- C28
- C30
- Training Building C19
- Warehouse B

The actual decision to implement a Site Assembly is the responsibility of the BVPS Emergency Director. This decision is based largely on his evaluation and judgment 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 the Primary Assembly Areas. In the event of a multiple alarms (fire, ARMs, or CAMs) within the Controlled Area, the BVPS Emergency Director may deem it prudent not to evacuate personnel outside of the Controlled Area but within the Site's protected area fence, and allow work to continue if these personnel are not at risk.

.4 Site Evacuation

Site Evacuation requires that all individuals within the BVPS exclusion area, except for Control Room operations personnel and others, with specific emergency assignments, evacuate and proceed to the designated Remote Assembly Area, located upwind of the release or other designated area. This Site Evacuation includes all non-essential persons on site, and any other persons within the exclusion area. The Remote Assembly Areas for BVPS personnel are located at:

- The Hookstown Grange
- Western Power Delivery Division, Raccoon Headquarters

Implementation of a Site Evacuation is the responsibility of the BVPS 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 site, particularly (but not exclusively) at the Primary Assembly Area. Primary Assembly Area dose rates and airborne radioactivity concentrations are determined by radiation control personnel using portable survey instruments and air sample collection devices and/or readings from fixed radiological monitors.

Notification of a Site Evacuation is made via the site paging system, consisting of evacuation alarm signal and message announcement.

.5 Personnel Accountability

To ensure that all Site personnel present in affected areas have been evacuated and to ascertain the whereabouts of all emergency personnel who have not evacuated, measures have been established to provide for personnel accountability in the event of an evacuation. Accountability of evacuated and nonevacuated personnel (emergency workers) will be performed in accordance with the detailed Emergency Implementing Procedures. All individuals within the protected areas of BVPS are issued a security keycard badge. These security badges form the basis of the accountability process.

In the event of a local assembly near-by supervision shall ensure that all personnel have evacuated the affected area.

In the event Accountability is declared, personnel accountability will be accomplished through the use of the computerized access security system (key-card). This system has provisions for identifying and printing a listing of all personnel in selected areas of the site. Site personnel update their whereabouts in the computer by inserting their security badge/key-card in the readers adjacent to the security doors leading to these areas. The results from the assembly areas, and from personnel performing emergency response functions who can not report to an assembly area but are listed on a Site Accountability Form are reported to the Security Coordinator (on-duty Security Supervisor, until relieved by designated Security Coordinator), who provides a tabulation of missing individuals to the Emergency Director. If necessary, search and rescue efforts will commence in accordance with Emergency Implementing Procedures. The initial accountability phase shall be completed within thirty (30) minutes. Unaccounted for personnel are reported to the Emergency Director who shall take the necessary steps to initiate Search and Rescue.

.6 Contamination Control

The Beaver Valley Power Station Health Physics Manual (HPM) contains provisions governing the control of contamination including access control, use of protective clothing, contamination monitoring, and the release of potentially contaminated items from controlled areas. Chapter 3 of the HPM contains procedures that implement the HPM provisions. The requirements and guidelines of these documents shall apply to contamination control during emergency conditions. Emergency Implementing Procedures provide the interface between the HPM and the Emergency Preparedness Plan. These procedures authorize the Radiological Controls Coordinator to waive or modify certain normal contamination control methods, if other conditions, such as delaying necessary evacuations, personnel rescue, or delaying access to necessary plant equipment would create a greater hazard to plant personnel or the general population.

There are no potentially affected agricultural products within the Beaver Valley Power Station exclusion area. The Ohio River, which flows within the exclusion area, however, is a navigable river and is the source of water for several downstream communities and industrial facilities.

Domestic water at the Beaver Valley Power Station is provided by the Midland Water System. It's distributed by the domestic water system, which is a closed system. As a result of this configuration, contamination of the drinking water is unlikely. The Midland Water System storage tank has sufficient capacity to meet short-term needs.

With the exception of food brought to the site by Site personnel, all food supplied to the site arrives sealed for vending machine sale. These machines are located in noncontrolled areas. If these areas become contaminated they will be considered as controlled areas, and eating will be prohibited as is normally the case for controlled areas. Normal controlled area access controls will prevent the removal of contaminated food from these controlled areas and possible ingestion by unwary individuals.

Contamination monitoring will be performed as specified in the HPM. During Site Evacuations, personnel and vehicle contamination surveys are performed at a location on the site exit road. Contaminated personnel will be returned to the Site, for decontamination. In the event that the Site Evacuation must be made immediately, the survey process will result in undue delay in evacuating site personnel, personnel will be directed to proceed, with personal automobiles, to the designated remote assembly area. Personnel monitoring will be performed at the location.

Decontamination of materials and equipment are performed in areas provided for that purpose within the Beaver Valley Power Station. The Liquid Waste System, described in the BVPS Operating Manual, provides the capability to store and process decontamination wastes. The handling of solid radioactive waste is also described in the Operating Manual and Health Physics Manual.

Personnel decontamination is described in Section 6.8.1.

.7 Exposure Control

The exposure of Site personnel during emergency operations shall be maintained as low as reasonably achievable, and should be maintained less than the administrative guides established in the BVPS Health Physics Manual (HPM) and/or less than the Federal Radiation exposure standards established in 10 CFR 20. In order to accomplish this objective, administrative means used during normal operations to minimize personnel exposure (such as radiation work permits and ALARA measures) should remain in effect to the extent consistent with timely implementation of emergency measures.

If necessary operations require personnel exposures in excess of the normal control limits, or if normal access control and radiological work practices will result in unacceptable delays, the Radiological Controls Coordinator may, at his discretion, waive or modify the established exposure control criteria and methods. The Emergency Director is the only individual who may authorize dose extensions in excess of 10CFR20.

Table 6.3 summarizes the emergency exposure criteria for entry or re-entry into areas for the purposes of undertaking protective or corrective actions. Two classifications of emergency exposure are identified: corrective actions, and lifesaving actions. Lifesaving actions include actions such as rescue, first aid, personnel decontamination, medical transport, and medical treatment services, when such actions are immediately necessary to save a life. Corrective actions include surveillance actions and plant operations necessary to minimize further deterioration of the level of plant safety or to mitigate the consequences of the accident, if failure to perform these actions could result in a significant increase in offsite exposures. Personnel exposures received performing emergency measures, other than those identified above, shall be limited pursuant to 10 CFR 20.

Dosimetry monitoring equipment is provided at the Site as part of the normal Radiation Control Program, and such dosimetry will continue to be used during emergency situations. Health Physics Procedures provide guidelines and procedures for issuing, using, and reading dosimetry devices and provisions for exposure record keeping.

The Beaver Valley Power Station Health Physics Manual contains provisions for administration of the facility bioassay program. Emergency Implementing Procedures provide guidance for accelerated or additional bioassays in the event there are individuals who are suspected of being exposed to elevated levels of airborne activity as a result of the emergency. This bioassay consists primarily of lung and thyroid counts. These are supplemented by whole body counts and urinalysis when pre-determined lung and thyroid count screening levels, or pre-determined airborne activity exposure levels, are exceeded or suspect of being exceeded. These procedures provide for follow-up monitoring, medical treatment, and incident reporting.

.8 Respiratory Protection

The Beaver Valley Power Station Health Physics Manual (HPM) contains provisions governing the use of respiratory protection equipment and administration of the BVPS Respiratory Protection Program, which is responsive to Regulatory Guide 8.15 and NUREG-0041. The provisions of this document and supporting procedures shall apply tò all usage of respiratory protection equipment during emergency conditions.

Three exceptions to normal respiratory protection practices may be authorized by the Emergency Director with the advice of the Radiological Controls Coordinator, in accordance with the provisions of Emergency Implementing Procedures. These exceptions are:

- Extension of normal uptake limits. Under these provisions, internal exposure is controlled such that the total dose commitment--due to internal and external exposure, does not exceed the emergency exposure limits established in Table 6.3.
- Use of Thyroid Prophylaxis. Potassium iodide is available for use by BVPS employees and contractors in the event of an emergency. This potassium iodide is only specified for use by emergency workers who must remain in affected areas, and for whom other means of respiratory protection are not available or are not practicable. Normally, potassium iodide will not be issued unless I-131 airborne activity in occupied areas would result in a thyroid CDE in excess of 25 REM. The use of thyroid prophylaxis by Site personnel is voluntary. Potassium iodide shall not be administered to non-emergency workers or to members of the general public by BVPS personnel, and is issued only at the direction of the Emergency Director.

- Use of Iodine Sorbent Canisters in Filter Respirators. During emergencies, iodine sorbent canisters may be used in filter respirators. If this is the case, the Radiological Controls Coordinator may recommend that BVPS petition the NRC for permission to assign protection factors for iodine sorbent canisters as specified in 10CFR20.

6.7.2 Offsite Protective Actions

The Nuclear Regulatory Commission has postulated (that in the event of a severe accident) protective actions may be necessary in a ten (10) mile radius Emergency Planning Zone (EPZ) around the Beaver Valley Power Station in order to minimize the exposure of the population to radioactive material in the plume. Under these conditions, it may also be necessary to monitor and control foodstocks and wildlife in a fifty (50) mile radius Ingestion Pathway Emergency Planning Zone. Both of these zones encompass areas with Pennsylvania, Ohio, and West Virginia. While there may be highly improbable accident sequences that would require extending these zones, the planning established for the ten (10) mile EPZ and the fifty (50) mile ingestion pathway planning zone provides an adequate basis for this expansion, should it be necessary.

To have the maximum effectiveness, the protective measures may require lead times before implementation, and with regard to evacuation, would require time to complete. Because of this, protective action decisions are based on the probability of a significant radioactivity release, as well as the existence of a current release. Under the worst postulated scenarios the time between event initiation and the occurrence of a significant release may be as little as thirty (30) minutes.

Although dose assessment methodologies are developed to a reasonable degree of accuracy, there are uncertainties involved with the input data to these assessments. It is unlikely that the release source term will be adequately quantified when the first protective action decisions are being made during a rapidly developing situation. Similarly, the meteorological conditions at the site may not be consistent with those a few miles from the site. These uncertainties, coupled with the need for rapid decisions in a fast breaking incident, and the significant lead time necessary to implement a protective action, has resulted in greater emphasis being placed on plant systems status assessments against pre-determined criteria, and lesser emphasis on dose assessments.

While it is appropriate that any protective action decision be discussed in conjunction with the three States and with the NRC, and while BVPS shall make reasonable efforts with these agencies to arrive at a common recommendation, in the absence of such an agreement the BVPS recommendation shall be based on the staff's best evaluation of the technical considerations involved, be the plant condition or dose assessment related, and will include only those geographical areas projected to be affected by the plume transport.

The state and local governments within the EPZ have developed emergency response plans for the protection of the general public in their jurisdictions. The role of the Beaver Valley Power Station in offsite protective actions is the notification of cognizant officials, performing accident assessments and apprising the offsite agencies, and making recommendations for offsite protective actions. The role of the local and state governments is to act upon the information and recommendations provided by the facility and to perform emergency measures necessary for the protection of the public.

The emergency preparedness plans of these jurisdictions are prepared and submitted to the Federal Emergency Management Agency and the Nuclear Regulatory Commission for review and approval. These documents should be consulted for detailed information on offsite protective actions. The following sections summarize the provisions for offsite protective actions in the BVPS EPZ.

.1 Protective Actions Within Beaver County, Pennsylvania. The responsibility for actions to protect offsite individuals rests with Beaver County government as described in the Beaver County Plan. The Beaver County Emergency Management Agency (BCEMA) is responsible for implementation of that plan.

The Pennsylvania Department of Environmental Protection/Bureau of Radiation Protection (DEP/BRP) is responsible for evaluating information obtained from the Beaver Valley Power Station and/or other sources and recommending appropriate offsite protective actions to BCEMA through the Pennsylvania Emergency Management Agency (PEMA). Such recommendations, based on all available data, local constrains and other considerations may include:

- Shelter for affected populations
- Evacuation within a specified radial distance and/or downwind sector

- Administration of thyroid prophylaxis (as approved by the State)

- Control of contaminated agricultural products

The principal offsite local coordinating agency for providing response to radiological emergencies in the vicinity of the Beaver Valley Power Station is the Beaver County Emergency Management Agency (BCEMA). Since the area and population inside the ten (10) mile emergency planning zone are partially within Columbiana County, Ohio and Hancock County, WVA; essentially parallel emergency response functions are provided by the coordinating agencies within those Counties. The implementation of protective actions within these areas are discussed in Sections 6.7.2.2 and 6.7.2.3. Upon notification by Beaver Valley Power Station or by PEMA of a situation, which may require protective actions for offsite populations, BCEMA will activate its emergency organization, and if required, will initiate appropriate actions in accordance with specific instructions from PEMA and the BCEMA emergency plans and procedures. If communication cannot be established with PEMA in the necessary time frame, BCEMA may implement limited protective actions with the concurrence of the County Commissioners on the basis of recommendations made by the BVPS Emergency Director (Emergency/Recovery Manager when EOF is activated).

- Providing assistance for evacuation of the County's population within the ten (10) mile emergency planning zone

- Identifying reception and mass care centers for individuals evacuated from Beaver County

Occupants within the ten (10) mile emergency planning zone of the Beaver Valley Power Station will be provided with information regarding emergency planning. This information will describe the method(s) 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.

A detailed study has been conducted of the status and capacities of roads, traffic patterns, and demography within the ten (10) mile emergency planning zone. This study includes the estimated times to evacuate all or specific 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 BCEMA, CCEMA, and HCOES. A summary of this study is presented in Appendix B.

The Ohio River, which flows within the exclusion area, is the source of water to communities and industrial facilities downstream. The closest water treatment facilities are at Midland, PA and East Liverpool, OH; less than 1 mile and approximately 5 miles down-stream, respectively. Additional water supply intakes are located 7 or more miles downstream. The minimum average flow in the river (Sept.) is approximately 5 million gallons per minute. In the event of an actual or projected release of radioactive material to the river, by any pathway, the Midland and East Liverpool water treatment companies may be notified and a recommendation made to secure water processing depending on the estimated or calculated river activity. If a water treatment plant is shutdown as a result of a recommendation by the BVPS Emergency Director, or by request of DEP/BRP (in the case of Midland), the decision to allow restarting those water treatment plants is the authority and responsibility of governmental agencies responsible for water purity in each of the three jurisdictions.

The Ohio River is navigable, and is routinely used for barge traffic. In the event of an emergency condition requiring protective actions within the BVPS exclusion area, the U.S. Coast Guard will be notified and requested to restrict vessels from entering affected areas. In addition, lockmasters at the New Cumberland Dam, located approximately 20 miles downstream; the Montgomery Dam, located approximately 3.3 miles upstream; and/or the Danshield Dam, located approximately 11.3 miles upstream; can be called upon to restrict access to affected areas on the river.

BCEMA has the capability and detailed plans for implementing protective actions in Beaver County, which include:

- Implementing prompt notification of the County's population within 10 miles of the Beaver Valley Power Station
- Transmitting specific instructions to the potentially affected populations

.2 Protective Actions Within Columbiana County, Ohio

The responsibility for actions to protect offsite individuals rests with the State of Ohio, as described in the State of Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities. The Ohio EMA is responsible for implementation of that plan.

The State Department of Health is responsible for evaluating information obtained from the Beaver Valley Power Station and/or other sources and recommending appropriate offsite protective action to the Governor through Ohio EMA. Such recommendations, based on all available data, local constraints and other considerations may include:

- Shelter for affected populations
- Evacuation within a specified radial distance and/or downwind sector
- Administration of thyroid prophylaxis (for emergency workers only)
- Control for contaminated agricultural products

The principal offsite local coordinating agency for providing response to radiological emergencies in Columbiana County is the Columbiana County EMA. Upon notification by the BVPS Emergency Director or by BCEMA or by OEMA of a situation, which may require protective actions for offsite populations, CCEMA will initiate appropriate actions in accordance with specific instructions from the notifying party, and within the guidelines of the CCEMA emergency plans. If time permits, CCEMA will obtain a review and verification by OEMA of recommendations made by the BVPS Emergency Director. CCEMA has the capability and detailed plans for implementing protective actions similar to those for BCEMA described in Section 6.7.2.1 of this Plan.

.3 Protective Actions Within Hancock County, West Virginia

The responsibility for coordination of protective action recommendations rests with the State of West Virginia, as described in the West Virginia Emergency Disaster Plan, Volume Four, Response/Radiological Beaver Valley Power Station. The West Virginia Office of Emergency Services (WVOES) is responsible for implementation of that plan.

The West Virginia Bureau For Public Health is responsible for evaluating information obtained from the Beaver Valley Power Station and/or other sources and recommending appropriate offsite protective actions to WVOES. Such recommendations, based on all available data, local constraints and other considerations may include:

- Shelter for affected populations
- Evacuation within a specified radial distance and/or downwind sector
- Administration of thyroid prophylaxis (for emergency workers only)
- Control of contaminated agricultural products

The principal offsite local coordinating agency for providing response to radiological emergencies in Hancock County is the Hancock County Office of Emergency Services. Upon notification by BVPS or by BCEMA or by WVOES of a situation, which may require protective actions for offsite populations, HCOES will initiate appropriate actions in accordance with specific instructions from the notifying party, and within the guidelines of the HCOES emergency plans. If time permits, HCOES will obtain a review and verification by WVOES of recommendations made by the BVPS Emergency Director. HCOES has the capability and detailed plans for implementing protective actions similar to those for BCEMA as described in Section 6.7.2.1 of this Plan.

.4 Public Warning System

The primary means for alerting and warning the population of an incident at the Beaver Valley Power Station is the Siren Warning System. [C29] This system involves alerting the population with sirens. In accordance with instructions provided by periodic public information programs (See Section 8.5), the alerted population will turn to Local Emergency Broadcasting radio or television stations for emergency information and instructions. Hardware has been provided for this public warning system within the plume exposure pathway EPZ. The design objective of this system is to have the capability to complete an initial notification of the public within the plume exposure pathway EPZ within about 15 minutes.

The hardware consists of fixed outdoor sirens located within the 10 mile EPZ.. The sirens will be activated remotely by radio from the emergency services office within the respective jurisdictions.[C29]

The responsibility for activation of the public warning system rests with the emergency services organization in each of the three risk counties. These organizations will activate their respective portions of the warning system and supply appropriate emergency messages to the Emergency Alert System (EAS) station serving their jurisdiction in accordance with the provisions of their emergency response plans. The control for these systems are located in the respective county emergency services offices. The Beaver Valley Power Station supplies information for these emergency messages in the form of the initial and follow-up notifications described in Section 6.4.1 and 6.4.2.

As a backup to the Siren Warning System, local fire and police personnel would perform house to house checks to ensure everyone has received the message. This Route Alerting System is described in Local and County Emergency Plans.

.5 Protective Action Guides and Recommendation of Protective Actions

A protective action guide is the projected radiological dose, or dose commitment, to individuals in the general public above which protective actions may be warranted following a significant release of radioactive material. Protective Action Guides (PAGs) have been established by the U.S. Environmental Protection Agency. These guides are specified for the population as a whole. The guides for dose commitment for the general public are:

General Public Protective Action Guides

TEDE (rem)	Child Thyroid (CDE) (rem)
1	5

As noted earlier, these guides are applied against projections of offsite dose, be they based on an ongoing release or a potential release. The plant system status indicators and the protective actions associated with each indicator, as provided in EPP/IP 4.1, "Offsite Protective Action," are based on the postulated offsite exposures associated with each condition and the protective action guides above.

- Protective actions such a sheltering or evacuation are mandatory in affected areas if projected offsite doses exceed the value of the protective action guide established above.

- Sheltering is an appropriate protective action for:

  Severe events in which evacuation cannot be implemented because of inadequate lead time due to rapid passage of the plume ("puff" release). Evacuation time estimates indicate that 3 hours are necessary to evacuate out to a five mile radius, and up to 7 hours out to 10 miles.[(14]

  When an evacuation is indicated, but local constraints, such as inclement weather, road conditions, etc., dictate that directing the public to seek shelter is a more feasible and effective protective measure than evacuation. Studies indicate that a normal wood structure that can be made reasonably snug can reduce the direct exposure to the plume by 10% and can minimize inhalation dose for about two-hours.

- Evacuation is an appropriate protective action for:

  An incident involving a release, or potential release, which is projected to result in an offsite dose greater than 1 rem TEDE, or 5 rem to the child thyroid (CDE), in situations where the lead time between declaration of the emergency and population relocation is compatible with plume movement, <u>and</u> in the absence of constraints to evacuation (inclement weather, etc.).

- Situations which do not provide for advance warnings, but for which substantial reductions in population dose can be made by avoiding exposure to residual radioactivity (plume fallout) in the wake of sudden severe incidents involving significant releases of radioiodine or particulate material. In these cases, sheltering should be maintained until the plume passes, if possible.

Offsite agencies responsible for implementing protective actions for the public will assign protective actions based on their evaluations and consideration of the BVPS recommendation. While the agencies in the three (3) jurisdictions will coordinate their respective actions with each other, the action taken in each jurisdiction is ultimately the prerogative of that jurisdiction.

The role of BVPS in offsite protective actions is to provide offsite agencies with timely notifications of emergencies, appropriate recommendations for protective actions, appropriate accident assessment data, and data from offsite monitoring performed by BVPS personnel in the event of a release; to provide a capability for warning the public in a timely manner; and to assist local officials with public information programs.

6.8 AID TO AFFECTED PERSONNEL

Established Emergency Plan Implementing Procedures, Operating Procedures, and Radiation Control Procedures provide for personnel decontamination and for assistance to injured persons including situations involving complications due to the presence of radiation or radioactive contamination.

6.8.1 Personnel Decontamination

The Beaver Valley Power Station Health Physics Manual identifies criteria and provides procedures for personnel decontamination. The provisions of the HPM and supporting procedures shall apply to emergency situations to the maximum extent possible. These procedures commence with simple washing with soap and water by the individual. If contamination is persistent, or involves significant amounts of contamination, particularly in the vicinity of facial openings, decontamination will be performed under the direction of radiation control personnel using established procedures.

Personnel decontamination areas, consisting of showers and sinks, which drain to the Liquid Radwaste System, are available within the Site for routine or emergency use. These facilities are located near the access to the controlled areas of the Site. Portable decontamination kits are maintained for use at remote assembly areas.

A listing of typical decontamination equipment located at the personnel decontamination areas is provided in Appendix D. Personnel having their personal clothing contaminated will be issued clean clothing as temporary replacement clothing.

In addition to decontamination within the Site, the Emergency Response Facility will provide a decontamination facility. Decontamination liquids are held-up in tanks for subsequent processing. In the interim, personnel decontamination will be performed prior to the departure from the Site, or at a designated location.

Normal contamination control limits expressed in the HPM shall remain in effect to the extent possible. However, the Radiation Control Coordinator, may modify the contamination control limits as provided in Emergency Implementing Procedures. Under site evacuation conditions, the level of removable contamination above which removable decontamination is mandatory is established as 5000 dpm/100 cm (500 cpm on HP210 detector), five times the normal control limit. No contamination limit applies to contaminated injured personnel needing immediate medical treatment at a hospital.

6.8.2 First Aid

At least two persons who are qualified in first aid methods shall be onsite at all times. The qualified individuals are trained in First Aid/CPR. 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 offsite emergency medical assistance involving radioactive contamination. For that purpose, measures are established in the Operations and Health Manuals to ensure timely offsite medical treatment. First Aid Kits are available for use at several locations within the Site, and a medical facility is available.

6.8.3 Medical Transportation

Arrangements have been made for the transportation of injured personnel from the Beaver Valley Power Station, who may have injuries complicated with radioactive contamination or who may have been involved in a radiation incident, to a medical treatment facility. These organizations can be contacted directly or through the Beaver County Emergency Services Center.

Emergency Medical Services radio provides for communications between the Beaver County Emergency Services Center, the ambulances, and the Beaver County hospitals. Copies of the agreement(s) to provide emergency services from these organizations are on file in the Emergency Preparedness Section. Ambulance emergency supply kits, which typically contain items shown in Appendix D, are available for use and are stored in the Medical Facility at the Site.

Ambulance personnel arriving at the Site are directed by security personnel to the appropriate area. Personnel dosimetry for ambulance personnel is provided by the Site. Contaminated patients are accompanied by radiation control personnel. The radiation control person is responsible for maintaining appropriate contamination control measures to minimize the contamination of the ambulance, the hospital, and hospital personnel. This individual is responsible for controlling contaminated material, and surveying the ambulance and the hospital treatment area following use.

If an ambulance can not be obtained in a reasonable period of time, a suitable BVPS vehicle, or employee vehicle (only on a voluntary basis), may be utilized to transport injured personnel.

6.8.4 Medical Treatment

Arrangements have been made for treatment of injured personnel from the Beaver Valley Power Station, who may have injuries complicated with radioactive contamination at:

- The Medical Center, Beaver, PA

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

- Presbyterian-University Hospital

Evaluation of significant contamination injuries, over-exposures, and radioactive materials uptakes can be made by the Radiation Protection Department at BVPS. [C31]

The BVPS Health Services maintains a contract for a qualified physician. This physician has or will complete training through REAC/TS at Oak Ridge, TN, and can assist with clinical diagnosis and/or treatment of contaminated/injured or irradiated persons.

Copies of agreements to provide medical treatment from the above organizations are on file in the Emergency Preparedness Section.

The Medical Center, and the Presbyterian-University Hospital are adequately supplied and equipped to receive and treat contaminated patients. Sets of contamination control supplies are provided at the Medical Center of Beaver County. A typical list of this equipment is shown in Appendix D.

6.9 EMERGENCY PUBLIC INFORMATION

First Energy Nuclear Operating Company respects the public's right to information about its operations and service and, in particular, information regarding accidents and unplanned events which occur at Company facilities, including the Beaver Valley Power Station. The Company's policy has and continues to be to make public, accurate information about these events.

The Emergency Public Information procedures describe the objectives, responsibilities, facilities, and protocol for emergency public information. Section 7 of this Plan describes the Joint Public Information Center (JPIC). Section 6.2.4.6 describes activation of the Joint Public Information Center and the Emergency Public Information Response staff.

The Joint Public Information Center, if activated, is the location from which replies to news media inquiries will be made, and at which news briefings will be held. If the situation warrants, news briefings may be held at other locations. The Beaver Valley Power Station will supply operational and technical information, upon request, to JPIC personnel via the onsite Emergency Public Information Response staff at the ERF. This individual shall have access to all information regarding the emergency. Senior management designated individuals will serve as Chief Company Spokesperson. [C31]

Space is provided at the Joint Public Information Center for State, local, and Federal public information personnel, and provisions are made for coordination of news announcements and press briefings.

As part of the Emergency Public Information procedures, telephone contact personnel respond during an emergency to handle incoming calls from members of the general public.[C31] In addition to other functions, these personnel will serve as the point of contact between the general public and BVPS. The purpose of this contact is to respond to concerns of the general public in an effort to suppress unfounded rumors and incorrect information which has not been answered by news announcements. In addition, the Emergency Public Information ERO provides an internal rumor control system to quell rumors to company employees and the news media.

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TABLE 6.1
SUMMARY OF IMMEDIATE NOTIFICATION AND RESPONSE

EMERGENCY CLASS	CRITERIA	IMMEDIATE NOTIFICATIONS		IMMEDIATE ACTIONS	
		ONSITE	OFFSITE	ONSITE PERSONNEL	OFFSITE 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.	* Fire Brigade * Damage Control Teams * Surveillance Watches * First Aid Teams * Rescue Teams * Monitoring Teams * Security Force * Outage Contractors	* Fire Units * Rescue Assistance * Ambulance Assistance * Hospital * BCEMA * PEMA * OEMA * HCOES * CCEMA * WVOES * NRC * FENOC Headquarters	* Make Prompt Offsite Notification * Fight fires * Perform emergency repairs * Designated Surveillance Functions * Administer First Aid * Conduct Rescue Operations * Perform Onsite Monitoring * Appropriate Security Measures * Perform Continuing Assessment * Make Prompt Onsite Notifications	* Provide Fire Fighting Assistance * Assist in rescue operations * Provide Medical Transportation * Provide Hospital Medical Treatment * Assist in Damage Control
ALERT	Events Which Indicate an Actual Degradation in the Level of Safety of the Plant	* Fire Brigade * Damage Control Teams * Monitoring Teams * Dose Projection Personnel * Security Force * Outage Contractors	* Fire Units * BCEMA * PEMA * OEMA * HCOES * CCEMA * WVOES * NRC * FENOC Headquarters	* Make Prompt Offsite Notifications * Fight Fire * Perform Emergency Repairs * Onsite and Offsite Monitoring * Offsite Dose Projection * Approp. Security Measures * Augment Onshift Resources * Activate TSC, OSC, [C15] Place EOF, JPIC on standby	* Provide Onsite Assist. as required * Activate Primary Response Centers * Alert Key Personnel to Standby * Conduct Confirmatory Dose Projections * Maintain Emergency Communications.

TABLE 6.1
SUMMARY OF IMMEDIATE NOTIFICATION AND RESPONSE

EMERGENCY CLASS	CRITERIA	IMMEDIATE NOTIFICATIONS		IMMEDIATE ACTIONS	
		ONSITE	OFFSITE	ONSITE PERSONNEL	OFFSITE PERSONNEL
SITE AREA EMERGENCY	Events Which Involve Actual or Likely Major Failures of Plant Functions Needed for Protection of the Public	* Appro. Emer. Teams * Security Force * All other station Personnel * Outage Contractors	* Appropriate Local Assist. * BCEMA * PEMA * OEMA * HCOES * CCEMA * WVOES * NRC * FENOC Headquarters	* Make Prompt Offsite Notifications * Take Appro. Corrective Action * Onsite and Offsite Monitoring * Offsite Dose Projections * Appro. Security Measures * Augment Resources/Activate Emergency Centers * Personnel Evacuation as Approp. * Alert Total Emergency Org. * Perform Continuing Assess. * Activate EOF, JPIC	* Provide Onsite Assistance as required * Activate and Man Response Centers * Mobilize Emer. Response Personnel * Continuously Evaluate Dose Projections * Place Public Notification System and Procedures in Standby Status * Implement Appropriate Near-Site Emergency Protective Measures * Maintain Emergency Communications
GENERAL EMERGENCY	Events Which Involve Imminent Substantial Core Degradation or Melting With Potential for Loss of Containment Integrity	* Appropriate Emer. Teams * Security Force * All Other Station Personnel * Outage Contractors	* Appro. Local Assistance * BCEMA * PEMA * OEMA * HCOES * CCEMA * WVOES * NRC * FENOC Headquarters	* Make Prompt Offsite Notif. * Take Appro. Corrective Actions * Onsite and Offsite Monitoring * Appro. Security Measures * Augment Resources/Activate Emergency Organization * Activate Total Emergency Organization * Personnel Evacuation as appropriate * Perform Continuing Assess. * Recommend Offsite Action	* Provide Onsite Assistance as required * Fully Staff Response Centers * Activate all Emergency Response Personnel * Implement Public Notif. Procedures * Continuously Evaluate Dose Projections * Implement Appro. Offsite Emer. Protective Measures * Maintain Emergency Communications

TABLE 6.2

NOTIFICATION MATRIX

ORGANIZATION	CONTACT PRIMARY	CONTACT ALTERNATE	COMMUNICATION PRIMARY	COMMUNICATION ALTERNATE	24-HOUR COVERAGE	PURPOSE
BCEMA	DISPATCHER	BCEMA DIRECTOR	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO	YES	ACTIVATE BCEMA
PEMA DEP/BRP	DUTY OFFICER	BCEMA	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO VIA[C2] BCEMA	YES	ACTIVATE PEMA VERIFICATION CALL
OEMA	DUTY OFFICER	OHIO HWY PATROL DISPATCHER	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO VIA[C2] CCEMA	YES	ACTIVATE OEMA
WVOES	DISPATCHER	HCOES DISPATCHER	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO VIA[C2] HCOES	YES	ACTIVATE WVOES
CCEMA	DISPATCHER	CCEMA DIRECTOR	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO	YES	ACTIVATE CCEMA
HCOES	DISPATCHER	HCOES DISPATCHER	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO	YES	ACTIVATE HCOES
NRC	DUTY OFFICER	N/A	NRC/ENS (RED PHONE)	TELEPHONE	YES	ACTIVATE FEDERAL RESPONSE
FIRE DEPTS	BCEMA DISPATCHER	N/A	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO	YES	FIRE ASSISTANCE
AMBULANCES	BCEMA DISPATCHER	AMBULANCE COMPANY	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO	YES	MEDICAL TRANSPORTATION
HOSPITALS	EMERGENCY ROOM	BCEMA DISPATCHER	COMMERCIAL TELEPHONE SYSTEM	BVPS RADIO	YES	MEDICAL TREATMENT

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EMERGENCY EXPOSURE CRITERIA TABLE 6.3

Dose to workers performing emergency services should not exceed the following recommendations of the EPA Manual of Protective Action Guides and Protective actions for Nuclear Incidents (EPA 400-R-92-001).

Dose Limit (a) (rem)	Activity	Condition
5	All	
10	Protecting valuable property	Lower dose not practicable
25	Life saving or protection of large populations	Lower Dose not practicable
>25	Life saving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved

(a) Sum of external effective dose equivalent and committed effective dose equivalent to nonpregnant adults from exposure and intake during an emergency situation. Workers performing services during emergencies should limit dose to the lens of the eye to three times the listed value and doses to any other organ (including skin and body extremities) to ten times the listed value. These limits apply to all doses from an incident, except those received in unrestricted areas as members of the public during the intermediate phase of the incident.

- The BVPS Emergency Director must approve all planned emergency exposures. The Radiological Controls Coordinator should be consulted prior to authorizing the planned emergency exposure, if time permits.
- All reasonable measures must be taken to control contamination and internal exposure.
- Persons performing emergency activities should be familiar with the consequences of the exposure.
- Persons performing emergency activities under these provisions should be volunteers.
- Personnel shall not enter any area where dose rates are unknown or unmeasurable with instruments and dosimetry immediately available.

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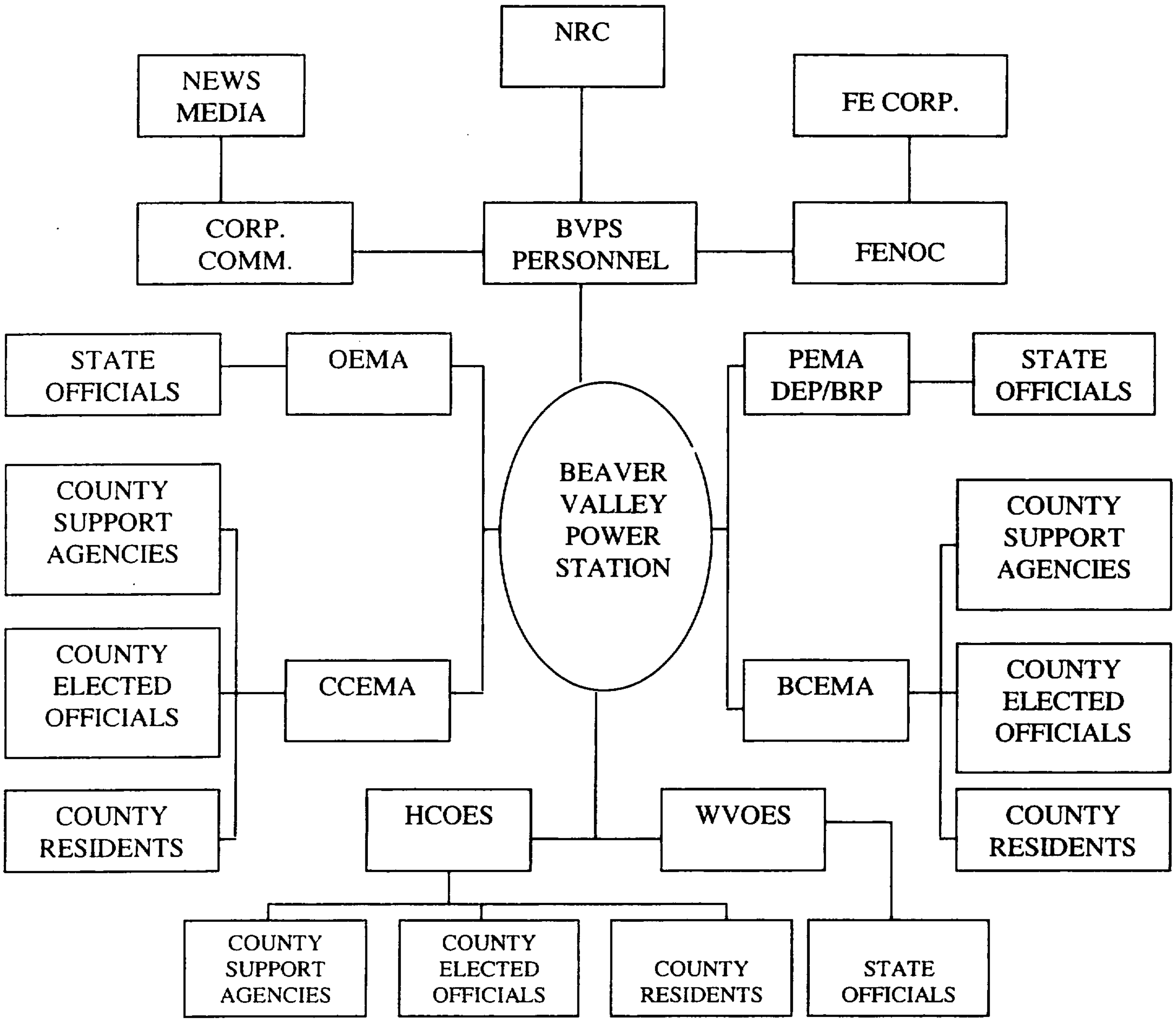
FIG. 6.1
PRIMARY INITIAL NOTIFICATIONS



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SECTION 7

EMERGENCY FACILITIES AND EQUIPMENT

Section 7

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7.0 EMERGENCY FACILITIES AND EQUIPMENT

Emergency facilities and equipment are provided at the Beaver Valley Power Station 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 ONSITE EMERGENCY CENTERS

Onsite emergency facilities at the Beaver Valley Power Station are described in this section. The Technical Support Center and the Emergency Operations Facility are located in the Emergency Response Facility (ERF) located approximately 1200 feet from the Beaver Valley Power Station Control Rooms. The significant instrumentation and communications available at each of the BVPS emergency facilities are listed in the Implementing Procedures.

7.1.1 Control Room

The Control Room is the primary location for the 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 communications systems.

The Control Room is initially the primary location for accident management and emergency communications until the Technical Support Center is activated. Located within the Control Room are telephone and radio communications equipment and emergency equipment and supplies necessary to support direction and coordination of emergency response activities.

The Control Room provides for the effective coordination of the following emergency response functions:

- Plant assessment and coordination of corrective actions
- Requesting initial call out of emergency response personnel
- Perform notifications to offsite government agencies
- Requesting offsite dose projections be initiated and directions provided for offsite monitoring until the TSC/EOF is activated

- Communicate with other onsite/offsite Emergency Operations Centers
- Serve as the central location for the receipt of data from radiological monitoring (until the TSC/EOF is activated) and other emergency teams
- Provide direction to emergency coordinators
- Make recommendations to offsite agencies regarding protective and other actions (until relieved by TSC/EOF)
- Provide administrative direction (until relieved by TSC/EOF)

7.1.2 <u>Operations Support Center</u>

The Operations Support Center (OSC) provides for assembly of Operations support personnel for supplemental emergency team personnel. The location of the OSC is the Outage Central Area[C15] located above the BVPS Control Rooms. This area has communications capability with the Control Room and the BVPS Site. Protective equipment for personnel assigned to the OSC is available in emergency cabinets in the OSC and at the Plant Health Physics Check Area, located adjacent to the access to the controlled area.

The OSC is equipped with the Radcon and Operations circuits, the site page party system and PAX/Commercial phone system capabilities.

The OSC is designated as a central location for coordinating the activities of radcon technicians for both BVPS units. Wall maps are provided for maintaining the status of radiological conditions within the Station.

If the nature of the emergency renders the OSC unusable due to radiological conditions, etc., OSC operations are co-located to the Alternate OSC.

The Alternate OSC is located in the Process Instrument and Rod Position Instrument Area below the Unit 1 Control Room. This area has the same shielding and ventilation features as the Control Room and the same communications capabilities as the OSC. The BV-1 remote shutdown panel is located in this area.[C15]

7.1.3 Emergency Response Facility

The Emergency Response Facility has been designed to satisfy the functional requirements of the Technical Support Center and the Emergency Operations Facility. The design of the building enhances the proper control and coordination of the principle emergency response activities without interfering with plant emergency operations. The facility provides for the following:

.1 Technical Support Center

The TSC provides for engineering and management support during emergency situations and has the following features:

a) Reasonably close proximity of the Control Room

b) Capability to display real-time plant status data

An Inplant Process Computer performs data acquisition, trending, alarm reporting, logging, CRT displays, data storage and various human communication functions to provide for the monitoring of plant variables in the Control Room.

The Safety Parameter Display System (SPDS), provides a display of plant parameters from which the safety status of operations may be assessed. The SPDS will help operating personnel make quick assessments of plant safety status and improve the exchange of information between TSC, EOF and Control Room.

c) Dedicated communications links to Control Room and NRC

A dedicated line system is provided between the Control Room and the TSC.[C31] This system is powered by emergency power. A base station for the BVPS Industrial Radio System is also provided. This base station has its own transmitter and antenna and can communicate (via the BVPS repeater) with all units. Emergency Telephone System (ETS) extension for contacting the NRC/ENS and HPN are available, as is PAX and Commercial system telephones.

d) As-built drawings are maintained within the building

e) Environmental Assessment and Dose Projection capability

An environmental assessment and dose projection area, located in the EOF area, provides the capability to perform dose projection and offsite radiological assessment functions. A terminal to the meteorological computer provides 15-minute average print-outs of meteorological parameters. An Atmosphere Radiological Effluent Release Assessment System (ARERAS) computer system will provide data needed for determination of meteorological conditions in the vicinity of BVPS and capability to access and monitor actual or potential offsite consequences of a release during a radiological condition. NRC/HPN, BVPS radio transceiver, and extensions to the DEP/BRP hotlines are available.

.2 Emergency Operations Facility

In the Emergency Response Facility, an Emergency Operations Facility is established for the Beaver Valley Power Station. Although separate, the EOF is located in the same building as the Technical Support Center (TSC). There is adequate desk space for 50 or more people, including desk space for State representatives. Telephones are provided. The nearsite EOF shares an environmental assessment and dose projection area with the Technical Support Center. When the EOF is activated, the EA&DP area becomes a part of the EOF. In the event this area is uninhabitable, the nearsite EOF may relocate with the TSC. In the event the ERF is uninhabitable, the nearsite EOF will relocate to the Alternate EOF which shares a building with the JPIC on Spring Run Road in Coraopolis, PA. The EOF will serve as the location from which the overall BVPS response will be directed and coordinated; and as a coordinating center for utility, Federal, State and local agencies. BVPS management personnel at this facility provide an interface with the Technical Support Center.

The Coraopolis facility provides adequate desk space for 12 individuals with overflow space for approximately 25 additional personnel. There are direct Commercial telephone lines, FAX units, PAX lines, and an operating console for the BVPS Industrial Radio System and an ERDS Terminal. The alternate EOF is located on Spring Run Road in Coraopolis, PA.

.3 Dosimetry Laboratory

A shielded dosimetry lab is provided with sufficient TLD availability to serve the needs of all Station personnel. Whole body counting facilities are located adjacent to the ERF.

.4 Sample Preparation and Counting Facilities

Shielded sample preparation areas are provided. Counting equipment include a gamma spectrometry system.

.5 Nuclear Regulatory Commission

Provisions have been made in the ERF to accommodate the complete NRC Site Team Organization. These provisions include desk space, communications capabilities and a conference room.

.6 Decontamination Facility

A decontamination facility is provided. This facility is intended for the use of ERF personnel. (Reserve portable survey instruments will be maintained here.)

.7 Other

- Kitchen
- Rest rooms and sleeping areas (for men and women)
- Medical Services
- Security and reception areas
- Records room

Increased shielding is provided for the EOF and the dosimetry/sample laboratories. Ventilation will be such that intake air flow can be diverted through high efficiency particulate (HEPA) filters and if necessary, charcoal filters. An emergency diesel generator, with an approximate 180-hour fuel supply, is provided for back-up power. Important instrumentation and communications equipment are powered by UPS and battery. Appropriate communications from the ERF to the Control Room, Onsite Response Facilities, and offsite agency Emergency Operations Centers, are provided.

7.1.4 Joint Public Information Center (JPIC)

The Joint Public Information Center (JPIC) will serve as the focal point for all Nuclear Communications activities. All media communications by First Energy personnel, including press conferences, will be coordinated through the JPIC. The location of the JPIC is in the Pittsburgh Airport Business Park, Spring Run Road, Coraopolis, PA. This facility provides working space for the press and for First Energy Communications personnel. A briefing area to seat 300 persons is available. Adequate parking for cars and trailers is available.

The Implementing Procedures provides for activation and operation of this facility. If the facility is unavailable due to radiological conditions, the activities of the JPIC will be transferred to the Corporate Headquarters.

7.2 EMERGENCY SUPPLIES

Emergency supplies are located at onsite and offsite locations to provide a ready supply of equipment and material necessary to meet the short-term needs for performing emergency functions. The emergency supplies include portable communication equipment, protective equipment, monitoring equipment, and applicable procedures. Additional, and/or replacement equipment and materials are available at the Station, or can be readily obtained from offsite sources to support longer term emergency measures or the recovery effort. Appendix D provides a typical inventory by general category.

In addition, BVPS maintains an inventory of contamination control material at The Medical Center, Beaver for minimizing the spread of contamination while handling contaminated injured personnel.

The emergency kits are inspected and inventoried at least quarterly and after each use.

7.3 COUNTY AND STATE EMERGENCY CENTERS

7.3.1 County Emergency Centers

The 10-mile emergency planning zone for the Beaver Valley Power Station includes areas and populations in Beaver County, PA; Columbiana County, OH; and Hancock County, WVA. Each of these county jurisdictions has Emergency Operations Centers, which meet or exceed the minimum Federal criteria for sufficient space, communications, warning systems, and self-sufficiency in supplies and accommodations. All three counties maintain employees to coordinate emergency planning and execution, and have made provision for 24-hour per day communications coverage.

Location of the county Emergency Operations Centers are:

- Beaver County Emergency Operations Center
  Beaver County Emergency Management Agency
  Beaver County Emergency Services Center
  250 East End Avenue
  Beaver, Pennsylvania

- Columbiana County Emergency Operations Center
  Columbiana County Emergency Management Agency
  7301 Lisbon Canfield Road
  Lisbon, Ohio

- Hancock County Emergency Operations Center
  Hancock County Office of Emergency Services
  Hancock County Court House
  102 Court Street
  New Cumberland, West Virginia

7.3.2 State Emergency Operations Center

The 10-mile Emergency Planning Zone (EPZ) for the Beaver Valley Power Station includes areas and populations in Pennsylvania, Ohio, and West Virginia. All of the states maintain full-time employees to coordinate emergency planning and execution, and have made provision for 24-hour per day communications coverage.

The Pennsylvania Emergency Operations Center is located at the PEMA headquarters in Harrisburg, PA. This center is equipped with a reliable communications system, which ties all area and county emergency operations centers with PEMA headquarters. During an emergency, the State will assemble at the State Emergency Operations Center to manage and support the emergency response activities.

The Ohio Emergency Operations Center is located at the Ohio Emergency Management Agency headquarters in Worthington, Ohio (near Columbus). This center is equipped with extensive communications capability, which ties all area and county emergency operations centers with the OEMA headquarters. During an emergency, representatives from designated State agencies will assemble at the State Emergency Operations Center to manage and support the emergency response activities.

The West Virginia Emergency Operations Center is located in the West Wing, main Capital Building, in Charleston, West Virginia. An integral Emergency Communications center provides communication support for the emergency response effort. Communications and warning links connect all area and county emergency operations centers with the State EOC. During an emergency, the State EOC is staffed by personnel from each of the major State departments and agencies.

7.4 ASSESSMENT FACILITIES

The primary emergency assessment facility is the site Control Room. Supplementary and complimentary assessment functions are performed in the TSC. This section discusses the assessment facilities provided for both initial and continuing assessment of emergency conditions.

7.4.1 Radiological Monitors

Radiological monitoring equipment has been provided at the Beaver Valley Power Station for the detection and assessment of emergency conditions. Radiological monitors include the process, effluent, and area radiation monitors included in the Radiation Monitoring System; portable radiation, contamination, and airborne activity sampling and measuring equipment; radiological laboratory equipment; radiological environmental monitors; and accident monitors. These monitors are summarized below. More detailed information is found in the BVPS Final Safety Analysis Report (FSAR), the BVPS Health Physics Manual, the BVPS Operating Manual, and Appendix D to this Plan.

.1 Radiation Monitoring System/Digital Radiation Monitoring System - This onsite system, consisting of effluent monitors, continuous air monitors, area radiation monitors, 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.

Each potential radioactivity release path has been provided with appropriate radiation monitors. These monitors, which provide for radioactivity detection and measurement during normal operations, are tabulated in Appendix D.

.2 Portable Instrumentation

Portable radiological sampling and measuring equipment is provided as part of the Beaver Valley Power Station Radiation Controls Program, as established in the BVPS Health Physics Manual. Appropriate gamma survey instruments, contamination monitoring equipment, and air sampling equipment are reserved in emergency kits for emergency use. With few exceptions, this equipment is battery operated. The reserved equipment is supplemented by the instruments provided for routine use. Appendix D tabulates, by type, the instruments available. The selection of instruments and sampling media, and the methodology established in Emergency Implementing Procedures, provides for a minimum field detection capability of at least 1 E-7 uCi/cc of Iodine-131 in the presence of radioactive noble gases.

.3 Radiological Laboratory Equipment

Appropriate radiological counting equipment is provided in support of routine operations. This equipment is available for use during emergencies. Equipment includes, beta counter, liquid scintillation counters, and gamma spectrometers.

Laboratory support from outside the Site can be requested through the Brookhaven D.O.E. Bettis Atomic Power Labs, located approximately one hour away by car is the nearest D.O.E. facility.[C1] A laboratory is included in the Emergency Response Facility.

Laboratory support for environmental sample analyses are available from the environmental contractor. [C31]

.4 Environmental Monitors

The primary functions of the environmental radiological monitoring program are to establish the pre-operational background levels, detect any gradual build-up 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. Field thermoluminescent dosimeters (TLDs) and sampling media from 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.

.5 Accident Monitors

Several radiological monitors have been provided for assessment of radiological conditions or radiological release rates in the wake of a significant accident. These monitors generally supplement the monitors in the Radiation Monitoring System by extending the range of radiation measurements. Such monitors are provided for each of the major radioactivity release paths to the atmosphere and in the Containment Building. The range of the effluent monitors is about 1 E-7 to 1 E5 uCi/cc (Xe-133), and the range of the Containment area radiation monitor is about 1 R/hour to 1 E7 R/hour.

7.4.2 Fire Detection Systems

Fire protection at the Beaver Valley Power Station is provided by a complete network of fire suppression and extinguishing systems. These systems include a central alarm system (with an annunciator panel located in the Control Rooms) which is activated by a variety of fire and smoke detection devices which are located throughout the plant. Although the suppression and extinguishing systems for BV-2 are similar to BV-1 they are not identical. These fire detection systems are identified in the BVPS Fire Protection Plans.

7.4.3 Geophysical Phenomena Monitors

Monitors are provided for detecting and recording geophysical phenomena parameters related to meteorology and seismic events.

.1 Meteorology

The Beaver Valley Power Station maintains an onsite Meteorological Measurements Program. This program is comprised of equipment and procedures which provide for indication and recording of meteorological measurements necessary to perform dose projections based on atmospheric dispersion of a radioactivity release from the station. Meteorological sensors are provided on a meteorology tower located near the site to measure and record the following parameters:

- Wind direction at three altitudes
- Wind speed at three altitudes
- Vertical temperature difference
- Ambient temperature
- Precipitation

There are two (2) redundant trains of sensors located on this tower. The output from the two sets of sensors is processed and recorded (chart recorders) by instrumentation in a shelter located near the tower. Two redundant communication links transmit the processed data to the Atmospheric Radioactivity Effluent Release Assessment System (ARERAS) located in the Emergency Response Facility. ARERAS samples the parameters every five (5) seconds and calculates and records an average value every fifteen (15) minutes and once every hour. A minimum of one (1) month of historical hourly data and two (2) weeks of historical quarter hour data is available online at any time. This data is available on request at any ARERAS terminal and is accessed by the MIDAS dose projection software. The MIDAS/ARERAS system provides the States with the capability to receive meteorological data via dial-up modems.

The instrumentation in the meteorological shelter and the tower sensors have an automatic backup power supply. ARERAS is powered by the Emergency Response Facility uninterruptable power supply (UPS). Backup meteorological information is available through the National Weather Service.

.2 Seismic Equipment

Appropriate seismic instrumentation is provided at the Station to monitor and record the motion and peak shock imparted to critical elements of the Station (structures and components) due to an earthquake. Alarms are provided for peak accelerations and mechanical/electrical devices record the extent of the acceleration for subsequent evaluation to determine if maximum allowable accelerations have been exceeded and if any plant corrective actions are necessary.

The seismic instrumentation is categorized into three separate subsystems:

- The Triaxial Time History Accelographs

  This system is continuously energized in standby. A triaxial acceleration switch activates recording equipment and sounds an annunciator in the Control Room at an acceleration of 0.01 g. Three independent triaxial sensors are provided--two in the containment, and one in the Auxiliary Building.

  In the event of a system activation, the operator will obtain and assess the results from the recorders using the BVPS Operating Manual. Both units are AC powered and have internal batteries.

- Peak Shock Recorders (Triaxial Spectrum Recorders)

  Three passive triaxial recorders are provided. One is located in the containment, the others are located in the Control Room and in the Auxiliary Building. The containment recorder provides trigger switches which activate annunciators located in the Control Room, at accelerations equivalent to 70% of the Operational Basis Earthquake (OBE) and 100% OBE. These sensors record the peak shock by reeds which scribe a metal plate. Each sensor contains several reeds of different resonant frequencies to provide for spectrum analysis.

- Peak Recording Accelerometers

  Four peak recording triaxial accelerometers are provided--three in the containment and one in the Auxiliary Building. These units record the peak acceleration by the erasure of prerecorded lines on a small piece of magnetic tape. The tape is prepared for visual evaluation by a chemical process.

.3 Hydrologic Data

Data on the river flow in the Ohio River is available from two sources. The Lockmaster at the Montgomery Dam, located upriver in Industry, PA., is the primary source. The US Army Corps of Engineers provide 24-hour coverage at this location. The National Weather Service, River Forecasting Section, Pittsburgh is a source of river flow data during normal work hours, and during emergency periods of high river levels.

7.4.4 Process Monitoring Equipment

Process monitoring instrumentation is provided in the Station Control Rooms to provide the operator with necessary data on plant status to operate the plant under normal and emergency situations. This instrumentation generally includes instruments that:

- Provide information required to take pre-planned manual actions.
- Provide information to monitor the process of accomplishing critical safety functions.
- Indicate the potential for damage, or actual damage, to fission product barriers.
- Indicate the effectiveness of individual safety systems.
- Provide information for use in determining the magnitude of the release of radioactive materials, as described in Section 7.4.1.

In addition to the instrumentation described above, additional process parameter instrumentation systems are installed. These systems are the Safety Parameter Display System (SPDS) Computer, and the Inplant Process Computer (IPC) and Plant Safety Monitoring System (PSMS).

.1 Safety Parameter Display System

The Safety Parameter Display Systems (SPDS) provide displays of essential plant parameters from which the safety status of operations may be assessed. The primary function of the SPDS is to help Control Room personnel make quick assessments of plant safety. Displays for this system are provided in the BVPS Control Rooms and the Technical Support Center (TSC). The display in the TSC serves both the TSC and the Emergency Operations Facility (EOF).

.2 Inplant Process Computer and Bypassed & Inoperable Status Indication System

The Inplant Process Computer (IPC) is designed to obtain data from the reactor control, reactor protection, the environmental monitor racks, and other transducers in the plant and provide access to these indications in the Technical Support Center (TSC), the Emergency Operations Facility (EOF) and in the Control Room. The Bypassed & Inoperable Status Indication (BISI) System provides an indication in the Control Room of bypassed or inoperable equipment in the facility to assist the operators in operating the plant.

.3 The Plant Safety Monitoring System (PSMS) is located in Unit 2 Control Room. The PSMS will monitor plant conditions such as incore thermocouples, rod positions, Reactor vessel water level, etc.

7.4.5 Post Accident Sampling[C20]

Beaver Valley Power Station has Contingency Plans for obtaining and analyzing highly radioactive samples of reactor coolant, containment sump, and containment atmosphere in the event of a radiological accident. These Contingency Plans are maintained in the BVPS Chemistry Manual.

7.4.6 Emergency Response Data System (ERDS)

The BVPS Emergency Response Data System (ERDS) collects and transmits data as specified by the Nuclear Regulatory Commission (NRC). The system is tested for both Units 1 and 2 on a schedule specified by the NRC.

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 Station Control Rooms

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

- Adequate shielding by concrete walls to permit continuous occupancy under severe accident conditions
- An independent emergency air supply system, equipped with absolute and activated charcoal filters
- Continuous monitoring of radiation levels in the Control Room and throughout the plant by the RMS/DRMS system, with readout in the Control Room
- Emergency lighting and power, supplied by a 125 V DC system
- Basic protection equipment for emergency teams (Appendix D), and listings of emergency supplies/equipment, and their locations within the station
- Communications systems, as described in Section 7.6

7.5.2 Site Assembly Areas

Specific locations are designated for assembly of personnel at the site in the event of a Site Assembly or a Site Accountability. 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 locations and the individuals assigned are:

.1 Primary Assembly Area (Unit 1 Service Building-Locker Room Area, South Office Shops Building - Locker Room Area and Nuclear Construction Office and Shops)

Personnel without emergency assignments within the BVPS protected areas will report to these areas. This includes BVPS employees, visitors, and contractor groups not covered by a specific evacuation plan. The responsibility to ensure that a visitor reports to the proper area is that of the individual accompanying the visitor at the time evacuation occurs.

.2 Unit 1/Unit 2 Contractor Personnel

Construction and contractor personnel are covered by the BVPS procedures, which provides instructions for assembly, accountability and evacuation. Personnel are instructed on these areas upon arrival at the BVPS site.

.3 Personnel Access Facility

Members of the Security Section assemble in accordance with the Beaver Valley Power Station Security Procedures.

.4 Training Building and other out-buildings designated in the Implementing Procedures. [C19, C25]

These buildings are located outside of the protected area. Personnel and visitors outside of the Unit 1-2 protected areas, will assemble in these buildings and await further instructions.

7.5.3 Remote Assembly Areas

These areas are designated for assembly of personnel from within the site in the event of a Site Evacuation. The locations are the Western Power Delivery Division, Raccoon Headquarters and the Hookstown Grange. The Western Power Delivery Division, Raccoon Headquarters facility is located approximately 6.2 miles from the site in the SE sector. The Hookstown Grange is located approximately 3.5 miles from the site in the SW sector. There are telephone links between each of these locations and the Control Room/TSC/EOF.

The BVPS Emergency Director will direct personnel to the appropriate area based on the direction of plume travel. If, based on radiological measurements at the Remote Assembly Areas and/or data from the Control Room, neither of these locations is deemed by the BVPS Emergency Director to be appropriate, the BVPS Emergency Director in cooperation with management and State and county agencies will direct personnel to another location.

Since accountability and radiological monitoring would be performed prior to exiting the site, no provisions are made for inclement weather. If weather conditions make use of the facilities impracticable, evacuated personnel will be sent home (or to their assigned Mass Care Center, identified in the county emergency plans). In cases of extreme weather conditions, non-essential Site personnel would be sent home prior to roads becoming impassable, and thus would not be onsite when the emergency was declared.

7.6 COMMUNICATIONS SYSTEMS

Communications are essential for effective activation and implementation of the Emergency Preparedness Plan. Beaver Valley Power Station has five independent systems for outside communication to Federal, state, county authorities, to corporate management, and to offsite support groups. These systems are the Commercial telephone system, the PAX system, the dedicated "hot lines", the Beaver Valley Emergency Response System and the Industrial Radio System. Onsite, the plant alarm system and the Station paging system provides communication/notification for Site personnel. Radio contact with the State agencies is via relay through their respective County[C2].

These multiple systems and redundancies ensure the performance of vital functions in transmitting and receiving information throughout the course of the emergency. Systems available at the various emergency facility locations are:

7.6.1 Commercial Telephone System

The Beaver Valley Power Station site is provided with telephone service by Verizon. All lines entering the site are direct connections with the telephone exchange (724-643/682) in Midland, (724-775) Rochester or (330-315) in Akron, Ohio. There are numerous direct lines, all of which can be used simultaneously. Power supply redundancy is provided for by emergency power supplies.

Emergency facilities served by direct lines:

- Control Rooms
- Technical Support Center (TSC)
- Emergency Operations Facility (EOF) and Alternate EOF
- BVPS Unit 1/2

The Commercial systems are routinely used by station personnel performing routine station activities, thus, periodic testing is not necessary.

7.6.2 PAX System

The PAX System includes automatic switchboards in the SOSB and the ERF. These switchboards are connected to each other and connected via T1 carrier and fiber optic trunks to a digital switchboard at Akron, Ohio which in turn is connected to the public telephone network as well as to other switchboards. The ERF and SOSB switchboards also has direct trunks to the public telephone network.

The PAX System has Direct Inward Dial capability for all telephone lines connected to any of the Company switchboards (724-682-xxxx). These telephone lines also have the capability of calling any other telephone line on the PAX System as well as Direct Dial calling anywhere on the public telephone network.

The PAX systems are routinely used by shift operations personnel performing routine station activities, thus periodic testing is not necessary. Alternate EOF phones shall be checked quarterly.

7.6.3 "Hot Lines" to DEP/BRP and NRC Communications

A separate and completely independent telephone "hot line" system provides direct communications with the Pennsylvania Department of Environmental Protection/Bureau of Radiation Protection (DEP/BRP).

The DEP/BRP "blue hotline" located in the EA & DP area of the ERF is used to provide radiological data. The DEP/BRP "White Hot Line" is located in the Control Room and is used to provide technical data. The DEP/BRP does not have 24-hour per day coverage on this circuit, but will activate the DEP/BRP staff upon notification from PEMA that an event has occurred. This phone is tested monthly.

The ENS (Emergency Notification System) is used to make the initial notification of an emergency declaration as well as providing ongoing information on plant status, systems and parameters to the NRC. The Emergency Telephone System (ETS) is a designated set of phones on the commercial phone system that **DOES NOT** go through either of the Beaver Valley Phone Switches but goes directly to Akron, Ohio for switching. This is to meet the requirements for dissimilar vulnerability to assure contact with the NRC during a declared emergency at Beaver Valley Power Station should the local phone switches become overloaded. The ETS operates in the same manner as the commercial phone systems when placing a long distance call. Simply lift the receiver, wait for a dial tone and dial "9" then "1" before dialing the ten digit phone number. ENS phones are located in the following locations:

- Control Room – Communications Console in the Administrative Assistant Area [C31]
- Control Room – Unit 1 Communications Console [C31]
- Technical Support Center
- Emergency Operations Facility
- NRC EOC

The HPN (Health Physics Network) phone, utilized to communicate radiological and meteorological conditions to the NRC, is also accessed by the ETS. These phones are located at:

- Operations Support Center
- Emergency Operations Facility (EA & DP Area)
- Technical Support Center (Rad Con Coord.)
- NRC EOC

Other phones associated with the ETS and dedicated to NRC Communications are located in the ERF and are described as follows:

- Reactor Safety Counterpart Link (RSCL)
- Protective Measures Counterpart Link (PMCL)
- Emergency Response Data System (ERDS) Channels (2) (Data transmission only)
- Management Counterpart Link (MCL)
- Local Area Network (LAN) Access

The Control Room ENS phone is tested daily, while the others are tested monthly.

7.6.4 Beaver Valley Power Station Industrial Radio

BVPS operates a radio communications network on two frequency bands. [C36] This service is used by BVPS, the DLC Power Stations Department, and other corporate groups. Tone-operated squelch prevents standby emergency stations from receiving routine operational transmissions.

There are six fixed base station transceivers associated with Beaver Valley Power Station (there are others serving other divisions within DLC). [C36] These are located at:

- Columbiana County Communications Center (CCEMA)

There are operating consoles for this base station located at the Sheriff's Dispatcher, the Ohio Highway Patrol, and at CCEMA.

- Hancock County Communication Center (HCOES)
- Pennsylvania State Police
- Remote Relay Station on Shippingport hill SW from BVPS
- Beaver County Emergency Services Center
- Western Power Delivery Division, Raccoon Headquarters

The remote relay station is operated from the Control Room SM communications console via a UHF radio link or a dedicated telephone line. This station has power redundancy supplied by batteries connected to a battery charger. Remote consoles are located at:

- US area in the Control Room (BV-1) (Both frequencies)
- U1 Plant Shutdown Panel
- U2 Plant Shutdown Panel
- Control Room Office (shared BV 1-2) (Both frequencies)
- EA and DP Area (ERF) [C36]
- TSC - Radiological Controls Area [C36]
- Alternate EOF

The offsite monitoring teams are provided with radios capable of communicating with the site.

The industrial radio system is operated routinely by shift operations and security personnel and the base stations are tested by substations and shops. The communications links between the Control Room, the risk counties, and the State Police are tested weekly. Portable transceivers maintained in the Control Room are used daily as part of the normal plant operations.

7.6.5 Beaver Valley Emergency Response System

The Beaver Valley Emergency Response System (BVERS) is a computer aided Voice Mail System with teleconferencing capabilities.

The system provides two basic functions. First, the system will activate the BVPS Emergency Response Organization. Second, the system features a Gold Executive Conference capability for upper level management discussions. BVERS will be tested monthly.

7.6.6 Station Page Party Telephone System

A Station page party telephone system is used for onsite communications and notifications. There are five party lines available at each transceiver location. Power supply redundance is provided by connection into the vital AC distribution, and by backup batteries.

The page party system is the primary means for alerting and providing instructions to Station personnel.

7.6.7 Personal Radio Pagers (Beepers)

Key personnel in the emergency organizations are provided with personal radio pagers. These pagers can be group-activated by calling the pager services. BVERS and Voice Mail Systems provide personnel calling in with a message directing them to report to their emergency location, and will record information provided by the caller.

7.6.8 Station Emergency Alarm System

A plant emergency alarm system provides audible warning of emergency conditions to station personnel. The emergency alarms are sounded over the station page system. The system is powered from the vital AC distribution.

7.7 ONSITE FIRST AID AND MEDICAL FACILITIES

A Medical Facility, equipped with normal industrial first aid supplies, is located in the ERF Building. The BVPS Emergency Squad provides immediate first aid for any emergency within the protected area.

Standard first aid equipment is stored at designated locations throughout the station. The first aid kits are checked periodically, in accordance with station procedures and replenished as necessary.

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 Emergency Squad Chief and the BVPS Emergency Director have access to keys for maintenance tool cribs, shops and other locations where appropriate damage control equipment may be stored.

Implementing Procedures provide guidance for emergency teams, and include locations for designated emergency equipment.

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SECTION 8

MAINTAINING PREPAREDNESS

CONTROLLED
BVPS UNIT 1/2

Section 8

MAINTAINING PREPAREDNESS

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8.0 MAINTAINING EMERGENCIES PREPAREDNESS

A concept of in-depth preparedness is employed regarding the Beaver Valley Power Station Emergency Preparedness 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. Similarly, members of the population within the emergency planning zone will be informed of their response actions to an emergency at Beaver Valley. 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 Responsibilities

The Director, Work Management has the overall responsibility to ensure that emergency response personnel receive the proper initial and/or annual retraining required.

a. The Engineering and Technical Training with input from Emergency Preparedness provides the initial training and annual retraining for the following personnel:[C18]

1) All station personnel granted unescorted access within the protected area of the Beaver Valley Power Station.
2) Fire Brigades.[C18]
3) First Aid and Rescue Teams.
4) Local Fire Departments participating in the Mutual Aid Program. (Emergency Preparedness will distribute them to the appropriate Local Fire Departments).[C18]

b. Operations training will provide the training for those personnel that require Severe Accident Management Guideline training and RVLIS training.[C18]

c. BVPS Emergency Preparedness provides the initial and annual retraining for the following:[C18]

1) All personnel assigned to the Emergency Response Organization.
2) Local medical support organizations and ambulance/rescue squads.
3) Major news organizations serving the EPZ, such as radio/TV stations, newspapers, local wire services offices and local correspondents.

4) In conjunction with the training programs provided by State and Local Agencies, all remaining offsite emergency workers exclusive of those already discussed.

d. BVPS Security will provide training to Local Law Enforcement Agencies (LLEA) annually.

Personnel assigned to the Emergency Response Organization with specific Emergency Preparedness duties and responsibilities shall receive specialized training for their respective assignments. The Emergency Preparedness Plan Training Program delineates which personnel will receive specialized training and the type of training. This program is included in an EP Administrative Procedure addressing the ERO. [c10]

8.1.2 Training Programs Provided

The methods for training and maintaining proficiency in emergency response capabilities include, but are not necessarily limited to, classroom lecture, independent study, hands-on component training, preparatory drills and exercises. Training records have been designated to be retained for the life of the plant.[C11] The classroom training is administered under the provisions of the Site Administrative Manuals. [C36] This manual provides appropriate measures to ensure effective training.

a. All unescorted personnel entering or working within the BVPS protected area will receive as a minimum the following:

1. Orientation of the Emergency Preparedness Plan and its implementation, assignments of duties and responsibilities, location of emergency centers and assembly areas, and the location of emergency equipment and supplies where applicable.

2. Familiarization with station alarms and personnel response and the use of applicable station communication systems.

3. Orientation in instructions and requirements associated with personnel accountability, evacuation and radiation exposure criteria.

b. At least annually, key personnel from various offsite agencies are invited to participate in a training program at BVPS. These agencies should include, but not be limited to:

- FEMA Region III
- FEMA Region V
- USNRC Region I
- Pennsylvania Emergency Management Agency
- Ohio Emergency Management Agency
- West Virginia Office of Emergency Services
- Pennsylvania DEP/BRP
- Ohio Radiological Health Program
- West Virginia Bureau for Public Health
- Beaver County Emergency Management Agency
- Columbiana County Emergency Management Agency
- Hancock County Office of Emergency Services

The training program will emphasize the interface and coordination required between BVPS and the offsite emergency organizations. The program should include a review and discussion of the utility's Emergency Action Levels (EALs) and discussion of any other timely industry concerns, as applicable.

c. Representatives of local fire companies participating in the Mutual Aid Program will be provided training material annually. The training program should consist of the following:

1. Orientation of the BVPS plant layout, the Emergency Preparedness Plan and listing of key station personnel including the Site Security Force

2. Basic Radiation Protection indoctrination and training

3. Onsite fire protection system equipment (permanent and portable) and the differences between onsite fire fighting equipment and fire company supplied equipment

4. Communications and notification systems

5. The onsite emergency organization with specific emphasis on the interface between the Beaver Valley Power Station emergency squad and fire company personnel

d. Local medical support organizations and ambulance/rescue squad personnel will receive training or be provided information annually. The local support hospitals training consists of at least:

1. Basic radiation principles

2. Instructions on receiving room preparation

3. Procedures for receiving notifications and relaying pertinent information

4. Instructions on interfacing with BVPS Radiation Protection personnel.

Local ambulance/rescue personnel training should include:

1. Basic radiation principles

2. Procedures for notification and interaction with BVPS personnel - especially prior to arrival at BVPS.

3. Expected roles upon arrival.

e. The Local Law Enforcement organizations (per the Security Plan) will be provided information annually. The information should consist of the following:

1. Review of Beaver Valley Power Station Emergency Preparedness Plan Implementing Procedures for notification and site access

2. Review of the Beaver Valley Power Station facility layout, communication systems and basic radiation protection

3. Orientation of the onsite emergency organization with specific emphasis on the interface between BVPS Security and Local Law Enforcement Personnel

f. Major news organizations serving the BVPS Emergency Planning Zone (EPZ), such as radio/TV stations, newspapers, local wire service offices, and local correspondents will be provided information annually. This program will be conducted by the Emergency Preparedness Department. The information should consist of the following:

1. Information regarding the content and implementation of the BVPS Emergency Preparedness Plan, with emphasis on the emergency classification scheme, the public notification system, the Emergency Nuclear Communication Procedures and basic radiation information.

8.1.3 Conduct of Exercises and Drills

a. Exercises are realistic, pre-planned simulations of accidents, designed and conducted in such a manner that the response of the emergency organization, and other site personnel closely approximates the response to an actual incident, and applicable portions of the offsite emergency response organization. Drills are pre-planned simulations in which the participants are "walked" or "talked" through one or more procedures, or aspects of the Emergency Preparedness Plan. The primary purpose of drills is to provide individuals with hands-on training in a controlled situation. Drills are evaluated by the drill controllers/observers, who will normally correct erroneous performance on-the-spot. In this aspect, drills differ from exercises, in that response to an exercise is evaluated during a subsequent critique. The response of site personnel to an actual emergency condition may be allowed to satisfy a particular drill requirement, provided that a critique is performed and documented in the manner specified for a drill/exercise.

b. Exercises and drills will be conducted in order to test the state of emergency preparedness of all participating personnel, organizations, and agencies. Each exercise or drill will be conducted to: (1) ensure that the participants are familiar with their respective duties and responsibilities (2) verify the adequacy of the BVPS Emergency Preparedness Plan and the methods used in the Emergency Implementing Procedures, (3) test communications networks and systems, (4) check the availability of emergency supplies and equipment, (5) verify the operability of emergency equipment, (6) verify the adequacy of inter-relationships with offsite agency plans and (7) test the adequacy of timing.

c. The Manager, Emergency Preparedness in conjunction with the Scenario Development Team is responsible for the planning and coordination of all emergency planning-related drills and exercises involving major portions of the Emergency Response Organization 10 CFR 50 Appendix E, or NUREG 0654. The Manager, Operations is responsible for planning, scheduling and coordinating all Emergency Squad/Fire Brigade-related drills.

d. Exercises and drills 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. These scenarios will consist of:

1. The basic objective of each exercise
2. The date, time period, place, and participating organizations
3. The sequence of simulated and actual events and expected response
4. Narrative summary of the conduct and organization of the exercise
5. Assignments for controllers/observers, including particular evaluation criteria to be observed at that location/activity

e. All exercise scenarios, which call for the activation of onsite Emergency Response Organizations, shall be approved by the Manager, Work Management or designee, prior to the exercise. Scenarios for joint exercises will be the result of a cooperative effort between all participants. To the extent possible, these scenarios will be written and implemented to allow free play for decision-making by participants. To minimize rumors and unintentional public response, all exercises involving major offsite activities shall be announced prior to initiation by the Emergency Public Information personnel.

f. Following the completion of all exercises, facilitations shall be conducted in all participating emergency facilities. The lead facility participant should conduct the facilitation with input from controllers, designated observers and exercise participants. As soon as practical following the Evaluated Exercise, a critique presentation will be conducted for participants and management of each emergency facility, or discipline, participating in the exercise. An overall exercise report will be compiled.

g. The exercise critique report shall document the strengths and significant deficiencies uncovered during the exercise. Recommended corrective action will be developed for each deficiency by the Manager, Emergency Preparedness. Items identified by the NRC as a Weakness, Violation, or as Areas for Improvement, along with appropriate FEMA Areas Requiring Corrective Action and BVPS identified deficiencies, shall be entered into the BVPS Condition Report System. [C43]

8.1.4 Exercise and Drill Frequency

Drills and Exercises are scheduled on the following frequency:

a. Radiation Emergency Exercise

1. An exercise appropriate to a General Emergency, and which simulates conditions resulting in offsite radiological releases which would require protective response by offsite authorities shall be conducted biennially for the Beaver Valley Power Station. This exercise shall test the integrated capability and a major portion of the basic elements of the Emergency Preparedness Plan. The scenarios will be varied from year to year such that all major elements of the Plan and the emergency organizations are tested within a six-year period. Consistent with offsite participation, this exercise should be scheduled to commence after 1400 hours and some exercises should be unannounced. The State and local organizations participate in exercises as described in 10 CFR 50 Appendix E.

2. BVPS will ensure that adequate emergency response capabilities are maintained between Biennial Exercises by conducting drills, which involve some principle functional areas of onsite emergency response. However, the licensee is required to provide an opportunity for State and local governments participation in drills/exercises if requested by the State or local governments.

3. Local governments located within the Emergency Planning Zone (EPZ) that are affected by only one power site, such as those in the BVPS planning zone, are required to participate fully every two years.

4. Participation of the general public in exercises pursuant to this part is not mandatory.

5. Each Biennial Exercise will be observed and critiqued by qualified observers from Federal, and/or State/local governments. A formal evaluation will result from these critiques.

b. Fire Emergency Drills

1. Each Site fire brigade member will participate in at least two fire drills per year.

2. At least one drill in the calendar year shall provide for the participation of a local offsite fire department, as coordinated by the Emergency Preparedness Section.

C36

c. Medical Emergency Drill

1. A Medical Emergency Drill involving a simulated contaminated individual which contains provisions for participation by the local medical support personnel and organizations (e.g., physicians, ambulance service, hospital, etc.) shall be conducted annually. The offsite portions of the medical emergency drill may be included in the scenario for the biennial radiological emergency exercise conducted through the EP Section and/or the Nuclear Training Department via other training Drills.

2. Documentation of these drills (including scenario, roster and critique) will be forwarded to the Manager, Emergency Preparedness.

d. Radiation Emergency Drills

1. Plant environs and radiological monitoring drills (onsite and offsite) shall be conducted annually. The Radiological Protection section will conduct and/or participate in these drills involving the collection and analysis of all sample media (e.g., water, vegetation, soil, and air), and provisions for record keeping and communications.

2. Documentation of these drills (including scenario, roster and critique) will be forwarded to the Manager, Emergency Preparedness.

e. Radiation Protection Drills

1. The Radiological Protection section shall conduct and/or participate in semi-annual Radiation Protection drills which involve response to and analysis of simulated elevated airborne and liquid samples and direct radiation measurements in the environment.

2. Documentation of these drills (including scenario, roster, and critique) will be forwarded to the Manager, Emergency Preparedness.

f. Communications Drills

1. Communication links between the Beaver Valley Power Station and the agencies on the emergency call list are tested at least C7 annually to ensure continued operability.

2. The frequency for conducting these tests and the organizations/agencies to be contacted are detailed in the BVPS Emergency Preparedness Administrative Procedures.

3. The BVPS Operating Manual Chapter 40, "Station Communications", provides instructions for operating this equipment.

8.2 MANAGER EMERGENCY PREPAREDNESS

The Director, Performance Improvement has overall responsibility and authority for the maintenance of an appropriate emergency preparedness stature at the Beaver Valley Power Station and is assisted in these functions by the Manager, Emergency Preparedness whose responsibilities shall include, but not necessarily be limited to:

a. Ensuring the coordination of the BVPS Emergency Preparedness Plan with:

- Federal Plans
- State Plans
- County Plans
- Municipal Plans (PA)
- Beaver Valley Power Station Security Plan
- Beaver Valley Power Station Fire Protection Plan

b. Ensuring that the information, data, and procedures detailed in the Emergency Plan Implementing Procedures are consistent with the BVPS Emergency Preparedness Plan.

c. Ensuring that the Emergency Plan Implementing Procedures interface properly with other procedures, including Administrative Procedures, Security Procedures, Health Physics Procedures, Emergency Operating Procedures, and Training Procedures. This function shall be satisfied by evaluating critiques of drills and exercises, which will reveal weakness in procedure interface.

d. Coordinating emergency planning-related drills and exercises including offsite portions for both.

e. Coordinating the review and updating of the BVPS Emergency Preparedness Plan and Emergency Plan Implementing Procedures.

f. Keeping abreast of changes in Federal regulations and guidance that may affect emergency planning.

g. Ensuring that all Emergency Preparedness Quality Assurance records, as identified in the BVPS Records Type List (RTL) are processed in accordance with NPDAP 6.3 "Beaver Valley Records Management Program".

The Manager, Emergency Preparedness and staff should attend appropriate emergency preparedness seminars and training courses in order to remain abreast of new methods, techniques, and regulatory requirements.

8.3 REVIEW AND UPDATING

This section describes the review and approval, distribution, and updating of the Beaver Valley Power Station Emergency Preparedness Plan (EPP). The Beaver Valley EPP is considered to be a part of the BVPS Operating Manual, and as such, falls within the purview of the BVPS review, revision, approval and distribution process, per the Site Administrative Manuals (ADM).[C22]

a. Included in the controlled copy distribution process are provisions to send copies of any change to the BVPS Emergency Preparedness Plan to the USNRC Region 1 office, and copies will be sent to the USNRC NRR, Washington DC.[C22]

If the review process determines that the proposed changes decrease the effectiveness of the NRC approved Emergency Preparedness Plan; such changes shall not be implemented without application to and approval by the USNRC. Such changes will be referred to senior management to request approval from the NRC prior to implementation of the change.[C22] If the changes do not decrease the effectiveness of the Plan, as described in the Code of Federal Regulations, the revisions will be forwarded to the NRC within 30 days.

Changes to the Emergency Plan made without prior NRC approval shall be retained for a period of three years from the date of the change. BVPS shall retain the Emergency Plan and each change that decreases the effectiveness of the plan as record until the NRC terminates the license for the Nuclear Power Reactor.

b. The Site Administrative Manuals establish methods and requirements governing the preparation and distribution of all Station manuals and procedures, including the Emergency Preparedness Plan and the Emergency Plan Implementing Procedures.[C22] Distribution Lists are prepared for the Emergency Preparedness Plan and procedures. These lists identify those organizations receiving controlled copies and the name of the individual responsible for maintaining those copies up-to-date. Changes are distributed to all holders of controlled copies, and documented, in accordance with the Site Administrative Manuals.[C22]

c. Individual Emergency Implementing Procedures may be distributed to selected locations and organizations for which distribution of the entire set of Emergency Implementing Procedures is unnecessary. A sectionalized listing on the Distribution List identifies the locations/organizations and the particular procedures involved.

d. The Manager, Emergency Preparedness, or designee, performs an annual review of the Emergency Preparedness Plan.

In addition, continued applicability of Letters of Agreements between BVPS and offsite emergency response and support groups shall remain in effect until changed by either party.

e. An annual review and audit of the Emergency Preparedness Plan and Implementing Procedures shall be performed at least once every 12 months. The review will be conducted by the Emergency Preparedness staff and the audit will be performed by the Quality Services Unit.[C2] The audit shall include an evaluation for adequacy of interfaces with the Sate and local governments and of licensee drills, exercises, capabilities and procedures.

f. The results of the audit along with recommendations for improvements shall be documented, reported to corporate and plant management and retained for a period of five years. Significant discrepancies in the emergency preparedness planning identified in the annual review by Quality Services Department will be identified via Condition Reports. The evaluation for adequacy of interfaces with State and local governments shall be made available to appropriate State and local governments.

g. To ensure continued capability to notify offsite agencies, all telephone numbers for offsite agencies and emergency support groups are verified periodically. All primary emergency response groups are contacted monthly to verify continued applicability of the telephone numbers on the emergency call list and to ascertain if there has been any changes which may require revision of the Emergency Preparedness Plan and Emergency Plan Implementing Procedures. The telephone numbers of those agencies who are normally contacted by others, but for some reason, may be contacted by BVPS personnel during an emergency are verified either quarterly or annually. A separate listing of Emergency Response Organization telephone numbers is verified and published bi-monthly.

8.4 MAINTENANCE AND INVENTORY OF EMERGENCY EQUIPMENT AND SUPPLIES

The Manager, Radiation Protection is responsible for ensuring the maintenance and inventory of emergency equipment and supplies. The responsibility for planning, scheduling, and performance of the quarterly master inventory and inspection of designated emergency equipment and supplies also belongs to the Radiological Operations Department. This department will ensure that personnel are assigned to perform these activities.

The emergency kits are inspected and inventoried at least quarterly and after each use. Instruments in the emergency kits will be inspected for operability and calibration status quarterly. Instruments with expired calibrations will be removed and calibrated, or replaced with in-calibration equipment. Since equipment designated for emergency use is essentially similar to that used to support normal Station Operations, a resource of back-up instruments is available to replace inoperative or out-of-calibration equipment. Master inventory and inspection checklists are maintained by the Manager, Emergency Preparedness and supplied to the Manager, Radiation Protection or his designee as needed. Procedures for instrument operability checks and calibrations are contained in the Station Health Physics Control Manual (HPM), the Station Operating Manual, and/or, the Station Maintenance Manual.

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, Emergency Preparedness. This report will also be forwarded to Document Control for retention. The Radiological Operations Department will ensure that identified deficiencies are corrected in a timely manner.

8.5 NUCLEAR COMMUNICATIONS

The Beaver Valley Power Station in cooperation with state and county authorities will develop and periodically disseminate emergency planning instructional material to residents in the Emergency Planning Zone to ensure that the permanent adult population is provided an adequate opportunity to become aware of this information annually. This instructional material will include:

- Public notification system
- Public response to warning signals
- Evacuation routes, procedures, and relocation centers
- Sheltering procedures
- Contacts for additional information
- Information on radiation

The following methods will be utilized to ensure that emergency planning information is transmitted to residents in the Emergency Planning Zone:

- An ad in the local newspapers, announcing the test of the siren notification system will be published annually.
- Printed instructions and evacuation maps will be distributed to EPZ residents, via local phone directories.
- Annually, Special Needs Cards are mailed to the EPZ population. Those needing assistance return the cards to their County EMA. The cards are kept on file in the County EOC's. Additionally, Beaver County supplies each Municipal EOC with a list of residents needing assistance.

The following methods will be used to periodically disseminate emergency planning instructional material to the transient population in the Emergency Planning Zone:

- Printed instructions will be included in the local telephone directory.
- Printed instructions providing appropriate information helpful if an accident occurs will be distributed to motels, hotels, recreation areas and other commercial establishments within the EPZ.

8.6 NRC/FEMA

In the event that the NRC finds that the lack of progress in completion of the procedures in the Federal Emergency Management Agency's final rule, 44 CFR Part 350, is an indication that a major substantive problem exists in achieving or maintaining an adequate state of emergency preparedness, the provisions of 10 CFR Section 50.54(s)(2) will apply.[C5]

SECTION 9

RE-ENTRY AND RECOVERY

CONTROLLED
BVPS UNIT 1/2

Section 9

RE-ENTRY AND RECOVERY

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9.0 RE-ENTRY AND RECOVERY

Actions taken during an emergency situation can be categorized into two general phases: Response and Recovery. Response actions are assessment, corrective, and protective measures taken to mitigate the consequences of the event and to place the emergency under control. Recovery actions are the longer-term actions taken to restore the Site, as nearly as possible, to its pre-emergency condition.

9.1 TRANSITION FROM RESPONSE TO TERMINATION AND/OR RECOVERY

The extent and nature of the corrective and protective actions and the extent of recovery operations will depend on the emergency conditions at hand and the status of Site areas and equipment. In many emergency situations, the condition may be resolved without significant plant damage, and thus, the Site can be restored to a normal operation mode without a definitive recovery phase and without extensive outside assistance. In the event of a more extensive damage, a long-term recovery will require the establishment of a recovery organization.

At the onset of an emergency condition, response actions to mitigate the consequences of the accident take precedence over recovery actions. The Emergency Recovery Manager may initiate some limited recovery operations during the response phase. Gradually as the response effort begins to abate the emergency classifications are terminated, recovery efforts gain more importance. Criteria for terminating emergency classifications are listed in EPP/IP 6.2 "Termination of the Emergency and Recovery". Finally, a point is reached where the emergency situation has decreased to the extent that it can be considered, for all practical purposes, to be resolved. At this point, the emergency can be declared to be terminated, and a recovery organization implemented as necessary.

If following the termination, the emergency situation recurs, then the Emergency Director or Emergency Recovery Manager will re-activate the onsite emergency organizations, and if necessary, the offsite emergency organizations. Recovery efforts will be suspended until the Emergency Recovery Manager allows them to resume.

9.2 TERMINATION CRITERIA

An emergency condition can be considered resolved, and a recovery organization established (if necessary) when the specific guidelines have been met. Some of the guidelines are:

.1 In-plant radiation levels are stable or are decreasing below acceptable levels with time.

.2 The release of radioactive material to the environment, greater than Technical Specifications, is under control or has ceased.

.3 Any fire, flooding, earthquake, or similar emergency conditions are under control or have ceased.

Termination from an emergency condition will be through joint evaluation by the organizations involved. In the case of a severe emergency involving offsite consequences, this would include the Emergency Recovery Manager, Emergency Director, the three states involved, and NRC. All emergency response and support organizations shall be notified of the termination of the emergency, and/or the initiation of recovery operations, in the same manner as was used for initial notification

9.3 RE-ENTRY

During the emergency response, it may become necessary for Site personnel to re-enter previously evacuated areas. In many cases the radiological conditions in these areas will be unknown. There may also be other unknown conditions in these areas which could place re-entry personnel at additional risk. The control of re-entry to these areas will depend on the nature of the initiating events, the extent of the affected area, and the radiological conditions and other hazards present. Emergency Implementing Procedures have been developed and implemented to provide guidance for re-entry activities. The Re-entry Emergency Implementing Procedure is divided into (a) re-entry team personnel and (b) necessary plant personnel. Re-entry of plant personnel will depend on information obtained by re-entry teams and present and future plant conditions. Significant provisions relative to re-entry to affected areas include:

.1 Re-entry will be by two-men (or more) teams. These personnel are directed to remain in voice or visual contact with each other while in the affected area. At least one individual in the team will be a Radcon Technician, or another individual appropriately qualified in radiation control procedures.

.2 With the exception of re-entries made for the purpose of saving human life, or performing necessary corrective actions, the exposure of re-entry personnel shall be limited to the occupational standards for radiation exposure established in 10 CFR 20.

9.4 RECOVERY

The Beaver Valley Power Station emergency organization shall continue to provide appropriate emergency response functions until such time as the emergency is terminated and/or a recovery organization is established. The Senior Vice President with the concurrence from the Company Nuclear Review Board and with the advice of the BVPS Emergency Recovery Manager may establish a recovery organization when the criteria of Section 9.2 have been met.

Although planning for recovery will vary according to the nature of the specific emergency situation, it is not expected that any recovery organization which may be necessary would differ significantly from the structure and staffing of the Nuclear Power Division described in Section 5 of this Plan and illustrated in Figure 5.1. The Nuclear Power Division is structured into functional areas and staffed by personnel competent in the various disciplines necessary for safe operation of the BVPS facilities under normal and emergency conditions. Since the Nuclear Power Division maintains office facilities either onsite or near the site, it is not necessary to identify working space for the recovery organization.

Upon activation of the recovery organization, the Senior Vice President, or alternate, will assume the role of Recovery Manager. In this capacity, the Recovery Manager will have the responsibility for directing and coordinating recovery operations. He will draw upon any necessary resources to support the recovery effort.

9.5 RECOVERY OPERATIONS

During recovery operations, the radiation exposure limits of 10 CFR 20 shall apply. Compliance with those limits shall be the responsibility of the Recovery Manager via the Health Physics organization.

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

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

9.6 POST-ACCIDENT EVALUATION

Following the termination of the response phase of the accident and the commencement of recovery operations, appropriate evaluations to assess Site conditions will be performed. The outcome of these evaluations will form the basis of recovery planning and licensee event reports to the USNRC. The scope of these evaluations will be consistent with the emergency classification, the nature of the initiating events, and the preliminary assessment of Site equipment status.

An integral part of these evaluations will be the periodic estimation of the total population exposure resulting from radioactivity releases during the emergency. Analysis will be performed to estimate population exposure from all applicable exposure pathways identified in Regulatory Guide 1.109 and the analysis will utilize monitoring and sampling data obtained during the incident and actual meteorology. The methodology for performing these analysis is provided in the environmental monitoring program described in the Offsite Dose Calculation Manual as it relates to compliance with 10 CFR 50 Appendix I requirements. Emergency Implementing Procedures provide guidance and methods for performing these analysis.

APPENDIX B
Demography and Evacuation Evaluation

APPENDIX B

DEMOGRAPHY AND EVACUATION EVALUATION

B.1 DEMOGRAPHY

The demography in the vicinity of the Beaver Valley Power Station was studied in detail as part of the Beaver Valley Power Station Final Safety Analysis Report (FSAR), and was re-studied as part of the Environmental Report of the BVPS-2 Safety Analysis Report. The results of these studies, which may have direct bearing on the emergency notification or implementation of other offsite protective measures are summarized in this Appendix.

B. 1. 1 General Population Distribution

The population within the 10-mile EPZ was approximately 122,750 in 2000. No community has a population in excess of 15,000. The major topographic features are the Ohio River and the Beaver River and the mountainous character of the area with numerous steep ridges and small valleys. As a result of this topography, a high percentage of the total population in this area is located along the banks of the rivers. Of the total 122,750 population, approximately 21,000 reside within 5 miles of the facility, the remainder reside between 5 and 10 miles from the facility.

The Low Population Zone (LPZ) has been designated as 3.6 miles. The population for the LPZ is approximately 7,000. This figure was derived from the 2000 census, interpolating the data from 3 miles and 4 miles.

B. 1.2 Transient Population

Seasonal fluctuations in population within the 0-5 mile area is negligible as there are no parks or recreational areas within this area. Raccoon State Park, located about 8 miles from the site had an approximate attendance of 480,000 for the year. In addition to Raccoon State Park, Tomlinson State Park, West Virginia is dissected by the 10-mfle EPZ boundary. The transient population segment includes persons in the work force, hotels/motels and recreation areas. Based on the 2003 Evacuation Time Estimate, the additional population during a summer weekend would be approximately 10,500 people.

B.1.3 Projected Population

The 2000 census data show the EPZ population to be 122,752, compared to 1980 figure of 193,000. The development of the area has been hampered by an outmoded highway system. The Beaver Valley Expressway will have an influence on the growth of the area. However, there are no plans at present for any other major highway construction. Difficulties in the steel industries, once a major employer in this area, has minimized significant population growth.

B.2 EVACUATION EVALUATION

A detailed study relative to evacuation of the BVPS 10-mile Emergency Planning Zone was conducted during 2003 by Earth Tech Inc. This study updated the 1980 by Alan W. Voorhees and Associates study. The Voorhees study was submitted to the USNRC in January 1980, included:

- Evaluation of the existing roads in the area relative to their capability to carry the traffic loads generated by an evacuation of all individuals from within the nominal 10-mile radius around the Beaver Valley Power Station.

- Identification and evaluation of mobility barriers such as river bridges, mountain ridges, deteriorated weather conditions, and flooding.

- Designation of concisely identifiable and comprehensive evacuation area boundaries.

- Identification of special populations have characteristics bearing on evacuation.

- Evaluation of public notification methods, including an evaluation of existing public warning capability, and recommendations for upgrading this capability.

- Evacuation time estimates, based on realistic measures for public notification, mobilization of all population segments, and movement to designated locations outside the 10-mile radius.

Table B-1 tabulates the evacuation time estimates for the analyzed evacuation zones. Figure B-2 illustrates the results of this evacuation study.

The study was coordinated with PEMA, BCEMA, HCOES, and CCEMA, and the results of the study were made available to those agencies to aid in the development of their respective evacuation plans. Copies of the 2003 study have also been provided to the above agencies.

TABLE B-1 EVACUATION TIME SUMMARY

	Population	Vehicles	Evacuation Times for Full EPZ (hours, minutes) 90%	100%
(a) Traditional Vehicle Demand for Residential Population				
Winter Day				
Fair Weather	164,514	65,222	3 hr 15 min	5 hr 16 min
Adverse Weather	164,514	65,222	4 hr 40 min	7 hr 22 min
Winter Night				
Fair Weather	130,634	55,178	2 hr 55 min	4 hr 21 min
Adverse Weather	130,634	55,178	3 hr 40 min	6 hr 5 min
Summer Weekend				
Fair Weather	135,351	56,567	2 hr 50 min	4 hr 18 min
Adverse Weather	135,351	56,567	3 hr 20 min	5 hr 17 min
(b) High Vehicle Demand for Residential Population				
Winter Day				
Fair Weather	164,514	89,066	4 hr 15 min	6 hr 57 min
Adverse Weather	164,514	89,066	6 hours	9 hr 45 min
Winter Night				
Fair Weather	130,634	79,022	3 hr 40 min	6 hr 4 min
Adverse Weather	130,634	79,022	5 hr 15 min	8 hr 18 min
Summer Weekend				
Fair Weather	135,351	80,411	3 hr 45 min	6 hr 1 min
Adverse Weather	135,351	80,411	4 hr 35 min	7 hr 24 min

From: Evacuation Time Estimates for the Beaver Valley Power Station, prepared by Earth Tech, Inc. (12/03)

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TABLE B-2 2000 POPULATION FIGURES

Beaver County, Pennsylvania		**88,468**
Cities and Boroughs		
Aliquippa	11,734	
Beaver	4,775	
Bridgewater	739	
Fallston	307	
Frankfort Springs	130	
Georgetown	182	
Glasgow	63	
Hookstown	152	
Industry	1,921	
Midland	3,137	
Monaca	6,286	
Ohioville	3,759	
Patterson Heights	670	
Shippingport	237	
South Heights	542	
	34,634	
Townships		
Brighton	8,024	
Center	11,492	
Chippewa (part)	2,270	
Greene	2,705	
Hanover	3,529	
Hopewell	13,254	
Independence	2,802	
Patterson	3,197	
Potter	580	
Raccoon	3,397	
South Beaver (part)	1133	
Vanport	1,451	
	53,834	

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TABLE B-3 2000 POPULATION FIGURES

Columbiana County, Ohio		22,627
Cities and Villages		
East Liverpool	12,152	
Townships		
Liverpool	4,250	
Middleton	290	
St. Clair	5,935	
	10,475	
Hancock County, West Virginia		11,657

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Figure B-1

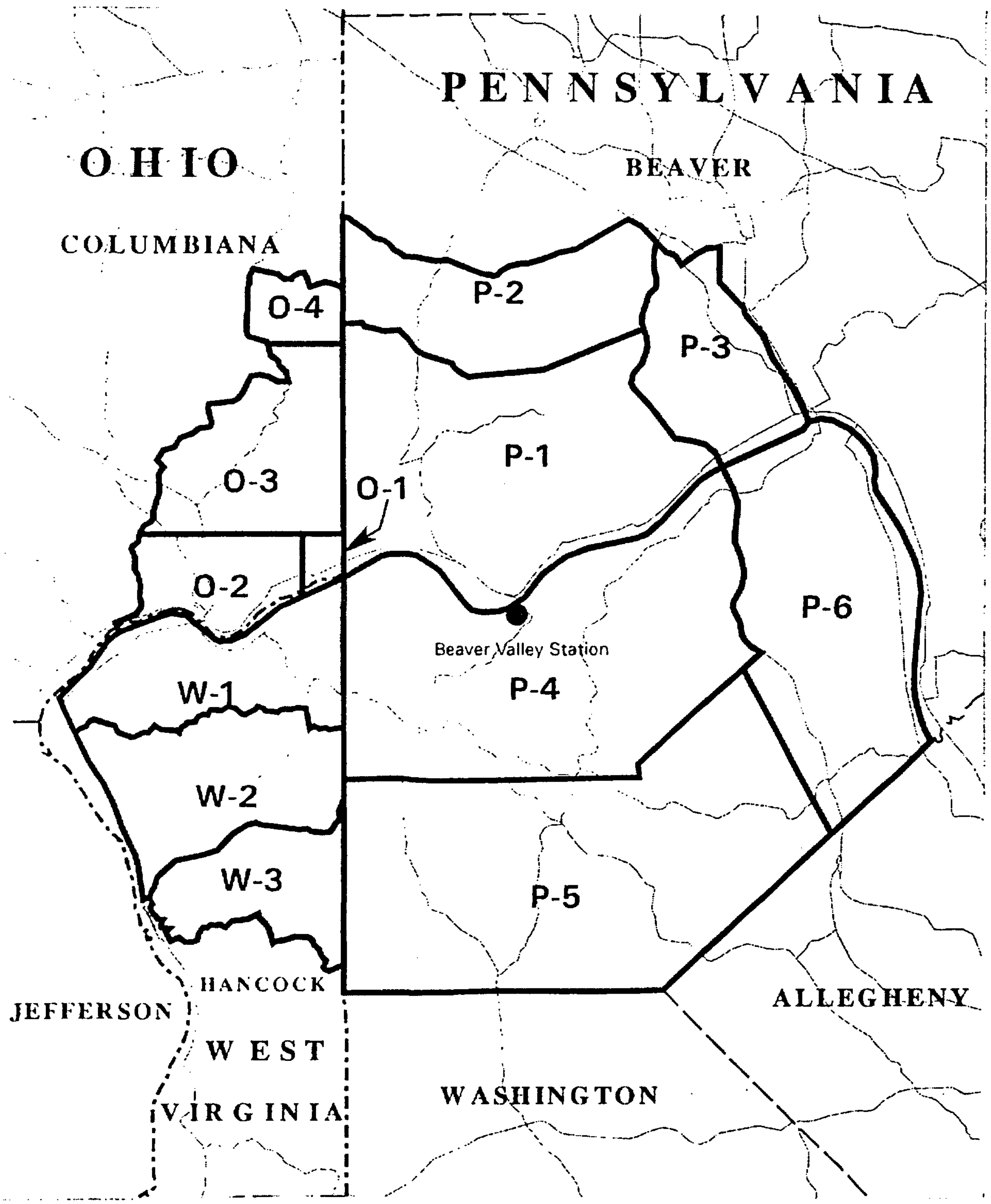
PENNSYLVANIA
OHIO
BEAVER
COLUMBIANA
O-4
P-2
P-3
P-1
O-3
O-1
O-2
P-6
Beaver Valley Station
W-1
P-4
W-2
W-3
P-5
HANCOCK
JEFFERSON
ALLEGHENY
WEST
VIRGINIA
WASHINGTON

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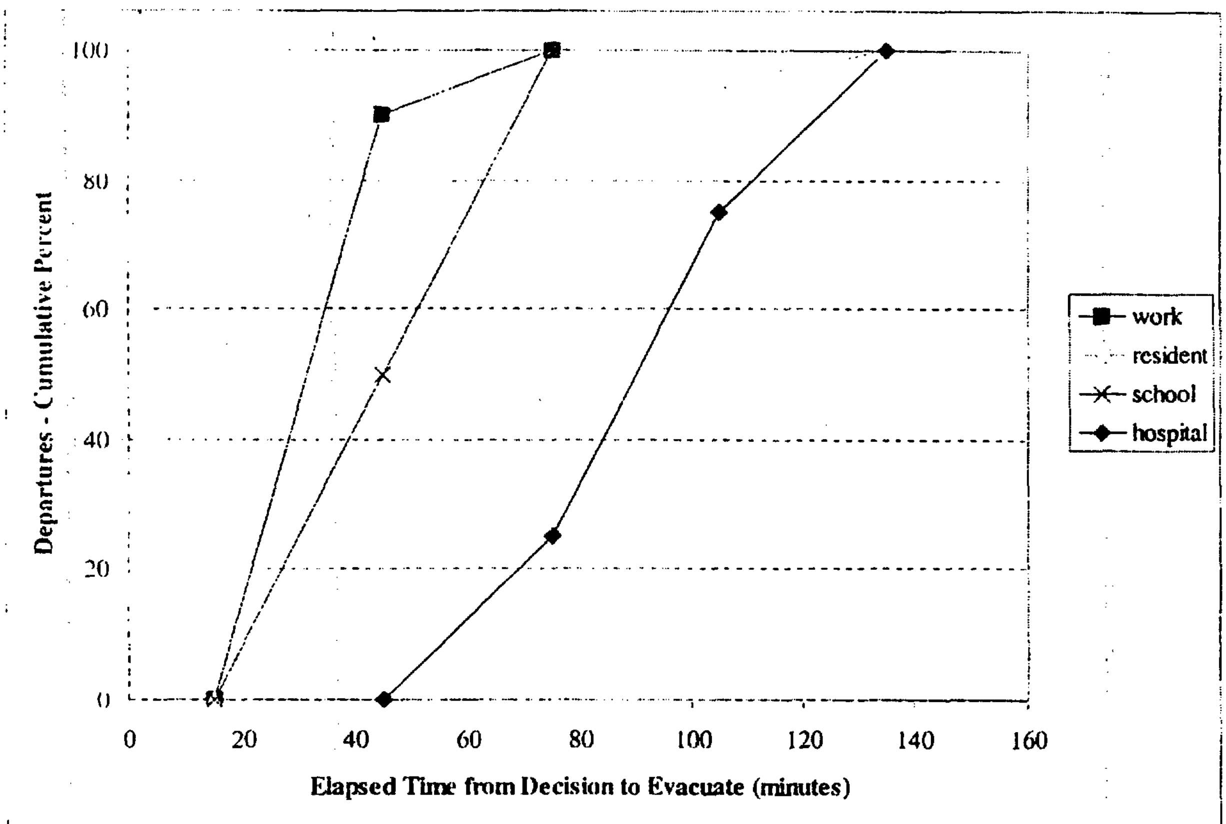
TABLE B-4 RESIDENT POPULATION

County	Sub-Area	Distance	Population
Beaver	P-1	0-5 miles	12,617
	P-2	5-10 miles	2,861
	P-3	5-10 miles	15,968
	P-4	0-5 miles	7,804
	P-5	5-10 miles	6,461
	P-6	5-10 miles	42,752
County Total			88,468
Columbiana	O-1	0-5 miles	579
	O-2	5-10 miles	16,589
	O-3	5-10 miles	5,294
	O-4	5-10 miles	165
County total			22,627
Hancock	W-1	5-10 miles	6,992
	W-2	5-10 miles	2,693
	W-3	5-10 miles	1,972
County total			11,657
Total Beaver Valley EPZ			122,752

Figure B-2


100
80
60
40
20
0
Departures - Cumulative Percent
0
20
40
60
80
100
120
140
160
Elapsed Time from Decision to Evacuate (minutes)
work
resident
school
hospital

APPENDIX D

Emergency Equipment Listings

CONTROLLED
BVPS UNIT 1/2

APPENDIX D

EMERGENCY EQUIPMENT LISTINGS

The listings contained herein are represented of the equipment typically in place. Inventory lists used to ensure availability of appropriate equipment are controlled by Emergency Preparedness Administrative Procedures.[C3]

Enclosures

1. Typical Decontamination Equipment
2. Typical Ambulance Contamination Control Material
3. Typical Hospital Contamination Control Material
4. Typical Emergency Control Room Equipment
5. Typical Emergency Squad Equipment
6. Typical Monitoring Team Equipment
7. BVPS Unit 1 Radiation Monitoring System (RMS)
8. BVPS Unit 2 Digital Radiation Monitoring System (DRMS)
9. Typical Technical Support Center Equipment
10. Typical Operations Support Center Equipment

APPENDIX D - Enclosure 1

Typical Decontamination Equipment
(Available at BVPS)

Decontamination procedures

Protective clothing

Decontamination agents and equipment

Poly bags

Contamination monitoring instruments are drawn from normal storage locations and carried by the Radiation Technician. Detailed inventory lists are provided to be utilized in the required inventories.

APPENDIX D - Enclosure 2

Typical Ambulance Contamination Control Material
(Available at BVPS)

Contamination control supplies for minimizing contamination of ambulances used to transfer contaminated/injured personnel are provided at the Station. Exposure control items are provided for personnel involved with the transfer. These supplies typically include:

Blotting paper

Poly bags

Protective clothing

Lead blankets

Adhesive tape

Contamination monitoring instruments and anti-c's are maintained in Radiation Technician Response Kits. Dosimetry is drawn from normal storage locations and carried by the Radiation Technician escorting the transfer. Detailed lists are provided to be utilized in the required inventories.

APPENDIX D - Enclosure 3

Typical Hospital Contamination Control Material

Beaver Valley Power Station maintains an inventory of contamination control material at the local hospitals to which contaminated/injured personnel may be transferred from the station. Typically, this equipment includes:

- Blotting paper
- Water proof, non-skid sheeting
- Yellow Poly bags
- Step-off-pads
- Sample bottles/vials/eye droppers
- Adhesive tape
- Protective clothing
- Rubber gloves
- Radioactive material labels/tags/tape
- GM Tube frisking instrument

Additional contamination monitoring instruments are available in Response Kits carried by the Radiation Technician who escorts the contaminated/injured person to the hospital. Inventory lists for this equipment are provided to be utilized in the required inventories.

APPENDIX D - Enclosure 4

Typical Control Room Equipment

Controlled copy of the BVPS Emergency Preparedness Plan and Emergency Implementing Procedures.

System Prints

BVPS EPZ Map (wall mounted)

BVPS EPZ Maps

Dose projection material maintained in OSC

Radio and telephone equipment

Stationary supplies (pencils, paper, tape, etc.)

Inventory lists are provided to be utilized in the required inventories.

APPENDIX D - Enclosure 5

Typical Emergency Squad Equipment

First Aid Kits

SCBA Equipment

Protective clothing

Respirators

Flashlights and batteries

Rope

Appropriate dosimetry

Splints

Emergency blankets

Firefighting equipment

Inventory lists are provided to be utilized in the required inventories and Fire Plan.

APPENDIX D - Enclosure 6

Typical Monitoring Team Equipment

Appropriate Emergency Implementing Procedures

Sample Containers

Rope

Flashlights and batteries

Raincoats

Rubber gloves

Pencils, pens, paper

Adhesive labels

Saran Wrap

GM survey instruments

Ion chamber instrument

Appropriate dosimetry

Timepieces

Air samplers (AC or battery operated)

Air sampler media (charcoal, silver, zeolite, filter paper)

Survey/monitoring maps

Clipboards

Potassium Iodide

Poly bags

APPENDIX D - Enclosure 6 (Continued)

Typical Monitoring Team Equipment

Adhesive tape

Protective clothing

Respirators

The following equipment is provided for radiological support of normal operations, but would be available to supplement the equipment specifically designated for emergency use.

Portable contamination monitors (friskers)

Beta-gamma survey instruments

Portable area radiation monitors

High range beta-gamma survey instruments

Portable neutron count rate meters

Alpha count rate meters

Thermoluminescent dosimeter (TLD) reader

Whole body counter

Alpha/beta laboratory counter

Liquid scintillation beta counter

Gamma spectrometer

Portable air particulate monitors

Continuous air particulate monitors (CAMs)

Portable air samplers (battery and AC operated)

APPENDIX D - Enclosure 7
BVPS UNIT NO. 1 RADIATION MONITORING SYSTEM (RMS)

MONITORING		FUNCTION		MONITOR LOCATION
1.	VS-101A,B	AUX. BLDG. VENTILATION AND CONTAINMENT PURGE	(GAS & PARTICULATE)	752" AUX. BLDG.
	VS-109	AUX. BLDG. VENTILATION AND CONTAINMENT PURGE	(GAS. PART. & IODINE)*	752' AUX. BLDG.
	VS-111	AUX. BLDG. VENTILATION AND CONTAINMENT PURGE	(GAS)*	768' AUX. BLDG.
2.	VS-102A,B	AUXILIARY BUILDING VENTILATION	(GAS)	752' AUX. BLDG.
3.	VS-103A,B	FUEL BUILDING VENTILATION	(GAS)	768' FUEL BLDG.
4.	VS-104A,B	CONTAINMENT PURGE EXHAUST (Not in service during operation)		CNMT. PURGE DUCT
5.	VS-105	LEAK COLLECTION AREAS	(GAS)	752' AUX. BLDG.
6.	VS-106	WASTE GAS DECAY TANK VAULT	(GAS)	752' AUX. BLDG.
7.	VS-107A,B	SUPPLEMENTARY LEAK COLLECTION SYSTEM	(GAS & PARTICULATE)	752' AUX. BLDG.
	VS-110	SUPPLEMENTARY LEAK COLLECTION SYSTEM	(GAS, PART. & IODINE)*	752' AUX. BLDG.
	VS-112	SUPPLEMENTARY LEAK COLLECTION SYSTEM	(GAS)+	768' AUX. BLDG.
8.	GW-108A,B	PROCESS VENT EFFLUENT	(GAS & PARTICULATE)	752' AUX. BLDG.
	GW-109	PROCESS VENT EFFLUENT	(GAS & PART. & IODINE)*	752' AUX. BLDG.
	GW-110	PROCESS VENT EFFLUENT	(GAS & PARTICULATE)+	768' AUX. BLDG.
9.	RM-215A,B	CONTAINMENT ATMOSPHERE	(GAS & PARTICULATE)	752' AUX. BLDG.
10.	RM-217A,B	MULTI-SAMPLE MONITOR PAB AREAS	(GAS & PARTICULATE)	752' AUX. BLDG.
11.	MS-100A	"A" STEAM GENERATOR STEAM RELIEF EFFLUENT	(STEAM)	M.S. VALVE RM. ROOF
12.	MS-100B	"B" STEAM GENERATOR STEAM RELIEF EFFLUENT	(STEAM)	M.S. VALVE RM. ROOF
13.	MS-100C	"C" STEAM GENERATOR STEAM RELIEF EFFLUENT	(STEAM)	M.S. VALVE RM. ROOF
14.	MS-101	AUX. FEEDWATER PUMP TURBINE EXHAUST	(STEAM)	M.S. VALVE RM. ROOF
15.	AS-100	AUX. STEAM CONDENSATE	(LIQUID)	735' AUX. BLDG.
16.	BD-101	STEAM GENERATOR BLOWDOWN	(LIQUID)	693' TURB. BLDG.
17.	SS-100	STEAM GENERATOR BLOWDOWN	(LIQUID)	735' AUX. BLDG.
18.	CCR-100	COMPONENT COOLING WATER	(LIQUID)	722' AUX. BLDG.
19.	RW-100	RIVER WATER FOR COMPONENT COOLING AND RECIRC. SPRAY HEAT EXCHANGERS	(LIQUID)	697' TURB. BLDG.
20.	RW-100A,B,C,D	RECIRC. SPARY HEAT EXCHANGERS RIVER WATER	(LIQUID)	722' SAFEGUARDS
21.	RW-101	COMPONENT COOLING HEAT EXCHANGER RIVER WATER	(LIQUID)	735' AUX. BLDG.
22.	CH-101A,B	REACTOR COOLANT LETDOWN	(LIQUID)	722' AUX. BLDG.
23.	LW-104	LIQUID WASTE EFFLUENT	(LIQUID)	722' AUX. BLDG.
24.	LW-116	LIQUID WASTE EFFLUENT	(LIQUID)	722' AUX. BLDG.
25.	DA-100	AUXILIARY FEEDWATER AREA	(LIQUID)	722' SAFEGUARDS
26.	SV-100	CONDENSER AIR EJECTOR	(GAS)	713' TURB. BLDG.
27.	RM-201	AREA RADIATION		OUTSIDE AIRLOCK
28.	RM-202	AREA RADIATION		767' CONTAINMENT
29.	RM-203	AREA RADIATION - CONTAINMENT FUEL MANIPULATOR CRANE (NOT IN SERVICE DURING OPERATION)		767' CONTAINMENT

* Special Particulate, iodine, Noble Gas - SPING
\+ SA9/SA10 Units

APPENDIX D - Enclosure 7
BVPS UNIT NO. 1 RADIATION MONITORING SYSTEM (RMS)

MONITORING		FUNCTION	MONITOR LOCATION
30.	RM-204	AREA RADIATION - INCORE INSTRUMENT ROOM	738' CONTAINMENT
31.	RM-205	AREA RADIATION	735' DECON BLDG.
32.	RM-206	AREA RADIATION - NEW FUEL STORAGE	752' FUEL BLDG.
33.	RM-207	AREA RADIAITON - FUEL POOL BRIDGE	767' FUEL BLDG.
34.	RM-208	AREA RADIATION	735' SOLID WASTE
35.	RM-209	AREA RADIATION	722' AUX. BLDG.
36.	RM-210	AREA RADIATION	752' AUX. BLDG.
37.	RM-211	AREA RADIATION	722' AUX. BLDG.
38.	RM-212	AREA RADIAITON - CHEMISTRY SAMPLE AREA	735' AUX. BLDG.
39.	RM-214	AREA RADIATION	RADIOCHEM. LAB
40.	RM-218A,B	AREA RADIATION	CONTROL ROOM
41.	RM-219A,B	AREA RADIATION - CONTAINMENT HIGH RANGE	767' CONTAINMENT

* Special Particulate, iodine, Noble Gas - SPING
\+ SA9/SA10 Units

APPENDIX D - Enclosure 8
BVPS UNIT NO. 2 DIGITAL RADIATION MONITORING SYSTEM (DRMS)

MONITORING		FUNCTION		MONITOR LOCATION
1.	2ARC-RQI100	AIR EJECTOR DISCHARGE	(GAS)	752-6 TURB. BLDG.
2.	2CCP-RQI100	COMPONENT COOLING WATER	(LIQUID)	718-6 AUX. BLDG.
3.	2CHS-RQI100	REACTOR COOLANT LETDOWN HIGH/LOW	(LIQUID)	718-6 AUX. BLDG.
4.	2CNA-RQI100	AUXILIARY STEAM CONDENSATE	(LIQUID)	718-6 AUX. BLDG.
5.	2CNA-RQI101	EVAPORATION REBOILER CONDENSATE	(LIQUID)	722-6 WASTE HNDLG.
6.	2GWS-RQI102	GASEOUS WASTE SURGE TK TRANSFER LINE	(GAS)	735-6 AUX. BLDG.
7.	2GWS-RQI102	AIR EJECTOR DELAY BED EXHAUST	(GAS)	755-6 AUX. BLDG.
8.	2GWS-RQI103	AERATED VENT TRANSFER LINE	(GAS)	735-6 AUX. BLDG.
9.	2GWS-RQI104	WASTE GAS STORAGE TANK	(GAS)	735-6 DECON BLDG.
10.	2HVL-RQI112	CONDENSATE POLISHING VENT STACK	(GAS & PARTICULATE)	794-6 COND. POL.
11.	2HVR*RQ104A	CONTAINMENT PURGE	(GAS)	782-CNMT.
12.	2HVR*RQ104B	CONTAINMENT PURGE	(GAS)	782 CNMT.
13.	2HVS-RQI101	VENTILATION VENT	(GAS & PARTICULATE)	773-6 AUX. BLDG.
14.	2HVS*RQ 109A	ELEVATED RELEASE (PARTICULATE)	(PARTICULATE)	773-6 AUX. BLDG.
15.	2HVS*RQ 109B	ELEVATED RELEASE (LOW RANGE)	(GAS)	773-6 AUX. BLDG.
16.	2HVS*RQ 109C	ELEVATED RELEASE (MID RANGE)	(GAS)	773-6 AUX. BLDG.
17.	2HVS*RQ 109D	ELEVATED RELEASE (HIGH RANGE)	(GAS	773-6 AUX. BLDG.
18.	2MSS*RQI101A	MAIN STEAM LINE	(STEAM)	745-6 SERVICE BLDG.
19.	2MSS*RQI101B	MAIN STEAM LINE	(STEAM)	745-6 SERVICE BLDG.
20.	2MSS*RQI101C	MAIN STEAM LINE	(STEAM)	745-6 SERVICE BLDG.
21.	2RMC*RQ201	CONTROL ROOM AREA		CONTROL BLDG.
22.	2RMC*RQ202	CONTROL ROOM AREA		CONTROL BLDG.
23.	2RMC-RQI301	CONTROL ROOM AIRBORNE	(GAS & PARTICULATE)	CONTROL BLDG.
24.	2RMF-RQ201	NEW FUEL STORAGE AREA		755-4 FUEL BLDG.
25.	2RMF-RQ202	FUEL PIT BRIDGE		FUEL BLDG.
26.	2RMF-RQI301	FUEL BUILDING VENTILATION	(GAS & PARTICULATE	766-4 FUEL BLDG.
27.	2RMJ-RQ201	WASTE HANDLING - 722 AREA		722-6 WASTE HANDLING
28.	2RMJ-RQ202	WASTE HANDLING - 755 AREA		WASTE HANDLING
29.	2RMJ-RL202	WASTE HANDLING - 755 AREA		WASTE HANDLING
30.	2RMJ-RQ203	WASTE HANDLING - 735 AREA		WASTE BLDG.
31.	2RMJ-RL203	WASTE HANDLING - 735 AREA		WASTE HANDLING
32.	2RMJ-RQ204	WASTE HANDLING - 735 AREA		WASTE HANDLING
33.	2RMJ-RQI301	WASTE HANDLING BUILDING	(GAS & PARTICULATE)	733-6 AUX. BLDG.
34.	2RML-RQ201	CONDENSATE POLISHING - 722 AREA		722-6 COND. POL.
35.	2RML-RQ202	CONDENSATE POLISHING - 735 AREA		735-5 COND. POL.
36.	2RML-RQ203	CONDENSATE POLISHING - 752 AREA		752-6 COND. POL.
37.	2RML-RQ204	CONDENSATE POLISHING - 744 AREA		744-6 COND. POL.
38.	2RML-RQ205	CONDENSATE POLISHING - 735 AREA		735-6 COND. POL.
39.	2RML-RQ206	CONDENSATE POLISHING - 735 AREA		735-6 COND. POL.
40.	2RML-RQI301	CONDENSATE POLISHING BLDG. AIRBORNE	(GAS & PARTICULATE)	794-6 COND. POL.
41.	2RMP-RQ201	AUXILIARY BUILDING - 710 AREA		718-6 AUX. BLDG.
42.	2RMP-RQ202	AUXILIARY BUILDING - 710 AREA		718-6 AUX. BLDG.

APPENDIX D - Enclosure 8
BVPS UNIT NO. 2 DIGITAL RADIATION MONITORING SYSTEM (DRMS) (Cont.)

MONITORING		FUNCTION		MONITOR LOCATION
43.	2RMP-RQ203	AUXILIARY BUILDING - 710 AREA		718-6 AUX. BLDG.
44.	2RMP-RQ204	AUXILIARY BUILDING - 735 AREA		735-6 AUX. BLDG.
45.	2RMP-RQ205	AUXILIARY BUILDING - 735 AREA		735-6 AUX. BLDG.
46.	2RMP-RQ206	AUXILIARY BUILDING - 735 AREA		755-6 AUX. BLDG.
47.	2RMP-RQ207	AUXILIARY BUILDING - 755 AREA		755-6 AUX. BLDG.
48.	2RMP-RQ208	AUXILIARY BUILDING - 755 AREA		755-6 AUX. BLDG.
49.	2RMP-RQ209	AUXILIARY BUILDING - 773 AREA		733-6 AUX. BLDG.
50.	2RMP-RQ210	AUX. BLDG. SAMPLE ROOM AREA		718-6 AUX. BLDG.
51.	2RMP-RL210	AUX. BLDG. SAMPLE ROOM AREA		718-6 AUX. BLDG.
52.	2RMP-RQI300	AUXILIARY BUILDING 718A	(GAS & PARTICULATE)	735-6 AUX. BLDG.
53.	2RMP-RQI302	AUXILIARY BUILDING 718B	(GAS & PARTICUALTE)	735-6 AUX. BLDG.
54.	2RMP-RQI304	AUXILIARY BUILDING 718C	(GAS & PARTICULATE)	735-6 AUX. BLDG.
55.	2RMP-RQI306	AUXILIARY BUILDING 735A	(GAS & PARTICULATE)	735-6 AUX. BLDG.
56.	2RMP-RQI308	AUXILIARY BUILDING 735B	(GAS & PARTICULATE)	735-6 AUX. BLDG.
57.	2RMP-RQI310	AUXILIARY BUILDING 755A	(GAS & PARTICULATE)	755-6 AUX. BLDG.
58.	2RMP-RQI312	AUXILIARY BUILDING 755B	(GAS & PARTICULATE)	755-6 AUX. BLDG.
59.	2RMQ-RQ201	DECONTAMINATION AREA		749-6 DECON. BLDG.
60.	2RMQ-RQI301	DECONTAMINATION BUILDING	(GAS & PARTICULATE)	766-4 FUEL BLDG.
61.	2RMQ-RQI303	WASTE GAS STORAGE VAULT	(GAS & PARTICULATE)	735-6 DECON. BLDG.
62.	2RMR-RQ201	REACTOR CONTAINMENT LOW RANGE		767' CONTAINMENT
63.	2RMR-RL201	REACTOR CONTAINMENT LOW RANGE		767' CONTAINMENT
64.	2RMR-RQ202A	OUTSIDE PERSONNEL HATCH AREA		767' CABLE VAULT & ROD CONT.
65.	2RMR-RQ202B	OUTSIDE PERSONNEL HATCH AREA		767' CABLE VAULT & ROD CONT.
66.	2RMR-RL202	OUTSIDE PERSONNEL HATCH AREA		767' CABLE VAULT & ROD CONT.
67.	2RMR-RQ203	MANIPULATOR CRANE	CONTAINMENT	CONTAINMENT
68.	2RMR-RL203	MANIPULATOR CRANE		CONTAINMENT
69.	2RMC-RQ202A	U2 CONTROL ROOM		CONTROL ROOM
70.	2RMC-RQ202B	U2 CONTROL ROOM		CONTROL ROOM
71.	2RMR-RQ204	INCORE INSTRUMENTATION AREA		743-4 CONTAINMENT
72.	2RMR-RL204	INCORE INSTRUMENTATION AREA		743-4 CONTAINMENT
73.	2RMR-RQ205A	SAFEGUARDS RECOMBINER AREA		742-0 SAFEGUARDS
74.	2RMR-RQ205B	SAFEGUARDS RECOMBINER AREA		742-0 SAFEGUARDS
75.	2RMR*RQ206	INCONTAINMENT HIGH RANGE		CONTAINMENT
76.	2RMR*RL206	INCONTAINMENT HIGH RANGE		CONTAINMENT
77.	2RMR*RL207	INCONTAINMENT HIGH RANGE		CONTAINMENT
78.	2RMR*RL207	INCONTAINMENT HIGH RANGE		CONTAINMENT

APPENDIX D - Enclosure 8
BVPS UNIT NO. 2 DIGITAL RADIATION MONITORING SYSTEM (DRMS) (Cont.)

MONITORING		FUNCTION		MONITOR LOCATION
79.	2RMR-RQI301	LEAK COLLECTION VENTILATION	(GAS & PARTICULATE)	773-6 AUX. BLDG.
80.	2RMR-RQI303	CONTAINMENT AIRBORNE	(GAS & PARTICUALTE)	738-10 CABLE VAULT & ROD CONT.
81.	2RMS-RQ221	SPARE		
82.	2RMS-RQ222	SPARE		
83.	2RMS-RQ223	PRIMARY ACCESS FACILITY AREA		
84.	2RMS-RQ224	SPARE		
85.	2SGC-RQI100	LIQUID WASTE PROCESS EFFLUENT	(LIQUID)	718-6 AUX. BLDG.
86.	2SSR-RQI100	STEAM GENERATOR BLOWDOWN	(LIQUID)	718-6 AUX. BLDG.
87.	2SWS*RQI100A	RECIRC. SPRAY Hx SW	(LIQUID)	759-0 DIESEL GEN.
88.	2SWS*RQI100B	RECIRC. SPRAY Hx SW	(LIQUID)	759-0 DIESEL GEN.
89.	2SWS*RQI100C	RECIRC. SPRAY Hx SW	(LIQUID)	759-0 DIESEL GEN.
90.	2SWS*RQI100D	RECIRC. SPRAY Hx SW	(LIQUID)	759-0 DIESEL GEN.
91.	2SWS*RQI101	COMPONENT COOLING SW	(LIQUID)	710-6 AUX. BLDG.
92.	2SWS-RQI102	COMPONENT COOLING Hx SW	(LIQUID)	710-6 AUX. BLDG.

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APPENDIX D - Enclosure 9

Typical Technical Support Center Equipment

Controlled copy of BVPS Emergency Preparedness Plan and Emergency Implementing Procedures.

BVPS EPZ Map (wall mounted)

Systems Status Boards

Keys to Files (manuals, procedures, engineering drawings)

Stationary Supplies

Blank data forms and logs

APPENDIX D - Enclosure 10)

Typical Operations Support Center Equipment

Appropriate dosimetry

Respirators (and Iodine sorbent canisters)

Anti-contamination clothing

Air Sampler and filter media

Potassium Iodide tablets

Contamination and access control material (poly bags, tape, signs, barriers)

Stationary supplies (pens, paper)

Survey instruments

APPENDIX E

Corporate Policy Statement

FENOC

Beaver Valley Power Station
P.O. Box 4
Shippingport, PA 15077

L. William Pearce
Vice President

724-682-5234
Fax: 724-643-8069

July 12, 2004

Beaver Valley Power Station Emergency Director
Letter of Authority

Immediate response, assessment and the implementation of protective and corrective measures pertaining to an emergency condition at the Beaver Valley Power Station shall be the responsibility of the BVPS Emergency Director. The individual who shall act in the capacity of BVPS Emergency Director is determined as follows:

> Immediately upon occurrence of an emergency, the Operations Shift Manager on duty at the affected Unit shall assume the role of BVPS Emergency Director. The Operations Shift Manager shall continue to perform the functions of the BVPS Emergency Director, as described in the BVPS Emergency Preparedness Plan, until relieved of that responsibility by the designated alternate (i.e., Shift Manager, TSC Emergency Director/Assistants).

The BVPS Emergency Director shall implement applicable portions of the BVPS Emergency Preparedness Plan to prevent or mitigate the consequences of emergencies at the Beaver Valley Power Station. They shall have the authority to act on behalf of Beaver Valley Power Station in all matters concerning an emergency, at least until such time as the scope, severity, and potential radiological consequences have been assessed, and the appropriate protective and corrective actions have been implemented, or until relieved of this responsibility by higher BVPS Management. Following this critical period, major decisions and corporate commitments are the responsibility of BVPS Management. For a Site Area Emergency or General Emergency, the Emergency Recovery Manager at the Emergency Operations Facility will assume overall responsibility and authority for the BVPS response to the emergency.

Throughout the course of an emergency condition, all expertise and support available within the BVPS organization shall be provided at the request of the BVPS Emergency Director or the Emergency Recovery Manager, as appropriate, depending upon the emergency classification.

L. W. Pearce

L. William Pearce
Vice President

FENOC

FirstEnergy Nuclear Operating Company

Beaver Valley Power Station
P.O. Box 4
Shippingport, PA 15077

L. William Pearce
Vice President

724-682-5234
Fax: 724-643-8069

July 12, 2004

Beaver Valley Power Station
Emergency Response Organization (ERO)
Responsibilities and Requirements

All employees, consultants and vendors at Beaver Valley Power Station (BVPS) are responsible for fulfilling the responsibilities and requirements assigned under the Emergency Preparedness Plan and Implementing Procedures for actual events, drills and exercises.

Management employees of the Beaver Valley Power Station are expected to participate as a member of the Emergency Response Organization (ERO). This participation includes acceptance of the duties and responsibilities associated with being a member of the ERO.

Individuals identified as being a member of the "On-Call" ERO shall remain fit-for-duty per NOP-LP-1002, as applicable, and be capable of responding to their Emergency Response Facility within their designated response time. If unable to meet their "On-Call" responsibility, the respective individual is responsible for obtaining a replacement and providing the necessary notification to the Emergency Preparedness Department.

It is the responsibility of the individual ERO member to ensure that they remain qualified by attending scheduled training classes annually (every 12 months) and by participating in scheduled drills and exercises. Supervisors are responsible for ensuring that ERO members under their control are able to attend scheduled training classes, drills and exercises.

Participation by an individual during their respective ERO team's scheduled drill and exercise is required. Any exemptions must be approved by the responsible Emergency Recovery Manager. If approved, the respective individual is responsible for obtaining a replacement for participation in the drill or exercise and arranging to participate in an alternate drill or exercise to maintain qualification.

It is my expectation that ERO personnel participate in ERO response activities and maintain their qualifications in order to adequately respond to an emergency condition at Beaver Valley Power Station.

L. W. Pearce

L. William Pearce
Vice President

APPENDIX G

REFERENCES

APPENDIX G

REFERENCE

C1	-	CR# 980708
C2	-	CR# 980706
C3	-	CR#980480
C4	-	NPDAP 5.1 "Report Requirements"
C5	-	Unit 2 Licensing Condition 2.C(6)
C6	-	CR#992882
C7	-	CR#990012
C8	-	CR#00-0616
C9	-	CR#00-0617
C10	-	CR#00-0618
C11	-	CR#00-0615
C12	-	CR#01-0246
C13	-	CR#01-1168
C14	-	CR#00-3939
C15	-	CR#00-2202
C16	-	CR#01-0246
C17	-	CR#99-1234
C18	-	CR#01-1011

APPENDIX G

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C19 - CR#01-3556

C20 - LAR #295 and #166 (Letter Number L-01-103, 8/13/01, PASS Elimination, CR# 01-2107)

C21 - CR#02-02195 and NRC Inspection Report 50-334/02-03, 50-412/02-03, dated 4/12/02

C22 - CR#02-02524

C23 - CA's # 01-6025-6, 01-3198-98, 02-00444-5

C24 - CA #02-00444-4

C25 - CA's #02-0667-01, 02-07647-06

C26 - CR's #02-08649, 02-09224

C27 - CR#02-09061-01

C28 - CR#03-01371

C29 - CA# 02-02195-8

C30 - CR#04-00104

C31 - CA#03-02202-15
(Includes deletion of Section 7, Figures and Tables

C32 - CA#03-09983-1

C33 - CA#04-01302-1

C34 - CA#03-12278-01

C35 - CA#04-02011-14

C36 - CA#03-02202-15

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C37	-	CA#03-06133-1
C38	-	CA#03-06133-2
C39	-	CA#03-06133-3
C40	-	CA#03-06133-6
C41	-	CA#03-12097-1
C42	-	CA-03-16133-4
C43	-	CA#04-05163

The Emergency Preparedness Plan/NUREG-0654 Cross Reference was developed using the following documents:

NUREG-0654, Rev. 1	November 1980
EPP Section 1	Rev. 10
EPP Section 2	Rev. 10
EPP Section 3	Rev. 10
EPP Section 4	Rev. 11
EPP Section 5	Rev. 10
EPP Section 6	Rev. 10
EPP Section 7	Rev. 10
EPP Section 8	Rev. 10 Unless Otherwise Noted
EPP Section 9	Rev. 10
EPP Appendix A	Rev. 10
EPP Appendix B	Rev. 10
EPP Appendix C	Rev. 10
EPP Appendix D	Rev. 10
EPP Appendix E	Rev. 10
EPP Appendix F	Rev. 10

NUREG-0654 CROSS REFERENCE

Reference	Emergency Plan Reference
NUREG-0654, Section II.A.1.a	Paragraph 5.5 Paragraph 5.6.1 Paragraph 5.6.2
NUREG-0654, Section II.A.1.b	Paragraph 5.2 Paragraph 5.3 Paragraph 5.4
NUREG-0654, Section II.A.1.c	Figures 5.1 through 5.5 Section 5.6
NUREG-0654, Section II.A.1.d	Paragraph 5.2.1 Paragraph 5.2.2
NUREG-0654, Section II.A.1.e	Paragraph 5.2 Tables 6.1 and 6.2
NUREG-0654, Section II.A.3	Paragraph 8.3.d Appendix A
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NUREG-0654, Section II.B.1	Figure 5.2
NUREG-0654, Section II.B.2	Paragraph 5.2.1 Paragraph 5.2.2 Appendix E
NUREG-0654, Section II.B.3	Paragraph 5.2.1 Paragraph 5.2.3
NUREG-0654, Section II.B.4	Paragraph 5.2.1
NUREG-0654, Section II.B.5	Paragraph 5.2 Table 5.1
NUREG-0654, Section II.B.6	Paragraph 5.5 Figure 5.6
NUREG-0654, Section II.B.7	Paragraph 5.2 Table 5.1
NUREG-0654, Section II.B.7.a	Paragraph 5.2.18

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NUREG-0654, Section II.B.7.b	Paragraph 9.3 Paragraph 9.4
NUREG-0654, Section II.B.7.c	Paragraph 5.2.19 Paragraph 5.2.2
NUREG-0654, Section II.B.7.d	Paragraph 5.3
NUREG-0654, Section II.B.8	Paragraph 5.5.2 Paragraph 5.5.3 Paragraph 5.5.4
NUREG-0654, Section II.B.9	Paragraph 5.5.5 Appendix A
NUREG-0654, Section II.C.1.a	Paragraph 5.2.1.7 Paragraph 5.2.2.6
NUREG-0654, Section II.C.1.b	Paragraph 5.6.2
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NUREG-0654, Section II.C.2.b	Paragraph 5.6.1
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NUREG-0654, Section II.E.2	Paragraph 7.6
NUREG-0654, Section II.E.3	Paragraph 6.4.1

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NUREG-0654, Section II.E.4	Paragraph 6.4.2
NUREG-0654, Section II.E.4.a	Paragraph 6.4.2
NUREG-0654, Section II.E.4.b	Paragraph 6.4.2
NUREG-0654, Section II.E.4.c	Paragraph 6.4.2
NUREG-0654, Section II.E.4.d	Paragraph 6.4.2
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NUREG-0654, Section II.E.4.m	Paragraph 6.4.2
NUREG-0654, Section II.E.4.n	Paragraph 6.4.2
NUREG-0654, Section II.E.6	Paragraph 3.3.3 Appendix F

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NUREG-0654, Section II.E.7	Paragraph 6.7.2.5
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NUREG-0654, Section II.G.4.b	Paragraph 5.3.1 Paragraph 5.3.2
NUREG-0654, Section II.G.4.c	Paragraph 5.3.4.1
NUREG-0654, Section II.G.5	Paragraph 8.1.2.f
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NUREG-0654, Section II.I.2	Paragraph 7.4.1 Paragraph 7.4.1.6
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NUREG-0654, Section II.J.10.b	Appendix B, Figure B-1

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NUREG-0654, Section II.J.10.c	Appendix F
NUREG-0654, Section II.J.10.m	Appendix B Paragraph 6.7.1.2
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NUREG-0654, Section II.K.6.b	Paragraph 6.7.1.6
NUREG-0654, Section II.K.6.c	Paragraph 6.7.1.6
NUREG-0654, Section II.K.7	Paragraph 6.7.1.6
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NUREG-0654, Section II.N.2.a	Paragraph 8.1.4(f)
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NUREG-0654, Section II.N.2.e	Paragraph 8.1.4(e)
NUREG-0654, Section II.N.3	Paragraph 8.1.3.d
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NUREG-0654, Section II.N.5	Paragraph 8.1.3.g
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NUREG-0654, Section II.O.2	Paragraph 8.1.2
NUREG-0654, Section II.O.3	Paragraph 6.8.2
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NUREG-0654, Section II.O.4.d	Paragraph 8.1.1.c Paragraph 8.1.2.c Paragraph 8.1.2e
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NUREG-0654, Section II.P.9	Paragraph 8.3.e Paragraph 8.3.f
NUREG-0654, Section II.P.10	Paragraph 8.3.g Paragraph 8.1.4.f