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July, 1985  
 Revision 5

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 Policy Statement

This document has been prepared to delineate the requirements and procedures governing the Commonwealth Edison Company Nuclear Division Generating Stations Emergency Plan (GSEP). Implementation of the GSEP as covered by the Generic Plan and Site Annex, including both Corporate and Site Emergency Plan Implementing Procedures (EPIPs), provides a degree of assurance that the number of ad hoc decisions made during an emergency are minimized. The GSEP ensures that necessary equipment, supplies, and essential services are available to meet the needs of an emergency in order to provide for the health and safety of the public, including Commonwealth Edison employees, the limitation of damage to facilities and property, and the restoration of such facilities.

Implementation of the GSEP provides for compliance with applicable requirements of the Nuclear Regulatory Commission, Federal Emergency Management Agency, states of Illinois, Iowa, Wisconsin and appropriate local governments, and their applicable emergency plans.

The Assistant Vice-President, Nuclear Services, is assigned the responsibility for development and updating of the Generating Station Emergency Plan, for maintaining the operational readiness of offsite Emergency Response Facilities, for training and retraining of offsite CECO emergency response personnel, and for providing guidance on readiness of onsite facilities and personnel. This individual reports to the Vice-President, Nuclear Operations.

The Assistant Vice-President and General Manager, Nuclear Stations, is assigned the overall responsibility for implementation of the Generating Stations Emergency Plan. This individual reports to the Vice-President, Nuclear Operations.

The scope of the GSEP covers all Nuclear Generating Stations both during the licensing phase and during their operation.

*Cordell Reed* 10/29/85  
 C. Reed (Date)

Vice-President,  
 Nuclear Operations

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3/11/86

# Commonwealth Edison Company Nuclear Stations Division



# Generating Stations Emergency Plan

NUCLEAR REGULATORY COMMISSION

Docket No. 60-456 Official Exh. No. 6  
 In the matter of COMMONWEALTH EDISON

Staff \_\_\_\_\_  NOTIFIED   
 Approval  \_\_\_\_\_  RECEIVED   
 Information \_\_\_\_\_  REJECTED  
 Date 3/11/86  
 Other \_\_\_\_\_  
 Signature GLS

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COMMONWEALTH EDISON COMPANY

GENERATING STATION EMERGENCY PLAN  
(GSEP)

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SUPERVISOR OF EMERGENCY PLANNING

10/18/85  
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GENERATING STATIONS EMERGENCY PLAN (GSEP)

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- D. LaSalle Station Emergency Plan Annex
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LISTING OF ACRONYMS

A/E	Architect/Engineer
ALARA	As Low As Reasonably Achievable
ANI	American Nuclear Insurers
ASLB	Atomic Safety Licensing Board
BEOF	Backup Emergency Operations Facility
BWR	Boiling Water Reactor
CCC	Corporate Command Center
CCP	Community Command Post
CECO	Commonwealth Edison Company
CEOC	County Emergency Operation Center
CFR	Code of Federal Regulations
DEG	Department of Emergency Government (Wisconsin)
DEQ	Department of Environmental Quality
DNS	Department of Nuclear Safety (Illinois)
DOE	Department of Energy
EAL	Emergency Action Level
EBS	Emergency Broadcast System
ECCS	Emergency Core Cooling System
ENC	Emergency News Center
ENS	Emergency Notification System (NRC)
EOC	Emergency Operations (or Operating) Center
EOF	Emergency Operations Facility
EPA	Environmental Protection Agency
EPIP	Emergency Plan Implementing Procedure
EPZ	Emergency Planning Zone
ERF	Emergency Response Facility
ERP	Emergency Restoration of Power
ESDA	Emergency Services and Disaster Agency (Illinois)
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FDA	Food and Drug Administration
FRMAP	Federal Radiological Monitoring and Assessment Plan
FRPCC	Federal Radiological Preparedness Coordinating Committee
GSEP	Generating Stations Emergency Plan
HPN	Health Physics Network (NRC)
INPO	Institute of Nuclear Power Operations
IPRA	Illinois Plan for Radiological Accidents
IRAP	Interagency Radiological Assistance Plan
JPIC	Joint Public Information Center
KI	Potassium Iodide
LGEOC	Local Government Emergency Operations Center
MAELU	Mutual Atomic Energy Liability Underwriters
NARS	Nuclear Accident Reporting System
NAWAS	National Warning System
NCRP	National Council on Radiation Protection
NDL	Nuclear Data Link
NDO	Nuclear Duty Officer
NRC	Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
NST	CECo's Nuclear Services Technical Department
OBE	Operating Basis Earthquake



LISTING OF ACRONYMS  
(Continued)

ODCS	Offsite Dose Calculation System
ODS	Office of Disaster Services (Iowa)
OSC	Operational Support Center
OSC	On-Scene Coordinator (Coast-Guard)
PA	Public Address
PAG	Protective Action Guide
P&ID	Piping and Instrument Diagram
PNS	Prompt Notification System
PWR	Pressurized Water Reactor
RAC	Regional Advisory Committee
RAFT	Radiological Assistance Field Team
RAP	Radiological Assistance Plan
REAC	Radiological Emergency Assessment Center
RF	Radio Frequency
SCP	State Command Post
SCRE	Station Control Room Engineer
SEOC	State Emergency Operations Center
SHL	State Hygienic Laboratory
SPCC	Spill Prevention Control and Countermeasure
SPDS	Safety Parameter Display System
SPSO	System Power Supply Office
SRC	State Radiological Coordinator
SRO	Senior Reactor Operator (NRC Licensed)
SSC	State Staging Center
SSE	Safe Shutdown Earthquake
STA	Shift Technical Advisor
TLD	Thermoluminescent Dosimeter
TS	Technical Specification
TSC	Technical Support Center
WB	Whole Body

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COMMONWEALTH EDISON

NUCLEAR GENERATING STATION EMERGENCY PLAN

REVISION 5

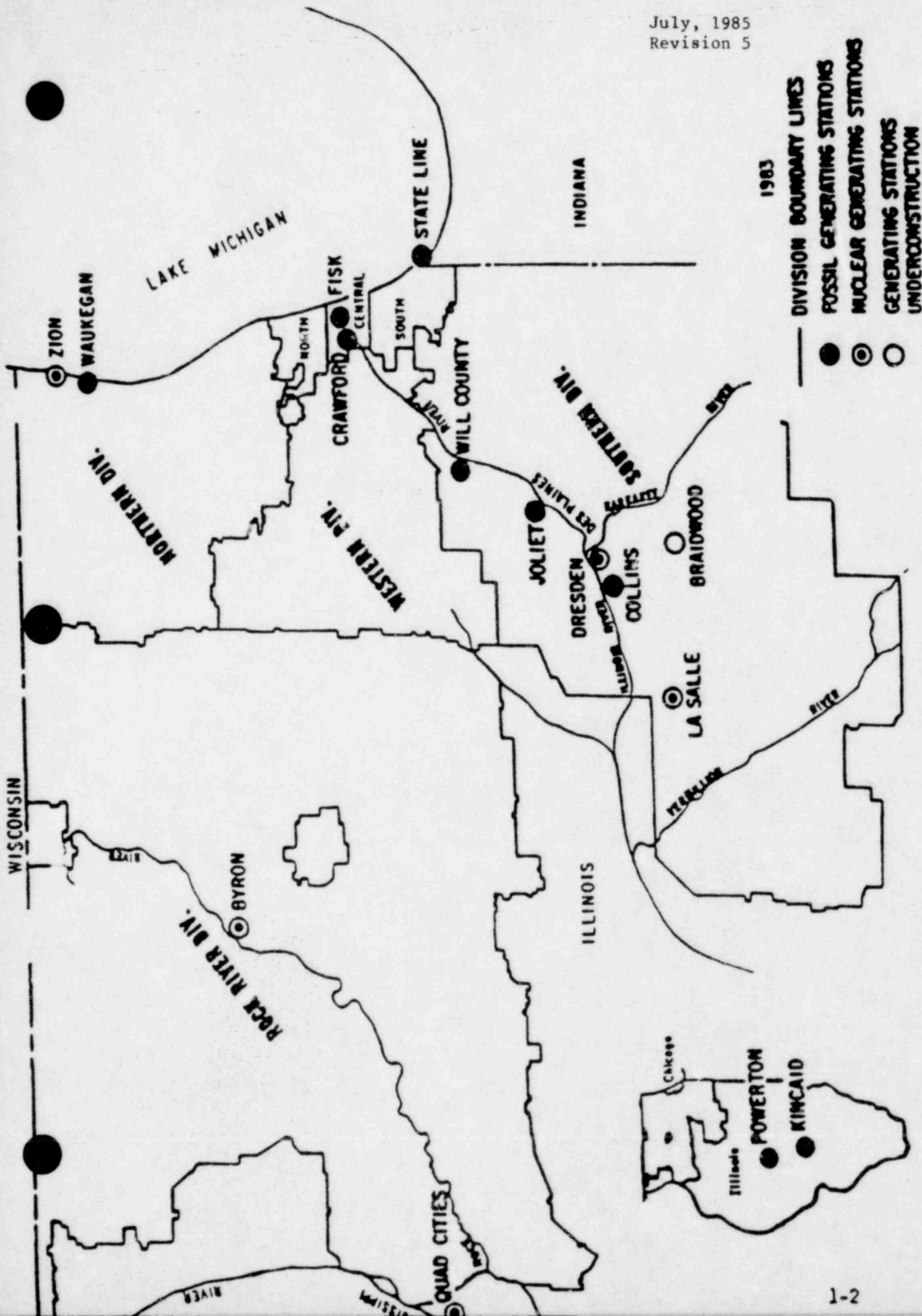
GENERATING STATIONS EMERGENCY PLAN (GSEP)

1.0 SCOPE AND APPLICABILITY

Commonwealth Edison Company (Commonwealth) provides electrical services to three million customers within a service area covering 11,525 square miles. Most of this territory is in northern Illinois and includes about one-fifth of the State. Refer to Figure 1.0-1. In providing its electrical service, Commonwealth is committed to the use of nuclear power and is licensed by the Nuclear Regulatory Commission (NRC) to operate several nuclear generating units within the State of Illinois.

In order to minimize the number of adhoc decisions made during an emergency and to ensure that necessary equipment, supplies, and essential services are available to meet the needs of an emergency, Commonwealth has developed the Generating Stations Emergency Plan (GSEP). The GSEP is an emergency plan applicable to all nuclear generating stations operated by Commonwealth and considers the consequences of radiological emergencies, as required by 10 CFR 50, Paragraph 50.47 and Appendix E. Additionally, the GSEP addresses the supplemental guidance provided by the NRC in the form of NUREG 0654/FEMA REP-1 (Revision 1, November, 1980). The GSEP also considers the consequences of nonradiological emergencies.

The GSEP provides for the protection of the health and safety of the public, Commonwealth employes, the limitation of damage to facilities and property, and the restoration of such facilities in the event of an emergency. Described in the GSEP is the emergency organization, including assignments of authority and responsibility. These GSEP guidelines provide for: identification and evaluation of emergency situations, protective measures, communications, coordination and notifications of governmental authorities, document review and control, emergency preparedness assessment, and training of all emergency personnel.



1983

- DIVISION BOUNDARY LINES
- FOSSIL GENERATING STATIONS
- ⊙ NUCLEAR GENERATING STATIONS
- GENERATING STATIONS UNDER CONSTRUCTION

Figure 1.0-1

COMMONWEALTH EDISON COMPANY ELECTRICAL SERVICE TERRITORY

## 2.0 DEFINITIONS

### 2.1 ANNUAL EXERCISE

Unless waived by Region III NRC due to requirements of FEMA, State of Illinois and contiguous States, annual as it relates to exercise frequency shall be a twelve month interval with a maximum allowable extension not to exceed three months.

### 2.2 Assessment Actions

Those actions taken during or after an emergency to obtain and process information that is necessary to make decisions to implement specific emergency measures.

### 2.3 Dedicated Communications

A communications link between two or more locations, access to which is limited to designated locations, and used only for the purpose intended. The communications link may be either telephone or radio.

### 2.4 Dose

A general term denoting the quantity of radiation or energy absorbed.

### 2.5 Dose Commitment

The radiation dose equivalent received by an exposed individual to the organ cited over a lifetime from a single event.

### 2.6 Dose Equivalent

A quantity that expresses all radiation on a common scale for calculating the effective absorbed dose. It is defined as the product of the absorbed dose in rads and certain modifying factors. The unit of dose equivalent is the rem.

### 2.7 Drill

A supervised instruction period aimed at testing, developing, and maintaining skills in a particular operation. A drill is often a component of an exercise.

### 2.8 Emergency Action Levels (EAL)

Radiological dose rates, specific concentration levels of airborne, waterborne, or surface deposited radioactive materials, or specific instrument indications that may be used as thresholds for initiating such specific emergency measures as designating a particular class of emergency, initiating a notification procedure, or initiating a particular protective action.



## 2.9 Emergency Personnel

Those organizational groups that perform a functional role during an emergency condition. Within Commonwealth, emergency personnel include the directors of the GSEP organization, accident assessment personnel, radiological monitoring teams, fire brigades, first aid teams, and security personnel.

## 2.10 Emergency Planning Zone (EPZ)

That area surrounding a nuclear station in which emergency planning is conducted for the protection of the public. With respect to protecting the public from the plume exposure resulting from an incident, the EPZ is usually an area with a radius of about 10 miles surrounding the facility. With respect to the ingestion exposure pathway, the EPZ is usually an area with a radius of about 50 miles.

## 2.11 Essential Personnel

Essential personnel are those needed to achieve the GSEP goals and tasks as deemed necessary by the CCC Director, Recovery Manager and/or Station Director. Identification of essential personnel is circumstance-oriented as determined by the Station Director and/or Recovery Manager.

Personnel identified as essential will vary with time, emergency classification, and circumstances at each generating station or emergency response facility.

## 2.12 Exercise

An event that tests the integrated capability and a major portion of the basic elements existing within an emergency plan. An exercise usually involves participation of personnel from State and local governments, utility personnel, and may involve participation of Federal government personnel.

## 2.13 GSEP

A document called the Generating Stations Emergency Plan that consists of two parts:

- 1) A generic plan that contains emergency planning information common to all Commonwealth nuclear stations; and
- 2) Site specific annexes that contain detailed emergency planning information unique to each nuclear station.

#### 2.14 Hazardous Material

A substance or material which has been determined by the United States Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated in 49 CFR 172.

#### 2.15 Imminent

Ready to take place; an event that will happen in the near future. The probability that an event will occur is projected to be 100%.

#### 2.16 Nonessential site personnel

Those personnel not needed for the continuing existence or functioning of the GSEP response organization. They are personnel not required to fill certain positions in the GSEP organization. Identification of nonessential personnel is circumstance-orientated as determined by the Station Director, Recovery Manager and/or CCC Director.

Examples of nonessential personnel might be:

- Nonstation CECO personnel
- Contractor personnel
- Vendor (Sales) personnel
- Delivery persons
- Public
- Nonemergency government personnel
- Nonemergency CECO personnel

#### 2.17 Nuclear Station

"Nuclear Station" as used herein refers to Commonwealth Edison nuclear generating stations.

#### 2.18 Offsite

That area around a nuclear generating station which lies outside the station's "site boundary".

#### 2.19 Onsite

The area around a nuclear generating station which lies within the station's "site boundary".

#### 2.20 Potential

Existing in possibility; an event that may or may not occur; the probability that an event will occur is less than 50%.

#### 2.21 Probable

Supported by evidence strong enough to establish presumption but not proof; an event that is likely to occur; the probability that an event will occur is greater than or equal to 50%.

#### 2.22 Projected Dose

That calculated dose commitment that some individuals in the population group may receive if no protective actions are implemented. Projected doses are calculated to establish an upper limit boundary.

#### 2.23 Protected Area

That onsite area within the security boundary as defined in each station's Security Plan.

#### 2.24 Protective Action Guides (PAG)

Projected radiological dose or dose commitment values to individuals in the general population that warrant protective action.

Protective Action Guidelines are criteria used to determine if the general population needs protective action regarding projected radiological doses, or from actual committed (measured) dose values.

#### 2.25 Protective Actions

Those emergency measures taken for the purpose of preventing or minimizing radiological exposures to affected population groups.

#### 2.26 Shall, Should, and May

The word "shall" is used to denote a requirement, the word "should" to denote a recommendation, and the word "may" to denote permission, neither a requirement nor a recommendation.

#### 2.27 Thyroid Blocking Agent

An agent which when properly administered to an individual will result in sufficient accumulation of stable iodine in the thyroid to prevent significant uptake of radioiodine. Potassium Iodide is such an agent.

#### 2.28 Worst Case Meteorology

Atmospheric dispersion conditions which are expected to occur only 5% of the time, i.e., conditions should be more favorable 95% of the time. This is Stability Class F and a wind speed of 1.0 meters/second for a short term release and 2.5 meters/second for a long term release (greater than 16 hours.).

### 3.0 SUMMARY OF GENERATING STATION EMERGENCY PLAN (GSEP)

The Assistant Vice-President and General Manager, Nuclear Stations, is responsible for the safe and reliable operation and maintenance of nuclear generating stations within Commonwealth Edison. This individual reports to the Vice-President Nuclear Operations and has line responsibility for the administration, management, and direction of all Nuclear Stations activities at operating nuclear stations.

The Assistant Vice-President and General Manager, Nuclear Stations, is assigned the overall responsibility for implementation of the Generating Stations Emergency Plan. This individual reports to the Vice-President, Nuclear Operations.

The Assistant Vice-President, Nuclear Services, is assigned the responsibility for development and updating of the Generating Station Emergency Plan, for maintaining the operational readiness of offsite Emergency Response Facilities, for training and retraining of offsite CECO emergency response personnel, and for providing guidance on readiness of onsite facilities and personnel. This individual reports to the Vice-President, Nuclear Operations.

The Generating Stations Emergency Plan (GSEP) is a written emergency plan that establishes the concepts, evaluation and assessment criteria, and protective actions that are necessary in order to limit and mitigate the consequences of potential or actual radiological emergencies. The GSEP provides the necessary prearrangements, directions, and organization so that all nuclear emergencies can be effectively and efficiently resolved in order to safeguard station personnel, property, and the general public.

The GSEP consists of two parts, a generic plan applicable to all generating stations, and a site specific annex for each nuclear generating station containing information and guidance that is unique to a particular station.

### 3.1 GSEP Organization

The GSEP organization consists of directors and staff personnel who shall ensure timely activation and implementation of emergency responses. The GSEP organization can be divided into two functional areas: onsite and offsite.

#### 3.1.1 Onsite Emergency Organization

The onsite GSEP organization consists of a Station Group that is primarily concerned with emergency response efforts necessary to control the plant during an incident.

The Station Group functions under a Station Director for organizing and coordinating the emergency efforts at and within the immediate vicinity of the station. Collectively, members of the Station Group provide for the following activities during an emergency:

- 1) Plant systems operations
- 2) Radiological survey and monitoring
- 3) Firefighting
- 4) Rescue operations
- 5) First aid
- 6) Decontamination
- 7) Security of plant and access control
- 8) Repair and damage control
- 9) Personnel accountability
- 10) Record Keeping
- 11) Communications

The responsibility for initial assessment of and response to an emergency rests with the Shift Engineer. The Shift Engineer is the initial Station Director and has the Station Director's responsibilities and authority until relieved of those responsibilities by the designated Station Director or his alternate (See Section 4.2). The Station Director is responsible for making the initial determination of the severity of the emergency and for activation of the GSEP as appropriate in accordance with the guidance provided in the generic GSEP, the site specific annex, and the station's implementing procedures.

### 3.1.2 Offsite Emergency Organization

The offsite GSEP organization consists of corporate and division personnel. This offsite organization is supported by environmental assessment staff and monitoring teams that provide long-term support to the affected station. These organizations consist of a Corporate Command Center Group and/or an Emergency Operations Facility Recovery Group. This Offsite GSEP organization also has liaison responsibilities with Federal, State, and local authorities.

During the less serious emergencies, the GSEP Corporate Command Center Group is responsible for evaluating, coordinating, and directing the overall company activities involved in coping with the emergency. The Corporate Command Center Group functions under a Director and its responsibilities include command and control, intelligence, logistics, engineering support, medical care, manpower requirements, communications, accounting, legal, health physics, environmental, and news information.

During the more serious emergencies the GSEP Recovery Group at the affected station's Emergency Operations Facility (EOF) is responsible for evaluating, coordinating and directing the overall company activities both at the Corporate Command Center and Technical Support Center. Once the Recovery Group is activated, the CCC Group becomes a support staff. (See Section 4.3).

### 3.2 Classification of Emergencies

The GSEP provides for classification of emergencies into six (6) categories. The first category, Transportation Accident, concerns an emergency involving the transportation of radioactive or other hazardous material from a generating station. The next four (4) categories: Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency address emergencies of increasing severity (See Section 5.0). The sixth category is Recovery: that period when the emergency phase is over and activities are being taken to return the situation to a normal state (acceptable condition). Herein, Notification of Unusual Event will be referred to as Unusual Event, and Site Area Emergency will be referred to as Site Emergency.

An emergency condition may be classified for purposes of reporting to offsite agencies, by the following persons:

1. Shift Engineer or alternate in line of succession as defined in Section 4.2 while acting as the initial Station Director;
2. Station Director while in the Control Room or TSC until the Corporate Command Center Director or Recovery Manager assumes responsibility for the emergency situation;
3. Corporate Command Center Director while at the CCC until the Recovery Manager assumes responsibility for the emergency situation;
4. Recovery Manager while at the EOF or other emergency response facility.

Following an event classification (reference Section 5.0), the emergency measures described in Section 6.0 shall be taken if not already underway. The initial notification of cognizant offsite government agencies shall be made within fifteen (15) minutes of classification or reclassification of the event. Regarding rapidly developing emergency conditions, classification or reclassifications by the (Acting) Station Director may be made with consultation with the designated CCC Director or Recovery Manager, as appropriate. Nevertheless this decision/consulting time shall be used expeditiously to prevent excessive delay between occurrence of the event and declaration of the classification or change.

Regardless of who makes the classification, the time spent in consultation with technical advisors, governmental agencies, administrative assistants, or any other support personnel supplying information to the decision maker prior to making the classification decision IS NOT included in the fifteen (15) minute time requirement for notification.

Emergency Action Levels (EAL's) are for unplanned events. Controlled activities designed to test systems and equipment that create an EAL are not subject to GSEP reporting and activation requirements as long as the test proceeds as planned. This condition may be subject to the reporting requirements of 10CFR50.72 effective January 1, 1984.

### 3.3 Emergency Measures

Emergency measures to be taken for each class/category of emergency are identified in the GSEP. Emergency measures begin with activation of the emergency organization. Subsequent measures are generally organized into assessment actions, corrective actions, protective actions, and aid to affected persons (See Section 6.0).



### 3.4 Facilities and Equipment

The GSEP identifies onsite and offsite facilities available for emergency assessment, communications, first aid and medical care, and damage control. Of particular importance are the emergency support centers: the Technical Support Center (TSC), the Operational Support Center (OSC), the Corporate Command Center (CCC) and the Emergency Operations Facility (EOF) and appropriate Backup Emergency Operations Facility. (BEOF) (Refer to Section 7.0).

#### 3.4.1 Technical Support Center (TSC)

The Technical Support Center (TSC) is the onsite location utilized by plant management, technical, and engineering support personnel to support the Control Room command and control function, for assessment of plant status and potential offsite impact, and for implementation of emergency actions.

#### 3.4.2 Operation Support Center (OSC)

The Operational Support Center (OSC) is the onsite location where support personnel will report to during an emergency and where they will be dispatched for assignment or duties in support of emergency operations.

#### 3.4.3 Corporate Command Center (CCC)

The Corporate Command Center (CCC), located at 72 West Adams, Chicago, is the location where the Corporate Command Center Director will normally direct a staff in evaluating, coordinating, and directing the overall company activities involved with an emergency. If the Recovery Group is activated at the EOF, then the CCC will be the location for a support staff reporting to the Recovery Group.

If the EOF facility for the station is declared to be inoperative then the CCC facility and organization may be designated by the appropriate CECO officials as the location and where overall company emergency response activities will be directed.

#### 3.4.4 Emergency Operations Facility (EOF)

The Emergency Operations Facility (EOF) that is located near the station provides for the management of overall emergency response, coordination of radiological assessments, and management of recovery operations. The organizations at this EOF function under a Recovery Manager and are activated for all Site and General Emergency situations. Activation of any EOF for other emergency situations is optional per the directions of CECo Station Director/CCC Director or Recovery Manager.

All EOF's are physically designed to function in a similar manner regarding voice communication and data transmission. Thus each EOF may be used as a backup for an inoperative EOF.

#### 3.4.5 Backup Emergency Operations Facility (BEOF)

The Zion Backup EOF, a facility located approximately 15 miles from the Zion plant in a portion of the Lake County Emergency Operations Center, provides the functions of the EOF if evacuation of personnel from the Zion EOF is required. Only Zion Nuclear Power Station has a backup EOF.

Relocation from the Zion EOF to the Zion BEOF is determined by the Recovery Manager at the Zion EOF. The Recovery Manager determines the essential personnel to be relocated to the BEOF and the staging area to which the remaining personnel (nonessential) are to be relocated.

### 3.5 Maintaining Emergency Preparedness

The GSEP describes the means to ensure that this plan will continue to be effective throughout the lifetimes of Commonwealth nuclear stations. Emergency preparedness includes training, exercises and drills, review and updating of the GSEP and procedures, as well as the administration of public information programs (See Section 8.0).

4.0 ORGANIZATIONAL CONTROL OF EMERGENCIES

Emergency planning must consider the capabilities of the normal plant organization, the onsite and offsite emergency organizations of Commonwealth Edison, and the offsite nonCommonwealth Edison emergency response agencies. The initial phases of an emergency situation at a nuclear station shall involve a relatively small number of individuals. These individuals must be capable of: (1) determining that an emergency exists; (2) providing initial classification and assessment; and (3) promptly notifying other groups and individuals in the emergency organization. The subsequent phases of the emergency situation may require an increasing augmentation to the emergency organization.

#### 4.1 Normal Plant Organization

The normal plant organization for Dresden, La Salle, Byron, Quad Cities and Zion is depicted in Figure 4.1-1a and the organization for Braidwood is depicted in Figure 4.1-1b.

##### 4.1.1 Station Manager\*

Each Commonwealth nuclear station is managed by a Station Manager who is responsible for management of the station, including Industrial Relations, planning, coordination, direction of the operation, maintenance, refueling, and technical activities. The Station Manager is responsible for compliance with the station NRC operating license, government regulations, ASME Code requirements, and the Commonwealth Quality Assurance Program. He also authorizes the use of procedures contained in the station procedures manuals and is responsible for final approval and distribution, and retention of documentation of station reports. The Station Manager authorizes all modifications to the station after the issuance of an Operating License and completion of preoperational testing. He forwards requests for modifications to the Commonwealth Edison Station Nuclear Engineering Department. The Manager supervises the Station's onsite review function as provided in the station Technical Specifications.

During an emergency situation, the Station Manager normally acts as the GSEP Station Director.

##### 4.1.2 Succession of Authority

The Station Manager has overall responsibility for station operation. During periods when the Manager is unavailable, this responsibility is designated to alternates who satisfy the requirements of ANSI N18.1-1971, "Experience Requirements for Plant Manager."

\*Note: At Braidwood, the Station Manager is referred to as the Station Superintendent.

#### 4.1.3 Shift Engineer

The Shift Engineer on duty is responsible for operating the plant in compliance with the station NRC operating license and the station operating procedures. During his shift, the Shift Engineer is in charge of the entire plant operation and is responsible for the plant being operated in a safe and reliable condition. He receives direction from the Operating Assistant Superintendent. The authority and responsibility of the operating Shift Engineer/Poremen and shift crews include:

- 1) The reactor operator's authority and responsibility for shutting down the reactor when he determines that the safety of the reactor is in jeopardy or when operating parameters exceed any of the reactor protection circuit setpoints and automatic shutdown does not occur;
- 2) The responsibility to determine the circumstance, cause, and limits under which operations can safely proceed before the reactor is returned to power following a trip or an unscheduled or unexplained power reduction;
- 3) The Shift Engineer's responsibility to be present at the plant and to provide direction for returning the reactor to power following a trip or an unscheduled or unexplained power reduction;
- 4) The responsibility to adhere to the station Technical Specifications;
- 5) The responsibility to review routine operating data to assure safe operation; and
- 6) The responsibility to adhere to plant operating procedures and the requirements for their use (However, during an emergency, operations personnel are authorized to depart from approved procedures where necessary to prevent injury to personnel, including the public, or damage to the facility). Guidance for departing from procedures, to ensure the health and safety of the public as well as station personnel is given in "Vice Presidents' Instruction" No. 1-0-17, dated May 23, 1983.

A Shift Engineer is on duty 24 hours a day and is the initial GSEP Station Director. While serving in this capacity the Shift Engineer has the authority for declaring an emergency and recommending protective actions to State authorities (Reference Section 6.3.1 and Figure 6.3-1.)

4.1.4 Station Control Room Engineer (SCRE) - Shift Technical Advisor (STA)

During normal plant operation the SCRE/STA, who reports to the Shift Engineer, directly supervises the licensed Reactors Operators and all activities in the Control Room. During an abnormal event of sufficient seriousness to require detached technical assessment, the Shift Engineer assumes direct supervision of personnel and all activities in the Control Room while the SCRE/STA steps back and assumes a role of overview as an STA with the specific responsibility of monitoring the maintenance of core cooling and containment integrity.

4.1.5 Minimum Shift Manning

All Commonwealth nuclear stations have the capability at all times to perform detection, classification, and notification functions required in the early phases of an emergency. Minimum shift manning at each nuclear generating station is specified in Figure 4.2-2. and in accordance with each station's Technical Specification.

4.1.6 Health Physics Organization

The Station Rad/Chem Supervisor is responsible for the Health Physics Program and for handling and monitoring of radioactive materials. Included in this organization are Health Physicists, Chemists, Foremen, and Technicians.

**FIGURE 4.1-1a**  
**NORMAL NUCLEAR PLANT ORGANIZATION**  
 (BYRON, DRESDEN, LASALLE, QUAD CITIES, ZION)

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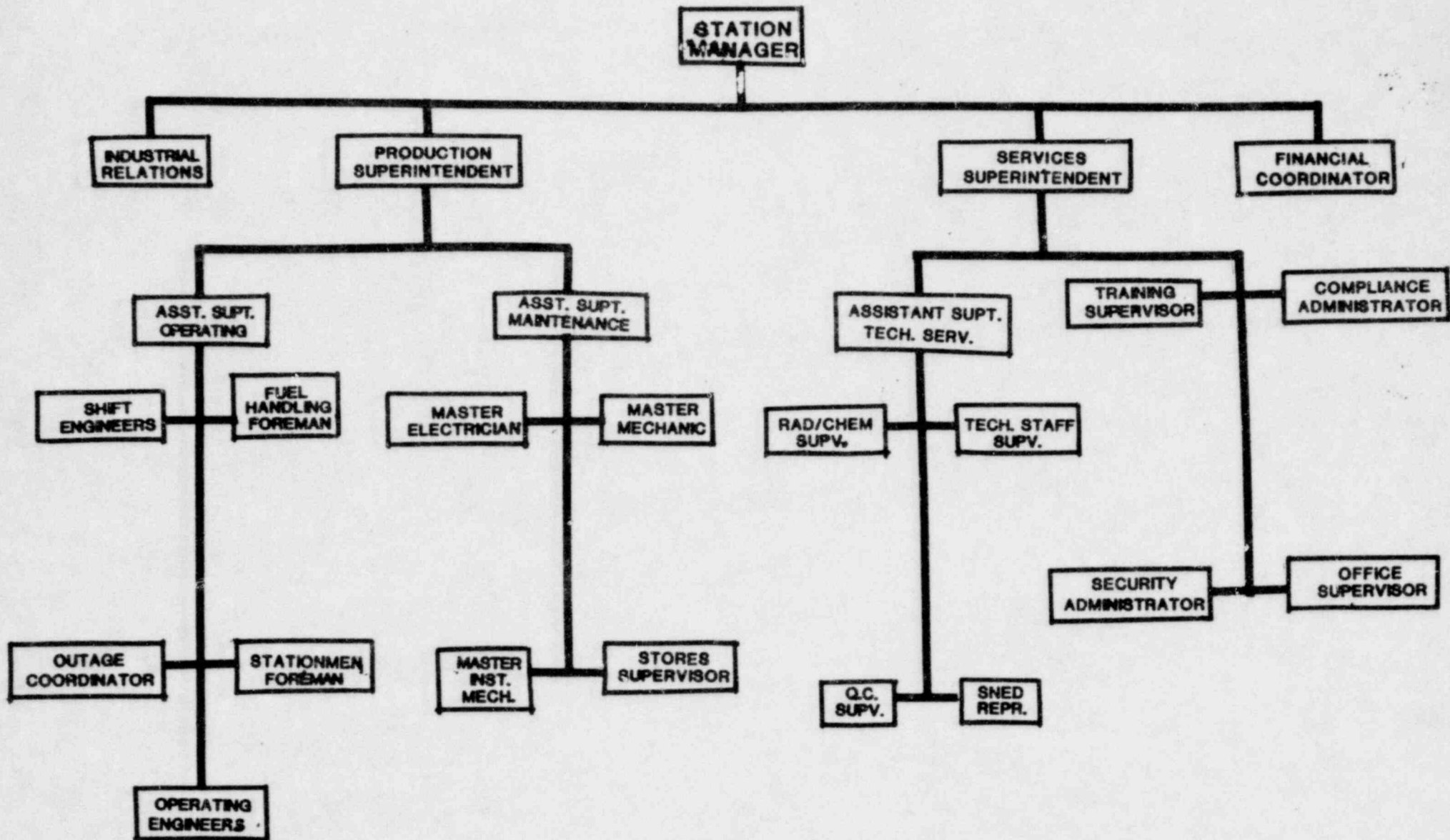
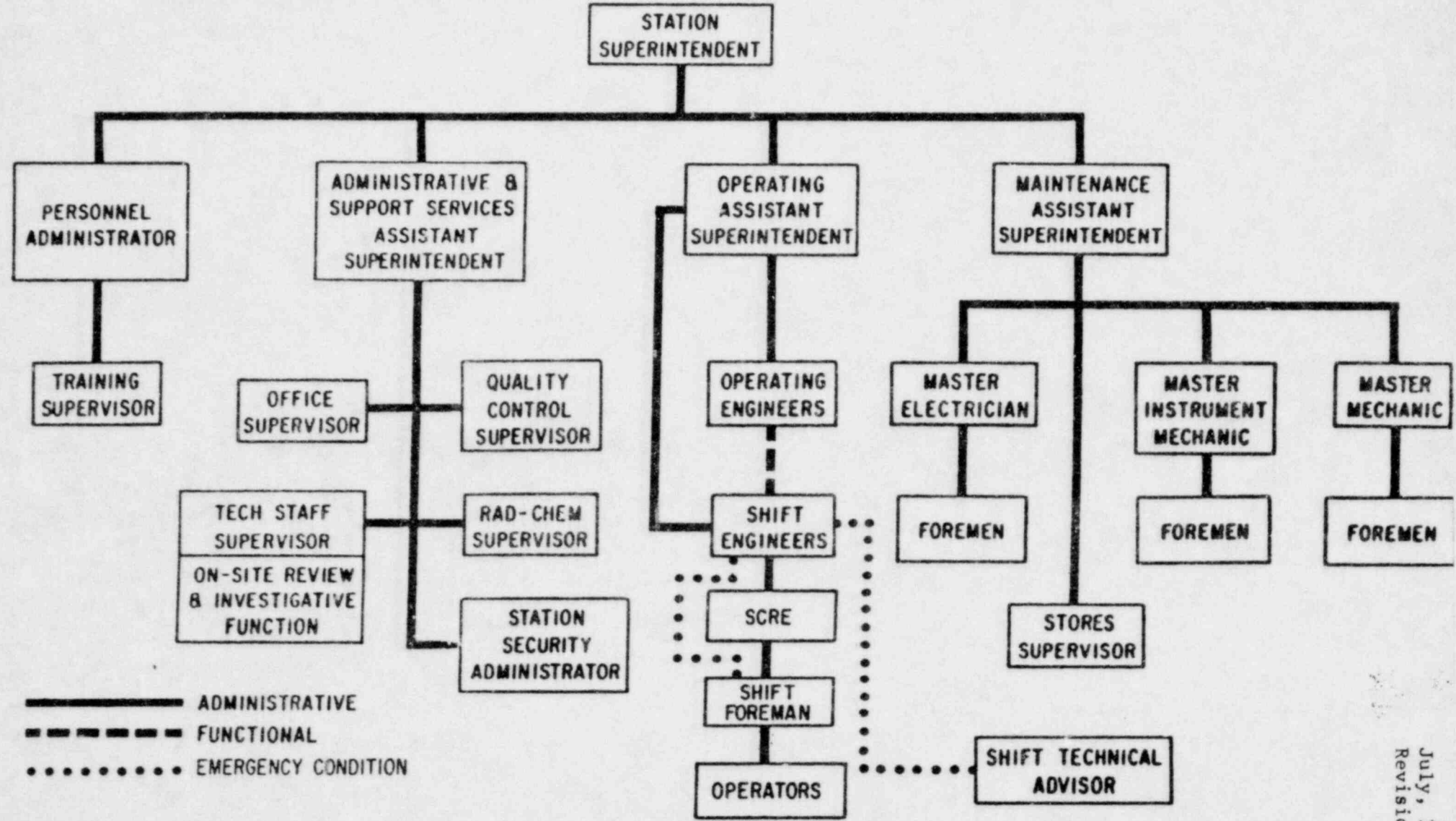




FIGURE 4.1-1b.  
 NORMAL NUCLEAR PLANT ORGANIZATION  
 (BRAIDWOOD)



THIS TABLE IS DERIVED FROM INFORMATION CONTAINED IN THE COMMONWEALTH EDISON COMPANY QUALITY ASSURANCE MANUAL. ANY CHANGES IN THAT MANUAL WILL SUPERSEDE INFORMATION CONTAINED IN THIS GSEP.

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#### 4.2 Station Group

The GSEP Station Group is the onsite emergency organization which is activated during an emergency. The Station Group functions under a Station Director responsible for carrying out all on-site emergency efforts as well as for carrying out the Commonwealth initial offsite environs monitoring efforts which are necessary for assessing plant releases. A diagram of the GSEP Station Group organization is shown in Figure 4.2-1.

The Shift Engineer, as initial Station Director, will take immediate action during an emergency and will activate the GSEP Station Group as appropriate. In the Shift Engineer's absence or incapacitation, the line of succession is:

- 1) Shift Foreman;
- 2) Station Control Room Engineer;
- 3) Nuclear Station Operator. (Senior experience personnel on-shift)

The Shift Engineer, or his alternate, may be relieved of the Station Director position of responsibility when it is assumed by the designated Station Director or the Station Director's alternate.

An individual assigned the duty as a Station Control Room Engineer (SCRE) shall be available to the Control Room at all times, unless relieved by responsible individuals. It is the responsibility of the SCRE/STA to diagnose off-normal events and advise the operating shift accordingly.

NUREG-0654 Criterion II.B.5 states that the "licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency." It further defines that short period as 30 and 60 minutes. Commonwealth Edison corporate management, including the NRC as stated in the October 26, 1981 letter of W. J. Dircks, NRC Executive Director for Operations to Dr. D. F. Knuth, President of KMC, Inc., agrees that the time frames for rapid augmentation of a nuclear power plant staff in the event of an emergency are not rigid inviolate requirements but rather goals. It is Commonwealth Edison's intent to expend its best efforts to meet the augmentation criteria (goals) regarding manning station facilities with sufficient skilled individuals capable of handling an emergency. Both the NRC and Commonwealth Edison realize that due to diversity of normal residential patterns for the stations' staff, possible adverse weather conditions, and road congestion, these time frames might be exceeded.

Commonwealth Edison has established a 24-hour duty-call individual at each station entitled "the Station Duty Officer" who will be notified first after the Shift Engineer has declared a GSEP emergency. This Station Duty Officer will initiate a prioritized notification (call list) procedure. The procedure identifies individuals who are capable of fulfilling the specific response functions which are listed in GSEP Figure 4.2-3, "Guidance for Augmentation of the Onsite Emergency Organization Within 60 Minutes". GSEP Figure 4.2-3 was developed based on the functions listed in Table B-1 of NUREG-0654. The call list procedures are prioritized considering least travel time of station staff.

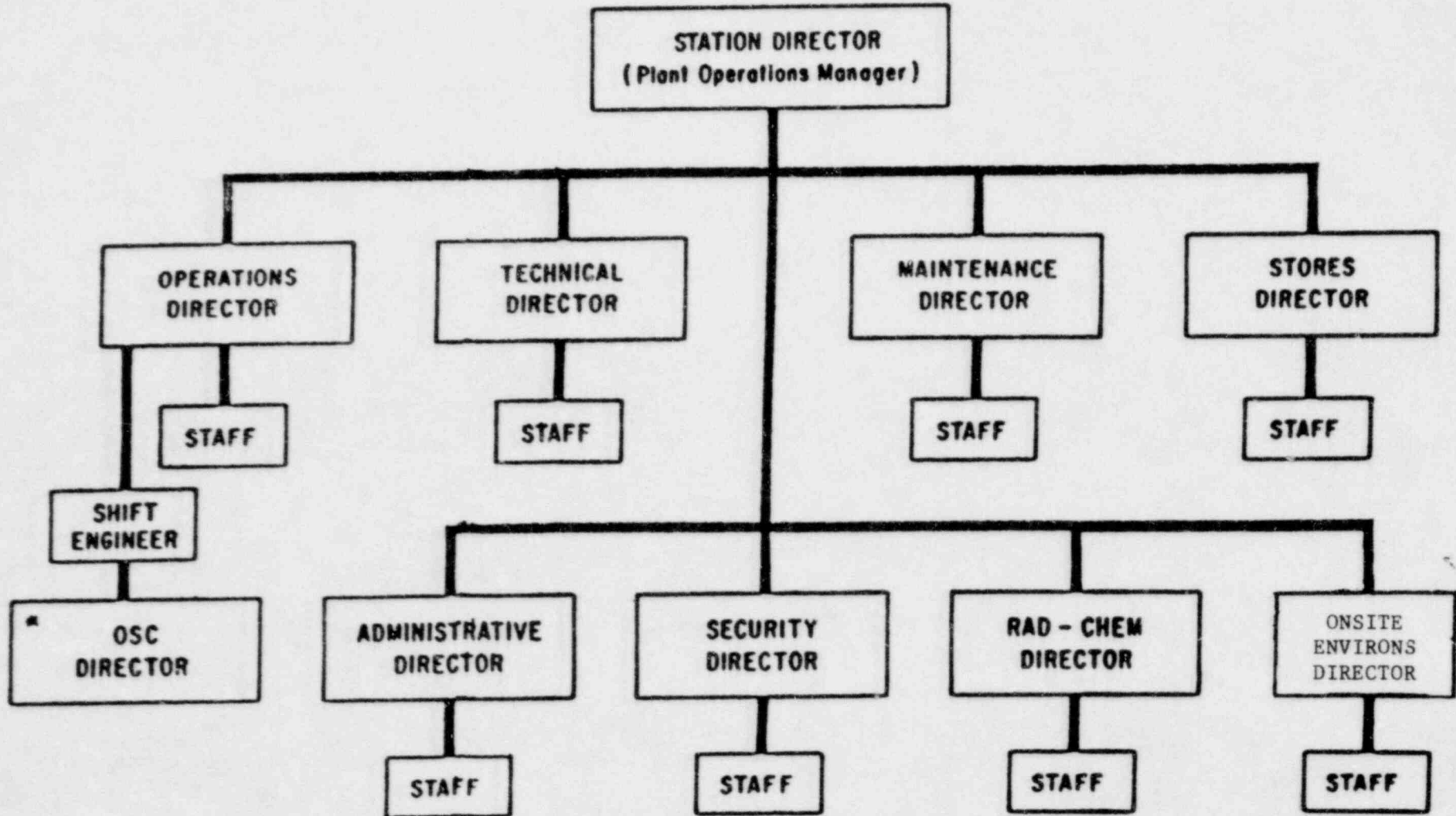
All GSEP Station Group personnel shall have the authority to perform assigned duties in a manner consistent with the objectives of this plan. The major responsibilities and duties of the Station Group directors are given in the following tables:

- 1) Table 4.2.1 - Station Director (Plant Operations Manager)\*
- 2) Table 4.2-2 - Operations Director;
- 3) Table 4.2-3 - Technical Director;
- 4) Table 4.2-4 - Maintenance Director;
- 5) Table 4.2-5 - Stores Director;
- 6) Table 4.2-6 - Administrative Director;
- 7) Table 4.2-7 - Security Director;
- 8) Table 4.2-8 - Rad/Chem Director;
- 9) Table 4.2-9 - Onsite Environs Director
- 10) Table 4.2-10 - Operational Support Center Director.
- 11) Table 4.2-11 - Shift Engineer

In addition to the onsite emergency organization (Station Group), the station's resources are augmented by the offsite GSEP organization and nonCommonwealth support groups.

\* The designation is to be consistent with INPO guidelines, however this "Plant Operations Manager" title will not be used within the GSEP.

FIGURE 4.2-1  
GSEP STATION GROUP ORGANIZATION



\*OSC Director reports  
to Operations Support Center

FIGURE 4.2-2  
MINIMUM SHIFT MANNING REQUIREMENTS  
FOR NUCLEAR POWER PLANT EMERGENCIES

	Number of Units Operational (e) (Single Control Room)	
	One	Two
Shift Engineer	1 (f)	1 (f)
Shift Foreman (c)	1 (f)	1 (f)
Nuclear Station Operator	2 (f)	3 (f)
Equipment Operator/Attendant (c)	3 (f)	4 (f)
Rad/Chem Technicians	2 (f)	2 (f)
Shift Technical Advisor (d)	1 (f)	1 (f)
Radwaste Operators (c)	1 (b) (f)	1 (b) (f)
Emergency Coordinator/ Station Director	1 (b) (f)	1 (b) (f)
Notification/Communication	1 (b)	1 (b)
Rescue Operations/First Aid	2 (b)	2 (b)
TOTAL	10 (f) (g)	12 (f) (g)
Minimum (a)	9 (f) (g)	11 (f) (g)

Notes:

- (a) The minimum number refers only to the case of shift shortage caused by a sudden sickness or home emergency.
- (b) May be provided by shift personnel assigned other functions.
- (c) These personnel are capable of performing emergency electrical, instrument or mechanical corrective actions and temporary repairs.
- (d) STA function is accomplished at each generating station by the Station Control Room Engineer (SCRE) who performs line duties during normal operation, but assumes an STA advisory position during an emergency.
- (e) Manning requirements do not consider Dresden Unit #1 which is in permanent shutdown.
- (f) Each station Technical Specifications govern the number of persons in these positions.
- (g) The totals do not include positions affected by footnote (b).

FIGURE 4.2-3

GUIDANCE FOR AUGMENTATION OF THE ONSITE  
EMERGENCY ORGANIZATION WITHIN 60 MINUTES

Augmentation Within 60 Minutes			
Functional Area	Unusual Event	Alert	Site & General Emergency
1. Command & Control	<u>Notification Only</u>		
Station Director	1	1	1
Oper. Director	1	1	1
Maint. Director	*1	1	1
Tech Director	*1	1	1
Admin. Director	*1	1	1
Stores Director	*1	1	1
Rad/Chem Director	*1	1	1
Security Director	*1	1	1
OSC Director	*1	1	1
Onsite Environs Director	*1	1	1
2. Notifications & Communications		1	1
Accident Assessment			
Offsite		*2	4
Onsite		*1	1
In-Plant		*1	1
Rad/Chem (Lab)		*1	1
4. Technical Support			
Nuclear (Core)		*1	1
Electrical		*1	1
Mechanical		*1	1
5. Repair & Correction			
Mechanical		*1	1
Electrical		*1	1
Radwaste		*1	1
Inst. & Control		*1	1
6. Protective Actions			
Radiation Protection		*2	4
	*2-10	*11-25	29

\*As needed depending upon the nature of the emergency

NOTE: Additional support in the areas of Command & Control; Communications; and Accident Assessment will be available from the offsite GSEP organization. It is reasonable to expect partial manning of the CCC or EOF within 60 minutes for the Site & General Emergencies.

TABLE 4.2-1

STATION DIRECTOR

The Station Director reports to the Corporate Command Center Director. He supervises and directs the GSEP Station Group in organizing and coordinating onsite emergency efforts (as well as directing all other plant activities). If the Recovery Group is activated at the EOF, the Station Director will report to the Recovery Manager at the EOF but will not relocate from the TSC to the EOF.

The Station Director is responsible for performing the following functions:

- o Classify emergencies in accordance with Section 5.0 of this plan.\*
- o Ensure that notifications are made as outlined in Section 6.0. (System Power Dispatcher, NRC, and state/local agencies in a General Emergency).
- o Activate the GSEP Station Group as outlined by Figure 4.2-3 of this plan.
- o Notify local support agencies, including ambulance service, as required in order to expedite their response to the emergency.
- o Provide for an assembly and evacuation of nonessential personnel from the site for a Site and General Emergency, or when other conditions warrant (refer to Section 6.4).
- o Keep the CCC Director, Recovery Manager, and Nuclear Regulatory Commission informed as to the status of the plant as determined by the station staff.
- o Request from the offsite GSEP organization, additional material, manpower, and equipment as necessary to perform decontamination, repair, and restoration work.
- o Ensure adequate manning and access control of the TSC when activated.
- o Implement emergency and recovery efforts as directed by the Corporate Command Center Director/Recovery Manager.
- o If the emergency involves a hazardous substance and/or oil discharges (per the Spill Prevention Control Countermeasure Plan), ensure that the appropriate notifications and responses have been made (Additional information is given in Section 9.3).
- o Maintain a record of the GSEP related activities.

\*Note: This responsibility can not be delegated.

TABLE 4.2-2

OPERATIONS DIRECTOR

The Operations Director determines the extent of station emergencies, initiates corrective actions, and implements protective actions for onsite personnel. Specifically, the Operations Director shall:

- o Verify that the System Power Dispatcher and the Station Manager have been notified of an emergency.
- o Direct a staff in determining the nature and extent of emergencies pertaining to equipment and plant facilities.
- o Initiate immediate corrective actions to limit or contain the emergency.
- o Direct switching and valving operations, equipment operations, equipment checking, and miscellaneous operations as required.
- o Implement protective actions for onsite personnel, to include site assembly and evacuation (when ordered by the Station Director).
- o Organize and direct rescue operations of injured personnel. Verify that ambulance services have been notified, as required. Coordinate the transfer of injured and/or contaminated personnel offsite.
- o Ensure adequate manning of the Control Room and the OSC. Designate an individual as the OSC Director and have the individual report to the Shift Engineer.
- o Identify steps or procedures that the Operations staff should be utilizing to properly respond to the GSEP condition.
- o Maintain a record of the GSEP related activities.



TABLE 4.2-3

TECHNICAL DIRECTOR

The Technical Director directs a staff in performing technical assessments of station emergencies and assists in recovery planning. Specifically, the Technical Director shall:

- o Accumulate, tabulate, and evaluate data on plant conditions such as plant operating data and inspection reports.
- o Evaluate vital plant parameters during an emergency to determine the overall condition of safety related systems, the core, and fission product barriers.
- o Identify critical data points and control parameters that the Operations staff should monitor.
- o Identify special procedures needed to effect recovery.
- o Supervise the total onsite technical staff effort. Acquire sufficient technical personnel to provide assistance during the stabilization and restoration phases.
- o Assist the Rad/Chem Director for onsite radiological/technical matters.
- o Maintain a record of the GSEP related activities.

TABLE 4.2-4

MAINTENANCE DIRECTOR

The Maintenance Director directs a staff in providing labor, tools, protective equipment, and parts needed for emergency repair, damage control, and recovery efforts to return the plant to its preaccident status. Specifically, the Maintenance Director shall:

- o Direct the total onsite maintenance and equipment restoration effort.
- o Request additional equipment through the GSEP organization in order to expedite recovery and restoration. Equipment such as trucks, cranes, or pumps may be required.
- o Assist in rescue operations by providing labor, tools, and equipment.
- o Identify required steps or procedures that need to be written or implemented in support of recovery efforts.
- o Maintain a record of the GSEP related activities.

TABLE 4.2-5

STORES DIRECTOR

The Stores Director directs a staff in obtaining and delivering all parts, protective equipment, and materials needed in recovery operations. Specifically, the Stores Director shall:

- o Identify what materials and supplies are available onsite and time frames for delivery of other materials and supplies from offsite.
- o Expedite delivery of needed materials from offsite.
- o Inventory required emergency materials so that necessary supplies are not depleted and uninterrupted work can continue.
- o Provide adequate respiratory equipment and protective clothing to emergency personnel.
- o Maintain a record of the GSEP related activities.

TABLE 4.2-6

ADMINISTRATIVE DIRECTOR

The Administrative Director provides administrative services in support of emergency/recovery operations. Specifically, the Administrative Director shall:

- o Direct a staff in preparation of emergency procedures and interim reports during an emergency.
- o Coordinate recordkeeping efforts at the Station.
- o Assist the Station Director in arranging for shift reliefs and continual manning of the station.
- o Arrange for food and sleeping facilities for onsite emergency workers.
- o Arrange for clerical staff at the EOF.
- o Maintain a record of the GSEP related activities.

TABLE 4.2-7

SECURITY DIRECTOR

The Security Director maintains plant security and personnel accountability at the nuclear station. Specifically, the Security Director shall:

- o Maintain plant security and account for all personnel within the protected area. In the event of an onsite assembly of all personnel, Security Director shall account for all individuals within the protected area at the time that the assembly was announced and should be able to ascertain the names of missing individuals within 30 minutes.
- o Identify to the Station Director any nonroutine security procedures and/or contingencies that are in effect or that require a response.
- o Coordinate with Rad/Chem Director in controlling ingress and egress to and from the protected area if radiological concerns are present.
- o Initiate security at the EOF if it is requested by the Corporate Command Center Director or the Station Director. It shall be the responsibility of the Security Director to contact an Access Control Director and to notify the Corporate Nuclear Security Administrator. Access Control Directors are listed in the GSEP telephone directory.
- o Maintain a record of the GSEP related activities.

TABLE 4.2-8

RAD/CHEM DIRECTOR

The Rad/Chem Director directs a staff in determining the extent and nature of radiological or hazardous material problems onsite. Specifically, the Rad/Chem Director shall:

- o Accumulate, tabulate, and evaluate data on plant conditions such as meteorological and radiological monitoring readings, hazardous material surveys, and other pertinent data.
- o Ensure use of protective clothing, respiratory protection, and access control within the plant as deemed appropriate to control personnel exposures.
- o Ensure that appropriate bioassay procedures have been implemented for onsite personnel when a radioactivity incident has occurred.
- o Ensure that personnel are decontaminated, if necessary.
- o Assist in planning rescue operations and provide monitoring services as required for hazardous material accidents.
- o Set up, as appropriate, a group qualified to receive contaminated and injured personnel and perform first aid duties.
- o Assist in the transfer of injured and/or contaminated nonessential personnel.
- o Decide, after consulting with the Station Director and Security Director, which of the predetermined personnel evacuation routes is to be used when deemed necessary.
- o Request through the offsite GSEP organization the following as necessary:
  - Additional or special personnel monitoring devices (TLDs, whole body counters, etc.)
  - Engineering evaluations of temporary shielding or special equipment and tools.
  - Additional health physics support personnel.
  - Additional instrumentation and equipment, as required.
- o Maintain a record of the GSEP related activities.

TABLE 4.2-9

ONSITE ENVIRONS DIRECTOR

The Onsite Environs Director is the member of the onsite GSEP organization who will supervise the activities of Commonwealth environmental sampling teams in an emergency. He shall carry out his activities at the direction of the Station Director at the TSC. At the discretion of the Station Director, he may transfer to the EOF to become the Offsite Environs Director, he may remain in the TSC once the Offsite Environs Director has taken control and continue to monitor offsite environmental data or he may be directed to assist the Rad/Chem Director.

Responsibilities assigned to the Environs Director are to:

- o Establish a headquarters at the affected station's TSC.
- o Assemble one or more environmental monitoring teams. During an actual or suspected gaseous release situation from the plant, two teams should be dispatched. If sufficient manpower is available, there should be three persons per team.
- o Dispatch and coordinate the activities of Commonwealth Edison environmental monitoring teams in order to determine the extent and nature of offsite releases of radioactive or other hazardous materials. Activities of the teams may include:
  - Dose rate surveys (including plume tracking);
  - Air sampling;
  - Soil, water, and vegetation sampling;
  - Contamination surveys; and
  - Exchange of TLDs and filter cartridges from fixed environmental stations.
- o Request through the GSEP organization:
  - Assistance for road blocks and security of contaminated properties until State, County and Local personnel are available;
  - Communications equipment as necessary. Telephones, mobile radios, and portable radios may be required;
  - Required transportation for personnel; and
  - Sufficient technical and nontechnical personnel to expand the operation as necessary.
- o Relinquish command of the Environs Field Teams to the Offsite Environs Director when instructed to do so by the Offsite Environs Director
- o Maintain a record of the GSEP related activities.

TABLE 4.2-10

OPERATIONAL SUPPORT CENTER DIRECTOR

Upon activation of the station's Operational Support Center (OSC) the Operations Director shall designate an individual to become the OSC Director if not already designated by the Shift Engineer. The OSC Director is located in the OSC to manage and supervise the activities of personnel reporting to the OSC as directed by the Shift Engineer.

Personnel who may report to the OSC include but are not limited to:

- o Operating personnel not assigned to the Control Room;
- o Radwaste personnel.
- o Rad/Chem Technicians.
- o Maintenance personnel.

Specifically the OSC Director shall:

- o Receive direction from the Shift Engineer.
- o Assign tasks to individuals in the OSC with approval of the Shift Engineer.
- o Maintain OSC resources including manpower, material, and equipment.
- o Maintain accumulated exposure records for personnel working from the OSC and report these values to the Rad/Chem Director after each shift.
- o Maintain records of GSEP related activities.



TABLE 4.2-11

SHIFT ENGINEER

- o The Shift Engineer acts as initial Station Director and shall perform the duties as specified in Table 4.2-1.
- o The Shift Engineer after being properly relieved by the Station Director shall report to the Operations Director and shall perform such duties as those described in Section 4.1.3 and such actions as necessary to mitigate emergency conditions.

#### 4.3 Offsite GSEP Organization

The size of the offsite GSEP organization will vary depending upon the nature and extent of the emergency. For planning purposes, two separate organizational arrangements will be defined.

For activation of the EOF, Commonwealth Edison has developed a prioritized Nuclear Duty Officer/Recovery Manager notification list. This call list shall enable the responsible corporate Nuclear Duty Officer to notify a Recovery Manager who would require the least travel time to a particular EOF. Consistent with the onsite augmentation goal, the EOF shall be activated as promptly as possible when necessary.

Once the Emergency Operations Facility is activated, all Commonwealth recovery efforts shall be directed, coordinated, and controlled from that location. There shall be three major emergency control functions (centers) at the EOF. They are: (1) the Recovery Center, (2) the Environmental Control Center; and (3) the Emergency News Center. Refer to Section 7.1.5 for a description of these centers.

##### 4.3.1 Offsite GSEP Organization for Emergencies of Limited Extent

During a Transportation Accident or during incidents at nuclear stations that are classified as Unusual Events or Alerts, it is unlikely that the Emergency Operations Facility would be activated. In these instances, the Corporate Command Center may be activated. Corporate Command Center personnel are indicated on Figure 4.3-1. The Corporate Command Center Director will activate only those directors and personnel deemed appropriate.

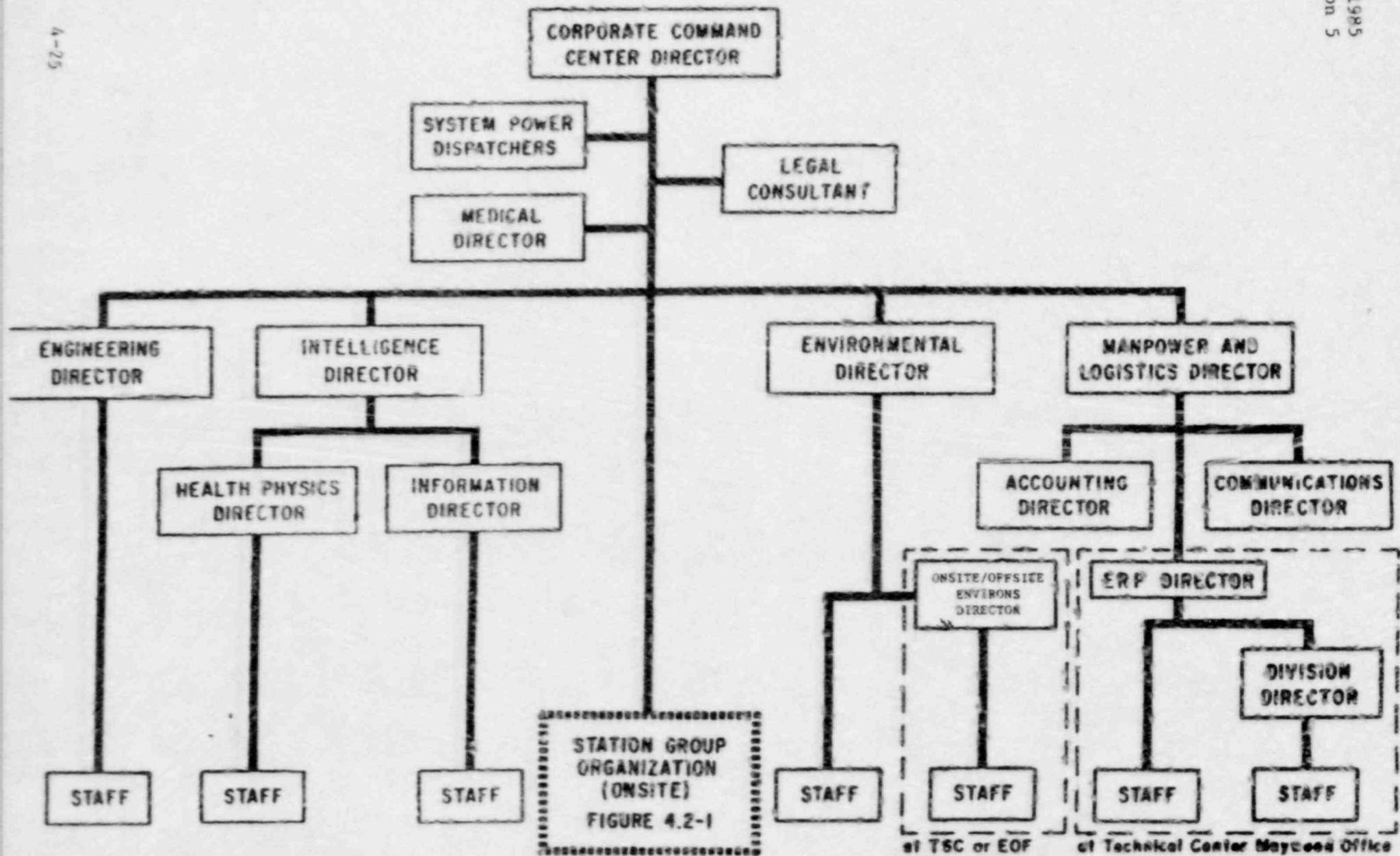
- 1) Table 4.3-11 Corporate Command Center Director
- 2) Table 4.3-12 System Power Dispatcher
- 3) Table 4.3-13 Medical Director
- 4) Table 4.3-14 Legal Consultant
- 5) Table 4.3-15 Engineering Director

- 6) Table 4.3-16 Intelligence Director
- 7) Table 4.3-17 Health Physics Director
- 8) Table 4.3-18 Information Director
- 9) Table 4.3-19 Environmental Director
- 10) Table 4.3-20 Manpower and Logistics Director
- 11) Table 4.3-21 Accounting Director
- 12) Table 4.3-22 Communications Director
- 13) Table 4.3-23 ERP Director
- 14) Table 4.3-24 Division Director
- 15) Table 4.3-25 Offsite Environs Director

FIGURE 4.3-1  
LIMITED RESPONSE OFFSITE GSEP ORGANIZATION

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#### 4.3.2 Offsite GSEP Organization for Emergencies of Great Extent

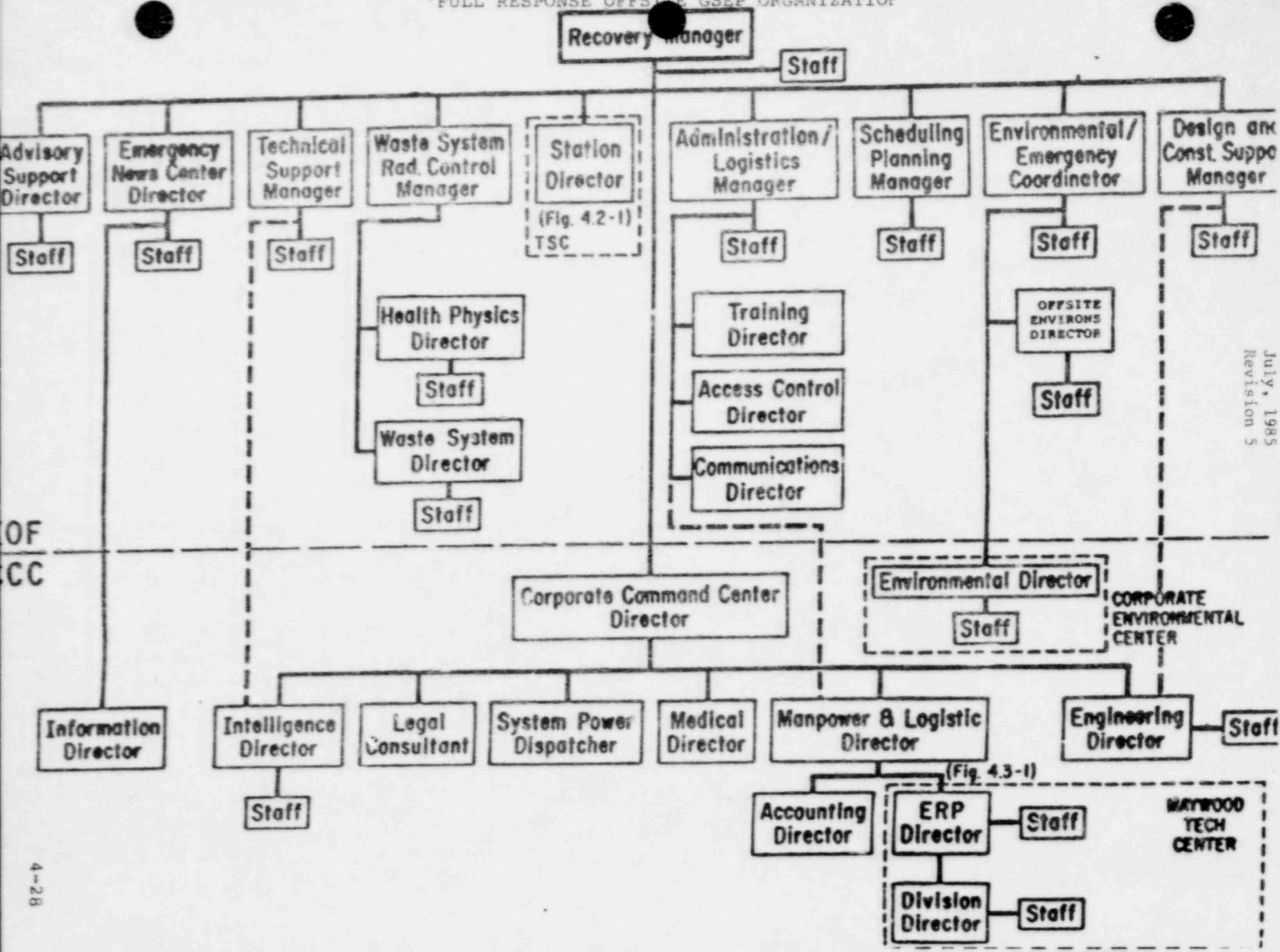
During incidents at nuclear stations that are classified as Site or General Emergencies, the GSEP Recovery Group will be activated at the Emergency Operations Facility. In many instances, activation of the Recovery Group requires that designated directors of the Corporate Command Center staff relocate to the EOF and assume additional responsibilities for assigned positions. The Recovery Group functions under a Recovery Manager who is responsible for the overall company activities aimed at restoring the affected station to a safe status. The Corporate Command Center staff provides support to the Recovery Group under this organizational arrangement. The offsite GSEP organization for serious emergencies (e.g., Site and General Emergency) is depicted in Figure 4.3-2. This organization consists of the following directors whose major duties are delineated in the referenced tables:

- 1) Table 4.3-1 Recovery Manager
- 2) Table 4.3-2 Station Director (Plant Operations Manager)\*
- 3) Table 4.3-3 Advisory Support Director
- 4) Table 4.3-4 Technical Support Manager
- 5) Table 4.3-5 Environmental/Emergency Coordinator
- 6) Table 4.3-6 Design & Construction Support Manager
- 7) Table 4.3-7 Scheduling Planning Manager
- 8) Table 4.3-8 Waste Systems/Radiation Control Manager
- 9) Table 4.3-9 Administration/Logistics Manager
- 10) Table 4.3-10 Emergency News Center Director
- 11) Table 4.3-11 Corporate Command Center Director
- 12) Table 4.3-12 System Power Dispatcher
- 13) Table 4.3-13 Medical Director
- 14) Table 4.3-14 Legal Consultant

\*The designation is to be consistent with INPO guidelines; however, this "Plant Operations Manager" title will not be used within the GSEP.

- 15) Table 4.3-15 Engineering Director
- 16) Table 4.3-16 Intelligence Director
- 17) Table 4.3-17 Health Physics Director
- 18) Table 4.3-18 Information Director
- 19) Table 4.3-19 Environmental Director
- 20) Table 4.3-20 Manpower and Logistics Director
- 21) Table 4.3-21 Accounting Director
- 22) Table 4.3-22 Communications Director
- 23) Table 4.3-23 ERP Director
- 24) Table 4.3-24 Division Director
- 25) Table 4.3-25 Offsite Environs Director
- 26) Table 4.3-26 Training Director
- 27) Table 4.3-27 Waste Systems Director
- 28) Table 4.3-28 Access Control Director

FIGURE 4.3-2  
 "FULL RESPONSE OFFSITE GSEP ORGANIZATION"



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TABLE 4.3-1

RECOVERY MANAGER

The Recovery Manager is the designated individual from Commonwealth Edison who has authority, management ability, and technical knowledge to manage the overall nuclear plant recovery operations whenever the Recovery Group is activated at the EOF Recovery Center. The primary individual designated as the Recovery Manager is the Assistant Vice-President and General Manager, Nuclear Stations.

Specifically, the Recovery Manager shall:

- o Direct the Recovery Group and coordinate all company and industry support activities in coping with an emergency.
- o Ensure notification of Federal, State, and appropriate local agencies of emergency declarations or reclassifications in accordance with Section 6.0 of this plan.
- o Ensure that Federal, State, and local authorities remain cognizant of the status of the emergency situation. If requested, dispatch informed individuals to State governmental emergency operations centers.
- o Review for factual content all information intended for conveyance to the news media by the Emergency News Center Director.
- o Ensure that appropriate measures are promptly taken onsite to:
  - Terminate the condition causing the emergency.
  - Protect employees and the public.
  - Minimize damage to the plant.
  - Effect postaccident recovery and deactivate the GSEP organization when appropriate.
- o Request assistance from outside emergency response organizations, such as the Department of Energy Chicago Operations Office, if required.
- o Determine after consultation with appropriate GSEP personnel when to evacuate the EOF and to determine who are ESSENTIAL and NONESSENTIAL personnel. He also determines where the evacuated personnel are to be reassembled.
- o Maintain a record of the GSEP related activities.



TABLE 4.3-2

STATION DIRECTOR

The Station Director is the designated individual from Commonwealth Edison who has the requisite authority, plant operating experience, and qualifications to implement in-plant recovery operations. The Station Director will normally not relocate to the EOF, but should remain at the TSC.

Responsibilities assigned to the Station Director are to:

- o Supervise the onsite operations support staff and the onsite Station Group organization.
- o Implement plans and schedules to meet recovery operations objectives.
- o Provide training of personnel for off-normal instructions, plans, and procedures.
- o Provide information and recommendations to the Recovery Manager.
- o Determine if the OSC is to remain activated.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-3  
ADVISORY SUPPORT DIRECTOR

The Advisory Support Director is the designated individual from Commonwealth who will coordinate the efforts of an advisory support group composed of the NSSS, the NRC, authoritative consultants and a public information expert who have requisite authority to commit resources and resolve technical issues for their respective organizations. This director located at the EOF reports directly to the Recovery Manager.

Responsibilities assigned to the Advisory Support Director are to:

- o Establish contact and maintain communications with appropriate nonCommonwealth Edison technical personnel whose assistance may be required to terminate the emergency conditions and to expedite the recovery.
- o Establish an advisory support panel composed of representatives from organizations such as the NSSS, authoritative consultants, and public information experts, to analyze the emergency and make recommendations to be considered by the Recovery Manager.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-4

TECHNICAL SUPPORT MANAGER

The Technical Support Manager is the designated individual from Commonwealth who has requisite authority, nuclear experience, and technical expertise to manage a technical staff in support of nuclear power plant recovery operations.

The Technical Support Manager who reports directly to the Recovery Manager shall:

- o Develop plans and procedures in direct support of plant operations personnel with the objective of taking the plant to and maintaining a safe shutdown condition.
- o Provide a central facility for collection, retention, retrieval, and transmission of plant and local environmental parameters.
- o Provide experienced licensed personnel for direct support of plant shift operations personnel.
- o Analyze conditions, develop guidance and out-of-normal operating and emergency procedures for direct support of plant shift operations personnel.
- o Analyze instrumentation and control problems, develop emergency procedures or alternate control schemes, and design and coordinate the installation of short-term modifications.
- o Direct a staff of personnel having technical expertise and formal education in transient analysis and system interactions, nuclear engineering and fuel management, core physics, electrical engineering, process computers, instrumentation and control systems, refueling operations, engineering mechanics, thermal hydraulics, plant structural and containment design, and metallurgy. Some of this expertise may have to be provided by nonCommonwealth personnel.
- o Coordinate and assist the activities of the Intelligence Director located at the CCC. The Technical Support Manager has functional control of the Intelligence Director, while the CCC Director has line control.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-5

ENVIRONMENTAL/EMERGENCY COORDINATOR

The Environmental/Emergency Coordinator is the designated individual from Commonwealth who is specifically qualified in the coordination and management of radiological consequence assessment and who is authorized to interact with supporting agencies. This individual will supervise the Environmental Control Center at the EOF and will serve as the official contact with State and Federal radiological assessment personnel.

Responsibilities assigned to the Environmental/Emergency Coordinator who reports to the EOF Recovery Manager are to:

- o Establish communications with the Corporate Environmental Center, the TSC, and/or the EOF Recovery Center and obtain information on the accident conditions, meteorological conditions, and estimates of radioactive material releases.
- o Establish communication with offsite authorities and relay information necessary for the respective authorities to implement their emergency plans.
- o Direct the activities of the Onsite/Offsite Environs Director and the environmental staff. Coordinate the activities of environmental contractors.
- o Interpret radiological data and based upon calculated dose projections, make recommendations for protective actions offsite consistent with Tables 6.3-1, 6.3-2, and 6.3-3 of this plan.
- o When the EOF is activated direct the activities of the Environmental Director located at the CCC.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-6

DESIGN AND CONSTRUCTION SUPPORT MANAGER

The Design and Construction Support Manager is the designated individual from Commonwealth who has the requisite authority to interface with the A/E, NSSS, and the construction forces on design or construction modifications required for recovery activities.

Responsibilities assigned to the Design and Construction Support Manager who reports to the EOF Recovery Manager are to:

- o Provide for direct contact between Commonwealth, the A/E, NSSS and the construction representatives on administrative matters.
- o Anticipate the need for and supply engineering and technical specialists to the GSEP organization.
- o Direct, coordinate, and approve other engineering, design, and construction activities onsite.
- o Establish which if any engineering, design, and construction activities shall be required to be controlled by the Quality Assurance Program.
- o Functionally coordinate the activities of the Engineering Director located at the CCC.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-7

SCHEDULING PLANNING MANAGER

The Scheduling Planning Manager is the designated individual from Commonwealth who has the requisite authority to coordinate and expedite plans and schedules to assist the Recovery Manager in recovery operations.

Responsibilities assigned to the Scheduling Planning Manager who reports to the EOF Recovery Manager are to:

- o Respond to specific directives of the Recovery Manager for the scheduling of activities.
- o Take the measures necessary to identify key problems, resource limitations, and the status of scheduled milestones.
- o Develop agendas for Recovery Group staff meetings and follow-up to expedite commitment compliance.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-8

WASTE SYSTEMS/RADIATION CONTROL MANAGER

The Waste Systems/Radiation Control Manager is the designated individual who has requisite authority, nuclear experience, and technical expertise to manage the radioactive waste and radiological control aspects of the recovery operations.

The responsibilities assigned to the Waste Systems/Radiation Control Manager who reports to the EOF Recovery Manager are to:

- o Maintain an updated status report of onsite liquid, solid, and gaseous waste volumes, with particular interest given to systems or tanks that are approaching or have exceeded their rated capacities. (This includes the plant charcoal filter exhaust system.)
- o Recommend sampling programs to the affected station that will allow an evaluation of radwaste system status.
- o Develop plans and procedures for processing liquid, gaseous, and solid wastes with a long-term goal of reducing all waste levels to a normal preaccident status and which maintains personnel exposures as low as reasonably achievable.
- o Develop plans for modifications to plant systems that will allow large scale waste processing in a way that will keep personnel and public radiation exposures as low as possible.
- o Provide information and recommendations to the Recovery Manager concerning future operations that could affect the plant, equipment, or environment.
- o Direct the activities of the Health Physics Director when that individual has been relocated to the EOF.
- o Direct the activities of the Waste Systems Director.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-9

ADMINISTRATION/LOGISTICS MANAGER

The Administration/Logistics Manager is the designated individual from Commonwealth who is responsible for providing administrative, logistic, communications, and personnel support for the recovery operations.

Responsibilities assigned to the Administration/Logistics Manager who reports to the EOF Recovery Manager are to:

- o Serve as purchasing agent for the Recovery group with the responsibility for contract negotiation/administration and material control.
- o Obtain the following services as appropriate:
  - Accommodations for lodging, trailer setups, airline and auto transportation (shuttle services).
  - Office support services such as typing, copying, office supplies, furniture, photography, and supply of area maps.
  - Food services and necessary (nonradioactive) waste disposal.
- o Provide for any necessary aerial services.
- o Provide any extra communication equipment.
- o Provide financial and accounting service.
- o Direct the activities of the Communications Director, Access Control Director, and the Training Director. Also functionally direct the activities of the Manpower and Logistics Director located at the CCC to obtain assistance in fulfilling the responsibilities listed above. The CCC Director has direct responsibility for the Manpower and Logistics Director.
- o Provide a processing center for the registration of all incoming personnel; provide security to the EOF or Backup EOF through the Access Control Director.
- o Maintain a record of the GSEP related activities.



TABLE 4.3-10

EMERGENCY NEWS CENTER DIRECTOR

The Emergency News Center Director, upon activation of the Emergency News Center Group at the EOF, is responsible for all recovery related information intended to be conveyed from CECO to the news media.

The responsibilities of the Emergency News Center Director who reports to the EOF Recovery Manager are to:

- o Assure the operability of, and supervise the activities in the Joint Public Information Center (JPIC).
- o Effect a smooth transition of the news media point-of-contact from CCC to JPIC, and of news information responsibilities from CCC/Information Director to EOF/ENC Director.
- o Maintain the primary interface between CECO and the news media, including, as necessary, briefings, news conferences, interviews, and response to information requests.
- o Keep up-to-date on conditions of the plant and environment, and actions of CECO personnel and outside agencies.
- o Obtain approval of the Recovery Manager, or his designee, of all information intended to be conveyed to the news media.
- o Coordinate with Federal, State, and local agencies, as well as with other organizations involved in the recovery, to maintain factual consistency of information to be conveyed to the news media.
- o Direct the activities of the CCC/Information Director.
- o Participate, as needed, in rumor control activities managed by State agencies.
- o Maintain a record of GSEP related activities.

TABLE 4.3-11

CORPORATE COMMAND CENTER DIRECTOR

The Corporate Command Center Director will direct company GSEP activities until such time when (and if) the Recovery Group at the EOF is activated. After the Recovery Group is activated, the CCC Director and his staff become a support group to the Recovery Manager.

Responsibilities assigned to the CCC Director (prior to activation of the Recovery Group) are to:

- o Direct the GSEP organization shown in Figure 4.3-1 and coordinate all company activities involved in coping with the emergency.
- o Notify appropriate Federal, State, and local agencies of emergency conditions in accordance with Section 6.0 of this plan.
- o Notify American Nuclear Insurers of any emergency classification and Transportation Accident.
- o Ensure that appropriate measures are promptly taken onsite to:
  - Terminate the condition causing the emergency.
  - Protect employees and the public.
  - Minimize the damage to the plant.
  - Effect post accident recovery and deactivate the GSEP organization.
- o Approve the factual content of CECO press releases to the public.
- o Request assistance from outside emergency response organizations, such as INPO and the Department of Energy Chicago Operations Office, if required.
- o Maintain a record of the GSEP related activities.
- o Activate the Recovery Group if the emergency escalates to a Site or General Emergency or if otherwise deemed appropriate.

Following Recovery Group activation at the EOF:

- o Remain at the CCC and provide assistance to the Recovery Manager, as requested.
- o Direct the CCC organization shown in Figure 4.3-2.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-12

SYSTEM POWER DISPATCHER

The System Power Dispatcher is the designated individual located at the System Power Supply Office (SPSO) who is responsible for performing normal duties and providing notification to the Nuclear Duty Officer, as outlined in Section 6.0.

Responsibilities assigned to the System Power Dispatcher who reports to the CCC Director are to:

- o Notify the Nuclear Duty Officer in the event of a Transportation Accident, an Unusual Event, an Alert, a Site Emergency, a General Emergency, or a loss of communications with a nuclear station as reported from the nuclear station.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-13

MEDICAL DIRECTOR

The Medical Director is the company physician or other medically qualified individual who is responsible for providing recommendations to the Corporate Command Center Director (both prior to and during the Recovery phase) for medical treatment and for specifying medical supplies necessary for decontamination treatment and general first aid.

Responsibilities assigned to the Medical Director who reports to the CCC Director are to:

- o Ensure that arrangements with appropriate hospitals have been made for the emergency care and admission of patients involved in hazardous materials/radiation incidents.
- o Recommend first aid and decontamination techniques for personnel requiring aid in the emergency area.
- o Coordinate the activities of contracted radiological medical assistance personnel.
- o Analyze all available health information data pertaining to persons who have received injuries or excessive exposure to hazardous materials, including radioactivity.
- o Ensure that procedures governing the use of thyroid blocking agents have been followed by Commonwealth emergency personnel.
- o Consult with the Corporate Command Center Director regarding measures to protect onsite personnel and the offsite public.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-14

LEGAL CONSULTANT

The Legal Consultant is a representative of Commonwealth's legal staff who is responsible for providing counsel on all legal matters. Prior to and during the recovery phase of the emergency, he will report to the Corporate Command Center Director.

Responsibilities assigned to the Legal Consultant are to:

- o Provide legal assistance to Commonwealth.
- o Provide counsel to the CCC Director regarding Federal, State, and local regulations pertaining to emergency plans.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-15

ENGINEERING DIRECTOR

The Engineering Director who reports to the CCC Director at the CCC will coordinate the engineering services necessary for plant modifications, special equipment arrangement, shielding, containers, or other devices needed during the emergency. Upon activation of the EOF Recovery Group, the Engineering Director will functionally serve as a support individual for the Design and Construction Support Manager.

Responsibilities assigned to the Engineering Director (prior to Recovery Group activation) are to:

- o Assist in the development of post accident recovery measures.
- o Provide technical information on the facility design.
- o Ensure that modifications needed for plant recovery are implemented in a timely manner.
- o Enlist the aid of consultants as necessary.
- o Maintain a record of the GSEP related activities.

Following EOF Recovery Group activation, the Engineering Director shall perform activities similar to those listed above, except that they shall be done in coordination with and in support of the Design and Construction Support Manager who is located at the EOF.

TABLE 4.3-16

INTELLIGENCE DIRECTOR

The Intelligence Director will coordinate activities relating to health physics evaluations and information distribution to inform and make recommendations to the CCC Director. The Intelligence Director will serve as CCC Director in the event that the CCC Director or an alternate is not available. Upon activation of the EOF Recovery Group, he will functionally serve as a support individual for the Technical Support Manager while remaining at the CCC.

Responsibilities assigned to the Intelligence Director (prior to EOF Recovery Group activation) are to:

- o Assist the CCC Director in the evaluation of the significance of an emergency with respect to the public.
- o Direct the activities of the Health Physics Director and the Information Director when located in the CCC.
- o Review and concur with press releases proposed by the Information Director.
- o Maintain records of information obtained from the other directors within the CCC organization, including contacts with offsite agencies, contractors and other support forces.
- o Serve as the CCC Director in the event that the CCC Director or an alternate is not available.
- o Provide for access control to the CCC with designated individuals.
- o Maintain a record of the GSEP related activities.

Following EOF Recovery Group activation, the Intelligence Director shall perform functional activities at the CCC in support of the Technical Support Manager.

TABLE 4.3-17

HEALTH PHYSICS DIRECTOR

The Health Physics Director shall serve as support from the CCC to the onsite health physics activities by providing additional instrumentation or personnel as necessary, under the direction of the Intelligence Director. He shall make recommendations on dose management techniques for both onsite and offsite activities for maintaining personnel exposures as low as reasonably achievable. Upon activation of the EOF Recovery Group, he shall serve as a support individual for the Waste Systems/Radiation Control Manager at the EOF.

Responsibilities assigned to the Health Physics Director (prior to Recovery Group activation) are to:

- o Determine the need for additional radiological support personnel.
- o Determine the need for additional health physics instrumentation, dosimetry, and protective equipment.
- o Review plant health physics information and make recommendations to the Intelligence Director. To the extent possible, make recommendations that will ensure that emergency and recovery operations are performed in accordance with Commonwealth radiation protection standards. Especially during reentry situations, normal 10 CFR 20 exposure limits are not to be exceeded, and in all situations personnel exposures should be maintained as low as reasonably achievable.
- o Assist the affected station in the development of plans for plant surveys, sampling, shielding, and special tools in support of waste systems processing and design modification activities.
- o Keep informed of the activities of offsite environmental monitoring teams. Make recommendations that will assist those teams maintain their exposures as low as reasonably achievable.
- o Maintain a record of the GSEP related activities.

Following an EOF Recovery Group activation, the Health Physics Director shall perform activities similar to those listed above, except that they shall be done at the EOF in coordination with and in support of the Waste Systems/Radiation Control Manager. The Health Physics Director shall also provide for the radiation protection of personnel at the EOF.



TABLE 4.3-18

INFORMATION DIRECTOR

The Information Director is responsible for collecting, verifying, and disseminating information on emergency situations to the public via the news media, under the direction of the Intelligence Director. Upon the activation of the Recovery Group, the Information Director shall report to the Emergency News Center Director.

Responsibilities assigned to the Information Director (prior to Recovery Group activation) are to:

- o Obtain information. Through GSEP personnel, determine the nature of the emergency and its effect on the public and other company operations.
- o Release information. Take steps to release accurate information as soon as possible. Coordinate the release of information with other involved agencies and companies. The news media seeking interviews and comments from Commonwealth officials should be given full cooperation.
- o Distribute internal information. Information should be promptly disseminated to Commonwealth employees as soon as possible through appropriate communications channels.
- o Maintain a record of the GSEP related activities.

Following an EOF Recovery Group activation, the Information Director becomes a support individual to the Emergency News Center Director and shall release information only when directed by the Emergency News Center Director. The Information Director is to maintain his office in either the CCC or other appropriate CECO locations.

TABLE 4.3-19

ENVIRONMENTAL DIRECTOR

The Environmental Director is responsible for initially coordinating all offsite sampling/monitoring activities of Commonwealth personnel and for interfacing with State personnel regarding dose assessment programs. Upon activation of the EOF Recovery Group, he shall serve as a support individual for the Environmental/Emergency Coordinator at the EOF.

Responsibilities assigned to the Environmental Director (prior to Recovery Group activation) are to:

- o Direct the environmental sampling activities of the Onsite/Offsite Environs Director.
- o Coordinate the environmental contractor's assistance in the collection of environmental data.
- o Cooperate with the Illinois Department of Nuclear Safety (and contiguous State agencies) in the implementation of an offsite dose assessment program.
- o Based on environmental sampling or known plant releases, calculate projected dose values for affected areas; based on these projections, advise the CCC Director of protective action recommendations for plant personnel and members of the public. These recommendations should be consistent with Tables 6.3-1, 6.3-2, and 6.3-3 of this plan.
- o Maintain a record of the GSEP related activities.

Following a Recovery Group activation:

- o Obtain information and perform activities at the Corporate Environmental Center at the direction of the Environmental/Emergency Coordinator.

TABLE 4.3-20

MANPOWER/LOGISTICS DIRECTOR

The Manpower/Logistics Director is responsible for directing a staff of manpower, logistics, communications, aerial assistance, and accounting personnel in support of the station as required by the Corporate Command Center Director. Upon activation of the Recovery Group, he shall serve as a support individual for the Administration/Logistics Manager.

Responsibilities assigned to the Manpower/Logistics Director (prior to Recovery Group Activation) are to:

- o Ensure that emergency communications equipment is kept operable during the course of the emergency.
- o Provide personnel, equipment, and services as required, primarily from the appropriate Division. Services may include transportation of personnel and equipment.
- o Keep the CCC Director informed of support services available to assist the station.
- o Direct the activities of the Accounting Director, and the ERP Director.
- o Maintain a record of the GSEP related activities.

Following a Recovery Group activation, the Manpower/Logistics Director shall perform activities at the CCC under the functional direction of the Administration/Logistics Manager who is located at the EOF.

TABLE 4.3-21

ACCOUNTING DIRECTOR

The Accounting Director is responsible for accounting and related cost monitoring practices related to the emergency. He shall remain at the CCC or other designated location throughout the emergency and recovery activities, functioning under the direction of the Manpower/Logistics Director.

Responsibilities assigned to the Accounting Director are to:

- o Seek counsel of Industrial Relations, the comptroller's office, and others as required.
- o Initiate use of the special GSEP function number to accrue GSEP costs.
- o Make provisions to establish a proper method of accounting for costs of contractual services and other expenditures related to the emergency.
- o Fulfill the clerical requirements for the other directors of the Corporate Command Center.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-22

COMMUNICATIONS DIRECTOR

The Communications Director is responsible for the procurement of required telephone and radio communications services and facilities as specified by the Manpower/Logistics Director and maintenance of these communications as required. Upon activation of the EOF Recovery Group, the Communications Director reports to the Administration/Logistics Manager.

Responsibilities assigned to the Communications Director are to:

- o Obtain additional radio and telephone equipment as necessary to meet the needs of the emergency.
- o Obtain sufficient personnel to maintain communications equipment in an operable condition.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-23

ERP DIRECTOR

The Corporate Command Center ERP Director, located in the CECO Technical Center Office in Maywood, Illinois, shall coordinate the activities of Division personnel and equipment. Under the direction of the Manpower/Logistics Director, he shall provide for Division support to the affected station.

Upon activation of the EOF Recovery Group, the ERP Director reports to the Administration/Logistics Manager, from the Technical Center office in Maywood, Illinois.

Responsibilities assigned to the ERP Director are to:

- o Activate the Emergency Restoration of Power Program as necessary to support the station activities.
- o Inform the respective Division Director of support service required by the Station or the EOF.
- o Obtain additional support from the other Division Directors, as the level of requirements increases.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-24

DIVISION DIRECTOR

The Division Director shall direct the GSEP Division personnel to provide support services required by the Corporate Command Center ERP Director.

Responsibilities assigned to the Division Director(s) are to:

- o Activate the Division resources for emergency support and coordinate all activities.
- o Provide the required personnel, instruments, equipment, and material to the station as specified by the CCC ERP Director.
- o Assist government agencies, if required, with the movement and evacuation of the public from a defined area.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-25

OFFSITE ENVIRONS DIRECTOR

The Offsite Environs Director is the member of the offsite GSEP organization who will supervise the activities of Commonwealth Edison environmental sampling teams in an emergency. He may be activated at the discretion of the Onsite Environs Director, or the Corporate Command Center Environmental Director, or by activation procedures of the recovery groups. He shall carry out his activities at the direction of the Corporate Command Center Environmental Director. Subsequent to a Recovery Group activation, he shall serve under the Environmental/Emergency Coordinator.

Responsibilities assigned to the Environs Director are to:

- o Establish a headquarters at the affected station's EOF.
- o Coordinate the transfer of command of the Environs Field Teams if initially under the direction of the Onsite Environs Director.
- o Assemble one or more environmental monitoring teams, if not previously assembled by the Onsite Environs Director. During an actual or suspected gaseous release situation from the plant, two teams should be dispatched. If sufficient manpower is available, there should be three persons per team.
- o Dispatch and coordinate the activities of Commonwealth Edison environmental monitoring teams in order to determine the extent and nature of offsite releases of radioactive or other hazardous materials. Activities of the teams may include:
  - Dose rate surveys (including plume tracking);
  - Air sampling;
  - Soil, water, and vegetation sampling;
  - Contamination surveys; and
  - Exchange of TLDs and filter cartridges from fixed environmental stations.
- o Request through the GSEP organization:
  - Assistance for road blocks and security until State, County and Local personnel are available;
  - Communications equipment as necessary. Telephones, mobile radios, and portable radios may be required;
  - Required transportation for personnel; and
  - Sufficient technical and nontechnical personnel to expand the operation as necessary.
- o Maintain a record of the GSEP related activities.



TABLE 4.3-26

TRAINING DIRECTOR

The Training Director shall coordinate the training of individuals needed to support recovery operations. The Training Director reports to the Administration/Logistics Manager

Responsibilities assigned to the Training Director include:

- o Provide the coordination necessary to train large numbers of personnel needed to support recovery operations at an affected nuclear station.
- o Ensure that training given to incoming personnel includes descriptions of the station layout, basic radiation protection, status of systems, and emergency procedures.
- o Ensure that training is given on out-of-normal procedures for shift operators, maintenance, health physics, and chemistry personnel.
- o Determine areas of abnormal radiation levels and provide specific instructions to personnel on how to limit exposures in such areas.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-27

WASTE SYSTEMS DIRECTOR

The Waste Systems Director who reports to the Waste Systems/Radiation Control Manager shall support the onsite radwaste activities by providing technical assistance in the form of manpower, equipment, supplies, and recommendations for both onsite and offsite activities.

Responsibilities assigned to the Waste System Director are:

- o Maintain an updated status report on onsite radwaste systems regarding solid, liquid, and gaseous materials.
- o Recommend sampling programs to the affected station that shall allow evaluation of radwaste system status.
- o Develop plans and procedures for processing contaminated materials for both short and long-term reduction programs.
- o Develop plans and procedures for shipment of contaminated materials to authorized burial locations.
- o Develop plans for modifications to plant systems that will allow waste processing in keeping with the "ALARA" concept.
- o Provide information and recommendations to the Waste Systems/Radiation Control Manager concerning future operations that could affect the plant, equipment, or environment.
- o Direct a radwaste system operations staff.
- o Maintain a record of the GSEP related activities.

TABLE 4.3-28

ACCESS CONTROL DIRECTOR

The Access Control Director reports to the Administration/Logistics Manager. Initially the Security Director working from the TSC may be the acting Access Control Director. The responsibilities of the Access Control Director are to:

- o Control access to the EOF or Backup EOF.
- o Coordinate with the Administration/Logistics Manager or his designee to control ingress and egress of the EOF personnel.
- o Report to the CCC Director or Station Director during early stages of EOF activation to control access until the Administration/Logistics Manager arrives at the EOF.
- o Maintain a record of the GSEP related activities.

4.4 Minimum Staffing Of Emergency Response Facilities

Emergency personnel assume responsibility for their positions upon receiving notification to activate. They may perform tasks related to fulfilling their responsibilities before arriving at an emergency facility. The command and control function, however, does not transfer from Control Room to TSC, from TSC to CCC, from TSC to EOF, or from CCC to EOF until certain criteria have been met. These criteria are:

1. Sufficient personnel are available in the facility to determine classifications, to determine recommended protective actions, to notify state and local agencies and to maintain communications.
2. Personnel in the facility have been fully briefed as to the status of the event and the currently proposed plan of action.
3. A formal statement of turnover between Shift Engineer and Station Director, between Station Director and Recovery Manager/Corporate Command Center Director or between Corporate Command Center Director and Recovery Manager have been made.

The essential activities that must be performed by a minimal staff once the command and control function have been assumed are as follows:

- o Determine proper emergency action level classification.
- o Determine proper recommended protective actions.
- o Notify state, local and federal agencies as appropriate.
- o Maintain communications with their source of information.

The minimum staff for the Technical Support Center is as follows:

- o Station Director.
- o Operations Director or Technical Director.
- o Rad./Chem. Director.
- o Environs Director. (Environs Director may function at either the TSC or the EOF)
- o One other Director or Communicator.

The minimum staff for the Corporate Command Center is as follows:

- o Corporate Command Center Director.
- o Environmental Director.
- o Engineering Director, Intelligence Director or Health Physics Director.
- o Two other Directors or Communicators.

The minimum staff for the Emergency Operations Facility is as follows:

- o Recovery Manager.
- o Environmental/Emergency Coordinator or Assistant Environmental/Emergency Coordinator.
- o Technical Support Manager, Advisory Support Manager or Recovery Manager's Communicator.
- o Design and Construction Support Manager, Technical Spokesman or Recorder.
- o Environs Director. (Environs Director may function from either the TSC or the EOF.)
- o One other Director or Communicator.

This allowance for a minimum staff assumes that remaining Directors and personnel will arrive within a short period of time. The concept allows the Station Director, CCC Director or Recovery Manager to relieve the Shift Engineer, Station Director or CCC Director of the responsibility for outside notifications once these positions have been filled.

#### 4.5 Non-Commonwealth Support Groups

Agreements are maintained with support agencies for each nuclear station. These support agencies (to be named in each site specific annex) provide services of:

- 1) law enforcement;
- 2) fire protection;
- 3) ambulance services;
- 4) medical and hospital support; and
- 5) radiological assistance.

Support groups providing transportation and treatment of injured station personnel are described in Section 6.5 of this plan.

Commonwealth retains contractors to provide supporting services to nuclear generating stations. Among services currently provided are the following:

- \*1) Teledyne Isotopes provides environmental radiological monitoring, and radiochemical analysis services. Bioassays are done by Controls For Environmental Pollution Inc. (CEP). In an emergency situation, Teledyne field personnel, at a minimum, would continue to maintain Commonwealth air samplers and exchange TLDs under the supervision of either the Environmental/Emergency Coordinator or the Onsite/Offsite Environs Director. The Teledyne laboratory in Northbrook, Illinois would analyze the environmental samples for their radioactivity content and report results to Commonwealth Edison.
- \*2) Radiation Management Corporation (RMC) provides services of medical and health physics support. RMC advises on the health physics aspects of situations requiring medical assistance, provides and maintains whole body counters at Commonwealth nuclear stations, and interprets bioassay results.
- \*3) Murray and Trettel, Inc. provides meteorological monitoring services, including weather forecasts. Murray and Trettel maintains all Commonwealth nuclear station meteorological facilities. Murray and Trettel has computer capability to pool remotely the meteorological facilities to ascertain local conditions and to detect instrument failure.
- \*4) R. S. Landauer, Jr., Company provides personnel dosimetry services. Landauer provides film badges and TLD rings to personnel at the nuclear stations; processes the dosimetry; and

\*NOTE: The specific contractors may change but the functions are maintained.

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reports the results in hardcopy and computer card format. In an emergency, Landauer would provide additional dosimetry to the affected nuclear station and to the Environmental/Emergency Coordinator, and to the Health Physics Director, if needed.

#### 4.6 Institute of Nuclear Power Operations (INPO)

Experience has shown that a utility may need resources beyond in-house capabilities for the recovery from a nuclear plant emergency. One of the roles of the Institute of Nuclear Power Operations (INPO) is to assist affected utilities by quickly applying the resources of the nuclear industry to meet the needs of an emergency.

INPO has an emergency response plan that enables it to provide the following emergency support functions:

- o Assistance to the affected utility in locating sources of emergency manpower and equipment;
- o Analysis of the operational aspects of an incident;
- o The dissemination of information to member utilities concerning aspects of the incident that are applicable to their operations; and
- o Organizing the support of industry experts who could advise the utility on technical matters.

To support these functions, INPO maintains the following emergency support capabilities:

- o A dedicated emergency call number;
- o Designated INPO representative(s) who can be quickly dispatched to the utility emergency response organization to coordinate INPO support activities and information flow; and
- o The 24 hour per day operation of an Emergency Response Center at INPO headquarters.
- o Emergency Resources Manual

Commonwealth Edison will notify INPO (via the designated emergency call number) for all situations involving an Alert, Site Emergency, or General Emergency declaration.

INPO has coordinated the preparation of a Voluntary Assistance Agreement for Transportation Accidents. Commonwealth has signed this agreement which establishes the rights and responsibilities of electric utilities in requesting or providing assistance for response to a nuclear materials Transportation Accident.



#### 4.7 Participating Federal Organizations

##### 4.7.1 Nuclear Regulatory Commission

The Nuclear Regulatory Commission (NRC) is responsible for licensing and regulating nuclear facilities and materials and for conducting research in support of the licensing and regulatory process. These responsibilities include protecting the public health and safety, protecting the environment, protecting and safeguarding materials and plants in the interest of national security and assuring conformity with antitrust laws.

The NRC Office of Inspection and Enforcement has the responsibility for auditing of nuclear power stations, special nuclear material, source material, and byproduct material licensees. It is responsible for ensuring that such activities are conducted in accordance with the terms and conditions of such NRC licenses and that as a result of such operations, there is no undue risk to the health and safety of the public.

The NRC Office of Nuclear Reactor Regulation, established by the Energy Reorganization Act of 1974, as amended, performs licensing functions associated with the construction and operation of nuclear reactors and with the receipt, possession, ownership, and use of special nuclear and byproduct materials used at reactor facilities.

With regard to emergency preparedness, the NRC shall:

- 1) Assess licensee emergency plans for adequacy;
- 2) Review the Federal Emergency Management Agency findings and determinations on the adequacy and capability of implementation of State and local plans; and
- 3) Make decisions with regard to the overall state of emergency preparedness and issuance of operating licenses.

The NRC shall respond to incidents at licensed facilities or vehicular accidents involving licensed materials, including radionuclides, in transit. The NRC shall act as the lead Federal agency with regard to technical matters during a nuclear incident including radiological assistance. The NRC shall be prepared to recommend appropriate protective actions for the public and technical actions to the licensee. FEMA shall act as the lead Federal agency for offsite, nontechnical concerns.

During an incident the Chairman of the Commission is the senior NRC authority for all aspects of a response. The Chairman shall transfer control of emergency response activities to the Director of Site Operations when deemed appropriate by the Chairman.

All NRC Regions as well as Headquarters are prepared to respond to potential emergencies. All Regions and Headquarters have developed plans and procedures for responding to radiological incidents involving NRC licensees. Headquarters has developed the NRC Incident Response Plans and Implementing Procedures. Each NRC Region has developed Regional Supplements that detail how the Region will fulfill all of the responsibilities assigned in the NRC Incident Response Plan. All NRC organizations are responsible for maintaining an effective state of preparedness through periodic training, drills, and exercises.

Each Region and Headquarters has established and maintains an Incident Response Center designed to centralize and coordinate the emergency response function. Adequate communications are established to link the licensee, Headquarters, and the Region. The NRC has established lines of communications with local government, State government, other Federal agencies, Congress, and the White House. Public information will be disseminated in a timely manner and periodically.

Each Region is prepared to send a team of qualified specialists to the scene expediently. All of the necessary supplies and equipment needed for emergency response will be provided and maintained by the NRC.

The NRC's Incident Response Plan objectives are to provide for protection of the public health and safety, property, and the environment, from the effects of radiological incidents which may occur at licensed facilities or which involve licensed materials, including radionuclides in transit.

The objectives of the agency plan set forth the organizational and management concepts and responsibilities needed to assure that NRC has an effective emergency response program.

The plan is intended to ensure NRC preparedness:

- o To receive and evaluate notification information of incidents, accidents and unusual events and determine the extent of NRC response necessary to meet NRC responsibilities for mitigating the consequences of these events;
- o To determine the cause of incidents, accidents, and unusual events in order to ensure that appropriate corrective actions are taken by the licensee to minimize the consequences of these events;
- o To provide onsite expertise in a timely manner, to evaluate the nature and extent of the incident, ascertain plant status (for reactors and fuel facilities), monitor licensee activities, determine compliance, make recommendations, and, if necessary, issue orders relative to the event;

- o To inform the public and others of plant status and technical details concerning the incident;
- o To recommend adequate protective actions to the responsible local and/or State agencies;
- o To provide technical assistance;
- o To ensure the plant is returned to a safe condition; and
- o To return the NRC Headquarters and Regional office to normal operations.

#### 4.7.2 Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency (FEMA) establishes policy and coordinates the civil emergency planning, management, mitigation, and assistance functions of the executive agencies of the United States. FEMA is also responsible for establishing a program of federal disaster preparedness and for providing technical assistance to states in developing comprehensive plans and practical programs for preparation against disaster.

With regard to radiological emergency preparedness, FEMA will:

- 1) Establish policy and provide leadership via the Federal Radiological Preparedness Coordinating Committee (FRPCC) in the coordination of all Federal assistance to State and local governments for developing, reviewing, assessing, and testing the State and local radiological emergency response plans;
- 2) Review and approve State and local radiological emergency response plans and preparedness in accordance with FEMA regulations;
- 3) Develop, with the NRC, scenarios for use by NRC licensed facility operators and State and local governments in testing and exercising radiological emergency plans; and
- 4) Develop, implement, and maintain a training program to support State and local radiological emergency response plans.

The role of FEMA during an emergency is that of coordinating and directing the offsite activities of all Federal agencies during a radiological accident.

4.7.3 Federal Radiological Preparedness Coordinating Committee (FRPCC)

The Federal Radiological Preparedness Coordinating Committee consists of the Federal Emergency Management Agency, which chairs the Committee, the Nuclear Regulatory Commission, the Environmental Protection Agency, the Department of Health and Human Services, the Department of Energy, the Department of Transportation, the Department of Defense, the Department of Agriculture, the Department of Commerce, and where appropriate and on an ad hoc basis, other Federal departments and agencies. The FRPCC shall assist FEMA in providing policy direction for the program of Federal assistance to State and local governments in their radiological emergency planning and preparedness activities.

4.7.4 Department of Energy Chicago Operations Office

The Department of Energy has extensive radiological monitoring equipment and personnel resources that it can assemble and dispatch to the scene of a radiological incident.

Upon request, the Department of Energy (DOE) Chicago Operations Office will provide assistance to Commonwealth Edison following a radiological incident as outlined in the Federal Radiological Monitoring and Assessment Plan (FRMAP). The objective of the DOE Chicago Operations Office would be to rapidly dispatch a team of specialists to the incident site where the team would:

- 1) Make needed radiological assistance available to the general public, State and local governments, and Federal agencies;
- 2) Provide a framework through which Federal agencies will coordinate their emergency monitoring and assessment activities in support of State and local governments radiological monitoring and assessment activities; and
- 3) Assist State and local governments in preparing for radiological emergencies by describing Federal radiological assistance responsibilities and capabilities.

If Commonwealth Edison deems that assistance from DOE is necessary or desirable, the Recovery Manager, the Corporate Command Center Director, or the Station Director would notify the DOE Chicago Operations Office. Assistance provided by DOE shall not abridge State or local authority.

#### 4.7.5 The U.S. Coast Guard

The U.S. Coast Guard patrols and ensures the safety of navigable waterways in the United States. The U.S. Coast Guard shall be promptly notified of any oil or hazardous substance discharges into rivers or lakes or radioactive contamination of rivers or lakes under Coast Guard jurisdiction at levels requiring assistance to effect protective actions (Refer to Section 9.3).

The U.S. Coast Guard will be contacted by the Illinois Department of Conservation in the event of an incident at a nuclear power plant. The Coast Guard will be responsible for officially closing the waterways to all commercial traffic (Refer to the State plan).

#### 4.7.6 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers controls barge and boat traffic at locks and dams on navigable waterways in the United States.

The Corps of Engineers will be contacted by the Illinois Department of Conservation in the event of an incident at a nuclear power plant. The Corps will be responsible for closing their locks and dams to all waterway traffic leading to the affected area, allowing only traffic leaving the area [Refer to the State Plan "The Illinois Plan for Radiological Accidents" (IPRA) Volume 1 & 2].

#### 4.7.7 Federal Bureau of Investigation (FBI)

Support from the Federal Bureau of Investigation (FBI) is available through its statutory responsibility based in Public Law and the US code, and through a memorandum of understanding for cooperation with the Nuclear Regulatory Commission. Notification to the FBI of emergencies in which they would have an interest will be through provisions of the Nuclear Station's Security Plan, or by the NRC.

#### 4.8 The State of Illinois

The State of Illinois has the statutory responsibility and authority for protecting the health and safety of the public in Illinois.

The State of Illinois has developed an "Illinois Plan for Radiological Accidents" (IPRA). This plan was developed in accordance with the guidance suggested by NUREG 0396 and NUREG 0654.

This section provides a summary of the essential elements of the State Plan.

The Illinois Plan for Radiological Accidents (IPRA) is based upon the implementation of five basic functions:

- o Command and Coordination
- o Notification and Warning
- o Accident Assessment
- o Protective Actions
- o Parallel Actions

Figure 4.8-1 depicts the overall concept of operations for the Illinois Plan for Radiological Accidents (IPRA).

##### 4.8.1 Governor of the State of Illinois

The Governor of the State of Illinois has overall command authority for both the radiological and nonradiological aspects of a nuclear incident. The Governor shall make the final recommendation for protective actions, and shall serve as the State's primary spokesperson.

#### 4.8.2 Illinois Department of Nuclear Safety (DNS)

The Illinois Department of Nuclear Safety (DNS) has both the command authority for radiological aspects of a nuclear incident and the responsibility for performing various radiological functions. These functions include food, water and milk control, radiation exposure control for the general public, and confirmatory accident assessment. During an emergency situation, the DNS shall make protective action recommendations to the Governor and the Illinois Emergency Services and Disaster Agency.

The State of Illinois Department of Nuclear Safety has the responsibility to inform the State of Wisconsin Department of Emergency Government with respect to GSEP emergency classifications at Byron Nuclear Power Station that impacts the 50 mile ingestion pathway zone.

The DNS response to a nuclear incident utilizes two functional subgroups. They are the Radiological Emergency Assessment Center (REAC) and the Radiological Assessment Field Team (RAFT).

##### 4.8.2.1 Radiological Emergency Assessment Center (REAC)

The DNS has established REAC at its Springfield headquarters. REAC will serve as the command location for all (State related) radiological aspects of a nuclear incident. The Associate Director of DNS, or his designated alternate, is in command of REAC.

##### 4.8.2.2 Radiological Assessment Field Team (RAFT)

RAFT has been organized to perform the field radiological functions of confirmatory accident assessments during a nuclear emergency. RAFT consists of a Mobile Command Center, a Mobile Nuclear Laboratory, and monitoring and sampling teams.

#### 4.8.3 Illinois Emergency Services and Disaster Agency (ESDA)

The Illinois Emergency Services and Disaster Agency (ESDA) has command authority for the non-radiological aspects of a nuclear incident and provides the overall coordination of the emergency response. The Illinois ESDA has the programmatic responsibility to implement protective actions as recommended for the public by the DNS and the Governor.

The State of Illinois has defined four levels of operational response; each level requires increasing degrees of response from State and local agencies. An immediate level of operational response for a given emergency (GSEP) classification shall be required so that the level of response shall accord with the accident classification. The minimum operational response levels for given incident classifications can be summarized as follows:

- Level 1 Unusual Event  
Notification of ESDA and DNS
- Level 2 Alert  
Notification of ESDA and its key personnel, DNS and its key personnel, and key local governments. REAC shall be activated.
- Level 3 Site Emergency  
Same as Level 2 plus the following: RAFT shall be dispatched to the affected site; ESDA shall activate the State EOC; county and local governments shall activate their EOCs and activate their public notification system.
- Level 4 General Emergency  
Notification of all parties involved in the operational response. Activation of all operations and command centers associated with the operational response. REAC shall be activated and RAFT shall be dispatched. Local governments shall activate their public notification system and implement protective action.

The operational response level for the Unusual Event, Alert, and Site Emergency may be increased to a higher level if deemed necessary.

The State's operational response to an emergency utilizes six (6) operational centers:

- o State Emergency Operations Center (SEOC)
- o State Command Post (SCP)
- o State Staging Center (SSC)
- o Community Command Post (CCP)
- o County Emergency Operations Center (CEOC)
- o Local Government Emergency Operations Center (LGEOC)

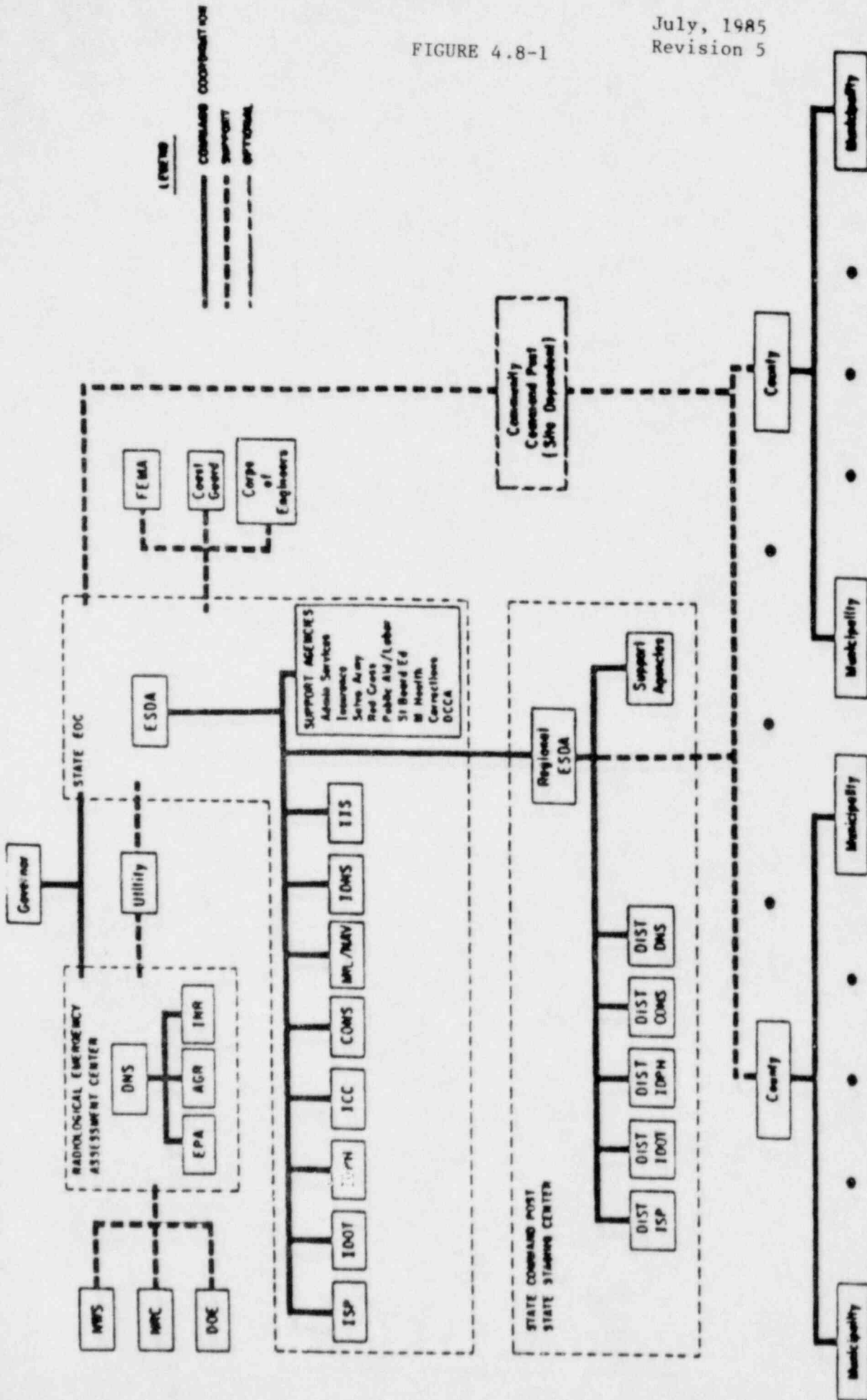
The following sections shall discuss the role of these operational centers. Depending upon the nature of the emergency, one or more of these centers may not be activated.



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FIGURE 4.8-1

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4.8.3.1 State Emergency Operations Center (SEOC)

The SEOC (manned 24 hours per day) is located in Springfield, Illinois and is the central command post for state agencies. The primary function of the SEOC is to coordinate the State's response with local governments. For this purpose, the SEOC is staffed during emergencies by representatives of State agencies under the overall direction of the ESDA Internal Support Coordinator.

4.8.3.2 State Command Post (SCP)

The SCP shall be located near or within the affected plume exposure EPZ and is responsible for the allocation of state agency resources and personnel in support of local government actions.

4.8.3.3 State Staging Center (SSC)

The SSC shall be located near the affected plume exposure EPZ and shall serve as an extension of the SEOC. Staging center personnel shall be responsible for summarizing personnel assignments. The SSC shall also be used to store state resources, such as TLDS and potassium iodide.

4.8.3.4 Community Command Post (CCP)

For certain sites, particularly those near major metropolitan areas and/or contiguous states, a Community Command Post shall be utilized. The CCP shall be similar to the SEOC in that it shall provide a central meeting place for representatives from local governments and contiguous states for tasks like response management and radiological assessment updates.

4.8.3.5 County Emergency Operations Center (CEOC)

In those areas without a CCP, the County EOC shall serve as the primary coordinating center for local government response within the county's jurisdiction and for coordination between counties.

4.8.3.6 Local Government Emergency Operations Center (LGEOC)

The LGEOC shall serve as the command post for organizing each local government's implementation of protective actions.

#### 4.8.4 Notification

Following the preliminary notification by the affected nuclear station, the State shall initiate a notification procedure commensurate with the reported emergency (Refer to the State Plan).

#### 4.8.5 Accident Assessment

Upon notification of an emergency, the DNS shall conduct a confirmatory accident assessment.

This assessment shall involve the determination of the source term, the projection of the atmospheric dispersion of the release, and the deposition of the radioactive material if appropriate.

#### 4.8.6 Protective Actions

The recommendation for protective actions for the public during the preliminary phase of a fixed nuclear facility incident shall, of necessity, be based upon the preliminary assessment made by the facility. After the confirmatory accident assessment, the recommendation for protective actions, if appropriate, shall be made by the Director of DNS to the Governor and the Director of ESDA. Such a recommendation shall be based upon the projected population dose as determined through the confirmatory accident assessment and/or the potential for such exposure.

Following the determination of appropriate protective actions, implementation of these actions shall be under the command and control of the ESDA which shall ensure completion in accordance with the State plan. Protective actions include: evacuation; shelter; access control; food, water, and milk control; and protective actions for emergency workers.

#### 4.8.7 Parallel Actions

Parallel actions are performed by the State after or in conjunction with protective actions. Parallel actions consist of:

- 1) Law enforcement;
- 2) Social services;
- 3) Emergency medical services;
- 4) Radiation exposure control; and
- 5) Re-entry.

#### 4.9 The State of Iowa

Much of the Emergency Planning Zone for the Quad Cities Nuclear Station lies within the State of Iowa. The State of Iowa has developed an "Iowa Emergency Plan". This plan is now under formal review by the Federal Emergency Management Agency, Regional and National offices. This section provides a summary of the essential elements of the Iowa Emergency Plan, specifically outlining the specific responsibilities of certain "key" Iowa State Agency players in a response operational mode.

##### 4.9.1 Protective Actions

The State of Iowa uses the following criteria in deciding upon specific protective actions during a radiological emergency:

- 1) EPA Manual of Protective Actions Guides and Protective Actions for Nuclear Incidents; and
- 2) Food and Drug Administration (FDA) guidance regarding contamination of human food and animal feeds published in the Federal Register on October 22, 1982.

The Governor, or in his absence, his designee, will make all protective action decisions (sheltering, evacuation). These decisions will be coordinated with the local government entities involved.

##### 4.9.2 Iowa Office of Disaster Services

The Iowa Office of Disaster Services shall coordinate all activities of State agencies and departments, all local governments, and the utility in support of emergency response activities. These activities shall be coordinated from the Iowa State EOC in Des Moines.

##### 4.9.3 The Iowa Commissioner of Public Health, or his designee, from the Iowa State Department of Health.

The Iowa State Department of Health shall alert the State Hygienic Lab when emergency action conditions are reported by a commercial nuclear power reactor, which impacts upon the public health and safety in Iowa, and when emergency team response has been determined to be necessary or imminent. They shall perform necessary calculation and evaluate the impact of existing and projected radioactivity releases in terms of public health risk. They shall translate the evaluation of existing and projected environmental contamination and resulting dose into terms of alternative protective actions. They shall recommend appropriate protective actions to the Governor's Office, the Iowa Office of Disaster Services, and other State agencies as appropriate.

4.9.4 State Hygienic Lab (SHL)

The State Hygienic Lab, located in Iowa City, Iowa shall: conduct and coordinate all field surveillance and monitoring activities directed toward measuring radiation exposure and radioactivity contamination in the environment resulting from an accident at a commercial nuclear power reactor; provide and coordinate laboratory support of all environmental sampling and radiological monitoring activities during a nuclear emergency; communicate all relevant data and protective action recommendations to the State Department of Health of the Des Moines EOC; provide radiological laboratory support for environmental samples analysis; and provide recommendations for decontamination of contaminated area.

4.9.5 Iowa Department of Water, Air, and Waste Management

This agency shall provide first and primary alert notification to the Federal EPA; prepare environmental advisories to public water supplies; provide primary coordination of disposal of contaminated materials; and provide primary control of public water supplies.

During a serious radiological emergency at the Quad Cities Nuclear Power Station, an Emergency Operating Center shall be activated at the Scott County Courthouse, basement, in Davenport, Iowa. The Director, or designee, of the State Hygienic Lab shall control environmental sampling, conducted by a number of radiological monitoring teams, from this emergency operations center. Also, during an emergency communications shall be established and ongoing between the Iowa Office of Disaster Services in Des Moines, the Illinois Department of Nuclear Safety in Springfield, Illinois, the Scott and Clinton County EOC's, and the Utility, for the purpose of mutual cooperation between Illinois and Iowa with regard to radiological assessment efforts.

4.9.6 Local Government

Local governments are responsible for overall emergency preparedness at the local level. This includes preparation of emergency plans, and designation of assembly areas and congregate care facilities within jurisdictional areas. The local governments are responsible for implementing the actual protective actions taken, including evacuation.

#### 4.10 The State of Wisconsin

A portion of the Emergency Planning Zone for the Zion Nuclear Station lies within the State of Wisconsin. The State of Wisconsin has developed a "State of Wisconsin Peacetime Radiological Emergency Response Plan." This section provides a summary of the essential elements of the Wisconsin emergency plan.

##### 4.10.1 Concept of Operations

Initially, responsibility for responding to a radiological emergency, including evacuation, rests with local governments and their emergency services. Notification, by either local authorities or legal possessors of uncontrolled materials, to the Division of Emergency Government (DEG) that a radiological emergency exists will bring in the resources of the Division of Health, Radiation Protection Section to assess and evaluate the situation and determine protective action. State agency notification for assistance and coordination of response operations of the state agencies in support of local government will be performed by the DEG as determined by the Governor.

##### 4.10.2 Division of Emergency Government

The DEG is to provide the principal support response to emergencies in the State of Wisconsin, coordinate the responses of other state agencies, brief the Governor of emergency situations, and activate the State Emergency Operating Center in Madison, if necessary.

##### 4.10.3 Division of Health

For peace time radiological emergencies, the Bureau of Health has designated the Chief of the Radiation Protection Section as the State Radiological Coordinator (SRC) for the State Radiological Response (RAD RESP) Team. Team members are personnel of the section, as designated by the SRC, augmented by selected personnel from the DEG and other state and local agencies trained specifically for radiological incidents.

Environmental sampling conducted by the State of Wisconsin following a serious radiological emergency will be coordinated from the Madison EOC by the SRC or his designated alternate. In the case of a serious radiological emergency at Zion Station, communications shall be maintained between the Madison EOC and the Illinois Department of Nuclear Safety in Springfield, Illinois for the purpose of mutual cooperation between Illinois and Wisconsin with regard to radiological assessment efforts.

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The State of Wisconsin utilizes guidance promulgated by the U.S. Environmental Protection Agency and the U.S. Department of Health and Human Services as the basis for determining what protective actions are necessary during a radiological incident.

#### 4.10.4 Kenosha County

Kenosha County will provide a coordinated local government response in conjunction with State, from the County Emergency Operating Center in Kenosha.

#### 4.11 American Nuclear Insurers (ANI)

In early 1982, American Nuclear Insurers (ANI) issued Bulletin #5B (81) "Accident Notification Procedures for Liability Insureds" which provides revised criteria for the notification of the Pools in the event of a nuclear emergency at one of the liability insured nuclear power reactor sites. This revision brings the ANI/MAELU (Mutual Atomic Energy Liability Underwriters) notification criteria into alignment with the standard emergency classification system adopted by the nuclear industry. This document also identifies a suitable channel for follow-up communication by ANI after initial notification.

##### 4.11.1 ANI/MAELU Emergency Assistance

In the event of an extraordinary nuclear occurrence (as defined in the Price-Anderson Law) ANI and MAELU (the pools) have plans prepared to provide prompt emergency funding to affected members of the public.

##### 4.11.2 ANI/MAELU Emergency Assistance (Claims Handling Procedures)

The pools' emergency assistance arrangements contemplate the mobilization and dispatch of emergency claims teams to directly dispense emergency assistance funds to affected members of the public.

The pools should be notified in the event of a nuclear emergency requiring notification of State or Federal governmental agencies, or if the insured believes that offsite persons may be affected and financial assistance of a nature discussed may be required. In these instances ANI expects notification as soon as possible after the initiation of the emergency. To be consistent with industry classification systems, the Commonwealth Edison GSEP notification of the pools in the event of an ALERT, SITE AREA EMERGENCY, or GENERAL EMERGENCY should be within eight (8) hours.

To assure operability of communication techniques and equipment ANI will also be notified of exercise scenarios that use the same type of classifications. Even if it appears to be remote that offsite persons will be affected, the pools should be notified in order that response plans can be initiated to the point of alerting teams of adjusters to stand by. Response activity can be discontinued if it proves less severe and does not require pool response.

All nuclear occurrences of an emergency or nonemergency nature which fall under the nuclear liability policy should be reported formally in writing to ANI by the Commonwealth Edison Insurance Administrator.



4.11.4 Emergency Notification and Follow-up Procedures

In the event of an emergency clear lines of communication have been established between each station Emergency Operations Facility/Corporate Command Center and ANI in order to exchange all required information during a developing emergency situation.

ANI maintains 24 hour coverage of an emergency notification number. During normal office hours (8:00 am - 4:00 pm) their number will be answered by the receptionist who will transfer an incoming emergency call to an appropriate individual in the office. Outside of normal office hours this phone line is covered by an answering service. The answering service will intercept the call and obtain the name, affiliation and phone number of the caller. They will then notify a designated ANI staff member who will in turn call back the facility to obtain appropriate information regarding the nuclear accident.

In order that follow-up information is available to the pool Commonwealth Edison Company has established the Recovery Manager/Corporate Command Center Director of their designee as a Point of contact that ANI personnel may use to update themselves regarding the status of the emergency.

## 5.0 CLASSIFICATION OF EMERGENCY CONDITIONS

The GSEP describes six mutually exclusive classifications for emergency conditions, covering the postulated spectrum of emergency situations.

Each of the first five (5) emergency classifications are characterized by Emergency Action Levels, or initiating conditions. These initiating conditions for the most part, have been selected so as to not infer any immediate need to implement protective actions, but rather to ensure adequate time is available to confirm in-plant readings by implementing assessment measures.

This section describes the GSEP emergency classification system. Additionally, the GSEP Station Director/Corporate Command Center Director/Recovery Manager may declare an incident to fall within a specific emergency classification if it is decided that the incident is of equivalent magnitude to the criteria used to define the emergency class. Each of the first five classifications is associated with a particular set of immediate actions to be taken to cope with situations.

In addition to the emergency classifications used to describe a developing emergency, guidance is provided for downgrading an accident classification, if warranted, until TERMINATION of the incident is possible. When the emergency condition no longer exists and return to normal plant operation status is imminent, then the emergency shall be TERMINATED. Termination may be performed from any of the five classifications or the Recovery Phase.

### 5.1 Emergency Action Levels (EALS)

Site specific annexes shall include a table of emergency action levels (EALS) consistent with the concerns of the general class descriptions and the examples provided in Appendix I of NUREG 0654. Where possible, these emergency action levels will be related to plant instrumentation readings. In some instances, it may be inappropriate for a particular station to adopt initiating conditions exactly equivalent to those examples specified in NUREG 0654. Site specific annexes should categorize postulated accidents contained in the Stations Final Safety Analysis Report provided the event produces a concern consistent with the class description in NUREG 0654.

In addition, the site specific annexes shall address the accident classifications identified in Table 5.1-1 and Sections 5.2 and shall reference the guidance provided for entry into a recovery phase for downgrading and for termination identified in Sections 5.3, 5.4, and 5.5, respectively.

TABLE 5.1-1  
EMERGENCY ACTION LEVELS  
FOR RADIOACTIVITY IN LIQUID EFFLUENTS

GSEP CLASSIFICATION	BASIS	EMERGENCY ACTION LEVEL <sup>a</sup>	
		GROSS BETA/GAMMA	TRITIUM (PWR)
UNUSUAL EVENT	Parallel logic to the NRC EAL for airborne release: T.S. limit $\leq$ Release $<$ 10xT.S. limit	$1 \times 10^{-7} \leq C(\text{uCi/ml}) < 10^{-6}$	$13 \times 10^{-3} \leq C(\text{uCi/ml}) < 3 \times 10^{-2}$
ALERT	Lower limit based on EPA's suggested 10 mrem whole body limit for drinking water alert level <sup>b</sup> Upper limit based on FDA's preven- tive level of 500 mrem whole body OR Release $\geq$ 10 x T.S. limit	$40 \leq A(\text{Ci}) < 2000^c$  OR $C(\text{uCi/ml}) \geq 10^{-6}$	$500 \leq A(\text{Ci}) < 20,000$  OR $C(\text{uCi/ml}) \geq 3 \times 10^{-2}$
SITE EMERGENCY	Lower limit based on FDA's preven- tive level Upper level based on FDA's emergency level of 5000 mrem whole body	$2000 \leq A(\text{Ci}) < 20,000$	$2 \times 10^4 \leq A(\text{Ci}) < 2 \times 10^5$
GENERAL EMERGENCY	In excess of FDA's emergency level	$A(\text{Ci}) > 2 \times 10^4$	$A(\text{Ci}) > 2 \times 10^5$

a EALs are measured or estimated to be in discharge water flow.

b Unofficial EPA guidance.

c Assumptions:

- water dilution of  $10^{10}$  liters (typical for any station.)
- weighted concentration limit of 0.2 uCi/ml for FDA's preventive level (assumes a mixture of 1% each I-131, Sr-90; 10% Sr-89; 44% each Cs-134, Cs-137.)
- Dose from Cs-134 is twice that from Cs-137 per unit of activity consumed.

Concentration (microcuries/milliliter)

A = Activity in Curies

5.2 DESCRIPTION OF TRANSPORTATION ACCIDENT

This class involves an accident involving the transportation of radioactive or other hazardous material from a nuclear station or other location where CECO is the shipper.

Depending on the materials involved and the type of accident, there is a wide range of possible releases, i.e., the accident could be of almost any severity.

1. A vehicle transporting radioactive materials or nonradioactive hazardous materials from a nuclear station is involved in a situation in which:
  - a. Fire, breakage, or suspected radioactive contamination occurs involving a shipment of radioactive material; or
  - b. As a direct result of any hazardous materials:
    - o A person is killed
    - o A person receives injuries requiring hospitalization
    - o Estimated carrier or other property damage exceeds \$50,000.
2. Any other condition of equivalent magnitude to the criteria used to define this category, as determined by the Station Director or the Corporate Command Center Director.

### 5.3 DESCRIPTION OF RECOVERY

This section describes criteria to be considered prior to reclassification of the emergency class to RECOVERY PHASE. Emergency classifications are used to protect the health and safety of the public, the environment, the emergency workers and the plant equipment by ensuring that commensurate levels of response personnel are activated. They are declared as the emergency develops. However, once the public and environment have been adequately protected, the plant has been stabilized, contained, and controlled, the Recovery phase can be established.

The Recovery phase is that period when major repairs are being performed to return the plant to operation. The emergency condition no longer exists. It is the responsibility of the Recovery Manager, plant conditions warranting, to establish the Recovery phase after consultation with cognizant governmental agencies and other parties.

Establishment of a Recovery phase can occur from any Emergency Classification Level. When normal operations are ready to resume the emergency situation will be TERMINATED.

Since the potential of releasing activity depends upon plant parameters and equipment, the establishment of a Recovery phase should not occur as long as uncontrolled releases are, or will occur. As long as offsite doses or dose projections remain above the PAG's due to plant conditions the Recovery phase should not be established. The potential for uncontrolled releases should be negligible and plant conditions stabilized before a Recovery may be established.

The following conditions are to be guidelines for determination of the possibility for establishing a Recovery. The purpose of a Recovery is to terminate the emergency, provide the necessary manpower to handle the long term activities, and to return the plant to an acceptable condition.

Establishment of a Recovery Phase should consider but not be limited to the following:

1. Has the risk to the health and safety of the public been mitigated?
2. Have plant parameters and equipment status been established and controlled?

3. Have any uncontrolled gaseous releases to the environment been terminated?
4. Has the environment been monitored?
5. Have CECO workers been protected?
6. Has any security threat been neutralized, and/or is plant security under the direction of CECO personnel?
7. Have effluent monitor readings returned to acceptable levels?
8. Have any uncontrolled liquid releases been terminated?
9. Have core coverage and containment integrity been restored?
10. Are plant safety systems operable?
11. Has the fuel pool been damaged, or spent fuel damage been contained and controlled?
12. Has excessive primary and/or secondary containment leakage been secured and controlled?
13. Is containment activity reduced to levels below that requiring protective actions?
14. Are plant conditions, parameters, systems, or equipment restored and/or replaced such that PAG's are no longer applicable?
15. Has the fire been extinguished?
16. Is the earthquake over?
17. Have adverse environmental conditions at the plant site been terminated?
18. Have flood waters subsided below EAL's?
19. Conditions that have initiated the emergency condition have been contained, controlled, eliminated or stabilized such that the classification is no longer applicable.
20. Has any other condition of equivalent magnitude to the criteria used by the Station Director/CCC Director/Recovery Manager to classify an emergency been determined to no longer be applicable?

#### 5.4 Guidance For Downgrading Of Classification

Downgrading of the emergency classification may occur if conditions in the plant have substantially changed so as to alter the condition for the potential of releasing activity to the environment. If the offsite dose equivalent and/or dose equivalent projections have been reduced to a value within a lower emergency classification, the actual classification may be downgraded to a lower level.

The purpose of downgrading the classification is to identify accurately the emergency, and to allow Federal, State and local officials to provide the necessary manpower to handle the current emergency condition.

Downgrading of the emergency classification may occur when conditions exist such that a lower level of classification would be appropriate.

Once a downgrading has been evaluated and established by the Station Director/Recovery Manager/Corporate Command Center Director the appropriate authorization level must report this action in accordance with established reporting procedures.

Any emergency classification may be reclassified directly to any other emergency classification, either upgrading to a more severe, or downgrading to a less severe emergency classification. It is also possible to change from any emergency classification to "Recovery" or from "Recovery" back to any emergency classification. An event may be changed from any emergency classification directly to "Normal Operations" without going through a "Recovery" if conditions permit.

5.5 Guidance For Termination Of Emergency

The purpose of terminating an emergency is to provide an orderly turnover of plant control from the GSEP organizations to the normal Commonwealth Edison plant organization. Termination of the emergency is declared by the person in charge: Recovery Manager, Corporate Command Center Director, or Station Director. Termination may occur from any Emergency Classification or from Recovery.

Termination of the emergency should consider but not be limited to the following:

1. Has the potential for activity release been adequately controlled?
2. Have offsite dose equivalent and/or dose equivalent projections been reduced to acceptable levels for public exposure?
3. Have plant parameters returned to acceptable conditions for normal plant organizational control?
4. Have conditions that initiated the emergency been mitigated?
5. Have appropriate Federal, State and local authorities been notified?



## 6.0 EMERGENCY MEASURES

This section discusses guidelines for Commonwealth Edison's

- 6.1 Emergency Response Actions
- 6.2 Assessment Actions
- 6.3 Protective Actions for the Offsite Public
- 6.4 Protective Actions for Onsite Personnel
- 6.5 Aid to Affected Onsite Personnel

Included are graphic and textual descriptions of preplanned organizational structures for notification of responsible agencies that an emergency has been declared at a nuclear power station. This section identifies communication flow paths for the rapidly developing emergency when only station personnel are available for evaluations and notifications. These same communication flow paths are used with additional requirements for the slowly developing emergency when additional Commonwealth Edison emergency response organizations are available for evaluations and notifications. This section identifies notification schemes for the five (5) emergency classes as listed in Section 5.0 as well as the actions for Recovery, and Downgrading of the Emergency classes.

Throughout each emergency situation, continuing accident assessment will occur; therefore, a generic description of equipment and systems available for these actions is provided within this section.

Protective actions for the public are based upon actual, potential, or imminent release of radioactive materials. Guidance on recommended protective actions, notification schemes, and reentry to evacuated areas is provided.

For onsite personnel, guidance is provided regarding protective equipment and personnel accounting depending upon their location. Also given is guidance for radiation exposure, decontamination and first aid, and medical transportation and treatment.

### 6.1 Commonwealth Emergency Response Actions

During an emergency situation at one of its nuclear stations, Commonwealth Edison has the responsibility to implement appropriate emergency measures. These measures include:

- o Notification of responsible authorities;
- o Activation of the GSEP organization;
- o Assessment of the emergency situation;
- o Initiation of actions to correct or mitigate an emergency at or near the source of the problem;
- o Recommendation of protective actions for the offsite public; reference Tables 6.3-1, 6.3-2 and 6.3-3, and Figure 6.3-1.
- o Initiation of protective measures for onsite personnel; and
- o Provision of aid to affected onsite personnel.

When Commonwealth Edison initially notifies State or local authorities of an emergency condition, the following information should be transmitted as a minimum:

- 1) Name and title of the reporting person;
- 2) Location and type of incident (i.e., the emergency classification);
- 3) Date and time of incident;
- 4) Whether a release of radioactive material is taking place;
- 5) Potentially affected population and areas;
- 6) Whether protective measures may be necessary; and
- 7) Verification to confirm authenticity of call.

Figure 6.1-1 (A), (B), (C), & (D) shows the initial notification scheme for declared GSEP emergencies.

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For GSEP events of Alert or higher classification, follow-up messages to State and local authorities will be made at least every 60 minutes and shall contain the following information if it is known and appropriate:

- 1) Type of actual or projected release (airborne, waterborne, surface spill), and estimated duration/impact times;
- 2) Estimate of quantity of radioactive material released or being released and the points and height of release;
- 3) Chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodines, and particulates;
- 4) Meteorological conditions at appropriate levels (wind speed, direction (to and from), indicator of stability; form of precipitation, if any);
- 5) Actual or projected dose rates at site boundary; projected integrated dose at site boundary;
- 6) Projected dose rates and integrated dose equivalent at the projected peak and at about 2, 5, and 10 miles, including sector(s) affected; \*
- 7) Estimate of any surface radioactive contamination in-plant, onsite, or offsite;
- 8) Emergency response actions underway;
- 9) Recommended emergency actions, including protective measures;
- 10) Requested onsite support from offsite organizations; and
- 11) Prognosis for worsening or termination of event based on plant information.

Major Commonwealth emergency response actions for upgrading to each emergency class are identified in Table 6.1-1 through Table 6.1-5 as indicated below:

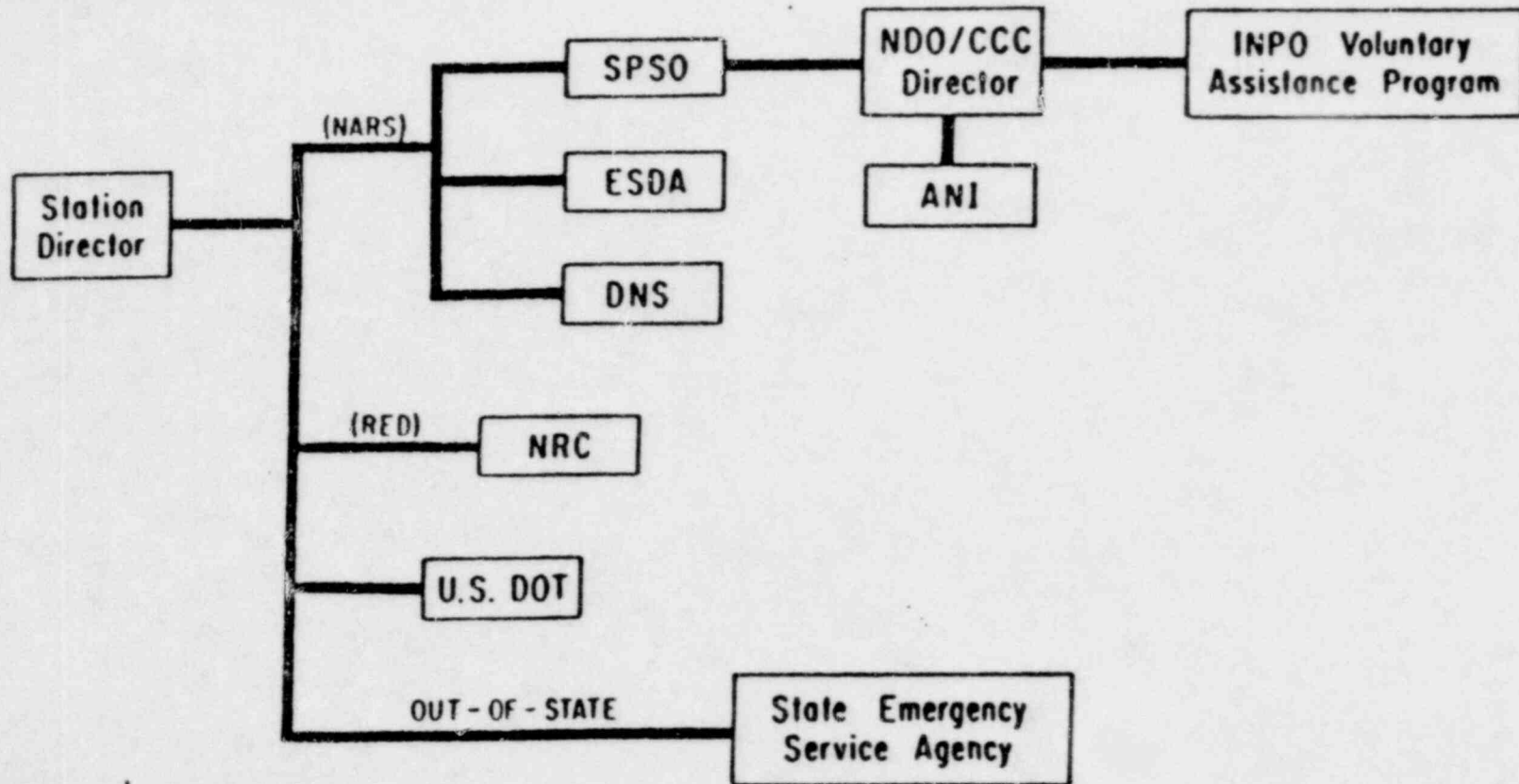
- 1) Table 6.1-1 - Actions for Transportation Accident;
- 2) Table 6.1-2 - Actions for Unusual Event;
- 3) Table 6.1-3 - Actions for Alert;
- 4) Table 6.1-4 - Actions for Site Emergency;
- 5) Table 6.1-5 - Actions for General Emergency.

Commonwealth Edison Company actions for downgrading an accident and for entering the recovery phase are given in Tables 6.1-6 and -7.

\* Figure 6.1-2 gives the sectors and zone designators that are used at each nuclear station.

FIGURE 6.1-1 (A)  
SIMPLIFIED EMERGENCY NOTIFICATION SCHEDULE

TRANSPORTATION ACCIDENT

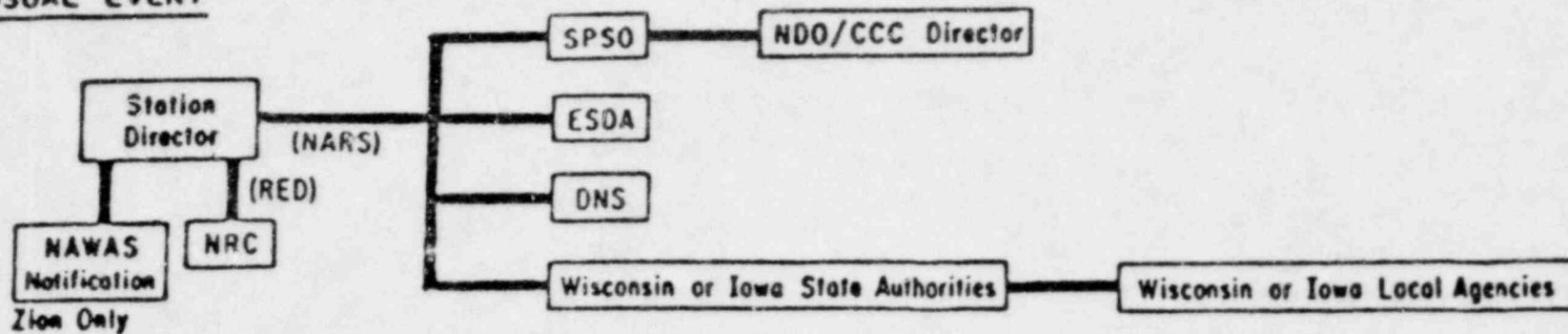


6-4

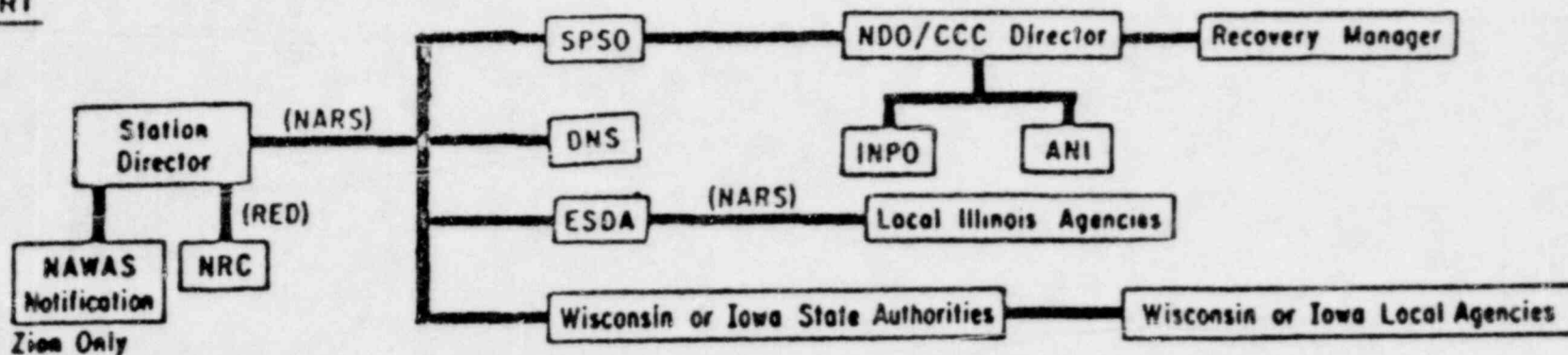
( ) INDICATES TYPE OF PHONE SYSTEM APPLICABLE FOR NOTIFICATION - UNLESS OTHERWISE NOTED, A STANDARD PHONE SYSTEM IS APPROPRIATE

FIGURE 6.1-1 (B)  
SIMPLIFIED EMERGENCY NOTIFICATION SCHEDULE

UNUSUAL EVENT

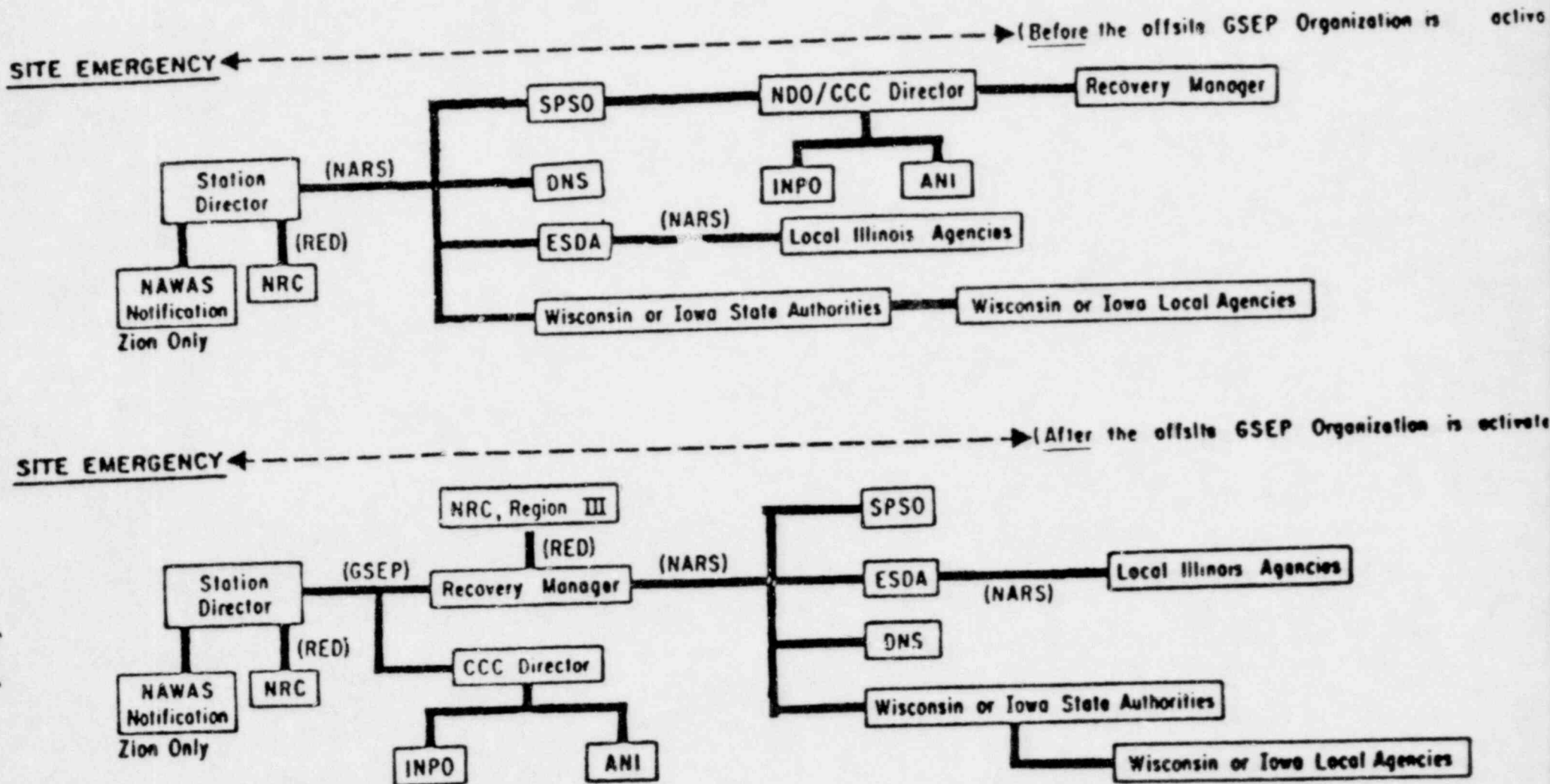


ALERT



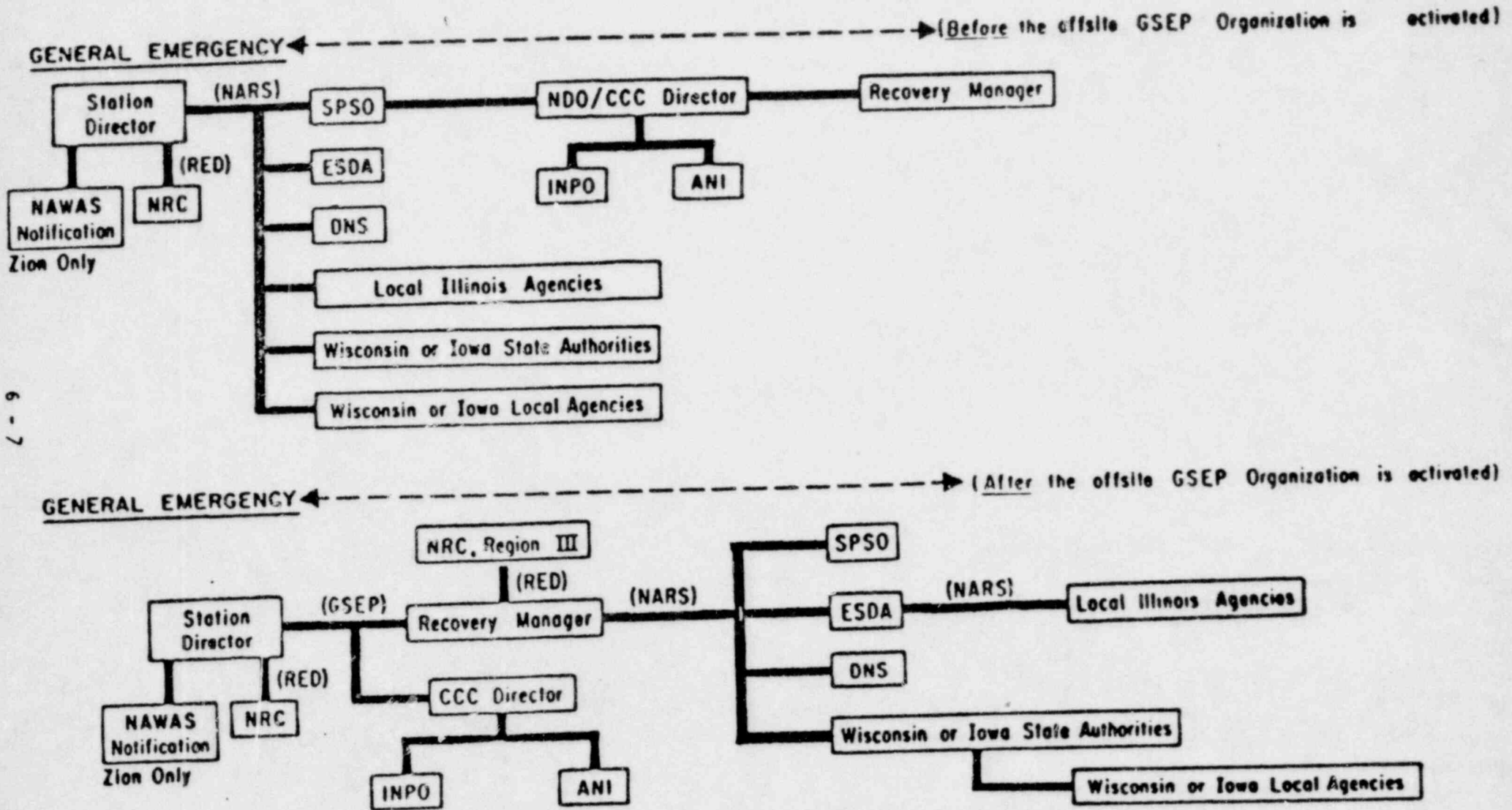
( ) Indicates type of phone system applicable for notification - unless otherwise noted, a standard phone system is appropriate

FIGURE 6.1-1 (C)  
SIMPLIFIED EMERGENCY NOTIFICATION SCHEDULE



( ) Indicates type of phone system applicable for notification - unless otherwise noted, a standard phone system is appropriate

FIGURE 6.1-1 (D)  
SIMPLIFIED EMERGENCY NOTIFICATION SCHEDULE



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( ) Indicates type of phone system applicable for notification - unless otherwise noted, a standard phone system is appropriate

FIGURE 6.1-2

SECTOR AND ZONE DESIGNATORS

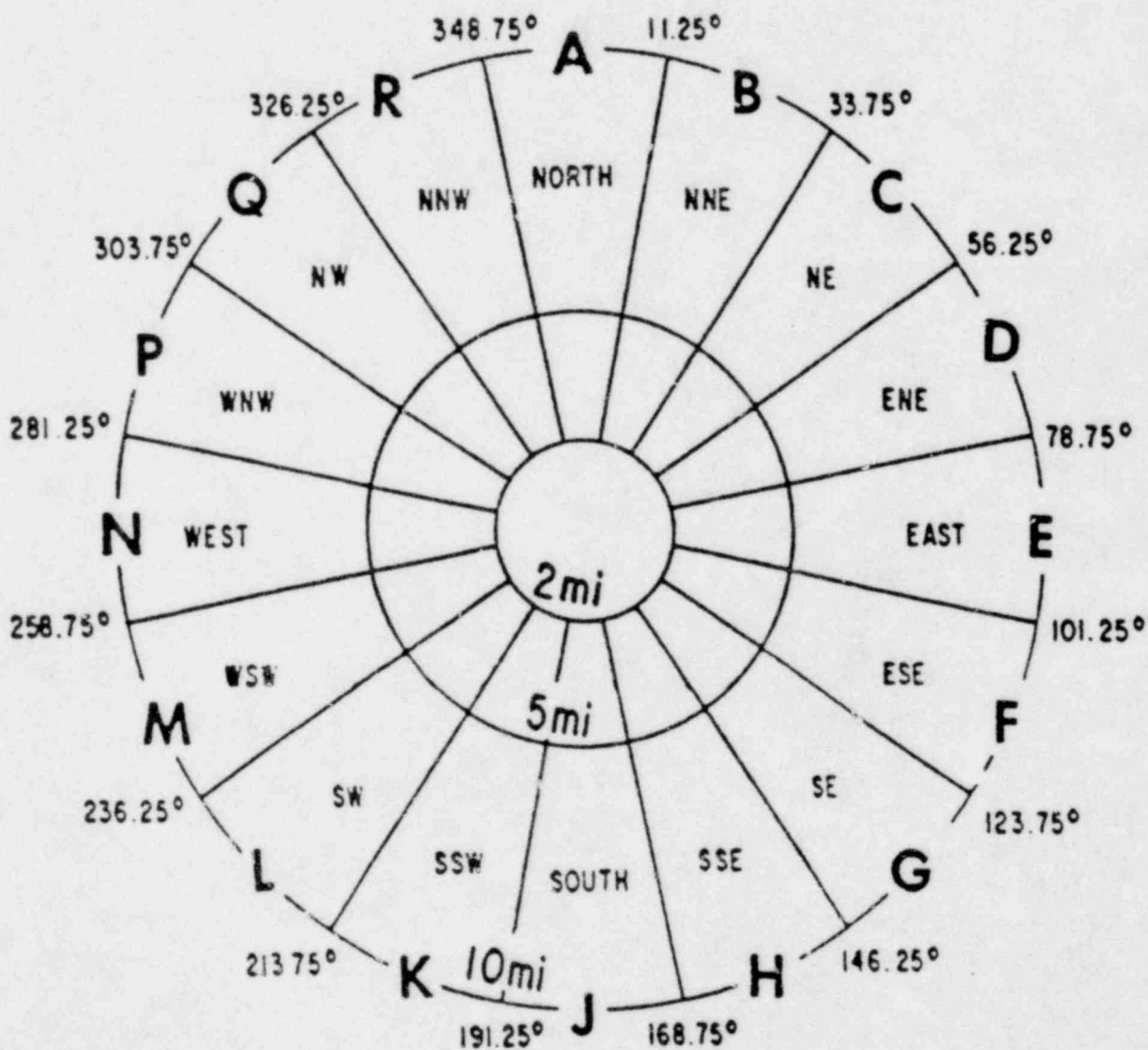




TABLE 6.1-1  
COMMONWEALTH ACTIONS FOR TRANSPORTATION ACCIDENT

1. STATION DIRECTOR\* (Reference Figure 6.1-1A)
  - a. Declare Transportation Accident Condition.\*
  - b. Notify System Power Dispatcher.
  - c. Notify the NRC Operations Center.
  - d. Notify the following agencies:
    - o The United States Department of Transportation
    - o The State and local emergency agencies nearest to the scene of the accident
    - o The Illinois Emergency Services and Disaster Agency (if the accident occurred within the State of Illinois)
    - o The Illinois Department of Nuclear Safety (if the accident occurred within the State of Illinois)
    - o The Iowa Office of Disaster Services (if the accident occurred within the State of Iowa)
  - e. Activate those parts of the GSEP Station Group needed to meet the needs of the emergency.
  - f. Dispatch personnel for evaluation, if deemed necessary.
2. SYSTEM POWER DISPATCHER
  - a. Immediately notify the Nuclear Duty Officer.
3. NUCLEAR DUTY OFFICER/CORPORATE COMMAND CENTER DIRECTOR
  - a. Activate those parts of the offsite GSEP organization needed to meet the needs of the emergency.
  - b. Ensure that the following agencies were promptly notified of the emergency by the carrier and provide an update as appropriate:
    - o The American Nuclear Insurers (ANI)
    - o The United States Department of Transportation (DOT)
    - o The State and local emergency agencies nearest to the scene of the accident
    - o The Illinois Emergency Services and Disaster Agency (if the accident occurred within the State of Illinois)
    - o The Illinois Department of Nuclear Safety (if the accident occurred within the State of Illinois)
    - o The Iowa Office of Disaster Services (if the accident occurred within the State of Iowa)
  - c. Notify INPO regarding the Voluntary Assistance Program

\*Since a Transportation Accident condition is an offsite occurrence, the Corporate Command Center Director may be notified of the emergency prior to a Station Director being notified; in that case, the CCC Director would declare the Transportation Accident condition.

Table 6.1-1 (Cont.)

Each notification should have included:

- o Name of reporter
  - o Name and address of the carrier represented by the reporter
  - o Phone number where the reporter can be contacted
  - o Date, time, and location of incident
  - o The extent of injuries, if any
  - o The classification, name, and quantity of hazardous materials involved, if such information is available
  - o The type of incident and the nature of hazardous material involvement and whether a continuing danger to life or health exists at the scene.
- d. If deemed necessary, dispatch environmental monitoring teams or seek the aid of other emergency response organizations to assist in the field.
- e. If the Transportation Accident occurs outside the Commonwealth Edison Company service territory and additional radiological assistance is necessary, contact the appropriate utility which has signed into the INPO Voluntary Assistance Agreement.

4. OVERALL GSEP RESPONSE

- a. Assess situation and respond.
- b. Activate the Corporate Command Center as appropriate.
- c. Initiate recovery measures in cooperation with State and local emergency personnel as appropriate.

TABLE 6.1-2  
COMMONWEALTH ACTIONS FOR UNUSUAL EVENT

1. STATION DIRECTOR (Reference figure 6.1-1b)
  - a. Declare an Unusual Event condition.
  - b. Ensure that the following organizations have been notified of the emergency:
    - o System Power Supply Office
    - o Illinois ESDA and DNS
    - o Scott/Clinton Counties (for Quad Cities Station only)
    - o Iowa Office of Disaster Services (for Quad Cities Station only)
    - o Wisconsin Division of Emergency Government (for Zion Station only)
    - o Kenosha County (for Zion Station only)
  - c. Notify for Zion Station only: Kenosha Co. Warning Center, Wisconsin DEG, and Waukesha Office.
  - d. Notify the NRC Operations Center.
  - e. Activate those parts of the GSEP Station Group needed to meet the needs of the emergency.

2. SYSTEM POWER DISPATCHER

- a. Immediately notify the Nuclear Duty Officer (NDO).

NUCLEAR DUTY OFFICER/CORPORATE COMMAND CENTER DIRECTOR

- a. Ensure that the following organizations have been notified of the emergency:
  - o Illinois ESDA and DNS
  - o Scott/Clinton Counties (for Quad Cities Station only)
  - o Iowa Office of Disaster Services (for Quad Cities Station only)
  - o Wisconsin Division of Emergency Government (for Zion Station only)
  - o Kenosha County (for Zion Station only)
- b. Activate those parts of the offsite GSEP organization needed to meet the needs of the emergency.
- c. Close out with a verbal summary to NRC, State of Illinois, and contiguous State authorities as appropriate, or escalate to a more severe class.

TABLE 6.1-2 (CON'T)  
COMMONWEALTH ACTIONS FOR UNUSUAL EVENT

4. OVERALL GSEP RESPONSE

- a. Assess situation and respond.
- b. Augment on-shift resources.
- c. Recommend protective actions to ESDA/DNS and contiguous State authorities consistent with Figure 6.3-1 and Tables 6.3-1, 6.3-2, and 6.3-3.

TABLE 6.1-3  
COMMONWEALTH ACTIONS FOR ALERT

1. STATION DIRECTOR (Reference figure 6.1-1b)
  - \*a. Declare Alert condition.
  - \*b. Ensure that the following organizations have been notified of the emergency:
    - o System Power Supply Office
    - o Illinois ESDA and DNS
    - o Scott/Clinton Counties (for Quad Cities Station only)
    - o Iowa Office of Disaster Services (for Quad Cities Station only)
    - o Wisconsin Division of Emergency Government (for Zion Station only)
    - o Kenosha County (for Zion Station only)
  - c. Notify for Zion Station only: Kenosha Co. Warning Center, Wisconsin DEG, and Waukesha Office.
  - \*d. Notify the NRC Operations Center.
  - e. Activate those parts of the GSEP Station group needed to meet the needs of the emergency.
  - f. Activate the TSC and OSC.
2. SYSTEM POWER DISPATCHER (If the CCC/EOF has not been activated)
  - a. Notify the Nuclear Duty Officer.
3. NUCLEAR DUTY OFFICER/CORPORATE COMMAND CENTER DIRECTOR
  - a. Perform actions 1a, 1b and 1d if in command of the situation.
  - b. Ensure that the following organizations have been notified of the emergency:
    - o Illinois ESDA and DNS
    - o Scott/Clinton Counties (for Quad Cities Station only)
    - o Iowa Office of Disaster Services (for Quad Cities Station only)
    - o Wisconsin Division of Emergency Government (for Zion Station only)
    - o Kenosha County (for Zion Station only)
    - o Institute of Nuclear Power Operations

\* Actions 1a, 1b and 1d are the responsibility of the Corporate Command Center Director if the Corporate Command Center is activated and the CCC Director has assumed command.

TABLE 6.1-3 (CONT)

- c. Activate those parts of the offsite GSEP organization needed to meet the needs of the emergency. Activate the EOF Recovery Group if deemed necessary.
- d. Evaluate emergency conditions, personnel requirements, health and safety aspects of the public, Commonwealth Edison Company personnel, plant status, and environmental conditions prior to briefing the NRC, State of Illinois, and contiguous State authorities as appropriate to escalate to a more severe class.
- e. Evaluate emergency conditions, personnel requirements, health and safety aspects of the public, CECO personnel, plant status, and environmental conditions prior to briefing the NRC, State Authorities (ESDA & DNS) of the recommendation for downgrading to a less severe class of emergency or to entering a Recovery Mode.
- f. Notify ANI (Reference GSEP Section 4.10)

4. OVERALL GSEP RESPONSE

- a. Assess situation and respond.
- b. Augment on-shift resources.
- c. Activate the Corporate Command Center, the TSC, and the OSC.
- d. Provide periodic plant status updates and meteorological information to ESDA/DNS and contiguous State authorities. If any releases are occurring, provide dose equivalent estimates for actual releases.
- e. Recommend protective actions to ESDA/DNS and contiguous State authorities consistent with Figure 6.3-1 and Tables 6.3-1, 6.3-2, and 6.3-3.
- f. Provide periodic plant and offsite status updates to ANI.

TABLE 6.1-4  
COMMONWEALTH ACTIONS FOR SITE EMERGENCY

1. STATION DIRECTOR (Reference figure 6.1-1c)
  - \*a. Declare Site Emergency.
  - \*b. Ensure that the following organizations have been notified of the emergency:
    - o System Power Supply Office
    - o Illinois ESDA and DNS
    - o Scott/Clinton Counties (for Quad Cities Station only)
    - o Iowa Office of Disaster Services (for Quad Cities Station only)
    - o Wisconsin Division of Emergency Government (for Zion Station only)
    - o Kenosha County (for Zion Station only)
  - c. Notify for Zion Station only: Kenosha Co. Warning Center, Wisconsin DEG, and Waukesha Office.
  - \*d. Notify the NRC Operations Center.
  - e. Activate the Station Group.
  - f. Activate the TSC and OSC.
  - g. Dispatch personnel for environs monitoring if required.
  - h. Call in additional personnel as necessary.
  - i. Initiate assembly and accountability of site personnel within the protected area.
  - j. Consider evacuation of nonessential personnel within the Protected Area; evacuate them if there are no serious impediments to doing so.
2. SYSTEM POWER DISPATCHER (If the CCC/EOF has not been activated)
  - a. Notify the Nuclear Duty Officer of the Site Emergency.
3. NUCLEAR DUTY OFFICER/CORPORATE COMMAND CENTER DIRECTOR/RECOVERY MANAGER
  - a. Perform actions 1a, 1b and 1d if in command of the situation.
  - b. Ensure that the following organizations have been notified of the emergency:
    - o Illinois ESDA and DNS
    - o Iowa Office of Disaster Services (for Quad Cities Station only)
    - o Scott/Clinton Counties (for Quad Cities Station only)
    - o Wisconsin Division of Emergency Government (for Zion Station only)
    - o Kenosha County (for Zion Station only)
    - o Institute of Nuclear Power Operations (INPO).

\* Actions 1a, 1b and 1d are the responsibility of the Corporate Command Center Director or Recovery Manager if in command.

TABLE 6.1-4 (CONT)

- c. Activate the total offsite GSEP organization, including the EOF Recovery Group.
- d. Brief the NRC, State of Illinois, and contiguous State agencies as appropriate, to escalate to a General Emergency.
- e. Evaluate emergency conditions, personnel requirements, health and safety aspects of the public, Commonwealth Edison Company personnel, plant status, and environmental conditions prior to briefing the NRC, State Authorities (ESDA & DNS) of the recommendation for downgrading to a less severe class of emergency or entering a Recovery Mode.
- f. Notify ANI (Reference GSEP Section 4.10).

4. OVERALL GSEP RESPONSE

- a. Assess situation and respond.
- b. Augment resources through activation of the Corporate Command Center, the TSC, the OSC, and the EOF.
- c. Dispatch environmental monitoring teams if deemed necessary.
- d. Provide periodic plant status updates and meteorological information to ESDA/DNS and contiguous State authorities. If any releases are occurring, provide dose equivalent estimates for actual releases.
- e. Recommend protective actions to ESDA/DNS and contiguous State authorities consistent with Figure 6.3-1 and Tables 6.3-1, 6.3-2, and 6.3-3.
- f. Provide periodic plant and offsite status updates to ANI.



TABLE 6.1-5  
COMMONWEALTH ACTIONS FOR GENERAL EMERGENCY

1. STATION DIRECTOR (Reference figure 6.1-1d)
  - \*a. Declare a General Emergency.
  - \*b. Ensure that the following organizations have been notified of the emergency:
    - o System Power Supply Office
    - o Illinois ESDA and DNS
    - o Scott/Clinton Counties (for Quad Cities Station only)
    - o Iowa Office of Disaster Services (for Quad Cities Station only)
    - o Wisconsin Division of Emergency Government (for Zion Station only)
    - o Kenosha County (for Zion Station only)
  - c. Notify for Zion Station only: Kenosha Co. Warning Center, Wisconsin DEG, and Waukesha Office.
  - \*d. Notify the NRC Operations Center.
  - e. Activate the Station Group.
  - f. Activate the TSC and OSC.
  - g. Dispatch personnel for environs monitoring if required.
  - h. Call in additional personnel as necessary.
  - i. Provide plant status updates to the state and local authorities (until this function can be performed by the CCC Director or the Recovery Manager.)
  - j. Assemble and evacuate nonessential personnel within the Protected Areas if not already done.
2. SYSTEM POWER DISPATCHER (If the CCC/EOF is not already activated)
  - a. Immediately notify the Nuclear Duty Officer of the General Emergency.
3. NUCLEAR DUTY OFFICER/CORPORATE COMMAND CENTER DIRECTOR/RECOVERY MANAGER
  - a. Perform actions 1a, 1b, 1c and 1d if in command of the situation.
  - b. Ensure that the Institute of Nuclear Power Operations has been informed of the appropriate classification.
  - c. Activate the total offsite GSEP organization, including the Recovery Group.
  - d. Brief the NRC, State of Illinois, local authorities, and contiguous State agencies, as appropriate of recommendation for downgrading to a less severe class of emergency or entering a recovery mode.
  - e. Notify ANI (Reference GSEP Section 4.10).
4. OVERALL GSEP RESPONSE
  - a. Assess situation and respond.
  - b. Augment resources through activation of the Corporate Command Center, the TSC, the OSC, and the EOF.

\* Actions 1a, 1b, 1c and 1d are the responsibility of the Corporate Command Center Director or Recovery Manager if in command.

TABLE 6.1-5 (CONT)

- c. Dispatch environmental monitoring teams if required.
- d. Provide periodic plant status updates and meteorological information to ESDA/DNS and contiguous State authorities. If any releases are occurring, provide dose equivalent estimates for actual releases.
- e. Recommend protective actions to ESDA/DNS and contiguous State authorities consistent with Figure 6.3-1 and Tables 6.3-1, 6.3-2, and 6.3-3.
- f. Provide periodic plant and offsite status updates to ANI.

TABLE 6.1-6

COMMONWEALTH ACTIONS FOR RECOVERY

1. STATION DIRECTOR/CORPORATE COMMAND CENTER DIRECTOR/RECOVERY MANAGER

After reviewing the guidance in Section 5.3.

- a. Evaluate the status of this new classification and the requirements to support this classification.
- b. Declare the Recovery phase to be in effect.
- c. Notify the following:
  - o The System Power Dispatcher
  - o The Illinois ESDA and DNS
  - o The Iowa Office of Disaster Services (for Quad Cities Station only)
  - o The Wisconsin Division of Emergency Government (for Zion Station only)
  - o The Contiguous local authorities as required
  - o The NRC
- d. Evaluate parameters, environmental condition and other information to determine what long-term organization is required for the Recovery phase.
- e. Schedule personnel, material, and equipment necessary to support the Recovery phase.
- f. Provide mechanisms, if required, for periodic plant status and meteorological information to ESDA/DNS and contiguous state authorities.
- g. Provide recommendations regarding long-term effect and reentry into sheltered and/or evacuated areas.
- h. Determine level of activation and/or manning of emergency response facilities if preplanned events are to occur that have a potential (possibility) of impacting upon the health and safety of the public, CECO personnel, plant equipment, and/or the environment.
- i. Modify the Station Group (OSC and TSC), Recovery Group (EOF) and Corporate Group (CCC) as necessary to support the Recovery Phase Classification.
- j. Notify INPO via the designated emergency call number.
- k. Notify ANI via their emergency notification number.

TABLE 6.1-7

COMMONWEALTH ACTIONS FOR DOWNGRADING OF EMERGENCY CLASSIFICATION

1. STATION DIRECTOR/CORPORATE COMMAND CENTER DIRECTOR/RECOVERY MANAGER

After review of the guidance in section 5.4

- a. Evaluate the status of this new classification and the requirements to support this classification.
- b. Downgrade to a lower emergency classification.
- c. Notify the following:
  - o The System Power Dispatcher
  - o The Illinois ESDA and DNS
  - o The Iowa Office of Disaster Services (for Quad Cities Station only)
  - o The Wisconsin Division of Emergency Government (for Zion Station only)
  - o NRC
  - o Contiguous State Authorities
- d. Modify the Station Group, Recovery Group, and Corporate Command Center as necessary to support the new classification.
- e. INPO and ANI shall be notified via their respective emergency notification numbers.

2. OVERALL GSEP RESPONSE

- a. Proceed as required by the new GSEP classification using guidance of Tables 6.1-2 to 6.1-7, as applicable.

## 6.2 Assessment Actions

Throughout each emergency situation, continuing accident assessment will occur. Based upon these assessments, decisions will be made to implement specific emergency measures.

### 6.2.1 Evaluation of Plant Conditions

Evaluation of plant conditions is accomplished through the monitoring of plant parameters both from indication in the Control Room and within the plant. Some of the more important plant parameters to be monitored in the Control Room are assembled into a single display location which is entitled the "Safety Parameter Display System" (SPDS)\*. The SPDS monitors such parameters as: reactor coolant system pressure, reactor/pressurizer water level, containment pressure, suppression pool water level and temperature, reactor power, feedwater flow, safety system status, containment radiation level and effluent monitor readings.

In addition to the SPDS there is the A model of the Offsite Dose Calculation System (ODCS) which uses plant parameters and meteorological conditions to automatically assess conditions and then produce recommendations to Control Room personnel regarding Emergency Action Levels (EAL'S)\*.

- \* This system will not be fully operable at all stations as described until the stations are equipped with new plant process computers, and the software programs are fully developed. Reference the CECO April 1983 response to NUREG 0737 Supplement #1 or latest submitted schedule for planned operational dates.

#### 6.2.2 Radiological Measurements

In-plant radiological measurements should provide information that may help determine the nature, extent, and source of emergency conditions. Systems are installed to permit reactor coolant and containment atmosphere sampling even under severe accident conditions.

Environmental teams are dispatched by Commonwealth Edison to perform a variety of functions during conditions that involve significant releases of radioactive materials from the plant. In addition to beta/gamma field measurements, the change out of TLDs and air sampler cartridges can be performed. Other actions may include soil, water, and vegetation sampling, as well as plume location verification.

#### 6.2.3 Dose Projections for the Offsite Public

Dose assessment activities shall be conducted with an emphasis on determining the necessity for protective action. Radiological and meteorological instrumentation readings shall be used to project dose rates at predetermined distances from the station, and to determine the integrated dose equivalent received. The primary method of estimating offsite doses is through the use of an Offsite Dose Calculation System described in Section 7.3.3.

#### 6.2.4 Core Damage Assessment

To aid GSEP and Control Room personnel in an assessment of core damage during an emergency condition, each site specific annex shall contain a plot of activity (Ci) versus containment radiation reading (R/hr) for each reactor unit at the site (if of different design). The following four points shall be calculated:

- 1) Core release of 25% iodines and 100% noble gases (Reference: Reg Guide 1.3);
- 2) 100% release of gap activity (Reference: Reg Guide 1.25);
- 3) 0.2% core release of iodines and noble gases (for BWRs) or 2.0% core release of iodines and noble gases (for PWRs) (reference: Reg Guide 4.2); and
- 4) 100% release of coolant activity;

at  $t = 0$  following an accident, assuming an immediate release of said activities into the containment. Points 1, 2, and 3 shall be plotted. Point 4 need not be plotted since results indicate a containment radiation level less than 1 R/hr.

### 6.3 Protective Actions for the Offsite Public

#### 6.3.1 Commonwealth Recommendations for Protective Action

For incidents involving actual, potential, or imminent releases of radioactive material to the atmosphere, the current issue of the "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA 520/1-75-001) shall be used as the basis for recommendations for protective actions for the offsite public. The EPA Guide provides Protective Action Guides (PAGs) for whole body external gamma radiation and for inhalation of radioactive material in an airborne plume.

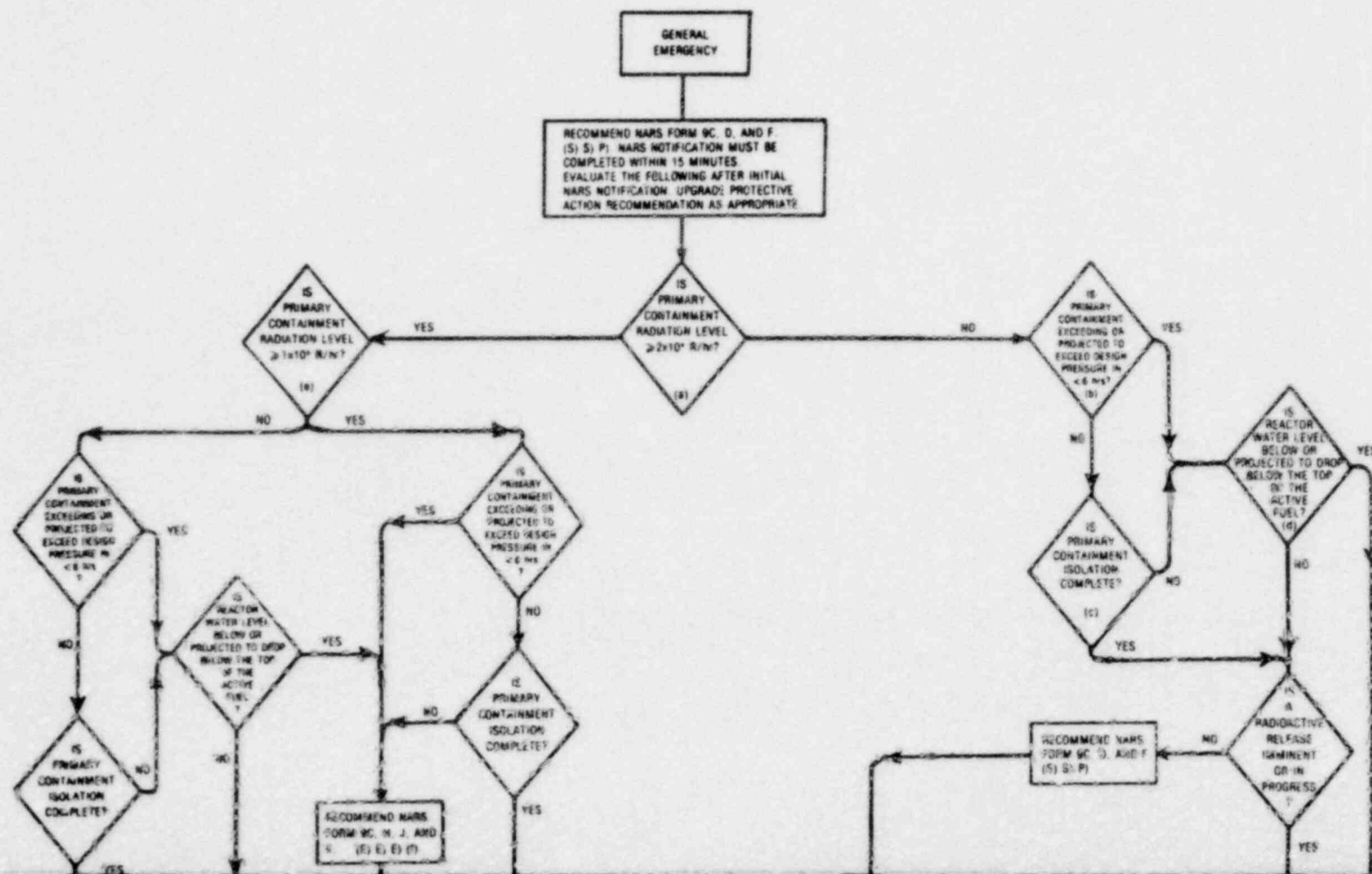
The most effective actions to be recommended to the public are evacuation, sheltering, and access control. Evacuation potentially provides the greatest margin of protection and should be the primary means of protective emergency action in the event of a gaseous fission product release. On the other hand, because sheltering may be implemented in less time than evacuation, it may be the protective action of choice if rapid evacuation is impeded for any reason. Also, since sheltering is less disruptive than evacuation, it may be the protective action of choice when the dose reduction factor associated with shelter is adequate to reduce the projected dose to less than PAG levels. Access control is an effective action to avoid exposure of personnel who might otherwise enter high exposure areas unnecessarily.

For incidents involving contamination of food, water, or milk, protective action recommendations will be consistent with the guidance of the U.S. Food and Drug Administration published in the Federal Register, "Accidental Radioactive Contamination of Human Food and Animal Feeds; Recommendation for State and Local Agencies" Vol. 47, No. 205, October 22, 1982. The FDA guidance includes PAGs for two levels: a Preventive and an Emergency PAG. The Preventive PAG is a 1.5 rem projected dose equivalent commitment to the thyroid or a 0.5 rem whole body dose equivalent commitment. The Emergency PAG is 10 times the preventive PAG, or a 15 rem thyroid or a 5 rem whole body dose equivalent commitment. This guideline has also been adopted by FEMA.

Protective action (such as placing dairy cows on uncontaminated stored feed) should be taken whenever a contaminating event is projected to expose an individual at the preventive level PAG. When the projected dose equivalent reaches the emergency level, food stuffs should be withheld from commerce until a judgement is made on condemnation or other appropriate action.

Figure 6.3-1, and Tables 6.3-1, 6.3-2, and 6.3-3 have been developed to aid Control Room personnel during a rapidly developing emergency situation requiring urgent action by offsite officials. These figures and tables provide a NARS recommendation based upon the nature of the emergency condition.

**FIGURE 6.3-1  
RECOMMENDED PROTECTIVE ACTIONS — GENERAL EMERGENCY**







Footnotes to Figure 6.3-1

- (a)  $2 \times 10^4$  R/hr corresponds to approximately 20% GAP release as described in Table B.2 of Appendix to NUREG/GR-2925, In-plant considerations for Optimal Offsite Response to Reactor Accidents, November, 1982.
- (b) Primary Containment pressure was chosen as the parameter that would be indicative of imminent containment failure. Imminent is defined here as a 100% probability that the condition will occur in less than (6) six hours. Six hours was chosen because offsite dose calculations are based on a six hour projection. It is expected that within this time period dose projections based on calculations would be made.
- (c) Incomplete Primary Containment Isolation would be another indication of a containment failure.
- (d) The top of the active fuel was chosen as the point of concern. Design studies show that the core can be protected with water level much below the top of the active fuel. However, once water level drops below the top of the active fuel the potential for further core damage is increased. As much time as possible is needed to move the offsite public.
- (e)  $1 \times 10^5$  R/hr corresponds to approximately 100% GAP release as described in the reference listed in Note (a).
- (f) This recommendation is made under the most severe conditions. At this point the philosophy is to move the people who are closest to the plant first and to move those who live farther away next until all who live within the area at risk are evacuated.

## GSEP Table 6.3-1 Recommended Protective Actions For Actual or Imminent Gaseous Release Conditions

Accident Classification		Projected Doses (Rem)** in Zonal Areas X, Y, & Z.						Recommended Prot. Actions			NARS Form Sections 9
		Whole Body			Thyroid			(S-Shelter, E-Evacuation, P-Prepare for Possible action, I.O.-info only)			
		X	Y	Z	X	Y	Z	X	Y	Z	
1. Unusual Event	(1)	Dose Projection work is not finished; C.R.L. is < 200 R/hr						I.O.			(1) 9.A
	(2)	Not finished and C.R.L. is ≥ 200 R/hr						Change accident class to alert; see below			(2) —
	(3)	< 0.5	Any	Any	< 2.5	Anywhere in 10 mile zone		I.O.			(3) 9.A
	(4)	≥ 0.5	Any	Any	≥ 2.5	Anywhere		Change accident class to alert; (Sec. 2 (4))			(4) —
	(5)	≥ 1	Any	Any	≥ 5	Anywhere		Change accident class to site emergency; (Sec. 3 (5))			(5) —
2. Alert	(1)	Not Finished and C.R.L. is < 200 R/hr						I.O.			(1) 9.A
	(2)	Not Finished and C.R.L. is 200-400 R/hr						(P)	(P)	(P)	(2) 9.B
	(3)	Not Finished and C.R.L. is > 400 R/hr						Change accident class to site emergency; (Sec. 3 (2))			(3) —
	(4)	< 1	Any	Any	< 5	Anywhere		(P)	(P)	(P)	(4) 9.B
	(5)	≥ 1	Any	Any	≥ 5	Anywhere		Change accident class to site emergency; (Sec. 3 (6))			(5) —
3. Site Emergency	(1)	Not Finished and C.R.L. is < 400 R/hr						(P)	(P)	(P)	(1) 9.B
	(2)	Not Finished and C.R.L. is 400-2000 R/hr						(S)	(P)	(P)	(2) 9.C & D

(3)	Not Finished and C.R.L. is > 2000 R/hr and containment integrity exists	(S) P) P)	(3) 9.C & D
(4)	Not Finished and C.R.L. is > 2000 R/hr and containment integrity is lost or loss is imminent	Change accident class to general emergency, go immediately to Fig. 6.3-1.	(4) —
(5)	< 1 Any Any < 5 Anywhere	(P) P) P)	(5) 9.B
(6)	≥ 1 < 1 Any ≥ 5 < 5 Any	(E*) S) P)	(6) 9.C, H, & F
(7)	≥ 1 ≥ 1 < 1.0 ≥ 5 ≥ 5 < 5	(E*) E*) S)	(7) 9.C, H, J, & G
(8)	≥ 5 Any Any ≥ 25 Any Any	Change accident class to general emergency (Sec. 4 (5))	(8) —

4. General Emergency	(1) Go to Fig. 6.3-1 Immediately before attempting to make dose projections (Steps (2) through (6) should be used only in conjunction with Fig. 6.3-1)	—	(1) —
	(2) ≥ 1 < 1 Any ≥ 5 < 5 Any	(E*) S) P)	(2) 9.C, H & F
	(3) ≥ 1 ≥ 1 < 1 ≥ 5 ≥ 5 < 5	(E*) E*) S)	(3) 9.C, H, J, & G
	(4) ≥ 1 ≥ 1 ≥ 1 ≥ 5 ≥ 5 ≥ 5	(E*) E*) E*)	(4) 9.C, H, J, & K
	(5) ≥ 5 ≥ 1 < 1 ≥ 25 ≥ 5 < 5	(E*) (E*) E*)	(5) 9.C, I & K
	(6) ≥ 5 ≥ 5 ≥ 1 ≥ 25 ≥ 25 ≥ 5	(E*) (E*) (E*)	(6) 9.C & new code needed for 0-10 miles evacuation

**Foot Notes:** The symbol "( )" represents the entire radius of all sectors of the designated zonal area, where a single "( )" represents the three downwind sectors only of the designated zonal area. Example: (S) S) P). The following recommendation is (S) - shelter 0-2 mile radius, S) - shelter 2-5 mile three downwind sectors, P) - Prepare for possible action 5-10 mile three downwind sectors.

C.R.L. — Containment radiation level (R/hr)

R — Range (Miles)

SB — Site Boundary

Any — Any dose irrespective of quantity

\* Evacuation, when noted, is the recommended protective action only when weather conditions permit and an evacuation time analysis confirms it as the preferred choice, otherwise sheltering is the protective action to recommend. If evacuation is recommended for zonal areas Y and Z and if zonal areas Y and Z are in Wisconsin or Iowa, then the recommendation for evacuation should extend only to the range at which the projected dose is 1 Rem WB or 5 Rem thyroid, whichever is the greater range. Sheltering is the protective action from this range out to 5 miles if the "range" is in Zone Y and out to 10 miles if it is in Zone Z.

\*\* Projected doses are made for actual or imminent release conditions and should be based on a 6 hour default period if the release termination time is unknown. (Use a two (2) hour default period for winds into Iowa or Wisconsin.) Projected dose rates are also based on the most likely release point and the existing site meteorological conditions.

The zones X, Y, and Z are: X = site boundary out to 2 miles (not including 2 mile)

Y = 2 miles out to 5 miles (not including 5 mile)

Z = 5 miles out to 10 miles (including 10 miles)

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TABLE 6.3-2

GSEP GUIDELINES FOR PROTECTION AGAINST INGESTION OF CONTAMINATION FOR THE OFFSITE PUBLIC

FOOD AND WATER CONTAMINATION

A. Derived Response Levels

Nuclide**	Critical Organ	Milk/Water***	Preventive Action Levels**	
			Total Intake via All Food and Water Pathways	Pasture Grass (Fresh Weight)
I-131	Thyroid	0.015 uCi/l	0.09 uCi	0.05 uCi/kg
Cs-134	Whole Body	0.15 uCi/l	4.0 uCi	0.8 uCi/kg
Cs-137	Whole Body	0.24 uCi/l	7 uCi	1.3 uCi/kg
Sr-90	Bone	0.009 uCi/l	0.2 uCi	0.18 uCi/kg
Sr-89	Bone	0.14 uCi/l	2.6 uCi	3.0 uCi/kg

\*The preventive derived response action levels relate to a 1.5 rem projected dose equivalent commitment to the thyroid or to a 0.5 rem projected dose equivalent commitment to the whole body, bone, or any other organ. Emergency action levels are equal to ten (10) times the preventive levels and relate to either a 15 rem projected dose equivalent commitment to the thyroid or a 5 rem projected dose equivalent commitment to the whole body, bone, or any other organ. \*\*If other nuclides are present, use Regulatory Guide 1.109 to calculate the dose equivalent commitment to the critical organ(s). Infants are considered to be the critical segment of the population.

B. Recommended Protective Actions

Preventive Level Exceeded

- . For pasture; remove lactating dairy cows from contaminated pasturage and substitute uncontaminated stored feed. Also, substitute a source of uncontaminated water.
- . For milk; withhold milk from market to allow radioactive decay. Consider diversion of fluid milk for production of butter or evaporated milk.
- . For fruits and vegetables; wash, brush, or scrub to remove contamination. Allow radioactive decay through canning, dehydration, or storage.
- . For grains; mill and polish.

Emergency Level Exceeded

- . Isolate food containing radioactive contamination to prevent its introduction into commerce and determine whether condemnation or another disposition is appropriate. Before taking this action, consider:
  - Availability of other possible actions;
  - Importance of particular foods in nutrition; and
  - Time and effort required to take action.

\*\*\*The preventive action levels apply to water as well as milk; the protective action for water would be to use a suitable source of uncontaminated water.

EPA Publication:

+ "Accidental Radioactive Contamination of Human Food and Animal Feeds; Recommendation for State and Local Agencies," Federal Register, Volume 47, Number 205, October 22, 1982.

TABLE 3  
SUMMARY OF POSSIBLE OFFSITE PROTECTIVE ACTIONS  
TO BE RECOMMENDED OR IMPLEMENTED DURING AN EMERGENCY †

ACCIDENT PHASE	EXPOSURE PATHWAY	EXAMPLES OF ACTION TO BE RECOMMENDED
1 EMERGENCY PHASE (0.5 to 30 hours*)	Inhalation of gases, radioiodine, or particulate	Evacuation, shelter, access control, respiratory protection, prophylaxis (thyroid protection)
	Direct whole body exposure	Evacuation, shelter, access control
2 INTERMEDIATE PHASE (30 hours to 30 days)*	Ingestion of milk	Take cows off pasture, prevent cows from drinking surface water, discard contaminated milk, or divert to stored products such as cheese
	Ingestion of fruits and vegetables	Wash all produce, or impound produce, delay harvest until approved, substitute uncontaminated produce
	Ingestion of water	Cut off contaminated supplies, substitute from other sources, filter, demineralize
3 LONG TERM PHASE (over 30 days)*	Whole body exposure and inhalation	Relocation, decontamination, access control
	Ingestion of food and water contaminated from the soil either by resuspension or uptake through roots	Decontamination, condemnation, or destruction of food; deep plowing, condemnation, or alternate use of land
	Whole body exposure from deposition material or inhalation of resuspended material	Relocation, access control, decontamination, fixing of contamination, deep plowing

1 Emergency phase - Time period of major release and subsequent plume exposure.

2 Intermediate phase - Time period of moderate continuous releases with plume exposure and contamination of environment.

3 Long Term Phase - Recovery period.

\*"Typical" Post-accident time periods.

†Reference: USNRC "Manual of Protective Actions Guides and Protective Actions for Nuclear Incidents," 1975.

### 6.3.2 Notification of the Public

The capability exists for the prompt notification of the general public within the plume exposure pathway emergency planning zones for Commonwealth Edison Company operating units. This notification capability consists of two principal elements: (1) the Prompt Notification Systems (PNS) and (2) the Emergency Broadcast System (EBS) radio stations. Information describing these two systems is contained in the public information brochure.

The Prompt Notification System (PNS) consists of fixed sirens and vehicles with public address (PA) systems. The Emergency Broadcast System (EBS) is a network of local radio stations prepared to transmit or relay emergency information and instructions from the civil authorities to the general public. The public information brochures instruct the public to go indoors and turn on their radios when they hear the PNS sirens operating; these brochures also identify which local radio stations the public should tune to for information related to the emergency. The public information brochures are distributed annually to all residents of the plume exposure pathway EPZs and are further discussed in Section 8.4.

Activation of the PNS sirens by the civil authorities will alert the public to turn on their radios to a local EBS radio station for detailed information on the emergency situation. At the same time the emergency service vehicles being deployed by local authorities will be broadcasting messages on their P.A. systems also advising the public to tune to the local EBS radio stations or to take specific protective actions. The activation of the PNS sirens, deployment of emergency service vehicles and operation of the Emergency Broadcast System is discussed in detail in the Illinois Plan for Radiological Accidents. A more site specific description of the various prompt public notification systems is presented in the station specific annexes to the GSEP.

The PNS is operated by local governmental agencies and maintained by Commonwealth Edison. To assure the PNS is maintained in an operational readiness posture, the local agencies have agreed to test the system (by sounding the sirens) monthly and to report inoperable equipment to NST-designated maintenance personnel. The goal of the maintenance program is to render the inoperable equipment functional as soon as possible but definitely within one month. In addition to this nonroutine repair program the PNS will be routinely tested and serviced on a semiannual basis.

### 6.3.3 Implementation of Offsite Protective Measures

State and local governments have the responsibility to coordinate actions taken to protect the public during emergency situations. Refer to State and local emergency response plans for protective action information for offsite areas. (Also refer to Sections 4.7, 4.8, and 4.9 of this plan).

Time estimates for evacuation of the plume exposure EPZ surrounding each Commonwealth nuclear station appear in each site specific annex. These evacuation time estimates may be used by the Environmental/Emergency Coordinator as an aid in determining the recommended protective action for the offsite public (i.e., sheltering or evacuation).

The Illinois Emergency Services and Disaster Agency (ESDA) and Department of Nuclear Safety (DNS) are responsible for evaluation of Commonwealth Edison Company recommended protective actions and preparing a State recommendation to the Governor, or his appointed agent. Similar concepts apply in Iowa and Wisconsin. Only when the State acts under the Governor's order does a recommended protective action become a directed protective action.

GSEP Figure 6.3-1 and Table 6.3-1 suggest a series of protective actions as a function of the conditions of radioactive release. This figure and table agrees with the Illinois Plan for Radiological Accidents and is consistent with Appendix 1 of NUREG-0654. Bad road conditions and other serious offsite conditions might alter the recommendations, as would information from the evacuation time estimates.



6.3.4 Guidance for Recommending Reentry into Evacuated Areas

If the plant conditions are stable and offsite radiological conditions are such that the public health and safety are not endangered then reentry to evacuated areas may be recommended. This recommendation shall be transmitted via the NARS reporting system to State authorities.

The recommendation shall be made by the highest acting authority within the Commonwealth Edison GSEP organization.

If the shelter/evacuation recommendation was based upon an actual plant uncontrolled release, then this release must have terminated and the offsite dose equivalents reduced to an acceptable level. This acceptable level should be based upon actual field measurements prior to recommendation of a Reentry Action .

The following conditions are guidelines for recommendation of the Reentry Action. Recommendation of this action will be at the discretion of the Recovery Manager/Corporate Command Center Director/Station Director based upon input from the EOF/CCC/TSC staff and/or other appropriate organization knowledgeable of the conditions.

A recommendation of a Reentry Action is for areas that were previously sheltered and/or evacuated. Some of the conditions to be considered prior to making a recommendation are:

1. Has the health and safety of the public been adequately considered?
2. Has the plant parameter, and/or equipment that caused the sheltering and/or evacuations been stabilized and adequately controlled?
3. Have any uncontrolled releases been terminated?
4. Has the environment been monitored?
5. Have effluent monitor readings returned to acceptable levels?
6. Have unacceptable environmental areas been identified, controlled and monitored?
7. Have contaminated areas requiring shelter/evacuation been returned to acceptable levels?
8. Has CECo provided necessary plant status to Federal, State and local officials such that they can evaluate the possibility of a Reentry Action?
9. Are there any conditions existing either in the plant and/or environment that would cause a recommendation of shelter and/or evacuation?
10. Are there any conditions that would prevent the recommendation of a Reentry Action?

The highest level of acting GSEP Organization authority shall make the recommendation of a Reentry Action for the environment, to Federal, State and local authorities. It is the responsibility of these authorities to evaluate the CECo recommendation and consider their own analysis of the emergency condition prior to advising the public on an acceptable course of action.

#### 6.4 Protective Actions for Onsite Personnel

During an emergency situation the Station Director has the responsibility to provide for protective actions for ALL onsite personnel. Protective actions to be considered for these personnel may be in the form of "Protective Equipment and Supplies", "Personnel Assembly", "Personnel Evacuation" or "Contamination Control".

##### 6.4.1 Protective Cover Use of Protective Equipment and Supplies for personnel

During the course of an emergency, protective actions shall be considered to minimize the effects of radiological exposures or contamination problems associated with all onsite personnel. For those who must work within the restricted area of the affected site, measures that shall be considered are:

- 1) Distribution of respirators;
- 2) Use of protective clothing; and
- 3) Use of thyroid blocking agents.

The criteria for issuance of respiratory protection and protective clothing are described in "Commonwealth Radiation Protection Standards" and/or site specific radiation/chemistry procedures.

The use of thyroid blocking agents may be recommended when a projected dose of 25 rem is exceeded for a worker's thyroid. This is the value recommended by "Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency: Final Recommendations on Use" Federal Register, Vol. 47, No. 125, June 29, 1982. The Commonwealth Medical Director is responsible for maintaining a supply of thyroid blocking agents within the company and for establishing the specific policy for its use.

##### 6.4.2. Personnel Assembly

During an emergency situation the Station Director may initiate an assembly of all personnel within the security "Protected Area". The purpose of an assembly is to account for all personnel inside the security "Protected Area", and to assemble emergency personnel at prearranged locations.

A site assembly may be initiated whenever:

- 1) It is determined that dose equivalent or projected dose equivalent can be avoided by relocation of personnel to the site assembly area. (All nuclear stations have a given system to signal personnel to assemble to previously designated areas.)

- 2) If it is determined by the Station Director that other dangers exist that present a threat to the health and safety of onsite personnel.
- 3) A Site Emergency or General Emergency is declared, if not previously initiated.

If it is determined that the prearranged assembly area unfit for personnel, the Station Director may designate an alternative site assembly area and assemble personnel using appropriate communication systems that are available.

When an assembly of onsite personnel is determined necessary by the Station Director then accountability of all personnel within the protected area shall occur and shall be completed within thirty (30) minutes.

#### 6.4.3 Personnel Evacuation

If it is determined that projected doses can be avoided by a relocation of personnel, or other dangers exist that present a threat to the health and safety of personnel inside the "Protected Area" or inside the "Site Boundary" an evacuation may be initiated at any time during the emergency.

##### 6.4.3.1 Personnel inside the Protected Area

After assembly/accounting of personnel within the Protected Area has been completed, evacuation of nonessential personnel shall commence in accordance with Station procedures as directed by the Station Director or his designee, unless one of the following conditions exist:

- a) severe weather conditions threaten safe transport;
- b) a significant radiological hazard would be encountered;
- c) there is a security threat occurring which would have an adverse impact on the personnel while leaving the site;
- d) a condition similar to these in magnitude which in the opinion of the Station Director, CCC Director, or Recovery Manager would adversely affect the site personnel.

Regardless of who is to be evacuated the offsite evacuation recommendations shall be considered prior to personnel leaving the Protected Area.

6.4.3.2 Personnel inside the "Site Boundary"

Each station shall identify locations where people might be expected to be present outside the Protected Area but within the owner controlled area called the "Site Boundary". In addition, provisions shall be established for notification and subsequent evacuation of personnel within the "Site Boundary". Personnel within the Site Boundary will be judged by the appropriate GSEP Directors as essential or nonessential personnel. Evacuation of nonessential personnel will be performed at the Site or General Emergency levels, as conditions permit.

6.4.4 Contamination Control

During an emergency, the Station Director is responsible for preventing or minimizing direct or subsequent ingestion exposure to radioactive materials deposited on the ground or other surfaces. Commonwealth Radiation Protection Standards are to be considered by the Station Director as general methods to be used in contamination control.

6.5 Aid to Affected Onsite Personnel

6.5.1 Emergency Personnel Exposure

Being licensed by the Nuclear Regulatory Commission, all Commonwealth nuclear stations maintain personnel exposure control programs in accordance with 10 CFR 20. The Commonwealth Edison Radiation Protection Standards and NCRP report number 39, "Basic Radiation Protection Criteria", include guidance that should be used for limiting personnel exposures under emergency conditions. Whenever possible, the prior approval of the Station Manager, the Commonwealth Medical Director, and/or the Station's Radiation Protection Supervisor should be secured before exposing individuals to dose equivalents beyond 10 CFR 20 limits. In addition to the guidance detailed in the above reference of the Commonwealth Edison Radiation Protection Standards, emergency personnel exposures shall be limited to the recommendations of the U.S. Environmental Protection Agency as follows:

- 1) Emergency Workers; This applies to conditions where it is desirable to enter an emergency area to protect facilities, eliminate serious unplanned release of effluents, or to control fires.
  - a) Planned whole body dose equivalent shall not exceed 25 rems;
  - b) Planned dose equivalent to the thyroid shall not exceed 125 rems.
- 2) Life Saving Actions; This applies to search for and removal of injured persons or entry to the emergency area to prevent conditions that would injure other people.
  - a) Dose equivalent to the whole body shall not exceed 75 rems;
  - b) No limit for the thyroid since total loss of thyroid function could be allowable.

"The emergency limits outlined in this section shall be voluntary and, if received, be limited to once in a lifetime."

## 6.5.2 Decontamination and First Aid

### 6.5.2.1 General

There are no resident physicians, nurses, or industrial hygienists on the staff of Commonwealth's generating stations. Each station does have an industrial hygiene advisor. Additionally, the radiation protection personnel at each nuclear station are experienced in control of radioactive contamination and decontamination work. The radiation protection personnel and certain supervisors are also trained and qualified to administer first aid. These individuals are annually retrained in first aid by the station training staff. At least one of these individuals is available on shift at all times.

The functions of station personnel in handling onsite injured people are:

- 1) afford rescue;
- 2) administer first aid including such resuscitative measures as are deemed necessary;
- 3) begin decontamination procedures; and
- 4) arrange suitable transportation to a hospital when required.

### 6.5.2.2 Initial First Aid

Primary attention shall be directed to the actual factors involved in the treatment of casualties, such as: control of bleeding, resuscitation including heart and lung, protection of wounds from bacterial or radioactive contamination and the immobilization of fractures.

### 6.5.2.3 Decontamination

Nuclear Station radiation protection personnel shall provide an initial estimate of the magnitude of surface contamination of the injured and preliminary estimates of total body dose to the injured. Directed by radiation protection personnel, the station should carry out primary rapid and simple decontamination of the surface of the body when possible and advisable before transportation of the injured to a designated hospital.

### 6.5.3 Medical Transportation

Arrangements are made by each nuclear generating station for prompt ambulance service for transporting persons with injuries involving radioactivity from the respective generating station to designated hospitals. Such service is available on a 24 hour per day basis and is confirmed in writing. Radiation monitoring services shall be provided by Commonwealth Edison whenever it becomes necessary to use the ambulance service for the transportation of contaminated persons.

Injured persons shall be transported to a hospital or other medical facility in a prudent and timely manner. Those persons contaminated with radioactive material shall be taken to the designated hospital and be accompanied by a person qualified in radiation monitoring techniques.

### 6.5.4. Medical Treatment

#### 6.5.4.1 Hospital Facilities

Arrangements, confirmed in writing every two (2) calendar years, are maintained by Commonwealth Edison with a qualified hospital located in the vicinity of each nuclear generating station for receiving and treating of contaminated or exposed persons. Such nearby hospital facilities shall be utilized for decontamination and initial treatment of persons with injuries involving radioactivity and requiring immediate hospital care. Commonwealth Edison shall provide medical consultants to aid in any special care necessary at these facilities.

Arrangements, confirmed in writing every two (2) calendar years, are also maintained by the corporate office with a qualified major medical facility well equipped and staffed for dealing with persons having radiation injuries and whenever necessary, such persons will be transferred to this major hospital facility for extended specialized treatment. Currently, Northwestern Memorial Hospital in Chicago, Illinois serves as this hospital. Commonwealth Edison will have available to the staff of this hospital its specialist who will provide the direction of the special care necessary for the treatment of persons having radiation injuries.

#### 6.5.4.2 Radiological Medical Consultants

Because of the specialized nature of the diagnosis and treatment of radiation injuries, Commonwealth Edison's Corporate medical office maintains a roster of physicians especially competent in this area of medicine and available for the



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care of persons with these special problems. Included in this roster are experts in the treatment of internal contamination, cutaneous radiation injury, total body irradiation and other potential problems related to exposure by ionizing radiation or radioactive materials.

These specialists may be in direct charge of the care of these patients or serve as consultants to other physicians in charge of their care.

## 7.0 EMERGENCY FACILITIES AND EQUIPMENT

### 7.1 Emergency Control Centers

#### 7.1.1 Station Control Room

The nuclear station Control Room shall be the initial onsite center of emergency control. Control Room personnel must evaluate and effect control over the initial aspects of an emergency and initiate activities necessary for coping with the initial phases of an emergency until such time that support centers can be activated. These activities shall include:

- o Continuous evaluation of the magnitude and potential consequences of an incident;
- o Initial corrective actions; and
- o Notification of appropriate individuals as outlined in Section 6.0 of this plan.

Support centers provided are the Technical Support Center, Operational Support Center, Corporate Command Center, and Emergency Operations Facility.

#### 7.1.2 Technical Support Center (TSC)

Each nuclear generating station has established a Technical Support Center (TSC) for use during emergency situations by plant management, technical, and engineering support personnel. When activated during an emergency, the TSC shall be manned by sufficient personnel to:

- o Support the Control Room command and control function;
- o Assess the plant status and potential offsite impact; and
- o Coordinate emergency response actions.

Staffing of the TSC shall be directed by the Station Director. Reporting initially to the TSC for the Site and General Emergencies shall be all directors of the Station Group, i.e., the Station Director, Operations Director, Technical Director, Maintenance Director, Stores Director, Administrative Director, Security Director, Onsite Environs Director, and Rad/Chem Director. (The Shift Engineer when acting as initial Station Director shall not report to the TSC). Other personnel may augment the TSC staff upon approval of the Station Director.

Each TSC provides reliable voice communications to the Control Room, the OSC, the EOF, the CCC, the NRC, and State and local operations centers. In addition, they provide facsimile transmissions capability to the EOF and the NRC Operations Center.

Each TSC is in proximity to the Control Room and is sized for a minimum of 25 persons and supporting equipment. Of the 25 persons, five shall be reserved for the NRC and one person shall be available for the State of Illinois. At Quad Cities and Zion Stations, an additional slot per station will be held for a contiguous state representative.

Personnel in the TSC shall be protected from radiological hazards, including direct radiation and airborne contaminants under accident conditions with similar radiological habitability as Control Room personnel. To ensure adequate radiological protection, permanent radiation monitoring systems have been installed in the TSC. These systems continuously indicate radiation dose rates and airborne radioactivity inside the TSC while in use. In addition, protective breathing apparatus (full face air purifying respirators) and thyroid blocking agents are available for use as required.

The TSC has access to a complete set of as-built drawings and other records, including general arrangement diagrams, P&IDs, and the electrical schematics. The TSC has the capability to record and display vital plant data, in real time\*, to be used by knowledgeable individuals responsible for engineering and management support of reactor operations, and for implementation of emergency procedures.

### 7.1.3 Operational Support Center (OSC)

Each nuclear generating station has established an Operational Support Center (OSC). The OSC is the location to which operations support personnel should report during an emergency and from which they will be dispatched for assignments or duties in support of emergency operations. Personnel who may report to the OSC include:

- o OSC Director
- o Operating personnel not assigned to the Control Room
- o Radwaste personnel
- o Rad/Chem Technicians
- o Maintenance personnel

\* This system will not be fully operable at all stations as described until the stations are equipped with new plant process computers, and the software programs are fully developed. Reference the CECO April 1983 response to NUREG 0737 Supplement 1 or latest submitted schedule for planned operational dates.

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The Operations Director shall designate an individual to become the OSC Director, if not already appointed by the Shift Engineer. This person will manage and supervise the activities of the OSC. The OSC shall be activated whenever the TSC is activated, but need not remain activated at the Alert level if its use is judged unnecessary by the Station Director. At the Site and General Emergency levels the OSC or an alternate OSC shall be activated at all times.

A limited inventory of supplies will be kept in the OSC. This inventory will include respirators, protective clothing, portable lighting, and portable survey instruments.

Each OSC is equipped with a dedicated direct voice communication line to the Control Room and normal station telephone access to the TSC and the EOF so that personnel reporting to the OSC can be assigned to duties in support of emergency operations.

#### 7.1.4 Corporate Command Center (CCC)

The Corporate Command Center located in the Edison Building, Chicago, Illinois is the location from which the Corporate Command Center Director will normally direct a staff in evaluating, coordinating, and directing the overall company activities involved in coping with an emergency. If the Recovery Group is activated at the EOF, then the CCC shall be the location for a support staff reporting to the EOF Recovery Group.

In addition to the above functions, the CCC Environmental Director shall support TSC/EOF environmental activities.

#### 7.1.5 Emergency Operations Facility (EOF)

The Emergency Operations Facility (EOF) is the location near the generating station that provides for the management of overall emergency response, the coordination of radiological and environmental assessments, the determination of recommended public protection actions, the management of recovery operations, and the coordination of emergency response activities with Federal, State, and local agencies. The EOF and associated Recovery Group function under a Recovery Manager and are activated for all Site and General Emergency situations. Activation for other emergency conditions is optional.

There shall be three major groups of emergency control personnel functioning at each EOF. They are (1) Recovery personnel; (2) Environmental Control personnel; and (3) Emergency News personnel. Refer to Figure 7.1-1.

Recovery personnel function under the direction of the Recovery Manager and serve as the command post for direction of all recovery operations.

Environmental Control personnel are under the direction of the Environmental/Emergency Coordinator and function to evaluate emergency situations that affect the public.

Emergency News personnel operate from the Emergency News Center, which is under the direction of the Emergency News Center Director and functions as the single point contact to interface with Federal, State, and local authorities who are responsible for disseminating information to the public. A technical spokesperson will be chosen by the Recovery Manager. This spokesperson will be knowledgeable about the affected station and its operation and will have the authority and responsibility to discuss technical problems associated with the emergency. The spokesperson shall be available to brief the press at the Joint Public Information Center.

The four primary EOFs (Mazon EOF to serve Dresden, Braidwood and La Salle County Stations, Dixon EOF for Byron Station, Morrison EOF for Quad Cities Station, and Zion EOF for Zion Station) are constructed according to the design criteria such that:

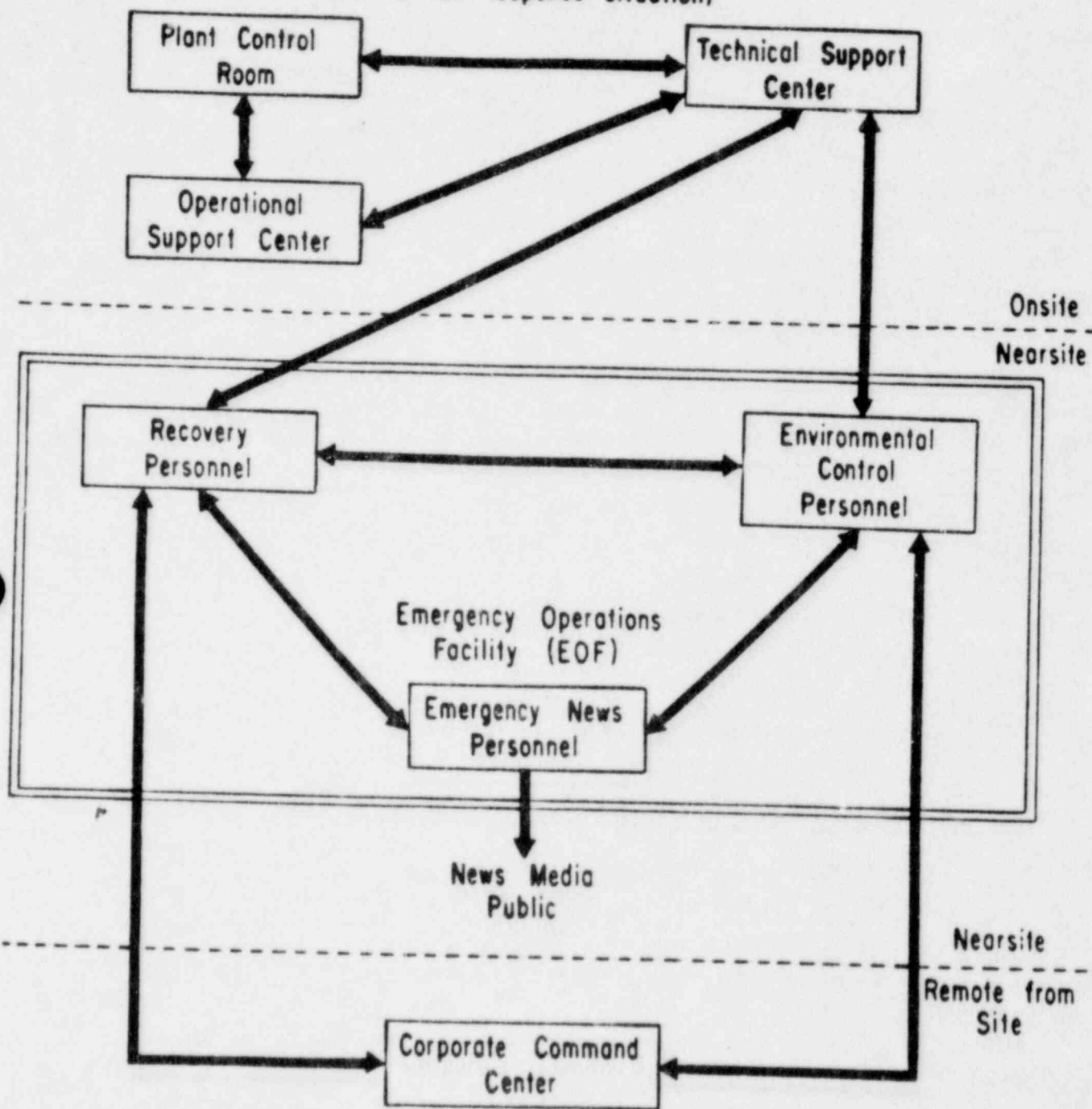
- 1) The location provides optimum functional and availability characteristics for carrying out overall strategic direction of CECO onsite and support operations, determination of public protective actions to be recommended to offsite officials, and coordination with Federal, State and local organizations.
- 2) They are well engineered for the design life of the plant and are of sufficient size to accommodate about 50 people. The Zion Station EOF, because of its close proximity to the station, is provided with additional radiological protection features.
- 3) They are equipped with reliable voice communications facilities to the TSC, the OSC, the CCC, the Control Room, NRC, and State and local emergency operations centers. In addition, each EOF has facsimile transmission capability to any other EOF, to all TSC's, and the NRC Operations Center.
- 4) Equipment is provided to gather, store, and display data needed in the EOF to analyze and exchange information on plant conditions with the designated senior CECO manager in charge of the TSC.
- \*5) The EOF technical data system receives, stores, processes, and displays information sufficient to perform assessments of the actual and potential onsite and offsite environmental consequences of an emergency condition.
- 6) They have ready access to plant records, procedures, and emergency plans needed to exercise overall management of CECO emergency response resources.

The Zion BEOF is constructed according to the design criteria in a portion of the Lake County Emergency Operations Center at a distance of 15 miles from the Zion plant. The facility is equipped with reliable communication and appropriate dose projection computer equipment, which provide for continuity of decision making capability.

- \* This system will not be fully operable at all stations as described until the stations are equipped with new process computers, and the software programs are fully developed. Reference the CECO April 1983 response to NUREG 0737 Supplement #1 or latest submitted schedule for planned operational dates.

### FIGURE 7.1-1 COMMONWEALTH EMERGENCY CONTROL CENTERS & COMMUNICATIONS FLOW

(For a full response situation)



Note: The EOF has three defined functional centers. Space limitations of individual EOFs may not allow separate physical rooms for each "center"

## 7.2 Communication Systems

Commonwealth has extensive and reliable communication systems installed at its generating stations, system power supply office, corporate headquarters, and Division load dispatching offices. These systems include the use of normal and dedicated telephone lines on land lines and microwave voice channels, mobile radio units, handi-talkies, and computer peripherals.

For the purposes of GSEP communications, the system is addressed in terms of functional areas as described in the following sections.

### 7.2.1 Nuclear Accident Reporting System (NARS)

The Nuclear Accident Reporting System is a dedicated telephone voice communications system that has been installed for the purpose of notifying State and local authorities of declared nuclear emergencies. This system links together the station Control Rooms, the Corporate Command Center, Technical Support Centers, System Power Supply Office, Emergency Operations Facilities, and State and local authorities as appropriate. (See Figure 7.2-1).

Except for special circumstances involving the Recovery Manager and directors of certain state agencies (ESDA, DNS, ODS, DEG) all NARS messages (Figure 7.2-2) shall be reported in the format of the current NARS form. The format and content of the NARS form must be mutually agreed to by the Directors of ESDA and DNS and the Nuclear Services Technical Manager before its use. The NARS form is a State of Illinois form included in the GSEP to aid the reader in understanding the reporting concept. This form is not subject to onsite/offsite review.

The State of Illinois Emergency Services & Disaster Agency, in cooperation with Commonwealth Edison, is responsible for the development and execution of all steps necessary to ensure continuous operation of the NARS.

### 7.2.2 Communications for Command and Control

Commonwealth has established four separate dedicated communication systems that ensure reliable and timely exchange of information necessary to provide effective command and control over any emergency response. These systems include:

- o A microwave voice channel between the Corporate Command Center and the Shift Engineer's Office, the TSC, and the EOF at each nuclear station. (Gray phone)
- o A telephone link that enables communication between the Corporate Command Center, the TSC, and the EOF. (Yellow phone)



- o A telephone link that enables communication between the Control Room and the TSC. (Noncolor coded)
- o A telephone link that enables communication between the Control Room and the OSC. (Noncolor coded)

Refer to Figure 7.2-3 for a more descriptive representation of the above systems.

#### 7.2.3 Environmental Assessment Communications

Two separate communication systems have been installed to allow coordinated environmental monitoring and assessment during an emergency.

The first system consists of the necessary hardware to allow communication between the Corporate Command Center, the Control Room, the TSC, the EOF mobile units in Commonwealth vehicles, and handi-talkies held by environmental monitoring teams in the field. The radio system has scramble and unscrambled capability to prevent monitoring by noncompany equipment.

The second system consists of a dedicated telephone which allow continuous communication between the Corporate Command Center and the Illinois Department of Nuclear Safety REAC in Springfield. Refer to Figure 7.2-4.

#### 7.2.4 NRC Communications

There exists a dedicated telephone, Emergency Notification System (ENS), between each nuclear station's Control Room and the NRC, with an extension of that line in the Technical Support Center and Emergency Operation Facility. There also exists a separate dedicated telephone, Health Physics Network (HPN), between the NRC and the Radiation Protection Office at each nuclear station (See Figure 7.2-5). The actual configuration of these systems may vary from station to station. Installation and use of the NRC phones is under the direction of the NRC.

#### 7.2.5 NAWAS

The Wisconsin National Warning System (NAWAS) network is available at the locations shown on Figure 7.2-1. The NAWAS is used to provide the initial notification of a reportable incident at the Zion Station to the State of Wisconsin and to Wisconsin Warning Center I located at the Wisconsin State Police Patrol District Headquarters in Madison, which is responsible for off-hours contact of the Wisconsin Duty Officer. NAWAS is used for initial contact only. Details of the initial report and subsequent changes in status shall be provided to Wisconsin officials by other communications.

FIGURE 7.2-1  
NUCLEAR ACCIDENT REPORT SYSTEM (NARS)

Selection of a predetermined code rings selected phones. The NARS phones are color coded GREEN.

<u>DIAL CODE NAME</u>	<u>LOCATION</u>	<u>DIAL CODE NAME</u>	<u>LOCATION</u>
<u>20</u>		<u>25 LA SALLE</u>	
*Dept. Nuclear Safety	Springfield	*La Salle Control Room	Seneca
*Illinois ESDA	Springfield	*Tech Support Center	Seneca
*System Power Supply	Lombard	*La Salle E.O.F.	Morris
<u>22 DRESDEN</u>		La Salle Co. Sheriff	Ottawa
*Dresden Control Room	Morris	La Salle Co. ESDA	Ottawa
*Tech. Support Center	Morris	Grundy County Sheriff	Morris
*Dresden E.O.F.	Morris	Grundy County ESDA	Morris
Grundy County Sheriff	Morris	*Dept. Nuclear Safety	Springfield
Grundy County E.S.D.A.	Morris	*System Power Supply	Lombard
Will County E.S.D.A.	Joliet	*Corporate Command Ctr	Chicago
*Dept. Nuclear Safety	Springfield	*Illinois ESDA	Springfield*
*Corporate Command Ctr.	Chicago	<u>33</u>	
System Power Supply	Lombard	*Dept. Nuclear Safety	Springfield
*Illinois ESDA	Springfield	*Iowa Disaster Serv.	Des Moines
Kendall Co. Sheriff	Yorkville	*Illinois ESDA	Springfield*
Kendall Co. EOC		*System Power Supply	Lombard
<u>23 QUAD CITIES</u>		<u>35</u>	
Quad Cities Control Rm.	Cordova	*Dept. Nuclear Safety	Springfield
*Tech Support Center	Cordova	*Illinois ESDA	Springfield
*Quad Cities E.O.F.	Morrison	*Wisconsin D.E.G.	Madison, WI
Rock Island Communication	Rock Island	*System Power Supply	Lombard
Rock Island Co. ESDA	Rock Island	<u>37 Byron</u>	
*Iowa Disaster Services	Des Moines, IA	*Byron Control Room	Byron
*Iowa Disaster Services	Des Moines, IA	*Tech Support Center	Byron
*Scott County Sheriff	Davenport, IA	*Dixon EOF	Dixon
*Clinton County E.O.C.	Clinton, IA	*Illinois ESDA	Springfield
Whiteside Co. Sheriff	Morrison	*Ill. DNS	Springfield
Whiteside Co. E.S.D.A.	Morrison	+*System Power Supply	Lombard
*Dept. Nuclear Safety	Springfield	*Corporate Command Ctr	Chicago
*System Power Supply	Lombard	Ogle Co. Sheriff/ESDA	Oregon
*Corporate Command Ctr.	Chicago	<u>38 Braidwood</u>	
*Illinois ESDA	Springfield	*Braidwood Control Rm.	Braidwood
<u>24 ZION</u>		*Tech. Support Center	Braidwood
+*Zion Control Room	Zion	*System Power Supply	Lombard
*Tech Support Center	Zion	Will County ESDA	Joliet
*Zion EOF	Zion	*Mazon EOF	Morris
Zion Police Dept.	Zion	Grundy Co. Sheriff	Morris
Community Coord. Ctr.	Libertyville	Grundy Co. ESDA	Morris
Lake County Sheriff	Waukegan	Kankakee Co. Sheriff	Kankakee
+Kenosha Co. W'n. Center	Kenosha, WI	Kankakee EOC	Kankakee
+*Wisconsin D.E.G.	Madison, WI	*Dept. Nuclear Safety	Springfield
+Waukesha Center	Waukesha, WI	*Corporate Command Ctr.	Chicago
*Dept. Nuclear Safety	Springfield	*ILL. ESDA	Springfield
+*System Power Supply	Lombard		
*Corporate Command Ctr.	Chicago		
*Illinois ESDA	Springfield		
Winthrop Harbor Police	Winthrop Harbor		

\*-DIAL CAPABILITY  
+-NAWAS

STATE OF ILLINOIS  
NUCLEAR ACCIDENT REPORTING SYSTEM FORM

TIME \_\_\_\_\_ DATE \_\_\_\_\_

1. STATUS

- [A] ACTUAL
- [B] EXERCISE/DRILL/TEST

2. SITE-IPRA VOL. #

- [A] DRESDEN-II
- [B] LASALLE-III
- [C] QUAD CITIES-IV
- [D] ZION-V
- [E] BYRON-VI
- [F] CLINTON-VII
- [G] BROADWOOD-VIII

3. ACCIDENT CLASSIFICATION EAL #

- [A] TRANSPORTATION ACCIDENT \_\_\_\_\_
- [B] UNUSUAL EVENT \_\_\_\_\_
- [C] ALERT \_\_\_\_\_
- [D] SITE AREA EMERGENCY \_\_\_\_\_
- [E] GENERAL EMERGENCY \_\_\_\_\_
- [F] RECOVERY/RE-ENTRY \_\_\_\_\_
- [G] TERMINATE CONDITION \_\_\_\_\_
- [H] OTHER \_\_\_\_\_

4. RELEASE STATUS

- [A] NONE
- [B] POTENTIAL
- [C] OCCURRING
- [D] TERMINATED

5. TYPE OF RELEASE

- [A] RADIOACTIVE GAS
- [B] RADIOACTIVE LIQUID
- [C] NO RELEASE
- [D] UNKNOWN

6. INCIDENT OCCURRED

7. ACCIDENT CLASSIFIED

TIME \_\_\_\_\_ DATE \_\_\_\_\_

TIME \_\_\_\_\_ DATE \_\_\_\_\_

8. WIND DIRECTION DATA (Check one, Read across)

WIND FROM	DEGREES	WIND TOWARD	SECTORS AFFECTED
[A] N	349-11	S	H J K
[B] NNE	12-33	SSW	J K L
[C] NE	34-56	SW	K L M
[D] ENE	57-78	WSW	L M N
[E] E	79-101	W	M N P
[F] ESE	102-123	WNW	N P Q
[G] SE	124-146	NW	P Q R
[H] SSE	147-168	NNW	Q R A
[I] S	169-191	N	R A B
[J] SSW	192-213	NNE	A B C
[K] SW	214-236	NE	B C D
[L] WSW	237-258	ENE	C D E
[M] W	259-281	E	D E F
[N] WNW	282-303	ESE	E F G
[O] NW	304-326	SE	F G H
[P] NNW	327-348	SSE	G H J

9. RECOMMENDED PROTECTIVE ACTIONS:

- [A] NOT APPLICABLE (INITIAL NOTIFICATION FOR INFORMATION ONLY)
- [B] PREPARE FOR POSSIBLE ACTION INVOLVING THE PUBLIC, TO INCLUDE NOTIFICATION
- [C] NOTIFY PUBLIC TO TAKE THE FOLLOWING PROTECTIVE ACTIONS:

IN ILLINOIS	SHELTER	EVACUATE	IN WISCONSIN/IOWA
0-2 MILE RADIUS	[D]	[H]	0-2 MILE RADIUS
0-5 MILE RADIUS	[E]	[I]	0-5 MILE RADIUS
2-5 MILES FOR THREE (3) DOWNWIND SECTORS	[F]	[J]	2-____ (R) MILES
5-10 MILES FOR THREE (3) DOWNWIND SECTORS	[G]	[K]	____ (R) TO 10 MILES (R IS THE RANGE EQUAL TO THE PAG DOSE.)

[L] DISCONTINUE USE OF POTENTIALLY AFFECTED WATER IN \_\_\_\_\_ LOCATION(S)

[M] PUT MILK PRODUCING ANIMALS ON STORED FEED IN DOWNWIND SECTORS OUT TO \_\_\_\_\_ MILES.

10. MESSAGE REPORTED BY: \_\_\_\_\_ NAME OF CALLER

12. MESSAGE RECEIVED BY: \_\_\_\_\_ YOUR NAME

ORGANIZATION \_\_\_\_\_

TELEPHONE NO. \_\_\_\_\_

13. MESSAGE VERIFIED BY: \_\_\_\_\_ NAME \_\_\_\_\_ TIME \_\_\_\_\_ ORGANIZATION \_\_\_\_\_

11. NARS DIAL CODE USED BY SENDER

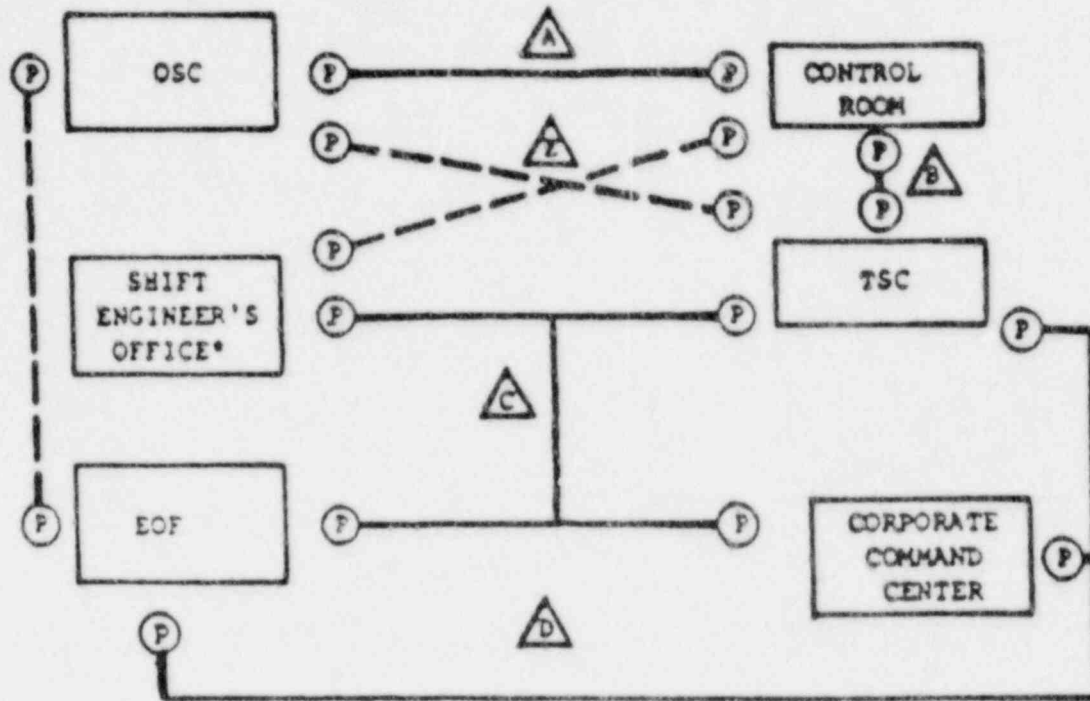
14. UTILITY DUTY OFFICER \_\_\_\_\_ NAME \_\_\_\_\_ TELEPHONE \_\_\_\_\_






July, 1985  
Revision 5

FIGURE 7.2-3

COMMUNICATIONS FOR COMMAND AND CONTROL

July, 1985  
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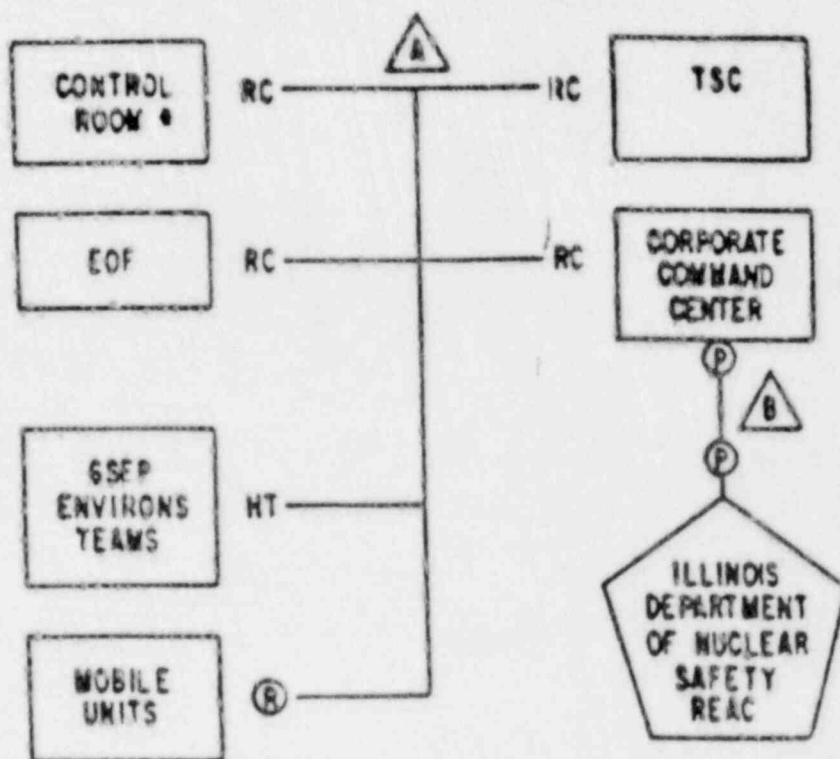
-  Telephone line between the OSC and Control Room. Color coding of this system is at the discretion of each nuclear station.
-  Telephone line between the Control Room and TSC. Color coding of this system is at the discretion of each nuclear station.
-  Microwave voice channel between the Corporate Command Center and the EOF, Shift Engineer's Office, and the TSC. Phone receivers are color-coded gray.
-  Telephone line between the EOF, Corporate Command Center, and TSC. Phone receivers are color-coded yellow.
-  Regular Station telephone line.

————— dedicated  
 - - - - - regular

P Phone receiver

At the discretion of each nuclear station, the gray phone for the Shift Engineer's Office may be placed in the Control Room.

ENVIRONMENTAL ASSESSMENT COMMUNICATIONS



Microwave radio link between the Corporate Command Center, TSC, Control Room, EOF, GSEP environs teams, and mobile units.



Telephone line between the Corporate Command Center and the Illinois Department of Nuclear Safety. Phone receiver is color-coded black.

RC Radio/console unit

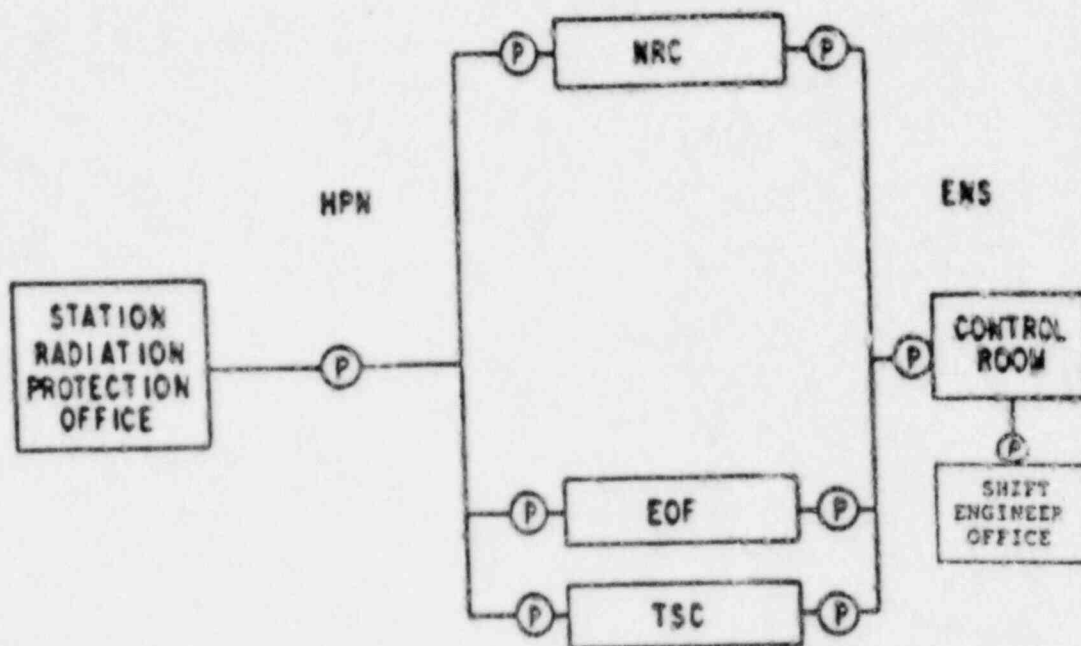
HT Handi-talkie (153.590 MHz)

Radio (153.590 MHz)

P Phone receiver

\* At the discretion of each nuclear station, the radio console for the Control Room may be placed in the Shift Engineer's Office.

FIGURE 7.2-5  
NRC COMMUNICATIONS



ENS: EMERGENCY NOTIFICATION SYSTEM; PHONE RECEIVERS ARE COLOR-CODED RED

HPN: HEALTH PHYSICS NETWORK; PHONE RECEIVER COLORS VARY FROM STATION TO STATION.

Ⓟ PHONE RECEIVER

THE EXACT CONFIGURATION OF THE ABOVE SYSTEMS MAY VARY FROM ONE NUCLEAR STATION TO ANOTHER. INSTALLATION AND USE OF THE NRC PHONES ARE UNDER THE DIRECTION OF THE NRC.

### 7.3 Assessment Facilities

#### 7.3.1 Onsite Systems, Instrumentation, and Equipment

Each nuclear station is equipped with instrumentation for seismic monitoring, radiation monitoring, fire protection, and meteorological monitoring. The actual instrumentation varies somewhat from site to site and thus will not be described in this generic plan. Descriptions of the above equipment will appear in each site specific annex. Instrumentation useful to the detection or analysis of emergency conditions shall be maintained in accordance with station Technical Specifications, if applicable, or commitments made to the NRC.

With regard to Commonwealth Edison's meteorological monitoring program, there has been a quality assurance program since 1976. The program was adopted from 10 CFR 50, Appendix B. However, since the meteorological facilities are not composed of structures, systems, and components that prevent or mitigate the consequences of postulated accidents and are thus not "safety related", not all aspects of 10 CFR 50, Appendix B apply. Those aspects of quality assurance germane to supplying good meteorological information for a nuclear power station were adopted into the meteorological quality assurance program.

#### 7.3.2 Safety Parameter Display System (SPDS)\* & Point History\*

The Safety Parameter Display System (SPDS) & Point History shall provide a display of plant parameters from which the safety status of operation may be assessed in the Control Room, TSC, and EOF for each nuclear station. The primary function of the SPDS and Point History is to help operating personnel in the Control Room make quick assessments of plant safety status. Duplication of the SPDS and Point History displays in the TSC, and EOF will promote the exchange of information between these facilities and the Control Room and assist management in the decision making process.

#### 7.3.3 Offsite Dose Calculation System (ODCS)\*

The Offsite Dose Calculation System (ODCS) is a computer based method for estimating the environmental impact of unplanned airborne releases of radioactive material from nuclear stations.

- \* This system will not be fully operable at all stations as described until the stations are equipped with new plant process computers, and the software programs are fully developed. Reference the CECo response to NUREG 0737 Supplement #1 or latest submitted schedule for planned operational dates.

The objectives of the Commonwealth ODCS are:

- c Provide, where possible, redundant independent pathways of data transmission and redundant data processing computers for use in an emergency situation.
- c Provide quick and reasonably accurate estimates of radiation dose equivalent to persons living offsite, including preparation of procedures and training of users required to accomplish this assessment.
- c Provide a method for the meteorological contractor to secure meteorological data for assessment of routine releases and to detect equipment failure quickly.

Each nuclear station's meteorological tower is frequently interrogated each day by the meteorological contractor to secure information necessary for preparation of meteorological operating reports and for detection of system failures.

Hourly, and more frequently during an accident, a corporate computer shall poll each meteorological facility to prepare the corporate data file and to check the system in order to maintain the ODCS in a readiness condition. The corporate computers shall then store the data for an extended time period.

At each nuclear station the plant computer will produce initial transport and diffusion estimates within 15 minutes following classification of an incident. The plant computer will produce refined estimates of dose equivalent as a terminal entry system to the corporate computer.

During an accident the plant computer system and a larger, corporate computer system will provide the various users with timely information required to make decisions. Emergency actions will be performed in the following sequence:

First: time frame: initial one-half hour or so postaccident; the Control Room Operator will rely on wind speed and direction and effluent release rate information provided by the plant process computer and these data converted into requisite Emergency Action Levels (EALs) by the Class A computer model.



\* The Class A model will provide warning to the Control Room operator when the following EALs have been exceeded: for Site Emergency: 2-minute average noble gas release rate having projected offsite dose rate of 500 mR/hr and 30-minute average noble gas release rate having projected offsite dose rate of 50 mR/hr, using worst case meteorology; and for General Emergency: 2-minute average noble gas release rate having projected offsite dose rate of 1000 mR/hr using 15-minute average actual meteorology.

second: 1/2 hour to few hours; emergency personnel should likely analyze the offsite consequences using the track model and C-model, both of which reside in the corporate computer and plant computer system.

third: few hours to duration of accident; the EOF environmental staff backed by a corporate environmental group will perform refined estimates of the offsite consequences for the duration of the emergency period. Computer models available for use include the A, B, C, and track models. This corporate group has been formed to support all nuclear stations and will perform its work in Chicago in lieu of having to relocate to each Emergency Operations Facility (EOF). A data link between the corporate facility and each EOF will be provided.

\* This system will not be fully operable at all stations as described until the stations are equipped with new plant process computers, and the software programs are fully developed. Reference the CECO response to NUREG 0737 Supplement #1 or latest submitted schedule for planned operational dates.

#### 7.4 Protective Facilities and Equipment

Each nuclear station has chosen locations to serve as both onsite assembly areas and offsite evacuation assembly areas. The specific locations of these areas are shown in each site specific annex.

#### 7.5 First Aid and Medical Facilities

Each nuclear station maintains onsite first aid supplies and equipment necessary for the treatment of contaminated or injured persons. As described in Section 6.5.2 of this plan, no resident physicians, nurses, or industrial hygienists are on the staff of Commonwealth's generating stations, and as such, medical treatment given to injured persons is of a "first aid" nature. When more professional care is needed, injured persons are transported to a local clinic or hospital. Hospital facilities are discussed in Section 6.5.4 of this plan.

#### 7.6 Damage Control Equipment and Supplies

The onsite storeroom of each nuclear station maintains a supply of parts and equipment for normal plant maintenance. These parts, supplies, and equipment are available for damage control use as necessary. When an emergency condition exists at one station, additional supplies can be obtained from other stations and from Division resources upon request.

#### 7.7 Facilities and Equipment for Offsite Monitoring

Commonwealth Edison has contracted with a company (currently Teledyne Isotopes) to conduct an extensive offsite environmental monitoring program to provide data on measurable levels of radiation and radioactive materials in the environs. The program includes: fixed continuous air samplers; routine sampling of river water; routine sampling of milk; routine sampling of fish; and a fixed TLD monitoring network. The TLD program consists of the following elements at each nuclear station:

- o A nearsite ring of dosimeters covering the 16 meteorological sectors.
- o A 16 sector ring of dosimeters placed in a zone about 5 miles from the plant.
- o TLDs placed at each of the normal fixed air sampler locations (typically about 8-15 air samplers per nuclear station).

Each nuclear station maintains a supply of emergency equipment and supplies which may be used for offsite monitoring. The actual equipment may vary somewhat from site to site and thus the specific listing of equipment appears in Station Emergency Plan Implementing Procedures (EPIP). A Corporate ERF procedure lists the types of equipment and minimum quantities of supplies required in Emergency Response Facilities and kits, which includes sufficient supplies of emergency equipment to be maintained in order to meet the initial requirements of two environmental sampling teams that would be dispatched for declared emergencies that involve releases of radioactive material to the environment. During subsequent phases of an emergency, equipment would be available from other Commonwealth Edison nuclear stations, vendors, and offsite response organizations.

8.0 MAINTAINING EMERGENCY PREPAREDNESS

8.1 Organizational Preparedness

8.1.1 Assistant Vice-President, Nuclear Services

The Assistant Vice-President, Nuclear Services, has the overall responsibility for radiological emergency response planning within Commonwealth Edison. The Assistant Vice-President, Nuclear Services, is assigned the responsibility for development and updating of the Generating Station Emergency Plan, for maintaining the operational readiness of offsite Emergency Response Facilities, for training and retraining of offsite CECO emergency response personnel, and for providing guidance on readiness of onsite facilities and personnel. This individual reports to the Vice-President, Nuclear Operations. A staff assigned to the Assistant Vice-President, Nuclear Services, has the responsibility for development and updating of the GSEP and coordination of the GSEP with other response organizations. This staff is headed by the Supervisor of Emergency Planning.

8.1.2 Assistant Vice-President and General Manager, Nuclear Stations

The Assistant Vice-President and General Manager, Nuclear Stations, is responsible for the safe and reliable operation and maintenance of Nuclear Generating Stations within Commonwealth Edison. This individual is assigned the overall responsibility for implementation of the Generating Stations Emergency Plan and is also the primary designated Recovery Manager. This individual reports to the Vice-President, Nuclear Operations.

All personnel designated as Directors in the GSEP organization shall be appointed by the Assistant Vice-President and General Manager, Nuclear Stations and documented by inclusion in the GSEP telephone directory listing of positions and personnel.

8.1.3 Station Manager

The Station Manager (or a designated alternate) has the responsibility to contact agencies with which the Station desires agreements for support during an emergency. This contact shall include:

- 1) An annual written invitation for members of these organizations to visit the station, discuss the emergency plan, and Emergency Action Levels (EALs), and familiarize themselves with plant facilities; and personnel.

- 2) Annual written offer by the nuclear stations to provide radiological training or retraining to members of these organizations with respect to their role in the emergency plan (also see Section 8.2); and
- 3) Once every two years, a request shall be made for written confirmation of the availability of assistance from each supporting organization not already a party to the Illinois Plan for Radiological Accidents or the equivalent plans in Iowa and Wisconsin. Agreement letters are not necessary with Federal Agencies who are legally required to respond based on Federal law; however, agreements are necessary if the agency was expected to provide assistance not required by law. Letters of agreement with private contractors and others who provide services in support of all six nuclear stations shall be obtained and maintained on file by Corporate Emergency Planning. Copies of these agreements will be provided to the stations. Letters of agreement with private contractors and others who do not provide services in support of all six nuclear station shall be obtained and maintained on file by the affected station. Copies of these agreements will be provided to the Corporate Emergency Planning. Letters of agreement will be referenced in the site specific annex and the actual letters will be maintained on file at each station respectively. Letters of agreement shall, as a minimum, state that the cooperating organization will provide their normal services in support of an emergency at the affected station.

The Station Manager has the following additional responsibilities:

- 4) Ensure the operational readiness of station communication systems for use during an emergency, by verification during drills (see Section 8.3.2.1);
- 5) Ensure the operational readiness of emergency equipment and supplies, such as, the Environs Team equipment (See Section 7.7), the Environs Team Van (at Mazon/Dresden, Quad Cities, and Zion), the TSC (See Section 7.1.2), the OSC (See Section 7.1.3), and the equipment needed to classify an accident (See Sections 5.0, 7.3-1 and the EAL section of the GSEP Annex);
- 6) Ensure that Station EPIPs are prepared as described in section 9.2 and are reviewed every two years; and
- 7) Support the Supervisor of Emergency Planning in the maintenance of the EOF and Zion Backup EOF, such as, maintenance of the health physics equipment stored there, and certain plant-related documents.

#### 8.1.4 Medical Director

The Commonwealth Medical Director is responsible for obtaining, in accordance with Section 6.5.4, agreements for the services of physicians or clinics, and medical consultants specifically skilled in the medical aspects of radiation accidents and other medical consultants as might be necessary for the case of a person involved in a radiation incident.

The Medical Director is responsible for maintaining a supply of thyroid blocking agents within the company and for establishing policy for its use.

Following is Commonwealth Medical Director's policy regarding administration of Potassium Iodide (KI) as a thyroid blocking agent.

1. A dose of 130 mg KI (1 tablet) should be administered prior to receiving a projected calculated dose equivalent to the thyroid of 25 rem or greater, or
2. One tablet should be taken as soon as possible upon an individual being subjected for 1 hour to an airborne concentration of I-131 of  $1.25 \times 10^{-5}$  uCi/cc or greater.

#### 8.1.5 Supervisor of Emergency Planning

The Supervisor of Emergency Planning is responsible for ensuring the operational readiness of the following offsite emergency response facilities:

- 1) The EOPs at Mazon, Morrison, Zion and Dixon (see Section 7.1.5);
- 2) The Corporate Command Center (see Section 7.1.4);
- 3) The Zion Backup EOP in Libertyville (see Section 7.1.5).
- 4) The Prompt Notification System (PNS) (See Section 6.3.2).

8.1.6 Quality Assurance

To meet the requirements of 10CFR50.54 the Commonwealth Edison Quality Assurance Group shall review select procedures, exercises, drills, and adequacy of interfaces with state and local governments at least every 12 months.

An independent audit of the GSEP shall be conducted on an annual basis by the Commonwealth Quality Assurance Department. Actions shall be taken for evaluation and correction of all audit findings.

## 8.2 Training

The proficiency of emergency personnel (as defined in Section 2.0) is ensured by the following means:

- 1) Assigning persons to emergency duties which are similar to those performed as a part of their regular work assignment;
- 2) The initial and annual retraining of emergency personnel on applicable generic and site specific portions of the GSEP and corresponding Emergency Plan Implementing Procedures; and
- 3) Participation in exercises and drills designed to sharpen those skills in which they are expected to use during a radiological emergency.

The training program for emergency personnel allows each member to meet the following objectives:

- o Know the objectives of the GSEP;
- o Understand the graded emergency classification system;
- o Display an adequate knowledge of personal responsibilities and duties as listed in the GSEP and EPIPs;
- o Know the persons with whom they may interface while performing GSEP functions; and
- o Display a functional knowledge of the documents (e.g., procedures) necessary to fulfill their role in the GSEP.

Control Room Personnel shall receive training in the following topics:

- a) Emergency Action Level Classification,
- b) Protective action recommendations,
- c) Radioactive Release Rate Determination,
- d) Nuclear Accident Reporting System form completion and use of the NARS system,
- e) Procedures for notifying Federal, State and Local Agencies as appropriate.
- f) Procedures for activating the onsite and offsite GSEP Organization.

Training on these topics shall be given on a frequency sufficient to ensure proficiency in each area but no less than semiannually.



### 8.2 Training (Cont'd)

The Commonwealth Edison Production Training Department, Station Training Departments and NST Emergency Planning have the responsibility of ensuring that Commonwealth Edison emergency personnel receive all necessary training and retraining. In order to carry out this responsibility, the Supervisor of Emergency Planning will notify the Production Training Department of changes to personnel assigned GSEP related positions. The Supervisor of Emergency Planning, working with appropriate station personnel, shall ensure GSEP training is taken by all emergency personnel. The Production Training Department and Station Training Departments shall ensure that appropriate initial training and retraining sessions are scheduled and given. The Production Training Department shall also maintain records of all emergency personnel trained.

Station personnel not specifically assigned to GSEP positions shall be provided with an annual review of the GSEP by the Station training staff.

Commonwealth Edison shall make an annual written offer to train those nonCommonwealth organizations referenced in the GSEP which may provide specialized services during a radiological emergency (e.g., firefighting, medical services, transport of injured, etc.). This training shall acquaint the participants with the special problems potentially encountered during a radiological emergency, notification procedures, and their expected roles. Those organizations who must enter the site shall also receive onsite training. They will also be instructed as to the identity (by position and title) of those persons in the onsite organization who will control their support activities.

Commonwealth Edison shall offer programs (at least annually) to acquaint news media with the GSEP, information concerning radiation, and points of contact for release of public information in an emergency.

### 8.3 Exercises and Drills

#### 8.3.1 Exercises

The Assistant Vice-President and General Manager, Nuclear Stations, shall ensure that Federally prescribed exercises are conducted at each nuclear station in order to test the adequacy of timing and content of implementing procedures and methods; to test emergency equipment and communication networks; and to ensure that emergency personnel are familiar with their duties. An exercise shall involve participation by Federal, State and local personnel as prescribed by the regulations.

A written scenario shall be prepared for each exercise. This scenario shall include:

- 1) The basic objective of the exercise;
- 2) The dates, time period, places, and participating organizations;
- 3) The simulated events;
- 4) The time schedule of real and simulated initiating events;
- 5) A narrative summary describing the conduct of the exercise to include such things as simulated casualties, rescue of personnel, deployment of radiological monitoring teams, and public information activities; and
- 6) Arrangements for qualified observers.

Once every six years, an exercise should be scheduled between the hours of 6:00pm and midnight, and another between midnight and 6:00am.

A critique shall be conducted as soon as practical after each exercise. The critique shall evaluate the ability of the GSEP organization to respond to a simulated emergency situation as called for in the GSEP.

### 8.3.2 Drills

#### 8.3.2.1 Communications Drills

The GSEP communications systems outlined in Section 7.2 of this plan shall be fully tested annually.

The capability of (NARS) to notify the Illinois Emergency Services and Disaster Agency, the Illinois Department of Nuclear Safety, the Iowa Office of Disaster Services (for Quad Cities Station), the Wisconsin Division of Emergency Government (for Zion Station), and appropriate local agencies shall be demonstrated at least monthly. The capability (ENS & HPN) to notify the NRC from the Control Room, TSC and EOF shall be demonstrated at least monthly.

The capability to notify the NRC Region III, FEMA Region V and VII and American Nuclear Insurers (ANI) and federal emergency response organizations as listed in the GSEP Phone Directory shall be demonstrated from the Commonwealth corporate office at least quarterly. Other GSEP communication and computer equipment shall be functionally tested each calendar quarter.

#### 8.3.2.2 Fire Drills

Fire drills shall be conducted at each nuclear station in accordance with Station Technical Specifications and/or Station procedures.

#### 8.3.2.3 Environmental Monitoring Drills

Plant environs and radiological monitoring drills shall be conducted annually. These drills should include collection and analysis of sample media such as water, grass, soil, and air.

#### 8.3.2.4 Health Physics Drills

Health Physics Drills shall be conducted semiannually. These drills shall include response to, and analysis of, simulated airborne and liquid samples within the plant. At least annually, these drills shall include a test of postaccident sampling systems.

#### 8.3.2.5 Medical Emergency Drills

A medical emergency drill, involving a simulated contaminated individual, which contains provisions for participation by local support service organization (i.e., ambulance and support hospital) shall be conducted annually at each nuclear station. Local support service organizations which support more than one station (ie. St. Joseph Hospital) shall only be required to participate once each calendar year. The offsite portions of the medical drill may be performed as part of the required exercise.

8.3.2.6 Assembly and Accountability Drills

An assembly and accountability drill shall be conducted annually. The drill shall include identifying the locations of all individuals within the protected area after an assembly is announced.

8.3.2.7 Offshift Augmentation Drill

Each station shall initiate an unannounced offshift notification drill at least every six months. These drills shall involve implementation of the individual station's notification procedure and documentation of the times at which persons are notified. No actual travel is required. Participants give an estimation of their travel time to the drill location. This drill shall serve to demonstrate the capability to augment the on-shift staff in a short period after declaration of an emergency.

#### 8.4 Public Education and Information

Commonwealth Edison is committed to the distribution of informational brochures on an annual basis. These brochures shall be distributed to the public residing within the ten mile plume exposure EPZ and shall address how they shall be notified and what their actions should be in an emergency.

The public information brochure shall include the following information: what to do if a take-shelter request is given, what to do if an evacuation request is given, educational information concerning radiation, a map of major evacuation routes, a list of communities likely to serve as host shelter areas, and instructions on how to obtain additional information, especially for the disabled or their caretakers and those without transportation.

The public information brochure described above shall be mailed to all residents in the plume exposure EPZ of each nuclear station and shall also be provided to appropriate locations where a transient population may obtain a copy.

8.5 Distribution, Review, and Updating of the GSEP and Corresponding EIPs

To ensure that the GSEP and the corresponding Emergency Plan Implementing Procedures are kept current and that updated copies are maintained by all persons assigned GSEP manuals, Commonwealth's Supervisor of Emergency Planning shall ensure the following:

- 1) Each GSEP manual shall be assigned a serial number;
- 2) An assignment record shall be maintained of all GSEP manuals;
- 3) GSEP manuals shall be distributed on a controlled basis to all individuals requiring them, including directors of GSEP positions and all appropriate Federal, State, and local agencies;
- 4) The GSEP will be certified (recorded) as current on an annual basis; the GSEP shall be updated as needed; the most current approved revision shall remain in effect until revised so long as it is certified as current;
- 5) Proposed revision to the GSEP shall be reviewed and approved by each nuclear generating station's Onsite Review Committee and the CECO Offsite Review committee. Documentation regarding this review and approval shall be maintained in the appropriate generating station and CECO corporate office files. In addition to this review and approval the GSEP shall be:
  - a) Reviewed by the Supervisor of Emergency Planning
  - b) Approved by the Nuclear Services Technical Manager, Nuclear Stations Division
  - c) Authorized for use by the Assistant Vice-President and General Manager, Nuclear Stations Division
- 6) All persons in possession of an authorized GSEP manual shall receive authorized changes. Revised pages of the GSEP shall be dated and marked to show where changes have been made; the new pages added and old pages destroyed;
- 7) Emergency Plan Implementing Procedures shall be developed consistent with the GSEP (see Section 9.2) and reviewed every two years. (Station Manager shall ensure that this review is conducted for Station EIPs);
- 8) Names and phone numbers of the GSEP organization and support personnel shall be reviewed and updated at least quarterly;
- 9) Whenever exercises and/or drills indicate deficiencies in the GSEP or corresponding EIPs, such documents shall be revised as necessary to ensure corrective action;
- 10) The public information brochures are distributed annually.

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#### 8.6 Emergency Equipment and Supplies

Various types of emergency equipment and supplies are maintained as required by this plan which specifies that items must be kept in the EOF, Zion Backup EOF, TSC and the OSC. The list of the emergency equipment and supplies are specified in the corporate EPIP's. The Supervisor of Emergency Planning shall identify a typical list of equipment to be maintained for offsite emergency monitoring. The operational readiness of these and other supplies is ensured by quarterly inventory and inspection required by each Station's procedures and their use during the required drills and exercises.

## 9.0 APPENDIX

### 9.1 Required Content of Site Specific Annex

The Generating Stations Emergency Plan (GSEP) consists of two parts, a generic plan and a site specific annex for each nuclear station. The site specific annex shall be developed by the respective nuclear station and shall contain information and guidance which is unique (site specific) to the station. The annex becomes part of the plan and is subject to the same review and audit requirements as the generic plan.

#### 9.1.1 Annex Format and General Content

The annex format shall conform to the format used in the generic plan. Information that is in the generic plan need not be restated in the annex; however, it may be desirable to do so in some cases in the interest of continuity and clarification. The annex shall address how (means, methods, resources) the requirements and responsibilities set forth in the generic plan are to be satisfied.

#### 9.1.2 Annex Content (Specific)

References have been made throughout the generic plan that additional information shall be in the site specific annex. Some areas require little additional information while other areas require significant input. As a minimum, site specific annexes shall address the areas described in the following subsections.

##### 9.1.2.1 Introduction

Define the unit, station and surrounding area (include maps, drawings and/or diagrams) and address in a summary statement the annex's interface with the generic GSEP and Station procedures. Include a map or table that indicates the population distribution around the nuclear station.

##### 9.1.2.2 Definitions

Provide definitions and/or abbreviations for terms used in the annex which are unique or have a meaning or connotation that differs from normally accepted usage.

##### 9.1.2.3 Summary of Emergency Plan

Address in a summary statement the participating status of state and local authority with regard to increasing severity of emergency classifications.



9.1.2 Organizational Control of Emergencies

- o Specify organization and manning for both day and night crews (to include health physics organization).
- o Address the Station's commitment to augment the onsite emergency organization following declared GSEP emergencies.
- o Specify the agencies with which the Station has independent agreements for support during an emergency.

9.1.2.5 Classification of Emergency Conditions

Include a table of EALs for all emergency classes.

9.1.2.6 Emergency Measures

- o Address provisions for the classification and declaration of an emergency from the control room. Specify the line of authority and responsibility for emergency classification and for contacting State and local authorities (officials) who have the responsibility for taking protective actions in the interest of the public. Also specify who has the authority and responsibility for recommending to state and local authority the protective actions to be taken, to include recommending evacuation.
- o Describe the means (methods) of State and local governments in notifying the public of an emergency condition and of the protective actions to be taken during an emergency.
- o Include a map indicating the location of onsite assembly areas.
- o Include map indicating site evacuation routes and address site personnel relocation and accountability and monitoring of site evacuees. Also address roadway/traffic control measures of roads under the control of the station.
- o Include a plot of Containment Activity versus Radiation Level for the points described in Section 6.2.4 of the generic GSEP.

9.1.2.7 Emergency Facilities and Equipment

- o Include "as built diagrams" and descriptions of the Station Control Room, Operational Support Center, the Technical Support Center, and the Emergency Operations Facility.
- o Include a description of the Station seismic instrumentation, radiation monitoring equipment, fire protection equipment, and meteorological instrumentation.
- o Specify location of offsite fixed radiation environmental monitors including the rings of TLDs.
- o Describe the capability and resources available to categorize accidents, including provisions for:
  - a) Detection of inadequate core cooling;
  - b) Monitoring of high level radiation reading in the containment;
  - c) Post accident sampling; and
  - d) Monitoring of in-plant iodine.
- o Specify the onsite dedicated communications to be established and maintained during an emergency.

9.1.2.8 Maintaining Emergency Preparedness

- o Address the Station requirements to provide training of emergency personnel.
- o Describe the means (methods) of ensuring that local agencies, media, general public (including transient populations) are provided educational information concerning planning in their behalf.

## 9.2 Required Content of Emergency Plan Implementing Procedures

Emergency Plan Implementing Procedures (EPIPs) that are necessary for implementation of this plan shall be developed and updated as described in Section 8.5. The content and format of the EPIPs shall be in accordance with this plan (GSEP) and guidelines issued by the Assistant Vice-President, Nuclear Services.

Each Station Manager is responsible for ensuring that the station's EPIPs are developed which address the following subjects areas:

- 1) Notification procedures using call lists to notify offsite authorities and to mobilize station personnel for all emergency conditions;
- 2) Emergency classification through the use of Emergency Action Levels;
- 3) Methodology for determining recommended protective actions based on Figure 6.3-1 and Tables 6.3-1 and 6.3-2;
- 4) Radiological survey procedures for emergency surveys in the plant and for onsite areas;
- 5) Corrective actions aimed at correcting the emergency situation at or near the source of the problem (e.g., firefighting);
- 6) Personnel monitoring and decontamination procedures for individuals leaving restricted areas or other areas known or suspected of being contaminated;
- 7) Evacuation procedures for "Protected Area" and Site Boundary;
- 8) Methods of personnel accountability that ensure all individuals within the site are warned of imminent threats or hazardous conditions;
- 9) Methods and instructions for receiving, transporting, and handling injured persons and providing onsite first aid and offsite medical treatment;

- 10) Assignments of responsibility and access control for onsite emergency control centers;
- 11) Operation and use of onsite emergency communication systems;
- 12) Inventory and operational readiness of emergency equipment and supplies; and
- 13) GSEP organization and support agency phone numbers.

Information to be addressed in Station EPIPs may be fulfilled by other station procedures, but those procedures shall be referenced within the context of the EPIPs.

The Supervisor of Emergency Planning is responsible for ensuring that general office EPIPs are developed which address the following subject areas:

- 1) Notification procedures using call lists to notify corporate management, offsite GSEP organization personnel, State authorities, and offsite emergency response organizations;
- 2) Detailed procedures for determining projected and actual doses to members of the public following a release of radioactive material from a nuclear station;
- 3) Detailed procedures for radiological surveys of the environs;
- 4) Operation and use of offsite emergency response facilities, computers and communications;
- 5) Assignments of responsibility and access control for offsite emergency control facilities;
- 6) Methods of disseminating information to the media and the general public;
- 7) Procedures that address the exercise and drill program;
- 8) Procedures that address the recovery of a nuclear station to a preaccident status, including reentry into previously evacuated areas, decontamination of the affected site, repair of critical plant equipment, and disposal of contaminated equipment and waste. It is not practical to plan detailed recovery actions for all conceivable situations in advance, but procedures that include at least initial planning considerations should be developed. Detailed procedures shall be developed after an emergency situation occurs as necessary; and
- 9) GSEP organization and support agency phone numbers.

### 9.3 Additional Emergency Response/Notification Requirements

The Generating Stations Emergency Plan is a plan written primarily to comply with the requirements of 10 CFR 50, Paragraph 50.47 and Appendix E. As such, GSEP addresses emergency conditions as defined in NUREG 0654. On the basis of other regulatory requirements, additional emergency conditions and required notifications have been defined. These regulations are listed below and define emergency conditions that may or may not warrant an emergency declaration under the GSEP in accordance with Section 5.0 of this plan:

- 1) 10 CFR 50.70, "Inspection, Records, Reports, Notifications".
- 2) 10 CFR 73, "Physical Protection of Plants and Materials".
- 3) 33 CFR 153, "Control of Pollution by Oil and Hazardous Substances."
- 4) 10 CFR 20.403 and State of Illinois Rules and Regulations for Protection against Radiation, Section D.403, "Incident Notification Requirements."
- 5) 10 CFR 50.72 Immediate Notification Requirements for Operation Nuclear Power Reactors.

The following sections summarize the actions required in accordance with the above rules and regulations.

#### 9.3.1 Notifications of NRC Operations Center

An on-duty Station Management person shall notify the NRC Operations Center via the NRC's Emergency Notification System of:

- 1) The declaration of any of the EMERGENCY CLASSIFICATIONS as specified in the GSEP, or
- 2) Those NONEMERGENCY events specified in 10 CFR 50.72 paragraph (b).

If the NRC's Emergency Notification System is inoperative the required notifications shall be made via commercial telephone service, other dedicated telephone service, or any other method which shall ensure that a report is made as soon as practical to the NRC Operations Center. Refer to the GSEP telephone directory for the NRC Operations Center phone number.

The GSEP Emergency Classification shall be reported to the NRC Operations Center immediately after notification of the appropriate State or Local agencies but not later than one (1) hour after the time classification.

Declaration of "NONEMERGENCY" events in accordance with 10 CFR 50.72 paragraph (b), shall be reported via the Emergency Notification System to the NRC Operations Center in accordance with the "ONE-HOUR REPORT" or "FOUR-HOUR REPORT" criteria.

The Nonemergency Event "ONE-HOUR REPORT" shall be made to the NRC Operations Center as soon as practical and in all cases within one hour of the occurrence of any of the items listed in 10 CFR 50.72 paragraph (b) (1), subparagraph i, thru vi.

The Nonemergency Event "FOUR-HOUR REPORT" shall be to the NRC Operations Center as soon as practical and in all cases, within four (4) hours of the occurrence of any of the items listed in 10 CFR 50.72 paragraph (b) (2), subparagraph i, thru vi.

Initial notification to the NRC Operations Center shall so state: the Emergency Class declared, or "One-Hour Report", or "Four-Hour Report" as well as necessary details to describe the event per 50.72 (b) (1) or (b) (2), as possible.

Follow-up notifications shall be reported to the NRC Operations Center immediately, but not later than one (1) hour if:

- i) There is any further degradation in the level of safety of the plant or other worsening plant conditions occur such that a GSEP Emergency Classification is now applicable,
- ii) there is any change from one Emergency Class to another, or
- iii) there is a termination of the Emergency Class is declared.

Additional follow-up notifications shall also be reported to the NRC Operations Center immediately, but not later than one (1) hour to inform the NRC of:

- iv) the results of evaluations assessments of plant conditions,
- v) the effectiveness of response or protective measures taken, or
- vi) information related to plant behavior that is not understood.

If requested by the NRC maintain an open, continuous communications channel with the NRC Operations Center.

### 9.3.2 Nuclear Station Security Plan

Each nuclear station shall have a Security Plan that complies with the requirements of 10 CFR 73.

The interface between the GSEP and the Nuclear Station Security Plan is basically one of parallel operation. The plans are compatible. The GSEP emergency response measures, once initiated, are executed in parallel with measures taken in accordance with the Station Security Plan.

The Nuclear Station Security Plan, Appendix C, Contingency Events, identifies situations which could be initiating conditions for GSEP response measures. Contingency events include bomb threats, attach threats, civil disturbances, protected area intrusions, loss of guard/post contact, vital area intrusions, bomb devices discovered, loss of guard force, hostages, extortion, fire/explosions, internal disturbances, security communications failure, and obvious attempts of sabotage. The Station Security Plan provides guidance for decisions and actions to be taken for each security contingency event. As guidance, the Security Plan allows for differing responses depending upon the assessment of the actual situation within each contingency event classification.

The assessment of any security contingency event and the decision to initiate, or not to initiate the GSEP will be the responsibility of the Station Director or the Shift Engineer acting as the Station Director. All identified security contingency events have the potential of being assessed as initiating conditions for an emergency declaration under the GSEP.

### 9.3.3 Control of Pollution by Oil and Hazardous Substances

#### 9.3.3.1 Reportable Discharges of Oil or Hazardous Substances

A reportable discharge for the purpose of the compliance with 33 CFR 153 is defined as the spilling, leaking, pumping, pouring, emitting, emptying, or dumping into or upon any public water body of:

- o Oil in such quantities as to cause a film or sheen upon or discoloration of the water or upon adjoining shorelines; or
- o Hazardous substances designated in 40 CFR 116 in quantities equal to or exceeding in any 24 hour period the harmful quantities established in 40 CFR 118.

Also, PCB fluid leaks or discharges of greater than one-half gallon or ten pounds are considered as reportable incidents.

9.3.3.2 Reporting Procedure

Upon learning of a reportable discharge as described in Section 9.3.3.1 above, the Station Manager or an alternate shall immediately notify the Duty Officer, National Response Center, U.S. Coast Guard, toll free telephone number 1-800-424-8802. If notification to the National Response Center is not possible or practical, notice shall be given to each of the following officials in order of priority:

- 1) Designated EPA/Coast Guard On-Scene Coordinator (OSC); and
- 2) Commanding Officer of any Coast Guard unit in the vicinity of the discharge; and
- 3) Commander of the Coast Guard district in which the discharge occurs.

In addition, the Station Manager or an alternate shall notify:

- 1) The Director of Water Quality, Environmental Affairs; and
- 2) The Assistant Vice-President and General Manager, Nuclear Stations Division.

9.3.3.3 Spill Prevention Control and Countermeasure Plans

Each generating station shall have a Spill Prevention Control and Countermeasure (SPCC) Plan prepared in accordance with 40 CFR 112.7 in order to minimize the potential for oil discharges. No SPCC plan shall be effective unless it has been reviewed and certified by a Registered Professional Engineer. Each SPCC Plan shall be reviewed and evaluated at least once every three years in accordance with 40 CFR 112.5.

Upon learning of the oil discharge into a navigable waterway at levels determined to be harmful to the public health or welfare, the United States Coast Guard must be immediately notified as set forth in Section 9.3.3.2.

The exact criteria for declaring oil discharges and the subsequent notification procedure shall be defined in the SPCC Plan and/or Station Emergency Plan Implementing Procedures.



9.3.4 Incident Notification Requirements for the NRC Region III Office and the Illinois Department of Nuclear Safety

In accordance with 10CFR20 - Standards for Protection Against Radiation Section 20.403 Notification of Incidents the following actions shall be taken by the appropriate CECO personnel.

An on-duty Station management person shall immediately notify the NRC Region III Office and the Illinois Department of Nuclear Safety by telephone, telegraph, mailgram, or facsimile of any incident involving any source of radiation possessed by the Station and which may have caused or threatens to cause:

- 1) A dose equivalent to the whole body of any individual of 25 rems or more radiation; a dose equivalent to the skin of the whole body of any individual of 150 rems or more of radiation; or a dose equivalent to the feet, ankles, hands, or forearms of any individual of 375 rems or more of radiation; or,
- 2) The release of radioactive material in concentrations which if averaged over a period of 24 hours, would exceed 5,000 times the limits specified for such materials in Appendix B Table II of 10CFR20; or,
- 3) A loss of one working week or more of the operation of any facilities affected; or,
- 4) Damage to property in excess of \$200,000.\*

An on-duty Station management person shall within 24 hours notify the NRC Region III Office and the Illinois Department of Nuclear Safety by telephone and telegraph, mailgram, or facsimile of any incident involving any source of radiation possessed by the Station and which may have caused or threatens to cause:

- 1) A dose equivalent to the whole body of any individual of 5 rems or more radiation; a dose equivalent to the skin of the whole body of any individual of 30 rems or more of radiation; or a dose equivalent to the feet, ankles, hands, or forearms of 75 rems or more radiation; or,

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- 2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 500 times the limits specified for such materials in Appendix B, Table II of 10 CFR 20; or,
- 3) A loss of one day or more of the operation of any facilities affected; or,
- 4) Damage to property in excess of \$2,000.\*

\*For the State of Illinois, the property damage reporting requirements are \$100,000 and \$1,000 for immediate and 24 hour notification, respectively.

9.3.5 Reports of Theft or Loss of Radiation Sources and/or Licensed Materials

In accordance with "Illinois Rules and Regulations for Protection Against Radiation", Section D.403 and D.402, the following section 9.3.5.1 to 9.3.5.3 have been developed. In addition this section also requires reporting to the appropriate NRC offices in accordance with 10 CFR 20 Section 20.402. These requirements are discussed in Sections 9.3.5.4 and 9.3.5.5.

9.3.5.1 Initial Notification to the Illinois DNS of Loss of Radiation Source.

An on-duty Station management person shall immediately notify the Illinois Department of Nuclear Safety by telephone and telegraph, mailgram, or facsimile of the theft or loss of any inventoried source of ionizing radiation after such occurrence becomes known.

9.3.5.2 Initial Notification to the Illinois DNS of Substantial Hazard in Unrestricted Area.

An on-duty Station management person shall immediately report to the Illinois Department of Nuclear Safety, after its occurrence becomes known to the licensee, any loss or theft of licensee material in such quantities and under such circumstances that it appears to the licensee that a substantial hazard may result to persons in unrestricted areas.

9.3.5.3 Notification of CECO Personnel.

An on-duty Station management person shall upon notification to DNS and/or NRC as referenced in paragraph 9.3.5.1 and/or 9.3.5.2 above, "immediately" notify both the System Power Supply Office (SPSO) Dispatcher, and the Nuclear Duty Officer (NDO). The SPSO will ensure the NDO is contacted by the Station by calling the NDO.

9.3.5.4 Initial Notification to the NRC of Loss or Theft of Licensed Material

An on-duty Station Management person shall report by telephone to the Director of the NRC Inspection and Enforcement office as listed in Appendix D of 10CFR20, immediately after its occurrence becomes known to the licensee, any loss or theft of licensed material in such quantities and under such circumstances that it appears to CECO personnel that a substantial hazard may result to persons in "Unrestricted Areas".

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9.3.5.5 Followup Notification to the NRC of Loss or Theft of  
Licensed Material

CECo personnel at the station where the loss or theft of Licensed Material had occurred, will perform the following report within thirty (30) days to the appropriate NRC offices in accordance with 10CFR20 Section 20.402.

#### 9.4 Bibliography

References and supporting plans consulted in writing the Commonwealth Generating Station Emergency Plan are listed in this section. With exception of regulatory requirements, inclusion of material on this list does not imply adherence to all criteria or guidance stated in each individual reference.

- 1) Code of Federal Regulations, Title 10, Chapter 1 Parts 20, 50, 73, and 100.
- 2) Code of Federal Regulations, Title 33, Chapter 1, Part 153.
- 3) Code of Federal Regulations, Title 40, Chapter 1, Parts 110, 112, 116, and 118.
- 4) Code of Federal Regulations, Title 44, Chapter 1, Part 401.
- 5) Code of Federal Regulations, Title 49, Chapter 1, Parts 171 and 172.
- 6) Commonwealth Edison Quality Assurance Manual.
- 7) EPA "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," 1975 (and updated, 1979).
- 8) NUREG 0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," Dec. 1978.
- 9) NUREG 0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations."
- 10) NUREG 0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, November, 1980.
- 11) NUREG 0696, "Functional Criteria for Emergency Response Facilities."
- 12) "Federal Bureau of Investigation and Nuclear Regulatory Commission Memorandum of Understanding for Cooperation Regarding Threat, Theft, or Sabotage in U.S. Nuclear Industry", Federal Register, Vol. 44, p. 75535, December 20, 1979.
- 13) "Illinois Rules and Regulations for Protection Against Radiation," Section D.403 and D.402.

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- 14) EPA 520/1-78-001B, "Protective Action Evaluation, Part 2, Evacuation and Sheltering as Protective Actions against Nuclear Accidents Involving Gaseous Releases".
- 15) "Commonwealth Edison Offsite Dose Calculation System," system description, latest approved copy.
- 16) "Emergency Preparedness INPO Criteria", dated February 12, 1980.
- 17) ANSI/ANS 3.7.2 - 1979, "Emergency Control Centers for Nuclear Power Plants."
- 18) ANSI/ANS 3.7.3 - 1979 - 1979, "Radiological Emergency Preparedness Exercises for Nuclear Power Plants"
- 19) "Nuclear Station Security Plan" Note: The Station Security Plan contains industrial security information must be withheld from public disclosure under provisions of 10 CFR 2.790(d).
- 20) Illinois Plan for Radiological Accidents (IPRA), Latest approved copy.
- 21) The Iowa Emergency Plan, Latest approved copy.
- 22) State of Wisconsin Peacetime Radiological Emergency Response Plan.
- 23) "Radiological Assistance Plan," Region 5, Department of Energy, Latest approved copy.
- 24) INPO Emergency Response Plan, Latest approved copy.
- 25) NUPEG 0737, "Clarification of TMI Action Plan Requirements," November, 1980.
- 26) "Evacuation Time Estimates for Areas Near Power Plants - Dresden, Quad Cities, Zion, La Salle County Stations", D.L. Peoples letter to B.K. Grimes, dated March 11, 1980. Preliminary estimates for Byron and Braidwood Station were submitted by letter to D.G. Eisenhut, NRC, from L.O. DelGeorge, on August 29, 1980. A document "Evacuation Time Estimates Within the Plume Exposure Pathway Emergency Planning Zone for the Byron Nuclear Generating Station", dated December 1982, was submitted to the Byron ASLB in December 1982.
- 27) "Voluntary Assistance Agreement By and Among Electric Utilities involved in Transportation of Nuclear Materials," dated November 1, 1980.

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- 28) Comprehensive Environmental Response, Compensation and Liability Act of 1980.
- 29) NUREG 0728 - "Report to Congress: NRC Incident Response Plan".
- 30) Accidental Radioactive Contamination of Human Food and Animal Feeds; Recommendation for State and Local Agencies, Volume 47, No. 205, October 22, 1982.
- 31) US NRC Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors", revision 2, October, 1981.
- 32) American Nuclear Insurers Bulletin #5B (81).
- 33) "Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency: Final Recommendations on Use", Federal Register Vol. 47, No. 125, June 29, 1982.
- 34) NUREG 0737 Supplement #1 or latest submitted schedule of planned operational dates.
- 35) CECO April 1983 response to NUREG 0737 Supplement #1 or latest submitted schedule of planned operational dates.
- 36) William J. Dircks, Executive Director for Operations, NRC, to Dr. Donald F. Knuth, President KMC, Inc. dated October 26, 1981.

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Controlled Copy Number \_\_\_\_\_

COMMONWEALTH EDISON COMPANY  
GENERATING STATIONS EMERGENCY PLAN (GSEP)  
GSEP TELEPHONE DIRECTORY

The personnel listed herein have been reviewed by the Assistant Vice President, Nuclear Services, and approved by the Assistant Vice President and General Manager, Nuclear Stations.

Reviewed: \_\_\_\_\_

N. E. Wandke

Approved: \_\_\_\_\_

Dennis P. Galle

\_\_\_\_\_  
Date

1-6-86

Changes and/or Corrections should be addressed to:

COMMONWEALTH EDISON COMPANY  
c/o Administrative Assistant  
P.O. Box 767  
72 West Adams Room 1248  
Chicago, Illinois 60690



GSEP TELEPHONE DIRECTORY  
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Commonwealth Edison Telephone Directory

Nuclear Stations (Telephone Operators)

Dresden  
Quad Cities  
Zion  
LaSalle  
Byron  
Braidwood

Division Headquarters (Operator)(After hours - 72 W. Adams Operator)

Chicago Central  
Chicago North  
Chicago South  
Northern Division  
Western Division  
Southern Division  
Rock River Division

System Power Supply (LD Office)

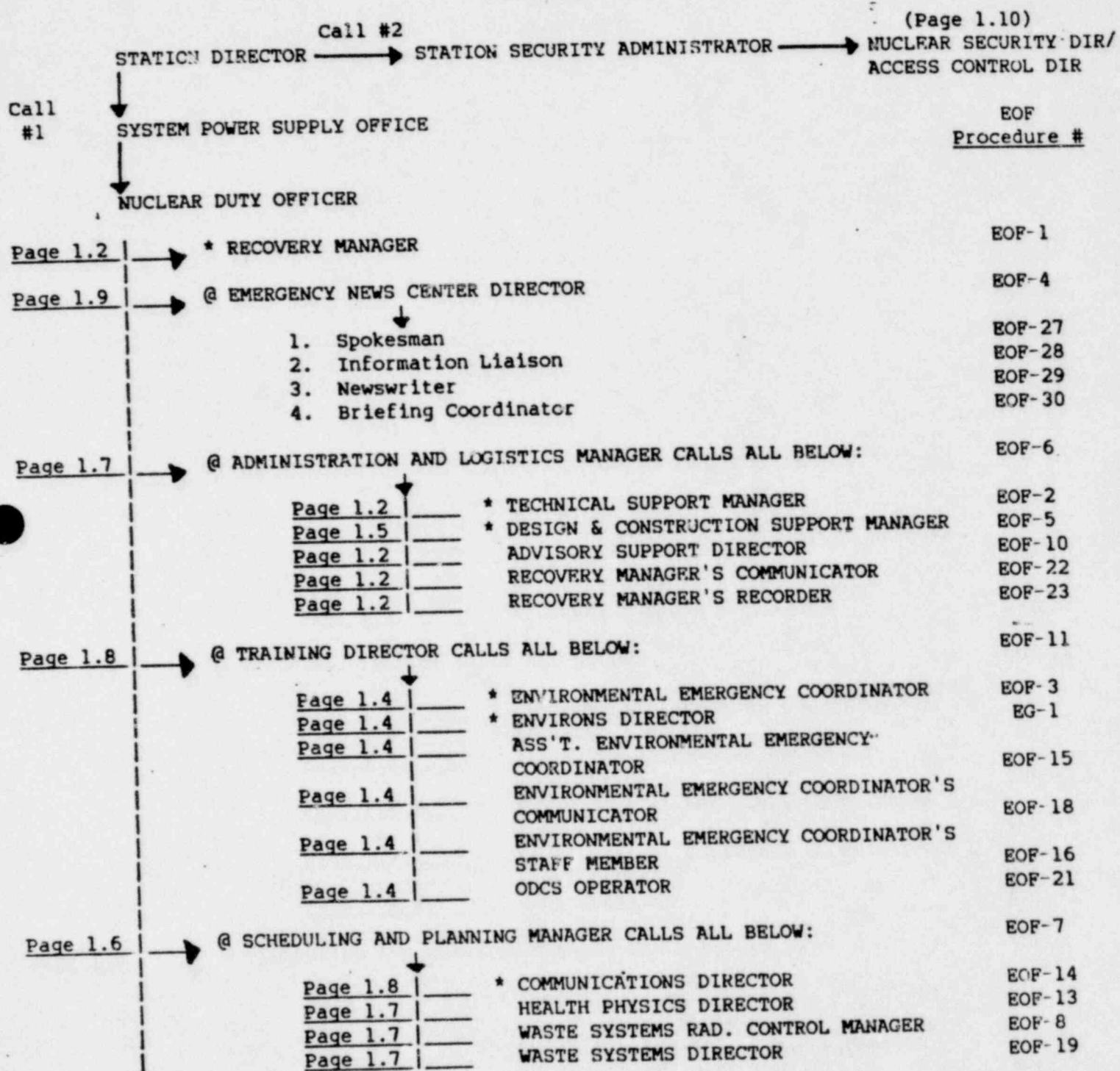
Technical Center (Operator)

CCC Telephone Lines

Environmental Director  
Environmental Staff  
CCC Director  
CCC Dir. Communicator  
Engineering Director  
Intelligence Director  
Health Physics Director  
\*Information Director  
\*Legal Consultant  
\*Medical Director  
\*Accounting Director  
\*Manpower & Logistics Director  
Telecopier

\* These telephone lines and desks are located outside of the CCC proper.

Callout Tree for EOF Manning  
Non Duty Hours



CODE

\* = Minimum Staffing

@NOTE: Once you have completed your assigned notifications, proceed to the designated EOF. Others proceed as notified.  
 See Page 1.1.1 for instructions

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Functional Call Tree Example

The station director has just informed the System Power Supply Office of the need to activate the EOF. The SPSO notifies the Nuclear Duty Officer who first calls a Recovery Manager who proceeds to the EOF. After contacting a Recovery Manager the Duty Officer's second, third, fourth and fifth calls are to the Emergency News Center Director, Administration and Logistics Manager, Training Director, and a Scheduling and Planning Manager respectively.

The latter four persons called will complete their calls prior to traveling to the EOF.

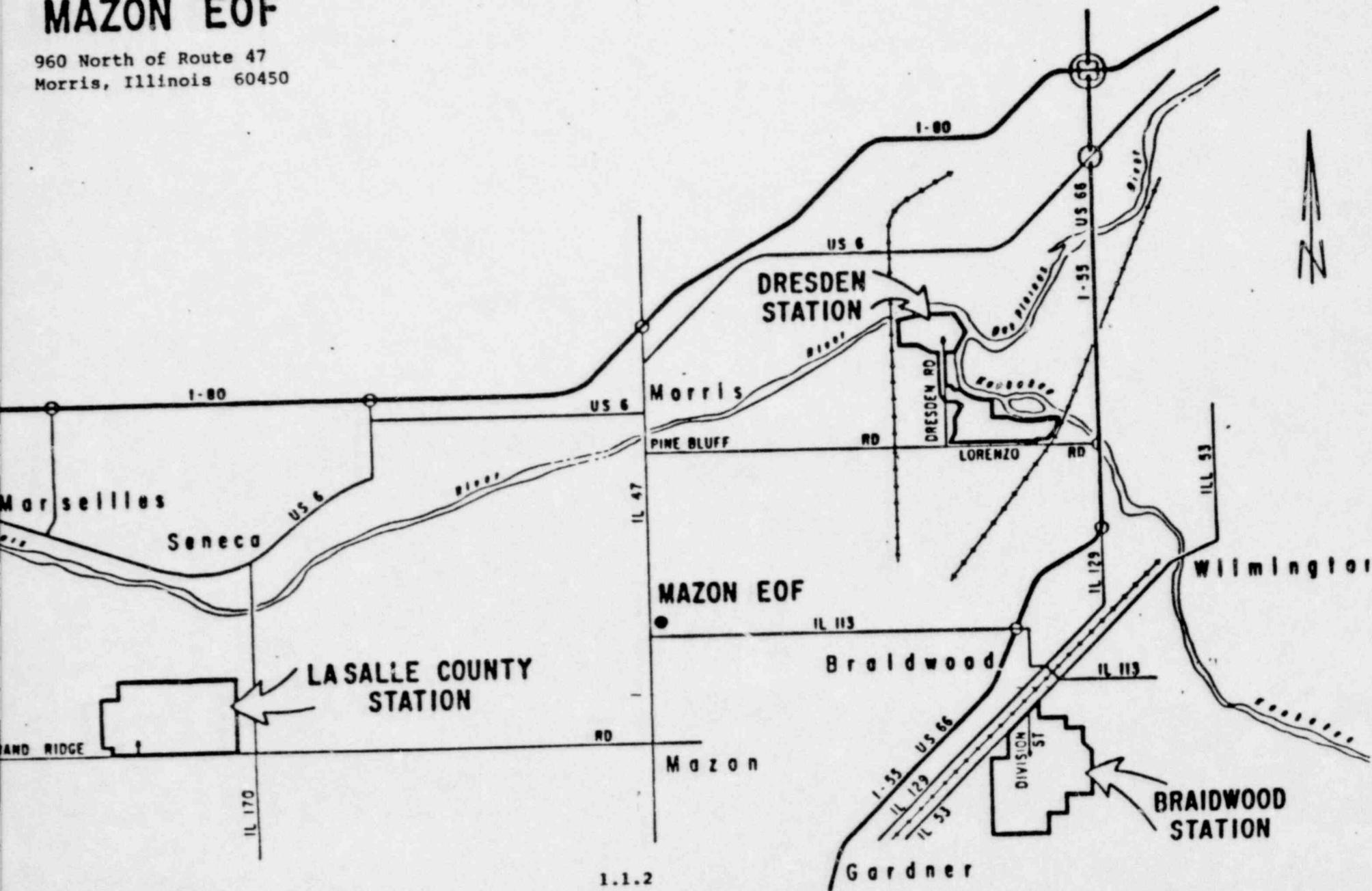
If for any reason the person or persons you are to contact cannot be reached, continue through the call list; then try again to reach the uncontacted person until you are successful.

1.1.1

#6036E/2

# Routes to MAZON EOF

960 North of Route 47  
Morris, Illinois 60450



OFFSITE GSEP ORGANIZATION  
Office Phone  
Tie Line/Ext.

Priority Notification EOP/CCC  
(Non-Business Hours)

Name	Location	Home Phone	Dixon Morrison	Mazon (LaSalle) (Dresden)	Zion	CCC
*RECOVERY MANAGER/CORPORATE COMMAND CENTER DIRECTOR EOP-1/CCC-1						
				2	1	4
			4	3	2	
						5
			4			3
					1	4
				5	5	3
						2
			3	1		
			5	4	4	
			1			
			2	3	5	

\*TECHNICAL SUPPORT MANAGER/INTELLIGENCE DIRECTOR EOP-2/CCC-2

				3		1	2
			4			3	
				2	3		4
			1	1	2		
			3	1			
			2	5	4		
							5
			5			4	
			4			2	
			3	4			1
					5	5	3

\*ADVISORY SUPPORT DIRECTOR EOP-10

				4	3	3
					5	2
			5	2		
			4	3	1	
			2		5	4
				4		
			1	2		
			5			1
			3		3	4
					2	5
			1			

\* The persons on the three listings above can also be used for the following positions:  
Recovery Manager's Communicator and Recovery Manager's Recorder.

Note: Contact a director per the numerical priority for the EOP requiring activation. If unable to contact one of the first five prioritized persons listed, contact anyone on the list that can be reached.

STATION DIRECTOR

This position will be filled by the Station Manager of the affected Station.

For Dresden Station	See Page 3.1
For Quad Cities Station	See Page 4.1
For Zion Station	See Page 5.1
For LaSalle Station	See Page 6.1
For Byron Station	See Page 7.1
For Braidwood Station	See Page 8.1

OFFSITE GSEP ORGANIZATION  
(Continued)

Priority Notification EOF/CCC  
(Non-Business Hours)

Name \_\_\_\_\_ Location \_\_\_\_\_ Office Phone \_\_\_\_\_ Tie Line/Ext. \_\_\_\_\_ Home Phone \_\_\_\_\_  
 \*ENVIRONMENTAL EMERGENCY COORDINATOR/ENVIRONMENTAL DIRECTOR EOP-3/CCC-16

	Dixon	Morrison	Mazon (LaSalle) (Dresden)	Zion	CCC
			5	4	1
5				1	5
			3		2
			1	5	3
		5			4
1			2	4	
3					
2		2		1	
4		3		2	
		4		3	
			4	5	2
		1		3	

\*ENVIRONS DIRECTORS EO-1

			1		
			2		
1			3		4
2			4		5
3				4	
4		5			
5				5	
		4		1	
		2	5	2	1
		3		3	2
		1			3

\* The persons on the two listings above can also be used for the following positions: Environmental Emergency Coordinator's Communicator, Asst. Environmental Emergency Coordinator, Environmental Emergency Coordinator's Staff Member, and ODCS Operator.

Note: Contact a director per the numerical priority for the EOF requiring activation. If unable to contact one of the first five prioritized persons listed, contact anyone on the list that can be reached.



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 Priority Notification EOF/CCC  
 (Non-Business Hours)

OFFSITE GSEP ORGANIZATION  
 (Continued)

Office Phone  
 Tie Line/Ext.

Home Phone

Name

Location

Office Phone  
 Tie Line/Ext.

Home Phone

	Dixon	Morrison	Mazon (LaSalle) (Dresden)	Zion	CCC
	5		4	3	1
	3	4	3		2
			5		
			2		
			4		
	4				4
	2			2	
		1		4	
		3	1		
		2		1	
			3	2	
	1				5
		5			3
				5	

DESIGN & CONSTRUCTION SUPPORT MANAGER/ENGINEERING DIRECTOR

Note: Contact a director per the numerical priority for the EOF requiring activation. If unable to contact one of the first five prioritized persons listed, contact anyone on the list that can be reached.

OFFSITE GSEP ORGANIZATION  
(Continued)

Priority Notification EOP/CCC  
(Non-Business Hours)

<u>Name</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>	<u>Dixon</u>	<u>Morrison</u>	<u>Mazon</u>	<u>Zion</u>	<u>CCC</u>
<u>SCHEDULING PLANNING MANAGER EOP-7</u>								
				1	3	5	2	
				3	1	3	3	
				6	6	1	6	
				2	2	6	5	
				4	4	2	4	
				5	5	4	1	

\* See page 9-14 for Outage Scheduling Software Operators

Note: Contact a director per the numerical priority for the EOP requiring activation. If unable to contact one of the first five prioritized persons listed, contact anyone on the list that can be reached.

Priority Notification EOP/CCC  
(Non-Business Hours)

OFFSITE GSEP ORGANIZATION  
(Continued)

Office Phone  
Tie Line/Ext. Home Phone

Name Location

WASTE SYSTEMS RADIATION CONTROL MANAGER/HEALTH PHYSICS DIRECTOR  
EOP-8/EOP-13

	Dixon	Morrison	Mazon (LaSalle)	Zion
4		2	3	3
2			5	1
1		5		4
		1		5
5		3	2	3
		4	1	1
3			4	4
5		4	1	3
1			2	4
2		1	3	5
3		3		2
		2	4	1
4		5	5	

WASTE SYSTEMS DIRECTOR EOP-19

ADMINISTRATION/LOGISTICS MANAGER/MANPOWER - LOGISTICS DIRECTOR EOP-6/CCC-6

	Dixon	Morrison	Mazon (LaSalle)	Zion	CCC
4	1		4		3
1	2	4	3	2	2
2	3	5	1	1	
	5	1	2	3	
5		3	4	4	5
3	4		5	5	1
		2		5	4

Note: Contact a director per the numerical priority for the EOP requiring activation. If unable to contact one of the first five prioritized persons listed, contact anyone on the list that can be reached.

Priority Notification EOP ONLY  
(Non-Business Hours)

OFFSITE GSEP ORGANIZATION  
(Continued)

Name \_\_\_\_\_ Location \_\_\_\_\_ Office Phone \_\_\_\_\_  
Tie Line/Ext. \_\_\_\_\_ Home Phone \_\_\_\_\_

COMMUNICATIONS DIRECTOR EOP-14

	Dixon	Morrison	Mazon	Zion
			4	2
3		5		
1				5
		3	1	
		4	2	
			3	
2				
4		2		4
5		1		3
	Dixon	Morrison	Mazon	Zion
			((LaSalle))(Dresden)	
1			3	5
				4
4		3	1	
		4	2	1
3		2		1
5		1	2	3
				4
2			4	3

TRAINING DIRECTOR EOP-11

Note: Contact a director per the numerical priority for the EOP requiring activation. If unable to contact one of the first five prioritized persons listed, contact anyone on the list that can be reached.

OFFSITE GSEP ORGANIZATION  
(Continued)

EMERGENCY NEWS CENTER

Name	Location	Office Phone Tie Line/Ext.	Home Phone	RMC Director/ Info Director EOP-4/CCC-4	NewsWriter EOP-29	Briefing Coord. EOP-30	Info Liaison EOP-26	Spokesman EOP-27
				10		6		
				6		4		
				9		8		
				4				
				8		3		
				5		9		
				1		2		
				2		5		
				7		10		
				3		1		1
						7		2
								3
								4
								5
								7
								1
								5
								6
								7
								2
								3

EMERGENCY NEWS CENTER

Note: Contact a director per the numerical priority.

OFFSITE GSEP ORGANIZATION NON-EOF POSITIONS

Priority Notification CCC Only  
(Non-Business Hours)

<u>Name</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
<u>CORPORATE ENVIRONMENTAL RESPONSE TEAM CCC-18 (only when the CCC is activated)</u>			

CCC
1
3
2
4
5

SYSTEM POWER DISPATCHER CCC-12

ACCESS CONTROL DIRECTOR EOF-12/CCC-17

<u>BOP/CCC</u>	
2	- Dresden-LaSalle-Brd
1	
5	
4	
3	
2	- Zion-Byron-Quad

MEDICAL DIRECTOR CCC-3

CCC
2
1

LEGAL CONSULTANT CCC-10

CCC
2
3
1

ACCOUNTING DIRECTOR CCC-9

CCC
1
2
3
7
4
5
6

Note: Contact a director per the numerical priority

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OFFSITE GSEP ORGANIZATION    NON-EOF POSITIONS  
Office Phone  
Tie Line/Ext.    Home Phone

Name

Location

Tie Line/Ext.

Home Phone

ERP DIRECTOR

1st Quarter 1986  
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OFFSITE GSEP ORGANIZATION  
(Continued)

<u>Name</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
<u>DIVISION DIRECTOR</u>			



SUPPORT GROUP DIRECTORY

STATE AGENCIES

State of Illinois

- \* Illinois Emergency Services and  
Disaster Agency
  
- \* Illinois Department of Nuclear Safety  
Office Hours  
Off Duty Hours  
REAC Center (24 hours)

Illinois State Police Command Center  
Armory Bldg. - Springfield, Illinois

State of Iowa

- \* Iowa Office of Disaster Services  
Duty Officer
  
- Iowa State Department of Water,  
Air and Waste Management
  
- Iowa Department of Public Safety  
Communications Division

State of Wisconsin

- \* Wisconsin Division of Emergency  
Government (24 Hours)
  
- Wisconsin Division of Health and  
Social Services
  - Radiation Protection Section
  - Office Hours -
  - Off Duty Hours -

\* Indicates those on the NARS System.

SUPPORT GROUP DIRECTORY  
(Continued...)

FEDERAL AGENCIES

Federal Emergency Management Agency - Reg. V

Federal Emergency Management Agency - Reg VII

Nuclear Regulatory Commission Region III

Nuclear Regulatory Commission - Operations Center  
(Bethesda) Ref. 10CFR50.72)

U.S. Department of Transportation (DOT)  
Regional Office - Homewood IL  
Ask for: Hazardous Materials Specialist  
Office Hours  
Off-Duty Hours  
(Call U.S. Coast Guard, Washington, D.C.)

Department of Energy Chicago Operations  
Office-Radiological Assistance Team  
Duty Hours  
Off Duty Hours  
(ask for Duty Officer)

U.S. Coast Guard Marine Safety Office - Chicago  
(Dresden, Zion & LaSalle)  
Office Hours  
Off Duty Hours

U.S. Coast Guard Davenport, Iowa (Quad)  
If no answer (recording) call Upper Mississippi  
River Group - Keokuk Ia

U.S. Coast Guard Milwaukee Group (Zion)

U.S. Coast Guard National Response Center  
Duty Officer (For Oil or Hazardous substance  
discharges into navigable waterways)

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SUPPORT GROUP DIRECTORY  
(Continued)

U.S. Corps of Engineers - Construction/Operations Division  
Chicago District - (Zion Only)

<u>NAME</u>	<u>OFFICE PHONE</u>	<u>HOME PHONE</u>
-------------	---------------------	-------------------

U.S. Corps. of Engineers - Construction/Operations Division  
Rock Island District - (Dresden-Quad Cities-LaSalle)

<u>NAME</u>	<u>OFFICE PHONE</u>	<u>EXT.</u>	<u>HOME PHONE</u>
-------------	---------------------	-------------	-------------------

<u>NAME</u>	<u>(San Jose)</u>	<u>OFFICE PHONE</u>
<u>NUCLEAR STEAM SUPPLY SYSTEM</u>		

Note: Make initial call to San Jose Office, with a back-up call to the Local Office.

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SUPPORT GROUP DIRECTORY  
(Continued)

WESTINGHOUSE ELECTRIC COMPANY  
Emergency Communication Network

Central Area  
Zion Station

Please inform one Westinghouse contact, using this list in the order shown, to ensure early notification to W of an emergency occurring at your plant. Please be prepared to discuss as many facts as are available at the time of the call and identify a cognizant individual in your organization to provide continuing communications and updates to W.

Title                      Name                      Office                      Home                      \*HHL/\*\*Pager

Note:

- \* HHL = Home Hot Line
- \*\* Tone & Voice Pager - Wait for beeps and give approx 5 second message

NAME  
NUCLEAR FUEL SUPPLIER

OFFICE PHONE  
Office Phone

HOME PHONE

RADIOLOGICAL MEDICAL CONSULTANT

DOSIMETRY SERVICES

1st Quarter 1986  
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SUPPORT GROUP DIRECTORY  
(Continued)

EMERGENCY SUPPORT

RADIOLOGICAL LABORATORIES

METEOROLOGICAL CONSULTANTS

1st Quarter 1986  
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DRESDEN STATION GROUP DIRECTORY  
815-942-2920

<u>Name</u>	<u>Office Phone</u> <u>Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	---	-------------------

STATION DIRECTOR

OPERATIONS DIRECTOR

TECHNICAL DIRECTOR

MAINTENANCE DIRECTOR

STORES DIRECTOR

ADMINISTRATIVE DIRECTOR

SECURITY DIRECTOR

1st Quarter 1986  
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DRESDEN STATION GROUP DIRECTORY

(Continued)

815-942-2920

<u>Name</u>	<u>Office Phone</u> <u>Tie Line/Ext.</u>	<u>Home Phone</u>
<u>RAD/CHEM DIRECTOR</u>		

DRESDEN STATION ENVIRONS DIRECTOR

STATION GSEP COORDINATOR

OSC DIRECTOR

1st Quarter 1986  
January-March

DRESDEN STATION SUPPORT GROUP

- \* Grundy County Sheriff
- \* Grundy County Emergency Services & Disaster Agency

Will County Sheriff

- \* Will County EOC                      Emergency Only  
    Normal Business

Will County Emergency Services & Disaster Agency  
24 Hour Number

Illinois State Police Headquarters (District 5)

Chicago Centrex

Coal City Fire Department

Morris Fire Department

General Electric Morris Operation

Ambulance:                      Medical Assistance Directory  
    Coal City Emergency Squad

Hospital:                          St. Joseph Medical Center  
    Joliet, Illinois

Emergency Room

Doctor:

Company Doctor:

I.R. Manager:

Radiological Medical Consultant -



1st Quarter 1986  
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QUAD CITIES STATION GROUP DIRECTORY

309-654-2241

Office Phone/

Tie Line/Ext.

Home Phone

NAME

STATION DIRECTOR

OPERATIONS DIRECTOR

TECHNICAL DIRECTOR

MAINTENANCE DIRECTOR

STORES DIRECTOR

ADMINISTRATIVE DIRECTOR

\*For Emergency Use only

1st Quarter 1986  
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QUAD CITIES STATION GROUP DIRECTORY  
(Continued)

<u>NAME</u>	<u>Office Phone/ Tie Line/Ext.</u>	<u>Home Phone</u>
<u>SECURITY DIRECTOR</u>		
<u>RAD/CHEM DIRECTOR</u>		
<u>QUAD CITIES STATION ENVIRONS DIRECTOR</u>		
<u>STATION GSEP COORDINATOR</u>		
<u>OSC DIRECTOR</u>		

1st Quarter 1986  
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QUAD CITIES STATION SUPPORT GROUPS

- \* Rock Island County Sheriff  
Rock Island Communication Center
  
- \* Whiteside County Sheriff
- \* Whiteside County ESDA
- \* Scott County Sheriff
- \* Clinton County Sheriff
- \* Illinois State Police Headquarters (District 7)  
Springfield Centrex
- \* Iowa Office of Disaster Services  
Iowa Department of Public Safety  
Communications Division

Fire Departments

Cordova:                   Emergency  
                                  Drill

Albany:                    Emergency  
                                  Drill

Medical Assistance Directory

Ambulance:               Dailey Gibson  
                                  Illini Hospital Ambulance Serv

Hospital:                 Moline Public Hospital

Doctor:

Company Doctor:

I. R. Manager:

Radiological Medical Consultant -

\* Indicates those on the NARS System

1st Quarter 1986  
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ZION STATION GROUP DIRECTORY  
312-746-2084

<u>NAME</u>	<u>Office Phone/ Tie Line Ext.</u>	<u>Home Phone</u>
<u>STATION DIRECTOR</u>		
<u>OPERATIONS DIRECTOR</u>		
<u>TECHNICAL DIRECTOR</u>		
<u>ADMINISTRATIVE DIRECTOR</u>		
<u>MAINTENANCE DIRECTOR</u>		
<u>STORES DIRECTOR</u>		
<u>SECURITY DIRECTOR</u>		

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ZION STATION GROUP DIRECTORY  
(Continued)

RAD/CHEM DIRECTOR

ZION STATION ENVIRONS DIRECTOR

STATION GSEP COORDINATOR

COMMUNICATOR

OSC DIRECTOR

To be named by Operations Director

1st Quarter 1986  
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ZION STATION SUPPORT GROUPS

- \* Zion Police Dispatcher (Police, Fire and Ambulance)
- \* Lake County Sheriff's Office (24 Hrs.)
- \* Kenosha County Sheriff's Office

Illinois State Police Headquarters (District 2)  
Chicago Centrex

- \* Wisconsin Division of Emergency Government

Medical Assistance Directory

Ambulance: Zion Rescue Department

Hospital: Victory Memorial Hospital  
Waukegan, Illinois

Doctors:

Company Doctor:

I. R. Manager

Radiological Medical Consultant -

- \* Indicated those on the NARS System.

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LASALLE COUNTY STATION GROUP DIRECTORY  
815-357-6761

<u>NAME</u>	<u>Office Phone/</u>	<u>Home Phone</u>
	<u>Tie Line Ext.</u>	
<u>STATION DIRECTOR</u>		
<u>OPERATIONS DIRECTOR</u>		
<u>TECHNICAL DIRECTOR</u>		
<u>MAINTENANCE DIRECTOR</u>		
<u>STORES DIRECTOR</u>		
<u>ADMINISTRATIVE DIRECTOR</u>		
<u>SECURITY DIRECTOR</u>		
<u>RAD/CHEM DIRECTOR</u>		

1st Quarter 1986  
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LASALLE COUNTY STATION GROUP DIRECTORY  
(Continued)

<u>NAME</u>	<u>Office Phone/ Tie Line Ext.</u>	<u>Home Phone</u>
<u>LASALLE STATION ENVIRONS DIRECTOR</u>		

STATION GSEP COORDINATOR

OSC DIRECTOR

To be named by Operations Director



1st Quarter 1986  
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LASALLE COUNTY STATION SUPPORT GROUPS

- \* LaSalle County Sheriff, Ottawa
- \* Grundy County Sheriff, Morris
- \* LaSalle County Emergency Services & Disaster Agency
- \* Grundy County Emergency Services & Disaster Agency
- Illinois State Police Headquarters (District 17)  
Springfield Centrex
- Illinois State Police Headquarters (District 5)  
Chicago Centrex
  
- Marseilles Fire Department (Primary)
- Seneca Fire Department
- Grand Ridge Fire Department
- Allen Township (Ransom) Fire Department

Medical Assistance Directory

Ambulance: Seneca Ambulance  
Grand Ridge Fire Department

Hospital: St. Mary's Hospital  
Streator, Illinois

Doctor: Emergency Medical Service  
St. Mary's Hospital  
Streator, Illinois

Company Doctor:

I.R. Manager

Radiological Medical Consultant

\* Indicates those on the NARS System

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BYRON STATION GROUP DIRECTORY  
815-234-5441

Office Phone/ Home Phone  
Tie Line Ext.

NAME

STATION DIRECTOR

OPERATIONS DIRECTOR

TECHNICAL DIRECTOR

MAINTENANCE DIRECTOR

STORES DIRECTOR

ADMINISTRATIVE DIRECTOR

SECURITY DIRECTOR

RAD/CHEM DIRECTOR

BYRON STATION ENVIRONS DIRECTOR

STATION GSEP COORDINATOR

OSC DIRECTOR

To be named by Operations Director.

1st Quarter 1986  
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BYRON STATION SUPPORT GROUPS

\*Ogle County Sheriff's Dept.  
\*Ogle County EOC

Illinois State Police (District 1)  
Chicago Centrex  
Wisconsin Division of Emergency Government

Byron Fire Protection District           Emergency:  
  Drill:

Ambulance: Byron Emergency Ambulance Service

Hospital: Rockford Memorial Hospital  
          Emergency Room

Company Doctor:

Hospital Doctors:  
I.R. Manager

Radiological Medical Consultant -

\*Indicates those on the NARS System.

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Braidwood Station Group Directory  
815-458-2801

Office phone/                      Home Phone  
Tie-line Ext.

Name  
STATION DIRECTOR

OPERATIONS DIRECTOR

TECHNICAL DIRECTOR

MAINTENANCE DIRECTOR

STORES DIRECTOR

ADMINISTRATIVE DIRECTOR

SECURITY DIRECTOR

RAD/CHEM DIRECTOR

ENVIRONS DIRECTOR

GSEP COORDINATOR

OSC DIRECTOR  
To be named by Operations Director

1st Quarter 1986  
January-March

Braidwood Station Support Groups

Will County Sheriff's Department

Will County EOC                      24 hour Emergency Number  
Normal Business

Will County ESDA                      24 hour Emergency Number

Grundy County Sheriff  
Grundy County ESDA

Kankakee County Sheriff              Normal Business  
Emergency Only

Kankakee County ESDA                Normal Business

Illinois State Police Headquarters (District 5)

Chicago Centrex

Braidwood Fire Department            Emergency  
Drill

Ambulance Service

Hospital: St. Joseph Medical Center (Joliet)  
Emergency Room

Doctor:

Company Doctor:

IR Manager:

Radiological Medical Consultant -

1st Quarter 1986  
January-March

### Technical Support Personnel Call List

Index-----	9.1
Transient Analysis & System Interactions-----	9.2
Nuclear Engineering & Fuel Management-----	9.3
Core Physics, Design & Control Theory-----	9.4
Electrical Power Systems-----	9.5
Process Computers, Prime Computers-----	9.6
Instrumentation & Control Systems-----	9.7
Refueling Operations-----	9.8
Engineering Mechanics of Power Plant	
System & Components-----	9.9
Thermal Hydraulics-----	9.10
Plant Structural & Containment Design-----	9.11
Metallurgy-----	9.12
Microprocessor Telephone Numbers-----	9.13
Outage Scheduling Software Operator-----	9.14

1st Quarter 1986  
January-March

TRANSIENT ANALYSIS & SYSTEM INTERACTIONS

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---------------------------------------	-------------------

\* Appears on more than one "callout list"

1st Quarter 1986  
January-March

NUCLEAR ENGINEERING & FUEL MANAGEMENT

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---------------------------------------	-------------------

\* Appears on more than one "callout list"



1st Quarter 1986  
January-March

CORE PHYSICS, DESIGN & CONTROL THEORY

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---------------------------------------	-------------------

\* Appears on more than one "callout list"

1st Quarter 1986  
January-March

ELECTRICAL POWER SYSTEMS

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone</u> <u>Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---	-------------------

1st Quarter 1986  
January-March

STATION PROCESS/PRIME COMPUTERS

<u>Name</u>	<u>Location</u>	<u>Office Phone</u>	<u>Home Phone</u>
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1st Quarter 1986  
January-March

INSTRUMENTATION & CONTROL SYSTEMS

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---------------------------------------	-------------------

\* Appears on more than one "callout list"

1st Quarter 1986  
January-March

REFUELING OPERATIONS

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone</u> <u>Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---	-------------------

\* Appears on more than one "callout list"

1st Quarter 1986  
January-March

ENGINEERING MECHANICS OF POWER PLANT  
SYSTEMS & COMPONENTS

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone</u> <u>Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---	-------------------

\* Appears on more than one "callout list"

1st Quarter 1986  
January-March

THERMAL - HYDRAULICS

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
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\* Appears on more than one "callout list"

1st Quarter 1986  
January-March

PLANT STRUCTURAL AND CONTAINMENT DESIGN

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---------------------------------------	-------------------

\* Appears on more than one "callout list"



1st Quarter 1986  
January-March

METALLURGY

<u>Name</u>	<u>Department</u>	<u>Location</u>	<u>Office Phone Tie Line/Ext.</u>	<u>Home Phone</u>
-------------	-------------------	-----------------	---------------------------------------	-------------------

1st Quarter 1986  
January-March

MICROPROCESSOR TELEPHONE NUMBERS

Station

At Tower

In-plant

Zion Supplemental Towers

1st Quarter 1986  
January-March

Outage Scheduling Software Operator

<u>NAME</u>	<u>WORK LOCATION</u>	<u>WORK PHONE</u>	<u>HOME PHONE</u>
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March 1986  
Revision 1

BRAIDWOOD STATION  
EMERGENCY PLAN ANNEX

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BRAIDWOOD GSEP ANNEX  
REVISION INDEX PAGE

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1-2	1	6-3	1
1-3	1	6-4	1
1-4	1	6-5	1
1-5	1	6-6	1
1-6	1	6-7	1
1-7	1	6-8	1
1-8	1	6-9	1
1-9	1		
1-10	1		
2-1	1	7-1	1
		7-2	1
		7-3	1
		7-4	1
3-1	1	7-5	1
		7-6	1
4-1	1	7-7	1
4-2	1	7-8	1
4-3	1	7-9	1
4-4	1	7-10	1
4-5	1	7-11	1
		7-12	1
5-1	1	7-13	1
5-2	1	7-14	1
5-3	1	7-15	1
5-4	1	7-16	1
5-5	1	7-17	1
5-6	1	7-18	1
5-7	1	7-19	1
5-8	1	7-20	1
5-9	1	7-21	1
5-10	1	7-22	1
5-11	1	7-23	1
5-12	1	7-24	1
5-13	1	7-25	1
5-14	1	7-26	1
5-15	1	7-27	1
5-16	1	7-28	1
5-17	1	7-29	1
		7-30	1
		7-31	1
		8-1	1
		8-2	1
		8-3	1

BRAIDWOOD STATION EMERGENCY PLAN ANNEX

TABLE OF CONTENTS

This annex generally follows the same format as the generic section of the QSEP. However, an exact section by section correspondence is not intended.

- 1.0 Introduction
- 2.0 Definitions
- 3.0 Summary of Emergency Plan
- 4.0 Organizational Control of Emergencies
  - 4.1 Normal Plant Organization
  - 4.2 Non-Commonwealth Support Groups
  - 4.3 Coordination with Governmental Agencies
- 5.0 Classification of Emergency Conditions
- 6.0 Emergency Measures
  - 6.1 Activation of the Emergency Organization
  - 6.2 Assessment Actions
  - 6.3 Protective Actions for Offsite Personnel
  - 6.4 Protective Actions for Onsite Personnel
- 7.0 Emergency Facilities and Equipment
  - 7.1 Emergency Control Centers
  - 7.2 Communications Systems
  - 7.3 Assessment Facilities
  - 7.4 Protective Facilities and Equipment
  - 7.5 First Aid and Medical Facilities
- 8.0 Maintaining Emergency Preparedness
  - 8.1 General
  - 8.2 Review and Updating of the Plan and Procedures

BRAIDWOOD STATION EMERGENCY PLAN ANNEX

1.0 INTRODUCTION

This Commonwealth Generating Stations Emergency Plan Annex addresses site specific emergency planning for the Braidwood Nuclear Station. Planning efforts common to all Commonwealth nuclear generating stations are encompassed within the generic GSEP. Written station procedures implement the requirements and guidance given in this plan.

The Braidwood Station Emergency Plan Annex is not independent of the generic Commonwealth GSEP. Emergency planning information common to all Commonwealth Nuclear Stations is not necessarily repeated in this annex, but may be in some cases in the interest of continuity and clarification. The content of this annex conforms to Section 9.1 of the generic GSEP.

1.1 Facility Description

The Braidwood Nuclear Generating Station - Units 1 & 2 (Braidwood Station) is located in northern Illinois, approximately 20.0 miles south-southwest of the City of Joliet and 3.0 miles west of the Kankakee River, in Will County. The site is situated in an area composed of flat agricultural farmland that has been scarred from coal strip mining.

The station site is roughly rectangular in shape, with the plant structures occupying the northwest portion of the site. The following coordinates of the centers of the containments in the Universal Transverse Mercator Coordinate System are given below to the nearest 100 meters. Latitude and longitude are given to the nearest second.

<u>Nuclear Unit</u>	<u>Latitude and Longitude</u>	<u>UTM Coordinates</u>
1	41° 14' 38"N X 88° 13' 42"W	4,565,300 N 397,000 E
2	41° 14' 36"N X 88° 13' 42"W	4,565,200 N 397,000 E



At its closest approach, the Kankakee River is approximately 3.0 miles east of the northeastern site boundary.

Braidwood Station occupies approximately 4454 acres of land. This area includes the main site area and the cooling lake. The main site area occupies approximately 1917 acres, and the cooling lake occupies the remaining 2357 acres. Figure BWA 1-1 shows the general location of Braidwood Station.

The plant consists of two identical pressurized water reactor (PWR) nuclear steam supply systems (NSSS) and turbine-generators furnished by Westinghouse Electric Corporation. Each nuclear steam supply system is designed for a power output of 3425 MWT. The equivalent warranted gross and approximate net electrical outputs of each unit are 1175 MWe and 1120 MWe, respectively. Cooling for the plant is provided by a cooling lake of 2537 acres with an average depth of approximately 10 feet.

Braidwood Station has two release points for gaseous radioactive effluents, the two Auxiliary Building ventilation stacks. The top of each stack rises 200 feet above the grade elevation. Braidwood Station has one release point for liquid radioactive effluents, the Kankakee River. Liquid radioactive wastes are stored and sampled prior to release to the Kankakee River. A radiation monitor in the discharge line will automatically terminate releases if radioactivity levels exceed predetermined values.

## 1.2 Plant Exclusion Area

The Braidwood Station Exclusion Area as defined in 10 CFR 100 is located entirely within the site boundary, as shown in Figure BWA 1-2. Since Commonwealth Edison owns all properties within the site boundary, it also owns the Exclusion Area and has the authority to determine and control all activities occurring within the Exclusion Area, including removal and exclusion of personnel or property from the site. Commonwealth Edison owns all mineral rights and easements for the Exclusion Area, as well as for the remainder of the site property.

For accident releases, the minimum Exclusion Area Boundary distance is 485 meters, measured from the outer containment wall.

## 1.3 Low Population Zone (LPZ)

The Low Population Zone (LPZ) as defined in 10 CFR 100.3(b) is "the area immediately surrounding the Exclusion Area which contains residents, the total number and density of which are such that there is a reasonable probability that appropriate protective measures could be taken in their behalf in the event of a serious accident." The 10 CFR 100.11(2) also lists numerical criteria to be met by the LPZ, namely that the LPZ is "of such size that an individual located at any point on its outer boundary who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of passage) would not receive a total radiation dose to the whole body in excess of 25 rem or a total radiation dose in excess of 300 rem to the thyroid from iodine exposure."

The Low Population Zone that was chosen for the Braidwood Station consists of that area within a 1810 meter radius (measured from the midpoint between the two reactors) of the site. The Low Population Zone for the Braidwood Station is based on dose considerations as delineated in 10 CFR 100 and the population distribution around the station. Figure BWA 1-3 depicts the transportation route and public facilities within the LPZ.

#### 1.4 Population Centers

A population center distance as defined in 10 CFR 100 means the distance from the reactor to the nearest boundary of a densely populated center containing more than 25,000 residents. Additionally, there must be "a population center distance of at least one and one-third times the distance from the reactor to the outer boundary of the low population zone." The closest such center is Joliet, Illinois. Its nearest boundary is located approximately 20 miles north northeast of the reactors, Joliet had a 1970 population of 80,367 and a 1980 population of 77,956.

Refer to Table BWA 1-1 which lists the population distribution within a fifty mile radius of Braidwood Station.

#### 1.5 Emergency Planning Zone

The plume exposure Emergency Planning Zone (EPZ) for Braidwood Station shall be an area surrounding the Station with a radius of about ten miles. See Figure BWA 1-1.

The ingestion exposure Emergency Planning Zone (EPZ) for Braidwood Station shall be an area surrounding the Station with a radius of 50 miles. See Figure BWA 1-4.



FIGURE BWA 1-2  
BRAIDWOOD STATION EXCLUSION AREA

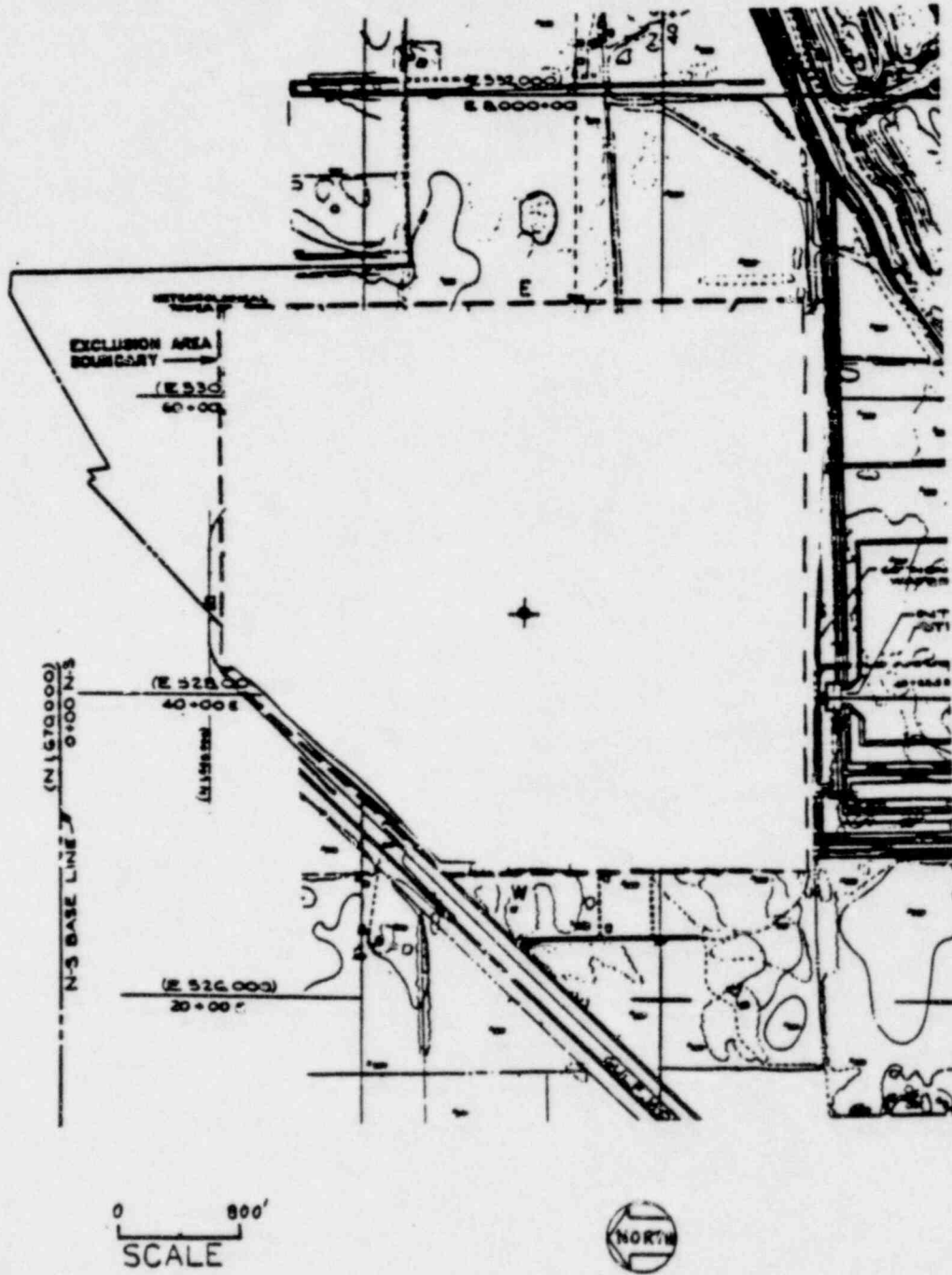


FIGURE BWA 1-3  
MAJOR ROADS AND RAILROADS  
WITHIN 5 MILES OF THE STATION

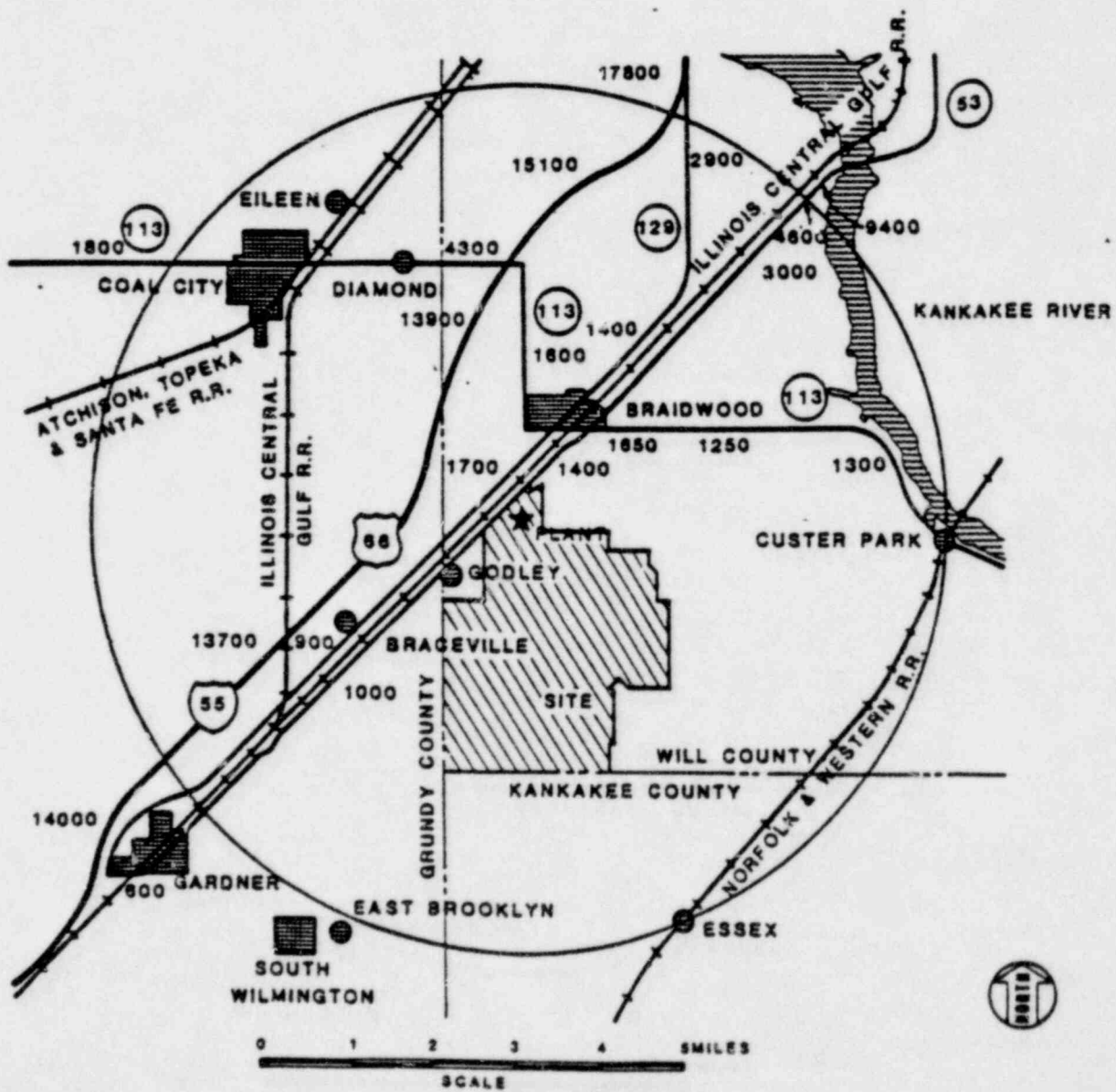


FIGURE BWA 1-4  
BRAIDWOOD STATION INGESTION EXPOSURE  
EMERGENCY PLANNING ZONE

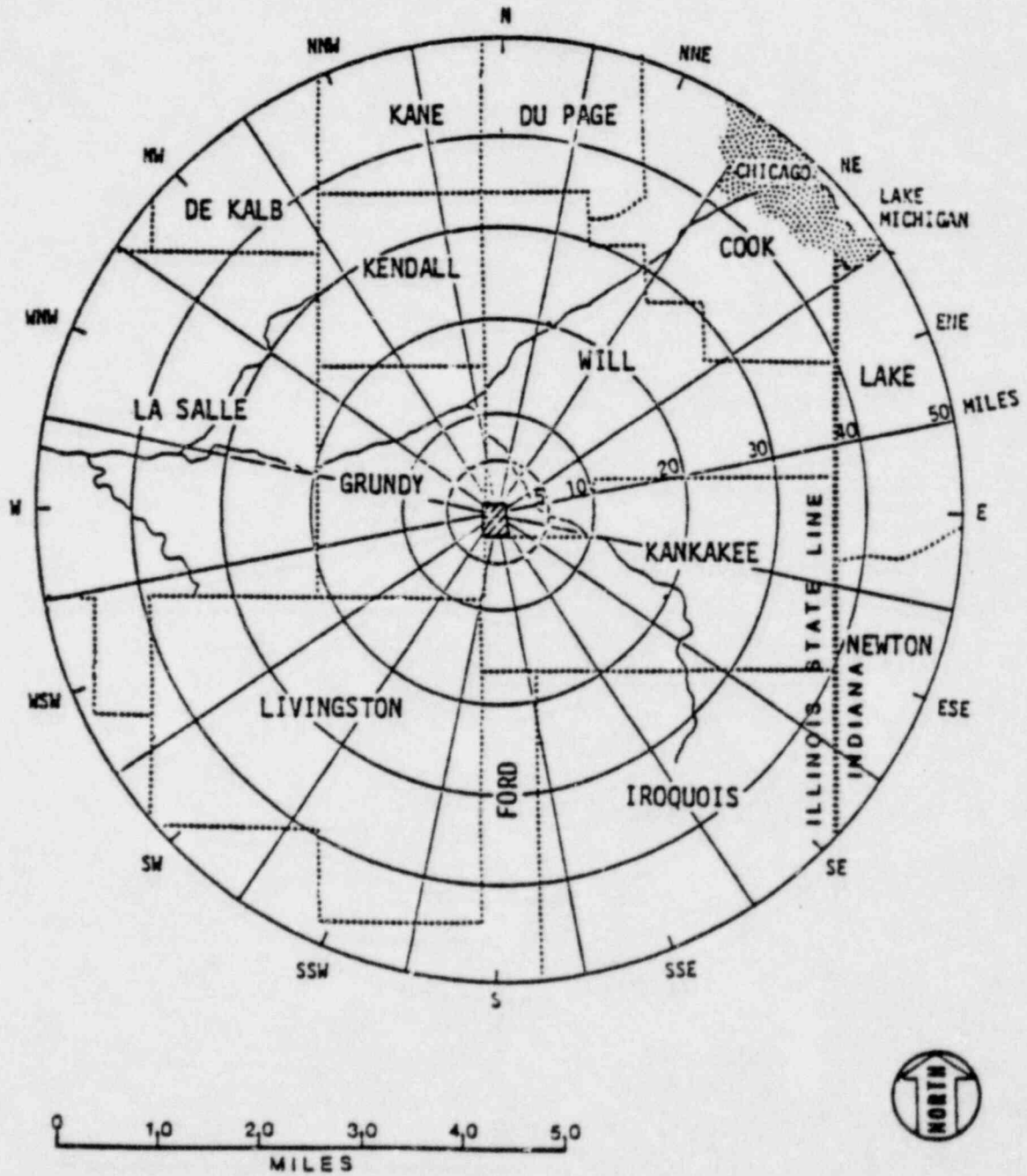


TABLE BWA 1-1

SECTORS AND ZONE DESIGNATORS AND CALCULATED 1980 POPULATION DISTRIBUTION  
WITHIN 50 MILES OF THE BRAIDWOOD STATION

SECTOR CENTERLINE IN DEGREES FROM TRUE NORTH FROM FACILITY	22-1/2° SECTOR	MILES FROM FACILITY										SECTOR TOTAL
		0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50	
0 + 360	A	34	690	389	15	2	309	18,118	21,607	159,852	196,880	397,896
22-1/2	B	75	823	960	294	70	234	18,014	140,555	210,493	806,860	1,178,378
45	C	0	107	103	0	480	4,735	4,170	31,037	328,860	1,631,653	2,201,145
67-1/2	D	4	12	22	0	291	1,980	1,252	7,008	135,725	251,879	398,195
90	E	0	0	13	28	22	1,027	1,875	7,055	6,972	16,999	33,991
112-1/2	F	0	0	17	18	50	236	25,876	45,742	9,524	3,854	85,317
135	G	0	0	4	9	8	156	3,479	6,320	2,591	9,739	22,306
157-1/2	H	0	0	60	9	235	358	1,963	1,977	5,545	2,618	12,765
180	J	0	0	0	3	3	686	1,191	1,583	2,918	2,502	8,886
202-1/2	K	0	8	17	29	173	849	833	1,395	6,401	2,418	12,123
225	L	402	296	214	19	89	1,384	4,926	2,012	14,651	6,144	30,137
247-1/2	M	82	218	0	3	214	163	711	2,612	21,515	5,561	31,113
270	N	0	34	179	3	11	794	1,075	2,013	8,987	31,459	44,555
292-1/2	P	8	0	8	37	13	251	1,970	9,491	19,687	4,206	35,671
315	Q	4	25	42	1,499	1,340	928	11,138	3,675	12,042	4,979	35,672
337-1/2	R	6	256	119	1,692	526	920	1,840	6,195	29,119	11,818	52,491
RADIAL ZONE	TOTAL	615	2,469	2,147	3,714	3,527	15,010	98,431	290,277	974,882	3,189,569	4,580,641

- Notes: 1. The 0-10 mile population estimates were based on a house count, 1981 - 1982 aerial photographs and a 1961 field survey.
2. The 10-50 mile population data represent the incorporated areas for which 1980 Census Bureau information was available and estimates of unincorporated areas, which were derived on the basis of 1980 County Population minus the 1980 population data for the incorporated areas. Both incorporated and unincorporated areas were visually proportioned into each sector.

0320A/wjm

March 1986  
Revision 1

BWA 1-10



## 2.0 DEFINITIONS

Terms used in this annex have the same meaning as those provided in Section 2.0 of the generic portion of the Commonwealth GSEP.

Acronyms used in this annex that are site specific are as follows:

ANSI - American National Standards Institute  
ARM - Area Radiation Monitor  
BWPS - Braidwood Nuclear Power Station  
BTR - Boron Thermal Regeneration  
BWA - Braidwood Annex  
CASP - Containment Air Sample Panel  
CVCS - Chemical Volume and Control System  
DEG - Division of Emergency Government  
DNBR - Departure from Nucleate Boiling Ratio  
ESF - Engineered Safety Feature  
FSAR - Final Safety Analysis Report  
HRSS - High Radiation Sampling System  
HVAC - Heating, Ventilation and Air Conditioning  
MSL - Mean Sea Level  
NFPA - National Fire Protection Association  
RCC - Rod Cluster Control  
RMS - Radiation Monitoring System  
RHR - Residual Heat Removal  
VCT - Volume Control Tank

### 3.0 SUMMARY OF EMERGENCY PLAN

The Generating Stations Emergency Plan (GSEP) addresses Commonwealth's planning efforts for emergency situations at each of its nuclear generating stations. Both the generic GSEP and this site specific annex were prepared utilizing guidance provided by Regulatory Guide 1.101, Revision 2, and NUREG 0654, Revision 1. The Plan addresses:

- 1) Organizational control of emergencies;
- 2) Classification of emergency conditions;
- 3) Emergency response measures;
- 4) Emergency facilities and equipment; and
- 5) Maintaining emergency preparedness.

This GSEP annex provides specific planning information that was deemed inappropriate for inclusion into a generic plan but yet considered necessary for a full understanding and representation of the Station's emergency response capabilities.

This annex does not specifically address efforts for protecting the public from the effects of an accident. The State of Illinois has developed an "Illinois Plan for Radiological Accidents" and will coordinate implementation of all necessary protective actions for the public in Illinois. The Illinois Emergency Services and Disaster Agency will notify and coordinate with Indiana's Department of Civil Defense and Emergency Planning to implement all necessary protective actions in Braidwood Station's Ingestion Pathway Emergency Planning Zone.

State emergency responses increase commensurate with the reported emergency.

#### 4.0 ORGANIZATIONAL CONTROL OF EMERGENCIES

The GSEP organization consists of two major groups. First, there is the Station Group, consisting of the directors and their associated staffs. Secondly, there is an offsite GSEP organization. A detailed description of the total GSEP organization appears in Section 4.0 of the generic GSEP.

The purpose of this section is to provide specific information with regard to the Braidwood Station organization and governmental support agencies.

#### 4.1 Normal Plant Organization

The normal plant organization is basically the same for all Commonwealth nuclear stations. (Refer to Section 4.1 of the generic plan.)

##### 4.1.1 Station Manager

Braidwood Station is managed by a Station Manager who is responsible for direct management of the station including industrial relations, planning, coordination and direction of the operation, maintenance, refueling, and technical activities. During an emergency condition, the Station Manager is normally the GSEP Station Director. His specific responsibilities and duties are outlined in Table 4.2-1 of the generic GSEP. Those responsibilities of the Station Director that may not be delegated are as follows:

- 1) Declaration that an Unusual Event, Alert, Site Emergency, or General Emergency Condition exists. General categorization of emergencies may be done by other plant personnel in accordance with approved Station procedures. But the final decision to declare the emergency condition rests with the Station Director; and
- 2) Decision to notify and recommend protective actions to offsite authorities in the case where a Site Emergency or General Emergency condition exists and the Recovery Manager or Corporate Command Center Director have not been contacted or are not prepared to make an informed decision. In all other cases, the decision to notify and recommend protective actions to offsite authorities shall be made by the Recovery Manager or Corporate Command Center Director. This responsibility may not be delegated. Actual notification and transmittal of these recommendations may be delegated.

#### 4.1.2 Shift Engineer

The Shift Engineer on duty is responsible for operating the plant in compliance with the station operating license and procedures. During his shift, the Shift Engineer is in charge of operating the entire plant in a safe and reliable condition.

A Shift Engineer is on duty 24 hours a day and is normally the initial GSEP Station Group Director and as such has the authority for declaring an emergency and recommending protective actions to local authorities.

#### 4.1.3 Qualifications of Plant Personnel

The guidelines of ANSI N18.1-1971 are generally followed by Braidwood Station management for personnel selection and training. For some positions, alternate qualifications are utilized based upon operating experience.

4.1.4 Contractor Performance

Ultimate responsibility for contractor performance from support contractors rests with the Station Manager.

4.1.5 Minimum Shift Manning

The minimum staffing required at Braidwood Station is the same as is required at other Commonwealth two-unit nuclear stations. Refer to Figure 4.2-2 of the Generic GSEP.

4.1.6 Health Physics Organization

The Station Rad/Chem Supervisor is responsible for the health physics program and for handling and monitoring of radioactive materials. Normally reporting to the Rad/Chem Supervisor are health physicists, chemists, foremen and technicians. During an emergency situation, the Rad/Chem Supervisor normally acts as the GSEP Rad/Chem Director.

4.1.7 Augmentation of Plant Staffing During An Emergency

Braidwood Station is committed to augment its onsite organization under emergency conditions. The Station uses, as guidance, Figure 4.2-3 of the generic GSEP in planning for its augmentation of plant staffing during an emergency. To facilitate the augmentation of plant staffing, Braidwood Station has established a 24 hour duty call individual who would be notified first after a station emergency is declared. This individual would initiate a prioritized notification (call-list) procedure.

4.2 Non-Commonwealth Support Groups

Agreements exist on file at Braidwood Station with several support agencies. These agencies and their support roles are as follows:

- 1) The Will County Sheriff's Office provides services of law enforcement.
- 2) Braidwood Fire and Rescue provides fire protection and ambulance services.
- 3) St. Joseph Medical Center in Joliet will serve as the supporting medical facility for BWPS.

Additionally, Commonwealth Edison Company has contractual agreements and other agreements with several companies and agencies whose services would be available in the event of an emergency. These companies and agencies and their available services are as follows:

- 1) Teledyne Isotopes Midwest Laboratories provides environmental radiological monitoring services and radiochemical analysis and bioassay services.
- 2) Radiation Management Corporation provides services of Medical and Health Physics support.
- 3) Murray & Trettel, Inc. provides meteorological monitoring services.
- 4) R.S. Landauer Jr. & Co. provides personnel dosimetry services.
- 5) The Department of Energy, Chicago Operations Office, will respond to requests for radiological assistance. This assistance will normally be limited to advice and emergency action essential for the control of the immediate hazards to health and safety.
- 6) The Institute of Nuclear Power Operations (INPO) has coordinated a voluntary assistance program whereby participating utilities will provide assistance in response to a Nuclear Materials Transportation accident. INPO can also provide emergency equipment and manpower.

4.3

Coordination with Governmental Agencies

As stated in the generic plan, the State of Illinois has the statutory responsibility and authority for protecting the health and safety of the public in Illinois. Within the State of Illinois authority is delegated as follows:

- 1) The Governor has overall offsite command authority for the protection of the public.
- 2) The Illinois Emergency Services and Disaster Agency (ESDA) exercises command and coordination and has programmatic responsibility for the implementation of protective actions as recommended for the public by the Illinois Department of Nuclear Safety (DNS) and the Governor.
- 3) The Department of Nuclear Safety has both the command authority for radiological aspects of a nuclear accident and the responsibility for performing various radiological functions. During an accident situation, the IDNS will make protective action recommendations to the Governor and the Illinois ESDA.

The State of Illinois has developed a Site-Specific Volume, "Illinois Plan for Radiological Accidents (IPRA)" - Braidwood, Vol. VII, to its State plan which specifically addresses protective action for the Illinois portion of the Braidwood Station Emergency Planning Zones.

The State of Indiana is a contiguous state affected by the Braidwood Station Ingestion Pathway Emergency Planning Zone. Within the State of Indiana, the Indiana Department of Civil Defense and Emergency Management will coordinate and provide liaison with the Illinois ESDA and supporting Federal agencies to ensure effective responses and aid in emergencies involving Braidwood Station which affect Indiana.

5.0 CLASSIFICATION OF EMERGENCY CONDITIONS

The generic section of the GSEP provides for classification of emergencies into six (6) categories. The first category, Transportation Accident, concerns an emergency involving the transportation of radioactive or other hazardous material from a nuclear generating station. The next four (4) categories: Unusual Event; Alert; Site (Area) Emergency; and General Emergency address emergencies of increasing severity. The sixth category of emergencies is the Recovery Phase. It is the responsibility of the Recovery Manager to consider the criteria in Table 5.0-6 of the Generic GSEP and determine when the Recovery Phase can be established.

Table BWA 5-1 includes the specific initiating conditions for the first five (5) emergency classes at Braidwood Station. Where possible, these initiating conditions are related to plant instrumentation readings.

In the event of equipment installation or other requirements, it may be necessary to quickly change the GSEP Emergency Action Levels at Braidwood Station. This may be done by first changing the Station Emergency Procedure for EALs and then, as soon as practical, by changing Table BWA 5-1 of this Annex.

In an emergency situation, if more than one distinctive EAL of different classification levels is reached, e.g., an EAL for Alert and an EAL for Site Emergency, the highest classification level reached shall be declared.

Similarly, if more than one distinctive EAL of the same classification level is reached, e.g., two EALs for Site Emergency, consideration shall be given for declaration of a higher classification.



TABLE BWA 5-1

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
Class Description	Events in progress or have occurred which indicate a potential degradation of the level of safety of the plant.	Events in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant.	Events in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public.	Events in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity.
1) Aircraft crash or missiles from whatever source.	Impacted on-site.	Impacted on-site and has degraded equipment described in the Technical Specifications such that a limiting condition for operation requires a shutdown.	A) Impacted on-site and has degraded equipment described in the Technical Specifications beyond the limiting condition for operation that requires a shutdown; or B) has exceeded a Technical Specification safety limit.	
2) Control Room Evacuation		When 10CFR20 exposure limits are expected to be exceeded.	Due to exceeding 10CFR20 exposure limits, evacuation is required and control is <u>not</u> established from Local Control Stations or from Remote Shutdown Panel within 15 minutes.	

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
3) Earthquake (activation of seismic monitoring alarm with level verification, not spurious, or testing)	Seismic equipment is activated. (at level of 0.02g)	At a level greater than Operating Basis Earthquake (> 0.095g)	At a level greater than Safe Shutdown (> 0.21g)	
4) Unplanned Explosion	Onsite but not affecting plant operations.	Explosion onsite has degraded equipment described in the Technical Specifications such that a limiting condition for operation requires a shutdown.	A) Explosion has degraded equipment described in the Technical Specifications <u>beyond</u> the condition for operation that requires a shutdown; <u>or</u> B) has exceeded a Technical Specification safety limit.	
5) Fire (ongoing as described by observation or alarm, and verified by the fire brigade)	A) Fire requires NRC notification if not identified within 10 mins.; <u>or</u> B) Fire requiring offsite assistance but not affecting plant operation.	Fire requires off-site assistance <u>and</u> has degraded equipment described in the Technical Specifications such that a limiting condition for operation requires a shutdown.	A) Fire requires off-site assistance <u>and</u> has degraded equipment described in Technical Specifications <u>beyond</u> the limiting condition for operation that requires a shutdown; <u>or</u> B) has exceeded a Technical Specification safety limit.	

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
6) Flood <u>OR</u> Low Water Level	Cooling pond dike failure affecting offsite property.	Water at level of Probable Maximum Flood (Cooling Pond water level at $\geq$ 599.17 feet MSL). eg. precipitation $\geq$ the Probable Maximum Precipitation of 31.9 inches in 48 hrs	Water level at plant grade elevation ( $\geq$ 601 feet MSL). eg. rainfall in excess of Probable Maximum Precipitation	
		<u>OR</u>	<u>OR</u>	
		Cooling Pond water level $\leq$ 590 feet MSL with coincident cooling pond dike failure.	Cooling Pond water level $\leq$ 584 feet MSL with coincident cooling pond dike failure.	
7) Security Threat Definition: Acts which threaten the safety of station personnel or the security of the nuclear units or special nuclear material. This includes crowd disturbances or acts of sabotage.	The following events as described in the Security Plan: (1) Obvious attempt to sabotage. (2) Internal disturbance (disturbance which is not short lived or is not a harmless outburst involving one or more individuals within the protected area).	An ongoing security threat (event) of increasing severity that persists for more than 60 min.	An ongoing security threat (event) involving an imminent loss of physical control of the facility.	An ongoing security threat (event) involving a loss of physical control of the facility.

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
7) Security Threat Definition: (cont'd)	(3) Bomb device discovered. (4) Hostage. (5) Civil disturbance (spontaneous collective group gathering which disrupts normal operations). (6) Armed or forced protected area intrusion. (7) Armed or forced vital area in- trusion.			

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
8) Tornado or severe winds being experienced (Wind speed as indicated in Control Room is used to classify condition.)	A) Tornado near Facility (1) Control Room informed by Load Dispatcher <u>OR</u> (2) Station personnel have made visual sighting; <u>OR</u> B) Sustained winds > 60 mph.	A) Tornado strikes Facility <u>or</u> B) Sustained winds > 75 mph	Sustained winds > 85 mph <u>and</u> either unit <u>not</u> in cold shutdown.	
9) Toxic Gas	Uncontrolled release of Toxic gas at life threatening levels near or onsite.	Entry of Toxic gas into the protected area.	Entry of Toxic Gas gas into vital areas affecting the safe shutdown of the plant.	
10) Loss of AC Power	Loss of all offsite AC power <u>or</u> loss of all onsite AC power required per unit.	Loss of all offsite AC power <u>and</u> loss of all onsite AC power required per unit.	Both ESP 4KV busses per unit deenergized for > 15 minutes.	Ongoing loss of power <u>and</u> total loss of feedwater makeup capability.

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
11) Loss of DC Power.	Loss of DC Power sources has degraded equipment described in the Technical Specifications such that a limiting condition for operation requires a shutdown.	Loss of all ESP DC power, per unit.	Busses 111 (211) and 112 (212) are <u>both</u> deenergized for 15 minutes.	
12) Plant Shutdown functions.		<p>A) Complete loss of any function needed to maintain cold shutdown (Both RH trains, <u>OR</u> both CC trains, <u>OR</u> both SX trains.)</p> <p><u>OR</u></p> <p>B) Failure of the Reactor Protection System instrumentation to initiate and complete a reactor trip, which brings the reactor sub-critical once a limiting safety system setpoint has been exceeded.</p>	<p>A) Complete loss of any function needed to maintain hot shutdown. (If you do not have at least one operable S/G with wide range level <math>\geq</math> 65% <u>AND</u> ability to control steam release either by S/G PORV, <u>OR</u> steam dump capability to the condenser.)</p> <p><u>OR</u></p> <p>B) Transient requiring operation of shutdown systems with failure to trip. (Power generation continues, but no core damage evident.)</p>	<p>Transient requiring operation of shutdown systems with failure to trip and core damage is evident.</p>

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
13) Loss of most or all alarm capability of annunciators.		In the Main Control Room.	In the Main Control Room <u>and</u> a plant transient in progress.	
14) Conditions or systems required by Technical Specifications (i.e. ECCS, fire protection, etc.)	Equipment described in the Technical Specifications is degraded such that a limiting condition for operation requires a shutdown.	A) Equipment described in the Technical Specifications is degraded beyond the limiting condition for operation that requires a shutdown;  <u>OR</u> B) Has exceeded a Technical Specification safety limit.		
15) Inadequate Core Coolant	> 650°F in average of 10 highest incore thermocouple readings  <u>OR</u> Subcooling < 25°F for 15 minutes.	Braidwood Status Tree's (BWST's) require entry into BWFR-C.2 Response to Degraded Core Cooling, based on subcooling, number of RCP's running, vessel level, and core exit thermocouples.	Braidwood Status Tree's (BWST's) require entry into BWFR-C.1 Response to Inadequate Core cooling based on subcooling, number of RCP's running, vessel level, and core exit thermocouples.	

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
16) Loss of Primary Coolant	<p>A) Failure of a primary system safety or relief valve to close, <u>OR</u> a primary PORV failure to close, and its block valve will not isolate.</p> <p>B) Exceeding Reactor coolant system leak rate as specified in Technical Specifications.</p>	A > 50 gpm leakage <u>increase</u> in a 4 hour period as indicated by either leak rate calculations, charging pump flow or VCT level changes.	Primary system leakage is beyond makeup capabilities of charging pumps.	<u>And</u> Failure to activate ECCS
17) Main Steam Line Break/Feed line Break	With zero or small primary to secondary leakage and/or small percentage of failed fuel.	With 1 gpm primary to secondary leakage and with 1% failed fuel.	Ten (10) gpm primary to secondary leakage <u>And</u> significant fuel damage.	
18) Loss of Heat Sink		Braidwood Status Tree's (BWST's) require entry into BWFR-H.1 Response to Loss of Secondary Heat Sink, based on total feedwater flow to the steam generators.	Alert condition is on going for 15 minutes. (Loss of all feedwater and all auxiliary feed water, and the residual heat removal system is not in operation.)	Alert condition is on going for 45 minutes. (Loss of all feedwater and all auxiliary feed water and the residual heat removal system is not in operation.)



BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
19) Steam Generator Tube Rupture	Exceeding primary to secondary leakage rates as specified in Technical Specifications.	Entry into BWEP-3 Steam Generator Tube Rupture with the following: Reactor Trip/Safety Injection <u>AND</u> 1. High radiation in the condenser air removal system. <u>OR</u> 2. High radiation in steam generator blow-down. <u>OR</u> 3. Unexplained increase in any steam generator level.	Same conditions as Alert <u>and</u> loss of offsite power <u>OR</u> Tube(s) rupture is beyond the capability of the charging pumps.	
20) Inadvertent positive reactivity insertions due to rods or dilution.	A. Inadvertent dilution such that: 1) Technical Specification shutdown margin requirements are violated. <u>OR</u> 2) The control bank low low insertion limit is reached. B. Uncontrolled rod withdrawal from subcriticality or power operation.			

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

<u>CONDITIONS</u>	<u>UNUSUAL EVENT</u>	<u>ALERT</u>	<u>SITE EMERGENCY</u>	<u>GENERAL EMERGENCY</u>
21) Feedwater Malfunction	Any feedwater malfunction resulting in a sustained decrease in Feedwater temperature to the steam generators by >60°F.			
22) ECCS Actuation	ECCS initiation. (Non-Spurious) with flow into reactor coolant system.			
23) Turbine-Generator accident in which missiles are generated.	A turbine generator failure in which missiles are generated and <u>no</u> penetration of the casing occurs and normal reactor shutdown follows.	A turbine generator failure in which missiles are generated and penetration of the casing <u>does</u> occur; all possible impact areas containing essential equipment are protected and normal reactor shutdown follows.		

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
24) Loss of Fission Product Barriers		A. $> 2 \times 10^2$ R/hr Primary Containment Radiation, <u>OR</u>	A. $> 4 \times 10^2$ R/hr Primary Containment Radiation, <u>OR</u>	A. $> 2 \times 10^3$ R/hr Primary Containment Radiation, <u>AND</u>
Primary Containment Radiation is observed on the RM-11 display console for: 1(2)RE-AR020 <u>or</u> 1(2)RE-AR021		B. Loss of <u>1</u> of the following <u>3</u> fission product barriers:	B. Loss of <u>2</u> of the following <u>3</u> fission product barriers:	B. Loss of <u>2</u> of the following <u>3</u> fission product barriers with an <u>imminent</u> loss of the third barrier:
		1) Cladding: grab sample results $> 300$ uCi/cc equivalent of I-131	1) Cladding: grab sample results $> 300$ uCi/cc equivalent of I-131	1) Cladding: grab sample results $> 300$ uCi/cc equivalent of I-131
		2) Reactor Coolant System: a) Containment press. $> 5$ psig <u>and</u> b) Containment temp. $> 150^\circ\text{F}$ <u>and</u> c) Containment humidity $> 50\%$	2) Reactor Coolant System: a) Containment press. $> 5$ psig <u>and</u> b) Containment temp. $> 150^\circ\text{F}$ <u>and</u> c) Containment humidity $> 50\%$	2) Reactor Coolant System: a) Containment press. $> 5$ psig <u>and</u> b) Containment temp. $> 150^\circ\text{F}$ <u>and</u> c) Containment humidity $> 50\%$
		3) Primary Containment a) Containment press. $> 50$ psig. <u>or</u> b) Containment temp. $> 280^\circ\text{F}$ , <u>or</u> c) Loss of containment integrity when containment integrity is required.	3) Primary Containment a) Containment press. $> 50$ psig. <u>or</u> b) Containment temp. $> 280^\circ\text{F}$ <u>or</u> c) Loss of containment integrity when containment integrity is required.	3) Primary Containment a) Containment press. $> 50$ psig. <u>or</u> b) Containment temp. $> 280^\circ\text{F}$ <u>or</u> c) Loss of containment integrity when containment integrity is required.

BRAIDWOOD  
EMERGENCY ACTION LEVELS

<u>CONDITIONS</u>	<u>UNUSUAL EVENT</u>	<u>ALERT</u>	<u>SITE EMERGENCY</u>	<u>GENERAL EMERGENCY</u>
25) Fuel Handling Accident (Direct information from fuel handling personnel indicating that an irradiated fuel assembly has been damaged.)		Fuel Handling Building exhaust has been diverted through the charcoal filters.	A) Radiation levels in the Fuel Handling Building are > 100 mR/hr as observed on the RM-11 display console for ORE-AR055 or ORE-AR056, <u>OR</u> B) Fuel Handling Building exhaust charcoal filters are depleted <u>OR</u> inoperable and radioactivity is being released to the atmosphere.	
26) Elevated Area Rad Monitor readings	Unplanned increase by factor of 20 in any ARM.	Unplanned increase (Resulting from degradation in the control of radioactive material and confirmed by survey or redundant instrumentation) by a factor of 100 in any ARM.		

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
27) <u>Gaseous Radiation Releases**</u> A. Core Damage Suspected	No core damage event is postulated at the Unusual Event level.	Instantaneous release rate exceeds $1.8 \times 10^6$ uCi/sec	Release rate averaged for 2 minutes exceeds $>500$ mR/hr whole body at the site boundary ( $8.9 \times 10^6$ uCi/sec) <u>OR</u> Release rate averaged for 30 minutes exceeds $>50$ mR/hr whole body at the site boundary ( $8.9 \times 10^5$ uCi/sec)	Instantaneous release rate exceeds level corresponding to $>1$ rem/hr whole body at the site boundary under actual meteorology. This condition exists when $Q > 7 \times 10^6 \times U$ where Q = release rate in uCi/sec U = mean wind speed in meters/sec
B. NO Core Damage Suspected	Instantaneous release rate exceeds $1.8 \times 10^6$ uCi/sec Noble gas <u>OR</u> 30 uCi/sec Iodine <u>OR</u> 10 CFR 20.105 instantaneous release limits are exceeded.	Instantaneous release rate exceeds $1.8 \times 10^7$ uCi/sec Noble gas <u>OR</u> 300 uCi/sec Iodine <u>OR</u> 10 times 10CFR20.105 instantaneous release limits are exceeded.	Release rate averaged for 2 minutes exceeds $>500$ mR/hr whole body at the site boundary ( $1.6 \times 10^8$ uCi/sec) <u>OR</u> Release rate averaged for 30 min. exceeds $>50$ mR/hr whole body at the site boundary ( $1.6 \times 10^7$ uCi/sec)	Instantaneous release rate exceeds level corresponding to $>1$ rem/hr whole body at the site boundary under actual meteorology. This condition exists when: $Q > 1.3 \times 10^8 \times U$ where Q = release rate in uCi/sec U = mean wind speed in meters/sec

\*\*Monitored releases can be measured by effluent monitoring or counting instrumentation. For noble gases, effluent monitor 1(2)RE-PRO030, channel 4, displays the release rate in uCi/sec on the RM-11 display console. For iodines, effluent monitor 1(2)RE-PRO28 displays a concentration in uCi/cc that must be corrected for stack flow rate to obtain a release rate in uCi/sec.

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
28) <u>Liquid Radiation</u> Releases from the Plant as measured by counting instrumentation or effluent monitoring instrumentation. (Radiation releases are observed on the RM-11 display console for ORE-PRO10.)	1) Gross Beta >1 x 10 <sup>-7</sup> uCi/ml or 2) Tritium >3 x 10 <sup>-3</sup> uCi/ml	1) Gross Beta ≥ 1 x 10 <sup>-6</sup> uCi/ml or > 40 Ci total in 24 hours or 2) Tritium ≥ 3 x 10 <sup>-2</sup> uCi/ml or ≥ 500 Ci total in 24 hours.	1) Gross Beta ≥ 2,000 Ci total in 24 hours or 2) Tritium ≥ 2 x 10 <sup>4</sup> Ci total in 24 hrs.	1) Gross Beta ≥ 2 x 10 <sup>4</sup> Ci total in 24 hours or 2) Tritium ≥ 2 x 10 <sup>5</sup> Ci total in 24 hrs.
29) Personnel Injury	Transportation of a radioactivity contaminated injured person to hospital			
30) Hazardous Materials	As a direct result of hazardous materials a person is killed or hospitalized or estimated property damage exceeds \$50,000.			

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

<u>CONDITIONS</u>	<u>UNUSUAL EVENT</u>	<u>ALERT</u>	<u>SITE EMERGENCY</u>	<u>GENERAL EMERGENCY</u>
31) Any other Conditions of equivalent magnitude to the criteria used to define the accident category as determined by the Station Director.*	Warrants increased awareness on the part of the state and/or local off-site officials..	Warrants activation of Technical Support Center	Warrants activation of the Emergency Operations Facility and monitoring teams; warrants notification of the public by State and local agencies.	Imminent Core Melt

\* Conditions that may or may not warrant classification under GSEP include:

- a. Incident reporting per 10CFR50.72.
- b. Incident reporting per 10CFR20.403 or Illinois Rules and Regulations, Part D.403.
- c. Discharges of oil or hazardous substances into waterways per 33CFR153.
- d. Security contingency events per the Station Security Plan.

The Station Director may, at his discretion, categorize the above situations as GSEP emergencies, depending upon the seriousness of the situation. (Refer to Section 9.3 of the generic plan for additional information.)

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

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TRANSPORTATION ACCIDENT

- A. A vehicle transporting radioactive materials or non-radioactive Hazardous materials from a Commonwealth Edison generating station is involved in a situation in which:
1. Fire, breakage or suspected radioactive contamination occurs involving a shipment of radioactive material or;
  2. As a direct result of Hazardous materials,
    - (a) A person is killed; or
    - (b) A person receives injuries requiring hospitalization; or
    - (c) Estimated carrier or other property damage exceeds \$50,000.
- B. Any other condition involving Hazardous material transportation and equivalent to the criteria in Item A.
-



## 6.0 EMERGENCY MEASURES

Commonwealth Edison emergency response actions are basically the same for all nuclear stations and are thus covered by Section 6.1 of the generic plan.

### 6.1 Activation of the Emergency Organization

If the conditions at Braidwood Station indicate that one of the Emergency Action Levels in Table BWA 5-1 is exceeded, the Station Director declares and classifies the emergency. A Nuclear Accident Reporting System (NARS) Form is completed and the information contained on this form is conveyed directly to the State. In addition, the NRC Operations Center is notified of the emergency in accordance with 10 CFR 50.72. For the initiating condition classified as a General Emergency, the Station Director is responsible for notifying the following Illinois Agencies of the emergency condition, as well as recommending initial protective actions for the offsite public:

- Illinois ESD<sup>s</sup> in Springfield
- Illinois Department of Nuclear Safety (IDNS)
- Will County EOC
- Grundy County Sheriff's Office
- Kankakee County Sheriff's Office
- Grundy County ESDA
- Kankakee County ESDA

When State and local agencies are notified of the emergency condition, they will take action in accordance with State and local emergency plans.

Figure 4.2-3 of the generic GSEP will be used by Braidwood Station in augmenting the Braidwood onsite emergency organization for declared GSEP emergencies. In addition, Braidwood Station has established an Technical Support Center and an Operational Support Center. These centers are activated (manned) for an Alert, Site Emergency, and General Emergency. Augmentation of plant staffing is achieved by implementing a prioritized notification procedure as described in Section 4.1.7.

6.2 Assessment Actions

Throughout each emergency situation, continuing assessment will occur. Assessment actions at Braidwood Station may include an evaluation of plant conditions; inplant, onsite, and initial offsite radiological measurement; and initial estimates of offsite doses. To aid emergency personnel in an assessment of core damage during an emergency condition, a figure has been prepared which represents a plot of activity (Ci) versus containment radiation readings. Figure BWA 6-1 is used only during the first six (6) hours following a release to primary containment in order to avoid any significant uncertainties which could be introduced due to the time-dependent energy spectrum of the released activity.

6.3 Protective Actions for the Offsite Public

Protective actions for the offsite public will be recommended and coordinated by the Illinois ESDA and Indiana Department of Civil Defense and Emergency Management in cooperation with local officials. The initial recommendation of protective actions will be issued to ESDA by Commonwealth Edison based on conditions at Braidwood Station. A notification capability to the population within the 10-mile EPZ is available for the purpose of alerting

the population of recommended protective actions.

#### 6.3.1 Prompt Notification System

This prompt public notification system consists of a permanently installed outdoor notification system within the zero (0) to ten (10) mile radius around the station. The zero (0) to ten (10) mile radius around the station is primarily an agricultural area with a population density below 2000 persons per square mile. The prompt notification system, as installed, consists of mechanical and electronic sirens which will cover this entire area with a minimum sound level of 60 db. Additionally, for the heavily populated areas within the zero (0) to ten (10) mile radius around the station which contain several communities, the prompt notification system will cover these communities with a minimum sound level of 70 db to ensure complete coverage.

Once the public has tuned to designated radio stations in an emergency, detailed instructional messages will be given to the public. State and local procedures provide for these messages.

Protective actions for the public may include:

- Sheltering by remaining inside buildings or homes.
- Evacuation from a potentially affected area and relocation to a preestablished registration/evacuation center.
- Food, water and milk control by sampling, testing and restricting the consumption of these potentially affected items.
- Access control by roadblocks and barriers to prevent entrance to potentially affected areas.

Sector evacuation times may be a factor in the recommended protective actions. Refer to Figure BWA 6-2 for a summary of evacuation time estimates for the ten-mile area surrounding Braidwood Nuclear Power Station.

#### 6.4 Protective Actions for Onsite Personnel

Braidwood Station has a siren system to warn onsite personnel of emergency conditions. Upon hearing a continuous two (2) minute siren all personnel within the protected area have been instructed to report to designated locations/assembly areas. Station GSEP directors report to the Technical Support Center. Personnel not having emergency assignments report to either one of two designated assembly areas. Permanent station personnel should normally report to the Service Building Machine Shop area. Contractors should normally assemble in the Unit #2 Turbine Building Trackway. (Note: While Unit 2 is under construction, the Unit 1 Turbine Building Trackway shall be utilized as an assembly area.) Refer to Figure BWA 6-3.

Accountability of site personnel will be the responsibility of the Braidwood Station Security Director using the computerized security control system.

If a site evacuation is considered necessary by the Station Director, personnel will be relocated and monitored at one or more of the following locations:

- 1) Dresden Nuclear Generating Station, Morris, Illinois
- 2) La Salle Nuclear Generating Station, near Marseilles, Illinois
- 3) Joliet Generating Station, Joliet, Illinois

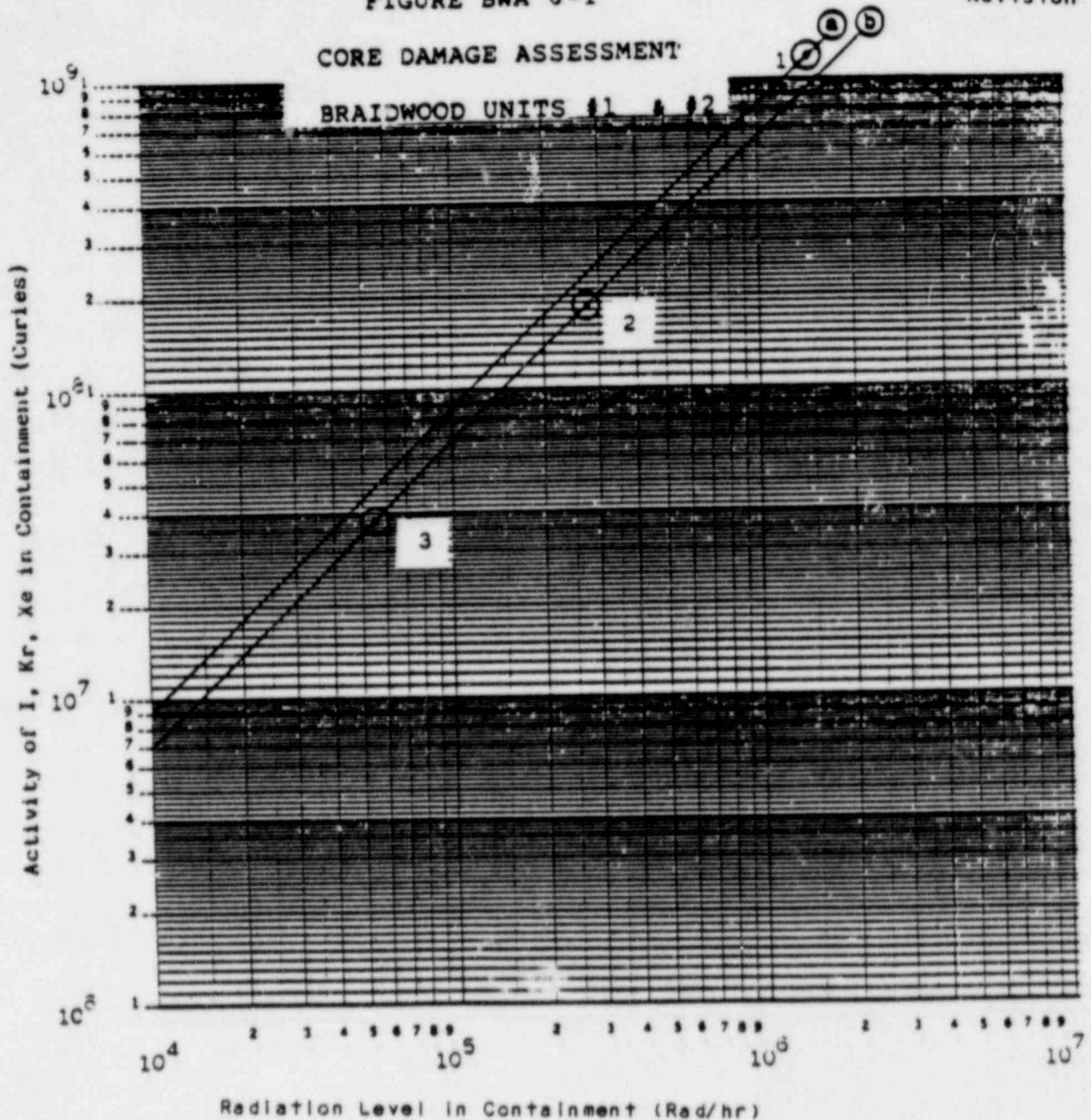
(with support coming from either Dresden Station or LaSalle Station)

Traffic control for onsite areas during an evacuation will be the responsibility of the Braidwood Station security force.

As necessary, equipment and personnel will be furnished by Braidwood Station to the relocation site(s) for monitoring, decontamination, and bioassay. Refer to Figure BWA 6-4 for evacuation routes to the relocation sites.

Other emergency measures are common to all nuclear station and are thus discussed in the generic plan.

FIGURE BWA 6-1

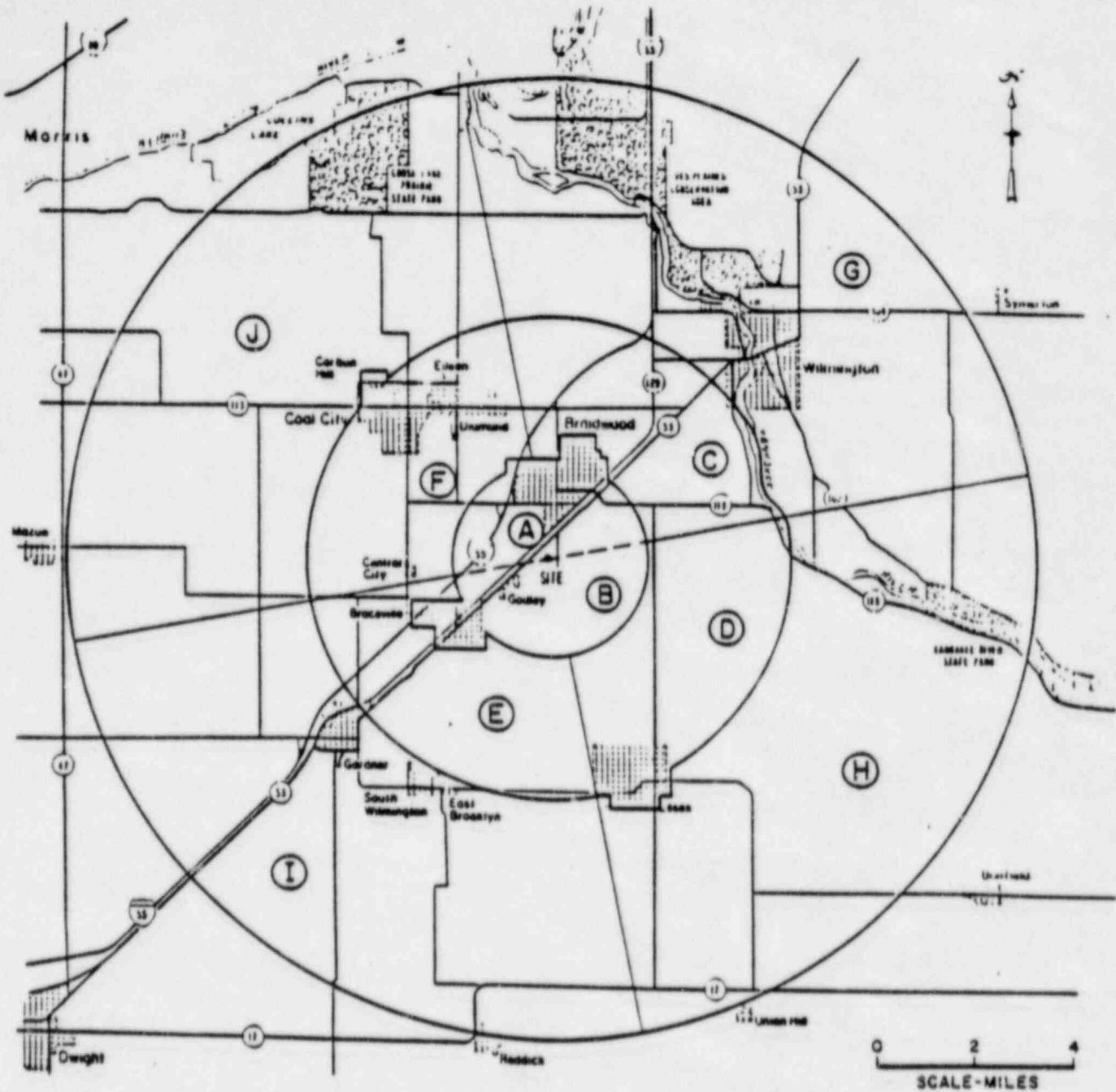


Curve a represents estimated activity levels in the containment during the first six (6) hours following releases in which the ratio of the "% noble gases released to the core" to the "% Iodines released from the core" is equal to 4. Curve b represents estimated activity levels in the containment following releases in which the above mentioned ratio is equal to one (1). Specifically, the following points are plotted on the curves:

- Point 1 ---- 100% noble gases released, 25% of Iodines released
- Point 2 ----- 10% noble gases released, 10% of Iodines released
- Point 3 ----- 2% noble gases released, 2% of Iodines released

Total coolant activity (Iodines plus noble gases) is 700 curies. If this activity becomes airborne in the containment, the radiation level would be less than one rad/hr and thus is too low of an activity to become plotted on this graph.

BRAIDWOOD STATION EVACUATION TIME ESTIMATES



GENERAL POPULATION EVACUATION TIME ESTIMATES

ZONE	ESTIMATED EVACUATION TIME (HOURS)	
	NORMAL WEATHER	ADVERSE WEATHER
A+B	3	4
A+B+C	3	4
A+B+D	3	4
A+B+E	3	4
A+B+F	3	4
A-F+G	3	4
A-F+H	3	4
A-F+I	3	4
A-F+J	3	4
A-J	3	4

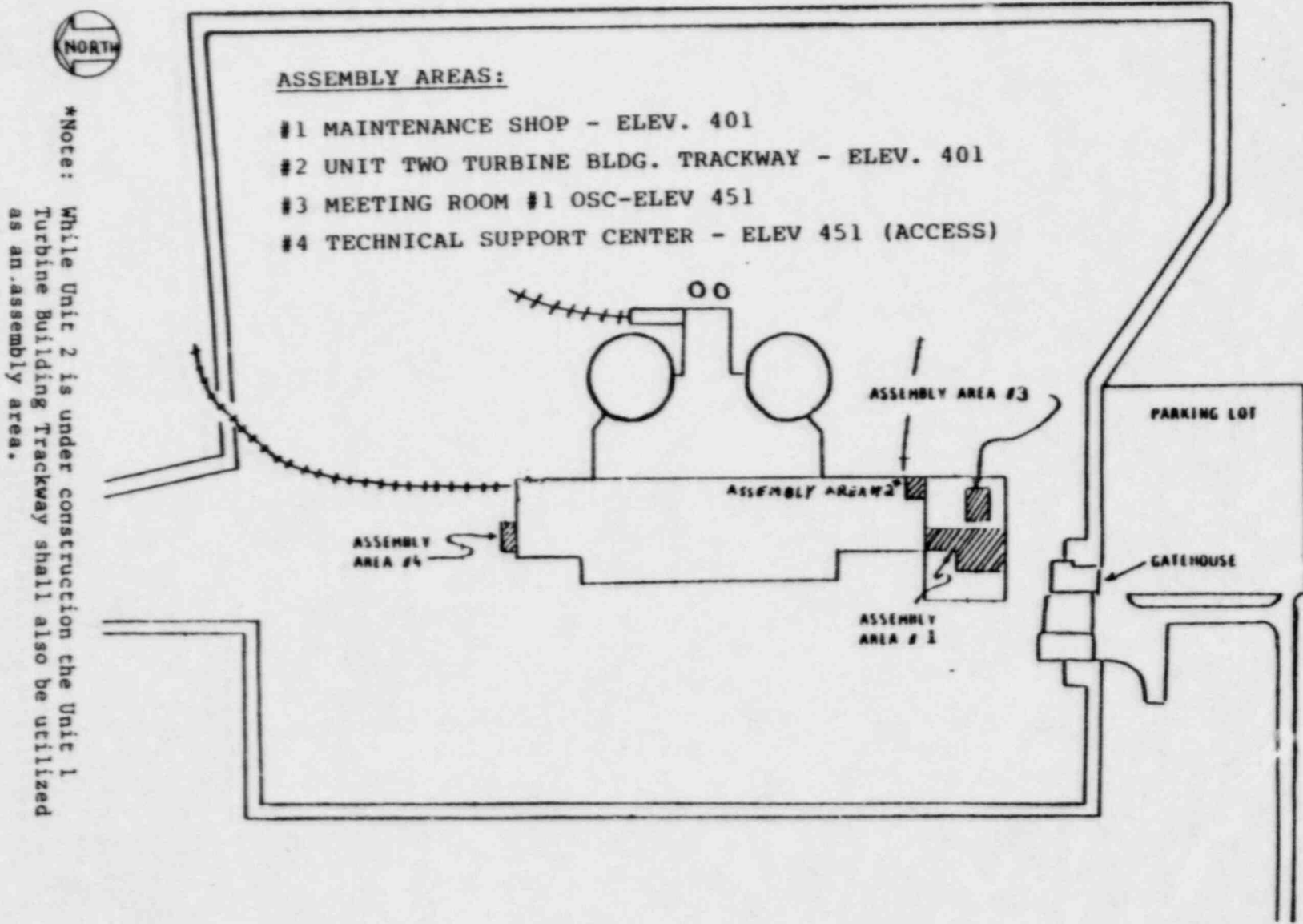
LEGEND

- STATE HIGHWAY
- INTERSTATE HIGHWAY
- INCORPORATED AREA (CITY OR VILLAGE)
- EVACUATION STUDY ZONE

NOTE: THIS FIGURE PRESENTS INFORMATION FROM THE "BRAIDWOOD EVACUATION TIME ESTIMATE STUDY" DATED SEPTEMBER 1984.

FIGURE BWA 6-2  
BRAIDWOOD STATION  
EVACUATION TIME ESTIMATES

FIGURE BWA 6-3  
ONSITE ASSEMBLY AREAS



\*Note: While Unit 2 is under construction the Unit 1 Turbine Building Trackway shall also be utilized as an assembly area.

BWA 6-8

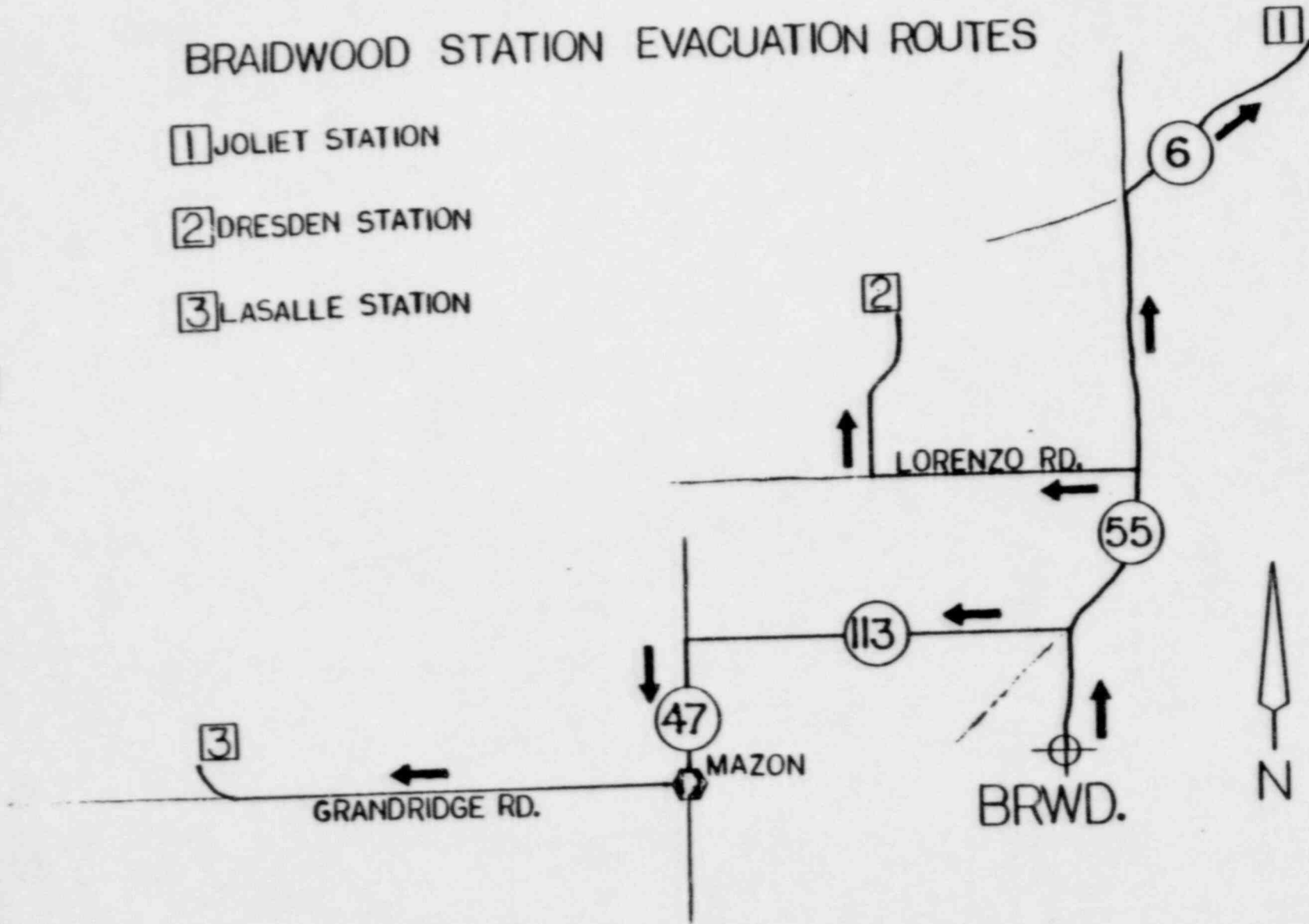
March 1986  
Revision 1



Figure BWA 6-4

# BRAIDWOOD STATION EVACUATION ROUTES

- ① JOLIET STATION
- ② DRESDEN STATION
- ③ LASALLE STATION



BWA 6-9

March 1986  
Revision 1

## 7.0 EMERGENCY FACILITIES AND EQUIPMENT

### 7.1 Emergency Control Centers

#### 7.1.1 Station Control Room

The Braidwood Station Control Room is the initial onsite center of emergency control and is located on the 451-foot elevation of the Auxiliary Building. Refer to Figure BWA 7-1 for the relative location of the Control Room within the Station. Figure BWA 7-2 provides an approximate layout.

#### 7.1.2 Technical Support Center (TSC)

Braidwood Station has designated a Technical Support Center which exists at the north end of the Turbine Building, as shown in Figure BWA 7-1. The TSC fully meets the requirements of Section 7.1.2 of the generic plan. Refer to Figure BWA 7-3 for an "as built" diagram of the TSC.

#### 7.1.3 Operational Support Center (OSC)

Braidwood Station has designated a primary Operational Support Center. The Primary OSC is Meeting Room #B on elevation 451' of the Service Building, as shown in Figure BWA 7-1. The OSC conforms to the requirements of Section 7.1.3 of the generic plan and is the location to which operations support personnel will report during an emergency and from which they will be dispatched for assignments in support of emergency operations.

Refer to Figure BWA 7-4 for an "as built" diagram of the OSC. The backup OSC is the Shift Engineer's office on Elevation 451 of the Auxiliary Building.

7.1.4 Corporate Command Center (CCC)

The Corporate Command Center (CCC), located in the Edison Building, downtown Chicago, is the location from which the CCC Director will normally direct a staff in evaluating, coordinating, and directing company activities involved in coping with an emergency.

7.1.5 Emergency Operations Facility (EOF)

Braidwood Station has designated a Emergency Operations Facility. The EOF is located at Mazon, Illinois, approximately 14 miles WNW of the Station. The EOF is the location where the GSEP Recovery Group would be activated, primarily for a Site or General Emergency. Refer to Figure 7-5 for an "as-built" drawing of the EOF. The designated EOF is greater than 10 miles from the TSC and therefore is exempt from habitability criteria.

7.2 Communications Systems

Dedicated communications systems at Braidwood Station allow effective coordination of any emergency response. These systems include:

- 1) A Nuclear Accident Reporting System (NARS) which links the Control Room, the Corporate Command Center, the Onsite TSC, the System Power Supply Office, the EOF, the Illinois ESDA (in Springfield), the IDNS (in Springfield), and selected local government agencies.

- 2) A microwave voice channel between the CCC and the Control Room, the TSC, and the EOF.
- 3) A telephone link that enables communication between the CCC, the TSC, and the EOF.
- 4) A telephone link that enables communication between the Control Room and the TSC.
- 5) A telephone link that enables communication between the Control Room and the OSC.
- 6) A telephone link that enables communication between the Onsite TSC and the OSC.
- 7) A radio voice channel between the CCC, the Control Room, the TSC, the EOF, mobile vehicles, and handi-talkies in the field.
- 8) An Emergency Notification System that allows communications between the Station and the Nuclear Regulatory Commission.

The Braidwood Station dedicated communications systems comply with the requirements of Section 7.2 in the generic GSEP.

Following a GSEP declaration, Braidwood Station makes initial notifications in accordance with Section 6.1 of the generic GSEP and this annex. In addition, the Control Room shall establish a communications link with the TSC and the OSC when they are activated. As soon as the TSC is activated and manned, the Control Room shall be relieved of the responsibility for maintaining an open communications link with the NRC Operations Center. The Control Room will then maintain communications with only the TSC and the OSC. The TSC shall maintain communications with the NRC Operations Center, the Control Room, the CCC, and/or the EOF. Communications links that are not required to be maintained open shall be terminated as quickly as prudence dictates. Termination is accomplished to minimize the number of personnel needed as communicators,

to minimize confusion in control centers and to reduce the probability for promulgation of erroneous information. Communications initiated by interested outside parties, not specifically addressed in the GSEP, shall be referred to the Corporate Office. Such communications shall never be allowed to interfere with response to an emergency condition nor with the implementation of the GSEP.

In addition to the dedicated GSEP communications described in this section, Braidwood Station has other reliable intraplant and plant-to-offsite communications. These communications include:

- A public address system
- A commercial phone system
- Security/Operations radio consoles and handi-talkies
- System Power Dispatcher microwave communications
- Sound-powered phones
- Vehicle radios
- Microwave communications

The Station's communications systems will be further described in an Emergency Plan Implementing Procedure.

### 7.3 Assessment Facilities

#### 7.3.1 Onsite Seismic Monitoring Instrumentation

A central recording time-history accelerograph unit with strip chart recorder, indicator lights, and playback system is provided.

The lights indicate whether the system is triggered and whether the operating basis or safe shutdown maximum accelerations are exceeded in any one of the three

orthogonal directions in the basement of the containment structures. An acceleration of .02g in any direction activates the seismic switch which turns on the seismic monitors and lights up the seismic alarm lights at the central station panel.

7.3.2 Onsite Meteorological Monitoring Instrumentation

A 320-foot meteorological tower is located approximately 1880 feet northeast of the Braidwood Station Containment Buildings.

The Braidwood Station meteorological monitoring system is equipped to monitor the following parameters:

- 1) Temperature (at 30 feet)
- 2) Differential Temperature (between 30 and 199 ft)
- 3) Dew point (at 30 and 199 feet)
- 4) Wind speed and direction (at 34 and 203 feet)
- 5) Precipitation (ground level)

In addition to the above, sigma-sub-theta, a derived meteorological parameter, is computed and is available to the CCC Environmental Director. Information gathered from the tower is recorded on chart recorders located in a building at the tower base. These meteorological parameters are provided as input to the station's process computer and are available as up-to-the-minute data in the Control Room.

The meteorological program at Braidwood Station provides information sufficient to assess local weather conditions and to determine the degree of atmospheric dispersion of airborne radioactive effluents from the station.

The Commonwealth Edison meteorological contractor maintains a comprehensive field program. Routine visits are made to each tower once a week to retrieve analog data and inspect equipment. These visits are directed towards ground based equipment, although a visual inspection of the tower sensing equipment is also made. Those instruments equipped with internal calibration capabilities are checked also. A log of the week's activities is filled out and kept on file both with the contractor and at the general office.

Besides the routine meteorological maintenance program, several independent methods are used to verify quality data transmissions and recovery from each meteorological tower. The corporate computer polls each meteorological tower throughout the day. Each day's data are screened by a validation program which flags all missing and/or suspect values. The meteorological contractor is notified of persistent outages and the proper restoration procedure is followed.

As an independent method of data retrieval, the meteorological contractor also interrogates each meteorological tower during the day. Data are passed through a validation procedure, and suspect data closely examined. Field teams are then assigned for restoration of the system.

Cooperation between the corporate office and the meteorological contractor assures that a timely restoration of any outage can be made. Emergency field visits to the meteorological sites are made as quickly as possible after detection of a failure.

Should an event of sufficient magnitude occur to destroy the tower structure, a contract is maintained to have a temporary tower erected within 72 hours, weather conditions permitting. Further, the meteorological contractor maintains two levels of sensors (wind speed, wind direction and temperature) in a state of readiness for use on the temporary tower.



### 7.3.3 Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area radiation monitoring system; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and is described in the following subsections.

#### 7.3.3.1 Radiation Monitoring System

Chapters 11 and 12 of the Braidwood FSAR describe the radiation monitoring system (RMS) in detail. The installed RMS is designed to continuously monitor the containment atmosphere plant effluents, and various in-plant locations.

The system includes Control Room readouts and recorders for each parameter that is monitored and an audible Control Room alarm when predetermined setpoints are exceeded. The system can be subdivided into process/effluent instrumentation and an area monitoring system.

- The process/effluent instrumentation consists of pumps, filter samplers, detectors, and associated electronics to determine noble gas, iodine, and particulate concentrations in plant cubicles or liquid and gaseous effluents. Several monitored effluent pathways have control functions which will terminate the release at a predetermined setpoint. These setpoints are premised on compliance with federal regulations.
- The area monitoring system provides information of existing radiation levels in various areas of the plant to ensure safe occupancy. It is equipped with Control Room and local readout and audible alarms to warn personnel of an increased radiation level. Some onsite equipment is particularly valuable for accident situations and is described in the following sections.

7.3.3.2 Post Accident Sampling Capability

The capability to obtain and perform radioisotopic and chemical analyses of the reactor coolant and containment atmosphere samples is provided by the high radiation sampling system (HRSS), the design of which is outlined in the following paragraphs.

The system is installed in the auxiliary building and consists of a liquid sampling subsystem and an air sampling subsystem. The major components of the system are:

- a. HRSS liquid sample panel,
- b. Liquid sample cooler rack,
- c. Chemical analysis panel,
- d. Chemical analysis monitor panel,
- e. HRSS auxiliaries control panel (liquid subsystem only),
- f. Waste drain tank and pumps,
- g. Containment air sample panel (CASP),
- h. CASP control panel, and
- i. Valves and piping for the system.

The liquid sampling subsystem is installed at elevation 401 feet in the auxiliary building except for the waste drain tank and pumps which are installed at elevation 383 feet. The air sampling subsystem is installed at the 364' elevation of the auxiliary building in proximity to the containment.

The HRSS liquid sampling is capable of sampling:

- a. Pressurizer steam space,
- b. Pressurizer liquid space,
- c. Each accumulator (emergency core cooling system),
- d. Reactor coolant hot leg loops 1 and 3,
- e. Reactor coolant cold leg loops 1 through 4,
- f. RHR heat exchangers A and B outlets,
- g. Reactor coolant letdown heat exchanger outlet,
- h. CVCS demineralizer outlet,
- i. BTR demineralizer outlet,
- j. Reactor coolant filter outlet,
- k. Auxiliary building floor drain tank A (B on Unit 2 panel),
- l. Auxiliary building equipment drain tank A (B on Unit 2 panel),
- m. Recycle holdup tank A (B on Unit 2 panel),
- n. HRSS waste drain tank,
- o. Containment floor drain sump,
- p. Chemical drain tank (Unit 1 panel only),
- q. Steam generator blowdown sample line, and,
- r. Regeneration waste drain tank (Unit 1 panel only).

In addition to taking the above samples for onsite and/or offsite analysis, the HRSS liquid sampling panel is capable of routing the reactor coolant samples to the chemical analysis panel. The chemical analysis panel is capable of performing the on-line analysis of pH, dissolved oxygen, specific conductivity, chloride, and hydrogen. For boron and isotopic analysis, samples diluted by a factor of 1000 to one will be transferred to the onsite laboratory. Excessive exposure to the system operator is limited by:

- a. Lead shielding in the liquid sampling panel and the chemical analysis panel;
- b. Concrete shielding above, below, and around the sides of the panels to prevent radiation from scattering around the lead shielding;
- c. The optimized design and reduced amount of piping in the panels containing reactor coolant;
- d. A special cart equipped with a shielding cask to transport the radioactive sample to its destination and;
- e. A ventilation system drawing air out of the sampling panels and discharging into a remote HVAC train via the waste drain tank room.

The containment air sampling panel is capable of sampling the primary containment atmosphere. The sample is drawn from the containment through a dedicated penetration.

Once the interfacing valves are arranged and the the sampling programmer is initiated, the containment air sampling panel in conjunction with a particulate iodine gas partitioner utilizes automatically sequenced sampling to trap the designated sample. The air sample will then be analyzed onsite. Excessive exposure to the operator is limited by:

- a. Lead shielding in the containment air sampling panel;
- b. Concrete shielding above, below, and around the sides of the panel to prevent radiation from scattering around the steel shielding;
- c. Automatic sampling;
- d. A ventilation system drawing air out of the sampling panels and discharging into a remote HVAC train.

Actual frequency of sampling shall be determined by station management; however, as a minimum the first sample can be taken and the results available within 3 hours from the time a decision is made to take a sample, continuing with at least one sample per day for the next 7 days and at least one sample per week thereafter. The time interval between taking a sample and receipt by plant management of the results of the analysis is estimated to be less that 2 hours.

7.3.3.3 Radiological Noble Gas Effluent Monitoring

Two General Atomic Company wide-range monitors will be installed on the auxiliary building vent stacks (final release points), one monitor per stack. The monitor has a range for radioactive gas concentration of  $1 \times 10^{-7}$  uCi/cc to  $1 \times 10^5$  uCi/cc. The monitor includes the following: two isokinetic nozzles, one for normal conditions operating at 2 ft<sup>3</sup>/min. and one for high range conditions operating at 0.06 ft<sup>3</sup>/min; sampling rack; sample conditioner to filter out large concentrations of radioiodine and particulates; and the wide-range gas detectors assembly, consisting of three radioactive gas detectors, a low-range detector, a mid-range detector, and a high-range detector. Each monitor system has a microprocessor which utilizes digital processing techniques to analyze data and control monitor functions. Control Room readouts include a RM-23 remote display module for all monitored parameters.

Two General Atomic Company detectors are provided for each of the four main steamlines upstream of the safety and relief valves. The range of the monitor is  $10^{-1}$  mr/hr to  $10^4$  mr/hr. The monitors will be mounted external to the main steamline piping and corrections made for the loss of low energy gammas.

7.3.3.4 Radioiodine and Particulate Effluent Monitoring

The General Atomic Company wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which utilizes a Ge(Li) detector. The iodine cartridges are reverse blown for at least ten minutes to reduce the level of entrapped noble gases. In addition, silver zeolite cartridges are available to further reduce the interference of noble gases.



7.3.3.5 High-Range Containment Radiation Monitors

Two high range containment radiation monitors are installed for each operating reactor. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is 1 rad/hr to  $10^8$  rads/hr (beta-gamma) or alternatively, 1R/hr to  $10^7$  R/hr for gamma only.

7.3.3.6 In-Plant Iodine Instrumentation

Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using silver zeolite as a sample media. Braidwood Station has a Transportable Data Acquisition and Analysis System for analyzing samples that cannot be counted and analyzed in the normal Station counting room because of background problems. Auxiliary counting room locations have been identified within the Turbine Building. It is expected that a sample can be obtained, purged, and analyzed for iodine content within a two-hour time frame.

#### 7.3.3.7 Station Survey and Counting Equipment

The Station maintains portable survey instrumentation to assess contamination levels, exposure rates, and gaseous, iodine, and particulate airborne radioactivity concentrations.

This equipment included G-M's, ion chambers, and air samplers. The equipment is operated and calibrated by Station personnel.

The Station counting room contains GeLi gamma spectrometer systems, gas-flow proportional counters for alpha and beta/gamma analysis, and liquid scintillators for tritium analysis.

The Station uses various combinations of film badges, TLDs, direct reading pocket ion chambers, and electronic dosimeters to monitor personnel exposures. In addition, a whole body counting system for bioassay determinations is located onsite.

#### 7.3.4 Monitoring for Vital Plant Parameters

Adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Byron/Braidwood FSAR. Instrumentation is installed to ensure monitoring of the following vital parameters:

INSTRUMENT

1. Containment Pressure
2. Reactor Coolant Outlet Temperature -  $T_{HOT}$  -  
Wide range
3. Reactor Coolant Inlet Temperature -  $T_{COLD}$  -  
Wide range
4. Reactor Coolant Pressure - Wide Range
5. Pressurizer Water Level
6. Steamline Pressure
7. Steam Generator Water Level - Narrow Range
8. Refueling Water Storage Tank Water Level
9. Boric Acid Storage Tank Level

A Braidwood Station Emergency Operating Procedure will aid personnel in recognizing inadequate core cooling. This procedure relies upon core exit thermocouples to indicate an inadequate core cooling condition.

7.3.5

Site Hydrological Characteristics

The hydrological characteristics of the Braidwood Station vicinity are described in Section 2.4 of the Braidwood FSAR. The river screen house is the only structure that could be affected by flooding on the Kankakee River. The controlling event for flooding at the site is the probable maximum flood for the cooling pond, resulting in a short term maximum water surface elevation of 600.6 ft in the immediate plant area.

Although the plant grade elevation is 600 ft, the safety related facilities are situated at elevation 601 ft; 0.4 ft above the estimated maximum water surface elevation.

Low flows in the Kankakee River cannot affect safety related facilities of the plant. In the unlikely event that emergency make-up water requirements cannot be satisfied by surface water withdrawals from the Kankakee River, the Cooling Lake will operate under a closed cycle system. Emergency shut down water is available from the cooling lake.

Because of the site hydrological characteristics given above, plant operation should not be affected by Kankakee River water level conditions and therefore, hydrological monitors have not been installed. The Kankakee River is not used for any public water supply, within 50 miles downstream of this site. There are no recorded plans for any future public water supply usage from the Kankakee River. The nearest surface water users downstream from Braidwood Station is Peoria, over 86 miles away. This allows for sufficient mixing that makes permanently installed hydrological monitors unnecessary. Provisions have been made for grab samples to establish release rates. In performing dose calculations from liquid releases, Braidwood Station uses a historical average river flow value, FW, as a parameter in the liquid release model.

7.3.6 Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable National Fire Protection Association (NFPA) Standards. The System is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection carbon dioxide, halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble.

In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas are required.

7.3.7 Facilities and Equipment for Offsite Environmental Monitoring

As described in the generic GSEP, Commonwealth has contracted with a company to conduct an offsite environmental monitoring program at each nuclear station. Figure BWA 7-6 shows the locations of the fixed continuous air samplers. Figure BWA 7-7 shows the inner ring of TLD's in a 5-mile radius and Figure BWA 7-8 shows the outer ring of TLD's in a 5-mile radius.

Braidwood Station maintains a supply of emergency equipment and supplies for offsite monitoring and sampling. The supply includes the minimum requirements delineated by Figure 7.7-1 of the generic GSEP.

#### 7.4 Protective Facilities and Equipment

The principal onsite assembly areas for Braidwood Station are the Machine Shop on the 401-foot elevation of the Service Building and the Turbine Building trackways. These areas are suitable because:

- 1) They are large open areas suitable for assembling a large number of people in a short time;
- 2) They can be easily exited if a site evacuation is deemed necessary following an assembly; and
- 3) They have a low probability of being affected by a serious accident involving the NSSS.

The offsite evacuation/relocation areas for Braidwood Station are discussed in Section 6.0 of this annex. All three locations are suitable, depending on the emergency condition, with personnel, supplies and communications readily available.

#### 7.5 First Aid and Medical Facilities

Braidwood Station has an in-plant first aid/decontamination room on the 426 foot elevation of the auxiliary building near the station laboratory complex. This room is provided with a sink, a shower, and a supply cabinet.

First aid kits, stretchers, sinks, eyewashes and emergency showers have been placed in strategic locations throughout the station.

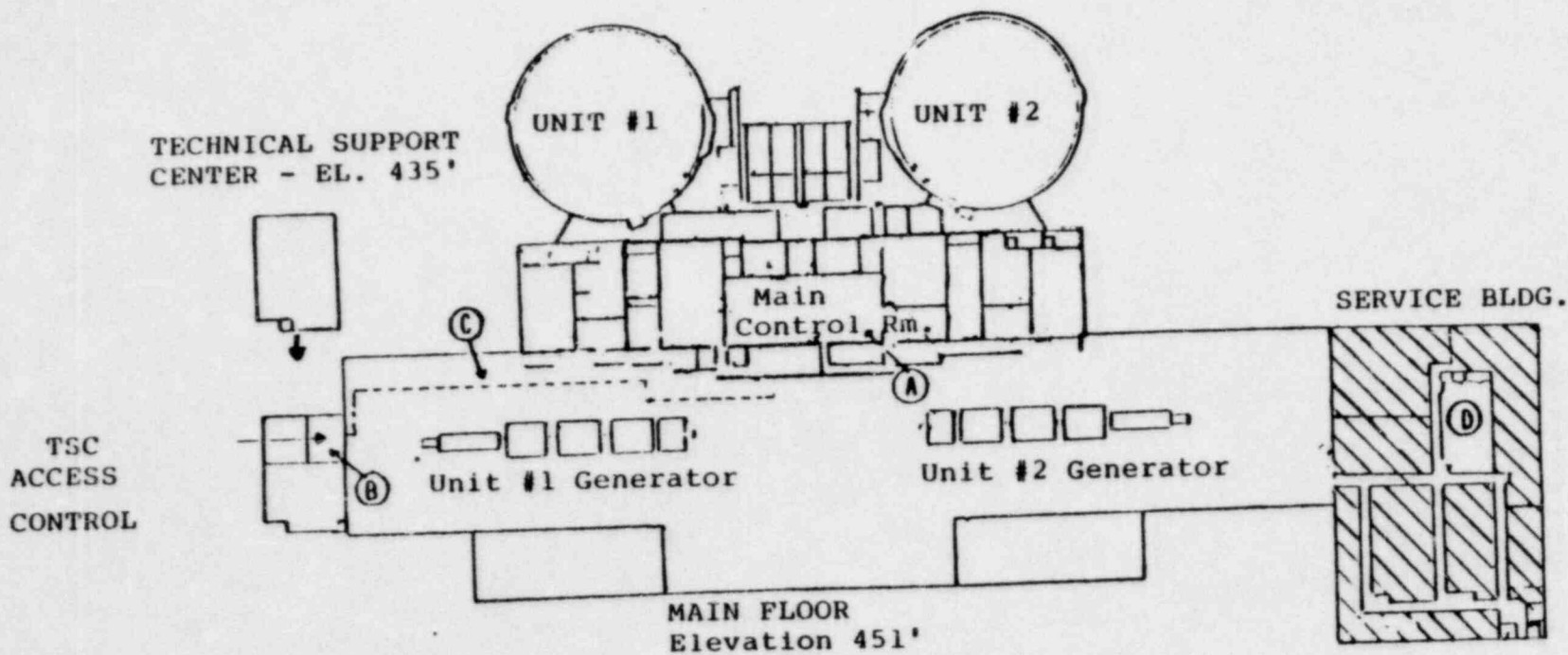
As mentioned in the generic plan, medical treatment given to injured persons at the station is of a "first aid" nature. When more professional care is needed, injured persons are transported to a local hospital or clinic. St. Joseph Medical Center in Joliet, Illinois is the designated hospital for handling contaminated injured personnel.




FIGURE BWA 7-1

LOCATION OF STATION EMERGENCY CONTROL CENTER

BWA 7-24



- A - CONTROL ROOM
- B - TECHNICAL SUPPORT CENTER
- C - PATHWAY TO TECHNICAL SUPPORT CENTER
- D - OPERATIONAL SUPPORT CENTER

 HIGHLIGHTS LOCATION OF OSC AND HALLWAYS WHICH HAVE ACCESS TO THE OSC IN THE SERVICE BUILDING

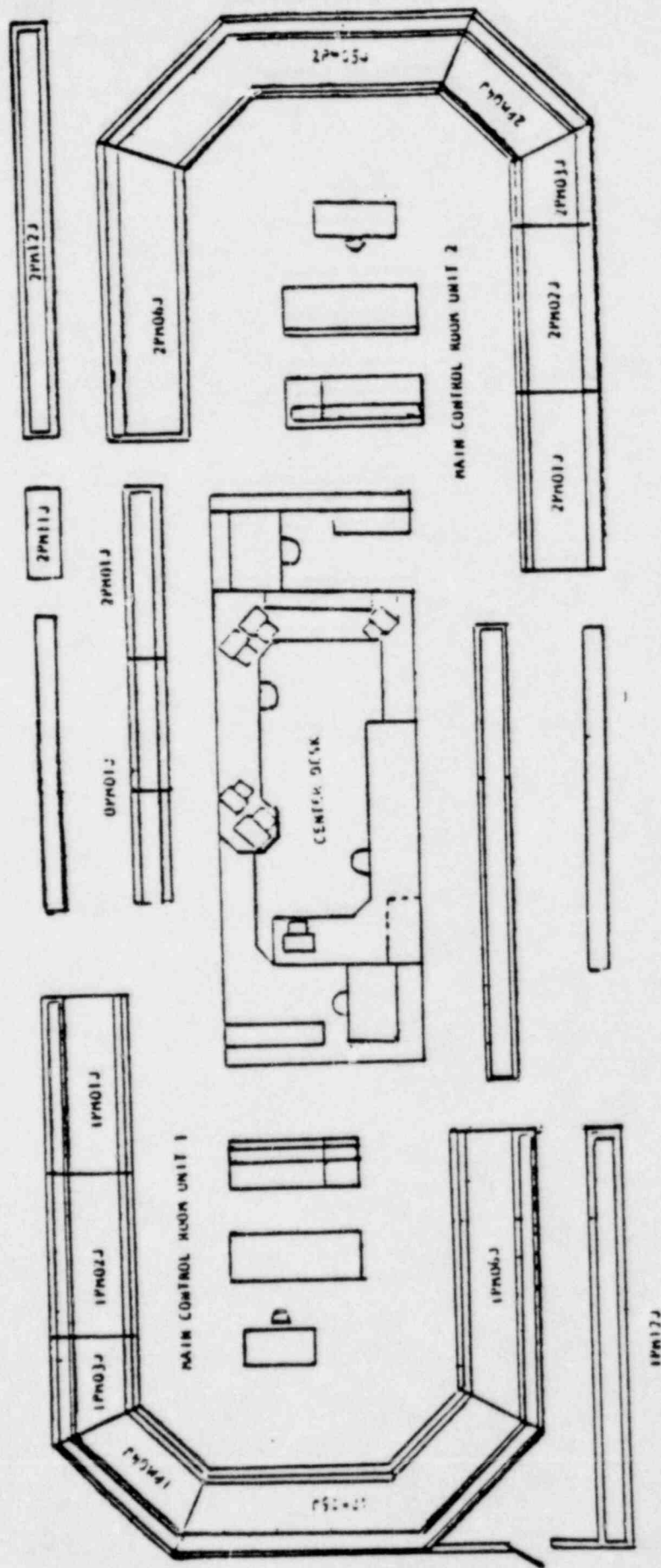


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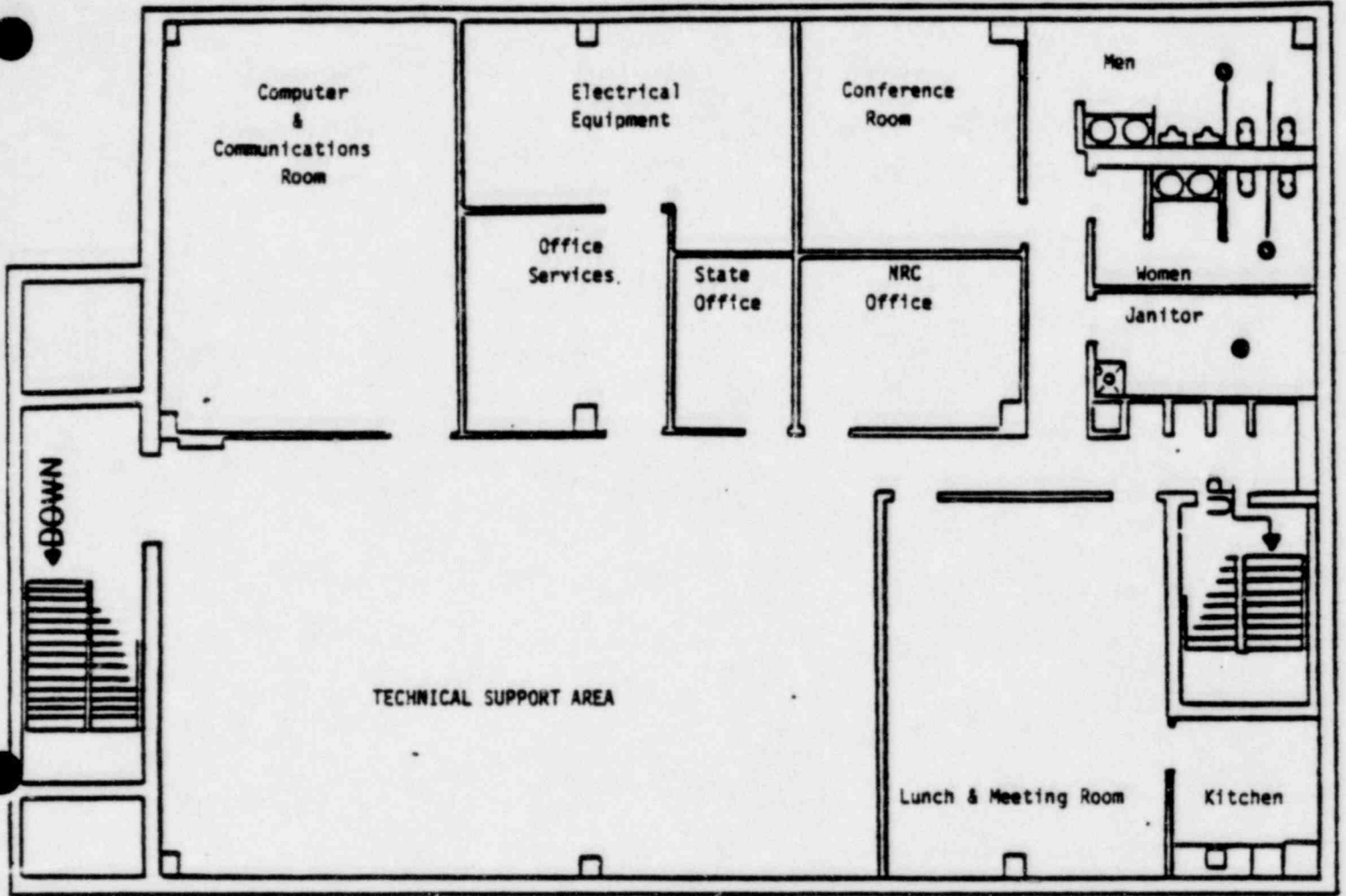
FIGURE BWA - 7-2

APPROXIMATE CONTROL ROOM  
LAYOUT

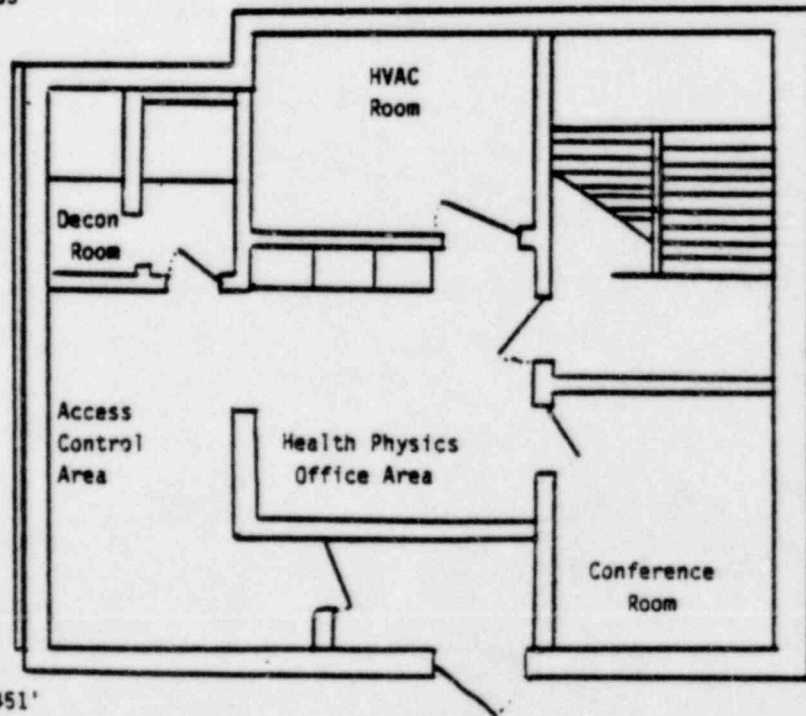


Control Room - Elevation 451' Level

FIGURE BWA 7-3



TSC Elevation 435'



TSC Elevation 451'

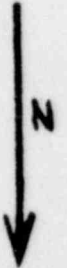
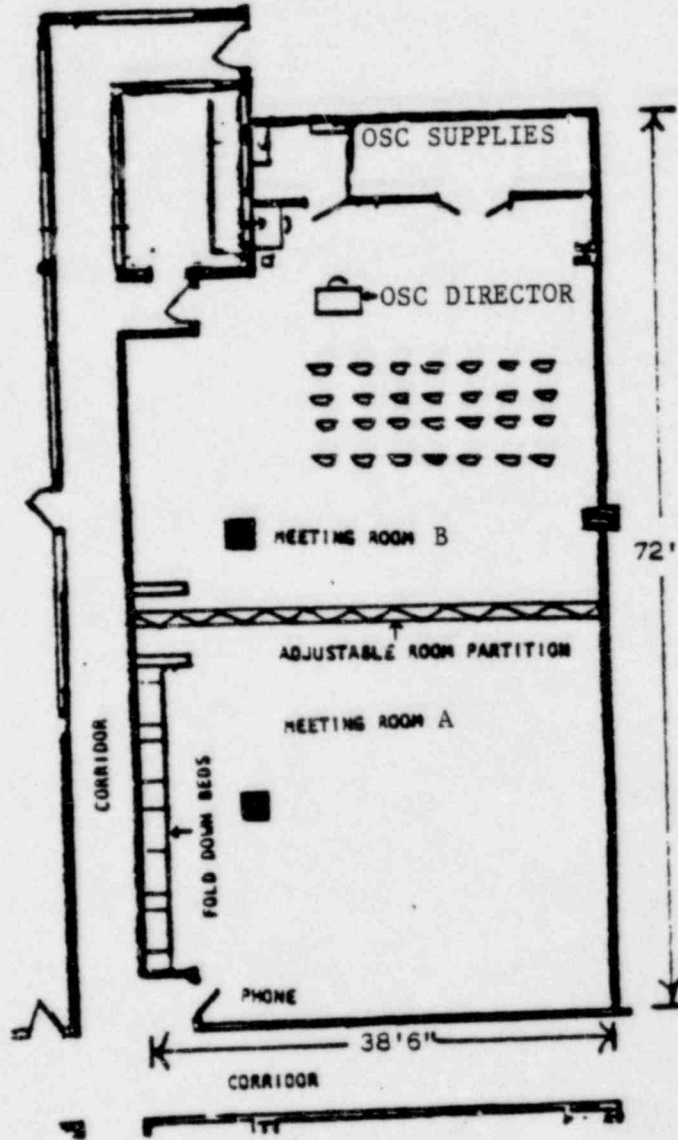


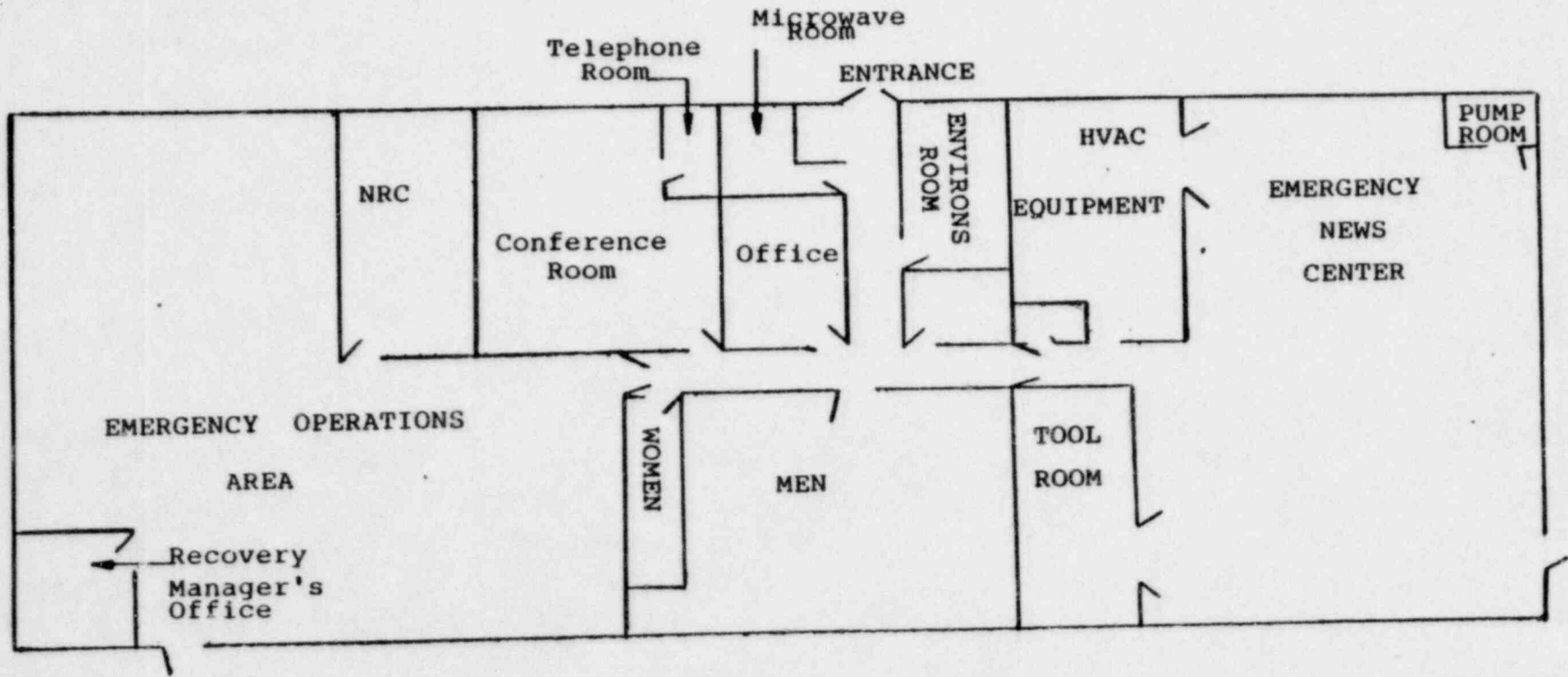
FIGURE BWA 7-4

APPROXIMATE LAYOUT FOR BRAIDWOOD STATION OSC



OSC SERVICE BLDG. 451' LEVEL

FIGURE BWA 7 - 5  
APPROXIMATE LAYOUT FOR BRAIDWOOD EOF,  
MAZON, ILLINOIS



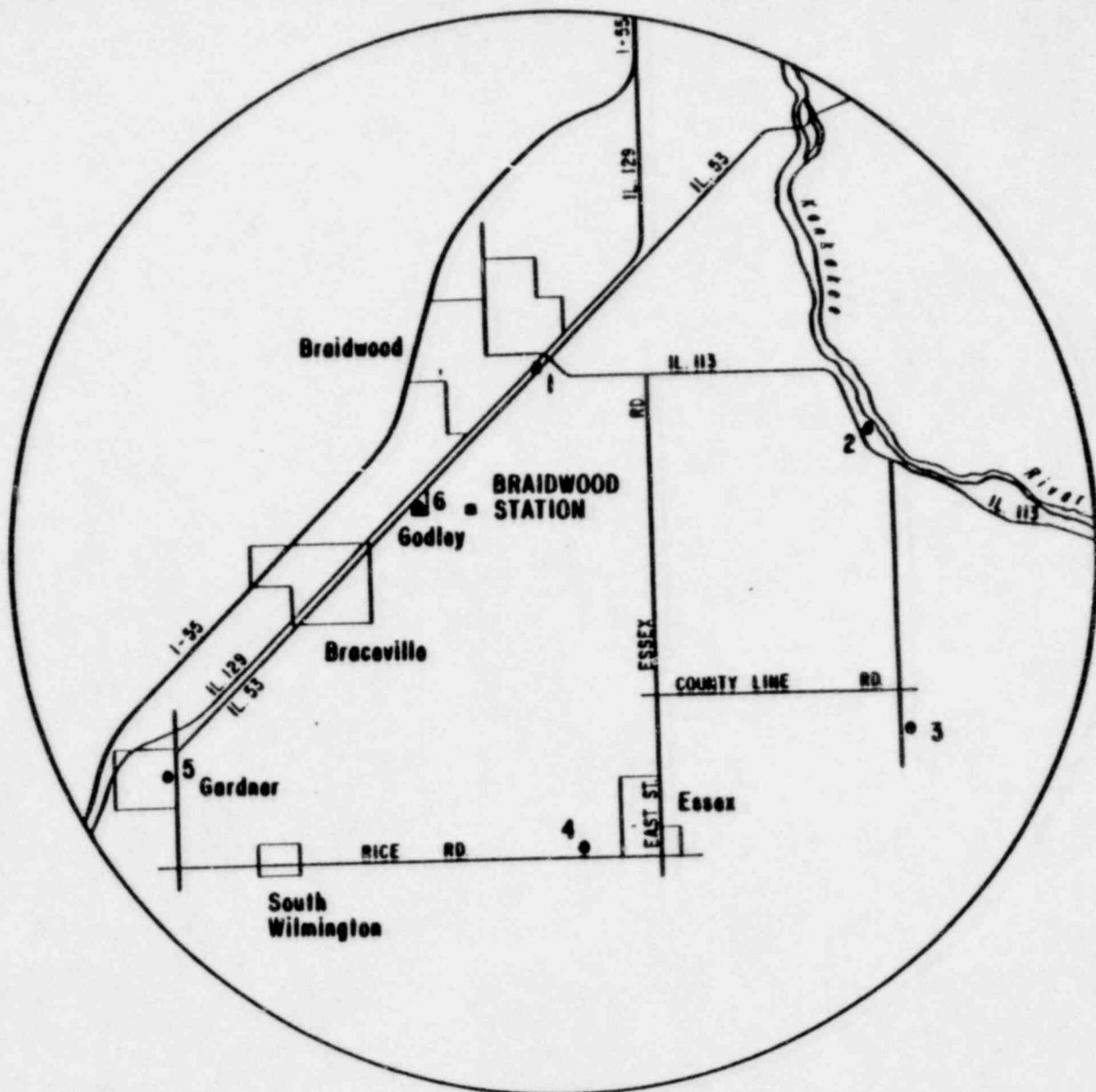
BWA 7-28

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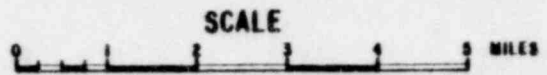
# LOCATIONS OF FIXED ENVIRONMENTAL RADIOLOGICAL MONITORING STATIONS

## BRAIDWOOD

- BD-01 Braidwood
- BD-02 Custer Park
- BD-03 County Line Road
- BD-04 Essex
- BD-05 Gardner
- BD-06 Godley



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FIGURE BWA 7-7

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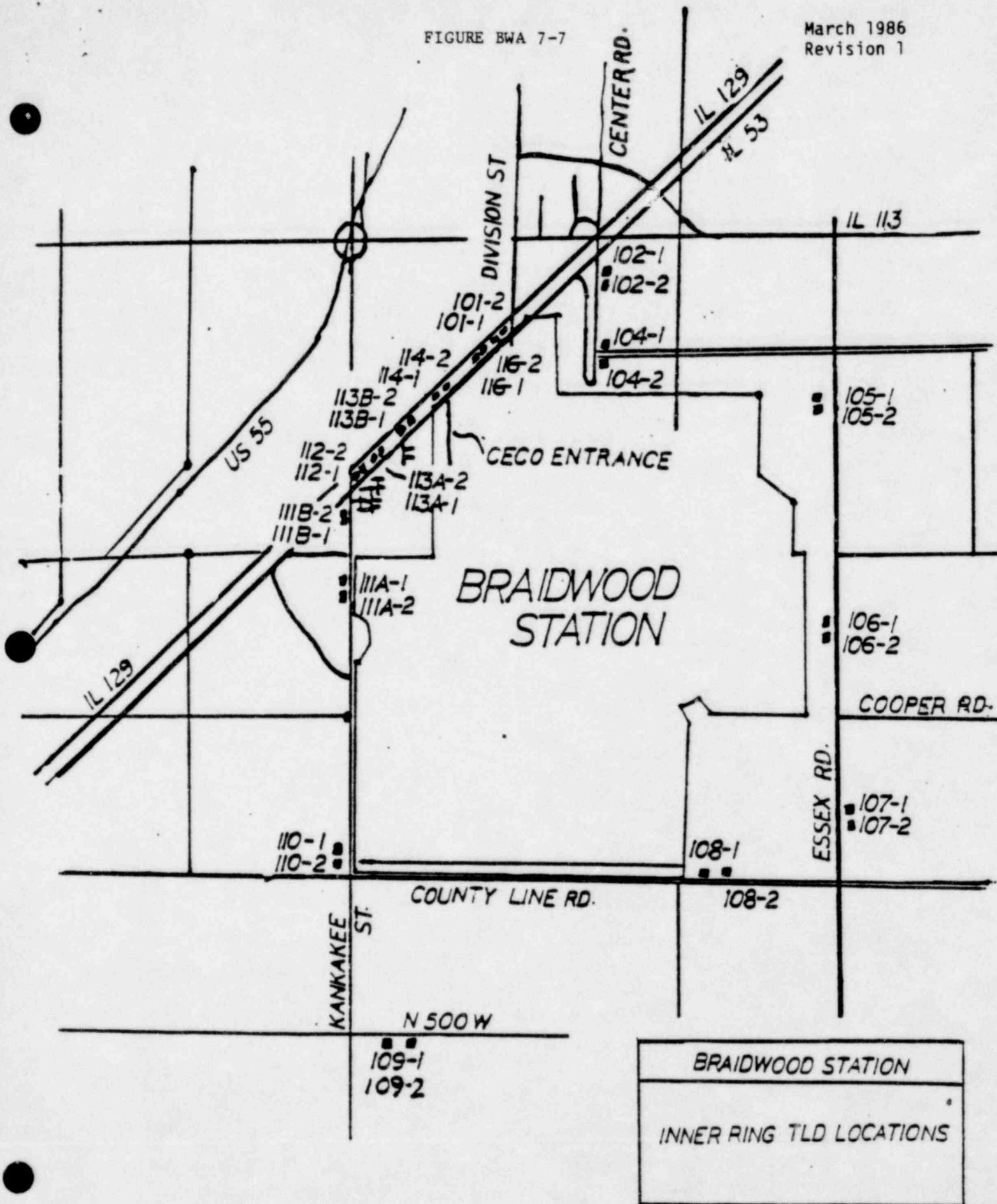


FIGURE BWA 7-8

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## 8.0 MAINTAINING EMERGENCY PREPAREDNESS

### 8.1 General

As required by the generic GSEP, appropriate initial and annual retraining must be given to all Commonwealth Edison emergency personnel. The Commonwealth Production Training Department is responsible for ensuring that necessary training is given. As a matter of practice, the Station Training Department will actually perform the training of onsite emergency personnel, under the guidance of the Production Training Department. Station personnel who are assigned positions in the offsite GSEP organization will receive appropriate additional training from staff members of the Division Vice-President, Nuclear Stations.

Section 8.3 of the generic GSEP outlines the required schedule for exercises and drills. The Division Vice-President, Nuclear Stations and his staff are responsible for ensuring that the required exercises and drills are scheduled and conducted. (For the monthly NARS test, periodic fire drills, and augmentation drills, however, the Station is entirely responsible for completion.) The required exercises and drills include:

- 1) Annual exercises
- 2) Annual Communication Drills
- 3) Monthly NARS tests
- 4) Annual Environmental Monitoring drills
- 5) Semiannual Health Physics drills
- 6) Annual Medical drills
- 7) Annual Assembly and Accountability drills

- 8) Semi-annual Offshift Augmentation drills
- 9) Periodic Fire drills (in accordance with technical specification requirements.)

The augmentation drills are unannounced and involve implementation of the Station call-list procedure and documentation of the times when persons are notified. These drills will serve to demonstrate the capability to augment the onshift staff within a short period following an emergency declaration.

Communications with the NRC Region III Office and the NRC Operations Center will be tested monthly from the TSC, EOF, and Control Room. During all scheduled exercises and drills, the Station is responsible for supplying requested equipment, facilities and participants; the Station is also responsible for providing assistance in choosing exercise and drill dates that are suitable for all involved parties.

Commonwealth Edison is committed to offer and provide educational information to the local population, news media, and local support agencies. With regard to annual dissemination of information to the populace within the ten mile EPZ, the Commonwealth Communication Services Department is responsible for mailing information to the populace as well as distributing the information to city halls, state parks, campgrounds, and other areas where a transient population may obtain a copy. The Commonwealth Communication Services Department will offer annual

programs to local news media surrounding each nuclear station. The Station Manager is responsible for offering training to local support organizations as described in Section 8.1.2 of the generic GSEP.

8.2 Review and Updating of the Plan and Procedures

This Annex shall receive an annual review by Braidwood Station and shall be updated as required in order to keep it consistent with the generic plan and to incorporate significant changes in site specific equipment, procedures, local agencies, etc. Refer to the generic plan for other aspects of document control for the GSEP.

Emergency Plan Implementing Procedures shall be developed consistent with the GSEP, shall be reviewed every two years\*, and shall address items discussed in Section 9.2 of the generic plan.

\*Reference: Braidwood FSAR Paragraph 13.3.16, Responsibility for Planning Effort, Paragraph 13.3.-10 and Paragraph 13.3.-11.

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## BRAIDWOOD GSEP ANNEX REVISION INDEX PAGE

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		8-3	0

BRAIDWOOD STATION EMERGENCY PLAN ANNEX

TABLE OF CONTENTS

This annex generally follows the same format as the generic section of the GSEP. However, an exact section by section correspondence is not intended.

- 1.0 Introduction
- 2.0 Definitions
- 3.0 Summary of Emergency Plan
- 4.0 Organizational Control of Emergencies
  - 4.1 Normal Plant Organization
  - 4.2 Non-Commonwealth Support Groups
  - 4.3 Coordination with Governmental Agencies
- 5.0 Classification of Emergency Conditions
- 6.0 Emergency Measures
  - 6.1 Activation of the Emergency Organization
  - 6.2 Assessment Actions
  - 6.3 Protective Actions for Offsite Personnel
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- 7.0 Emergency Facilities and Equipment
  - 7.1 Emergency Control Centers
  - 7.2 Communications Systems
  - 7.3 Assessment Facilities
  - 7.4 Protective Facilities and Equipment
  - 7.5 First Aid and Medical Facilities
- 8.0 Maintaining Emergency Preparedness
  - 8.1 General
  - 8.2 Review and Updating of the Plan and Procedures

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BRAIDWOOD STATION EMERGENCY PLAN ANNEX

1.0 INTRODUCTION

This Commonwealth Generating Stations Emergency Plan Annex addresses site specific emergency planning for the Braidwood Nuclear Station. Planning efforts common to all Commonwealth nuclear generating stations are encompassed within the generic GSEP. Written station procedures implement the requirements and guidance given in this plan.

The Braidwood Station Emergency Plan Annex is not independent of the generic Commonwealth GSEP. Emergency planning information common to all Commonwealth Nuclear Stations is not necessarily repeated in this annex, but may be in some cases in the interest of continuity and clarification. The content of this annex conforms to Section 9.1 of the generic GSEP.

1.1 Facility Description

The Braidwood Nuclear Generating Station - Units 1 & 2 (Braidwood Station) is located in northern Illinois, approximately 20.0 miles south-southwest of the City of Joliet and 3.0 miles west of the Kankakee River, in Will County. The site is situated in an area composed of flat agricultural farmland that has been scarred from coal strip mining.

The station site is roughly rectangular in shape, with the plant structures occupying the northwest portion of the site. The following coordinates of the centers of the containments in the Universal Transverse Mercator Coordinate System are given below to the nearest 100 meters. Latitude and longitude are given to the nearest second.

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<u>Nuclear Unit</u>	<u>Latitude and Longitude</u>	<u>UTM Coordinates</u>
1	41° 14' 38"N X 88° 13' 42"W	4,565,300 N 397,000 E
2	41° 14' 36"N X 88° 13' 42"W	4,565,200 N 397,000 E

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At its closest approach, the Kankakee River is approximately 3.0 miles east of the northeastern site boundary.

Braidwood Station occupies approximately 4454 acres of land. This area includes the main site area and the cooling lake. The main site area occupies approximately 1917 acres, and the cooling lake occupies the remaining 2357 acres. Figure BWA 1-1 shows the general location of Braidwood Station.

The plant consists of two identical pressurized water reactor (PWR) nuclear steam supply systems (NSSS) and turbine-generators furnished by Westinghouse Electric Corporation. Each nuclear steam supply system is designed for a power output of 3425 MWT. The equivalent warranted gross and approximate net electrical outputs of each unit are 1175 MWe and 1120 MWe, respectively. Cooling for the plant is provided by a cooling lake of 2537 acres with an average depth of approximately 10 feet.

Braidwood Station has two release points for gaseous radioactive effluents, the two Auxiliary Building ventilation stacks. The top of each stack rises 200 feet above the grade elevation. Braidwood Station has one release point for liquid radioactive effluents, the Kankakee River. Liquid radioactive wastes are stored and sampled prior to release to the Kankakee River. A radiation monitor in the discharge line will automatically terminate releases if radioactivity levels exceed predetermined values.



1.2 Plant Exclusion Area

The Braidwood Station Exclusion Area as defined in 10 CFR 100 is located entirely within the site boundary, as shown in Figure BWA 1-2. Since Commonwealth Edison owns all properties within the site boundary, it also owns the Exclusion Area and has the authority to determine and control all activities occurring within the Exclusion Area, including removal and exclusion of personnel or property from the site. Commonwealth Edison owns all mineral rights and easements for the Exclusion Area, as well as for the remainder of the site property.

For accident releases, the minimum Exclusion Area Boundary distance is 485 meters, measured from the outer containment wall.

1.3 Low Population Zone (LPZ)

The Low Population Zone (LPZ) as defined in 10 CFR 100.3(b) is "the area immediately surrounding the Exclusion Area which contains residents, the total number and density of which are such that there is a reasonable probability that appropriate protective measures could be taken in their behalf in the event of a serious accident." The 10 CFR 100.11(2) also lists numerical criteria to be met by the LPZ, namely that the LPZ is "of such size that an individual located at any point on its outer boundary who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of passage) would not receive a total radiation dose to the whole body in excess of 25 rem or a total radiation dose in excess of 300 rem to the thyroid from iodine exposure."

The Low Population Zone that was chosen for the Braidwood Station consists of that area within a 1810 meter radius (measured from the midpoint between the two reactors) of the site. The Low Population Zone for the Braidwood Station is based on dose considerations as delineated in 10 CFR 100 and the population distribution around the station. Figure BWA 1-3 depicts the transportation route and public facilities within the LPZ.

#### 1.4 Population Centers

A population center distance as defined in 10 CFR 100 means the distance from the reactor to the nearest boundary of a densely populated center containing more than 25,000 residents. Additionally, there must be "a population center distance of at least one and one-third times the distance from the reactor to the outer boundary of the low population zone." The closest such center is Joliet, Illinois. Its nearest boundary is located approximately 20 miles north northeast of the reactors, Joliet had a 1970 population of 80,367 and a 1980 population of 77,956.

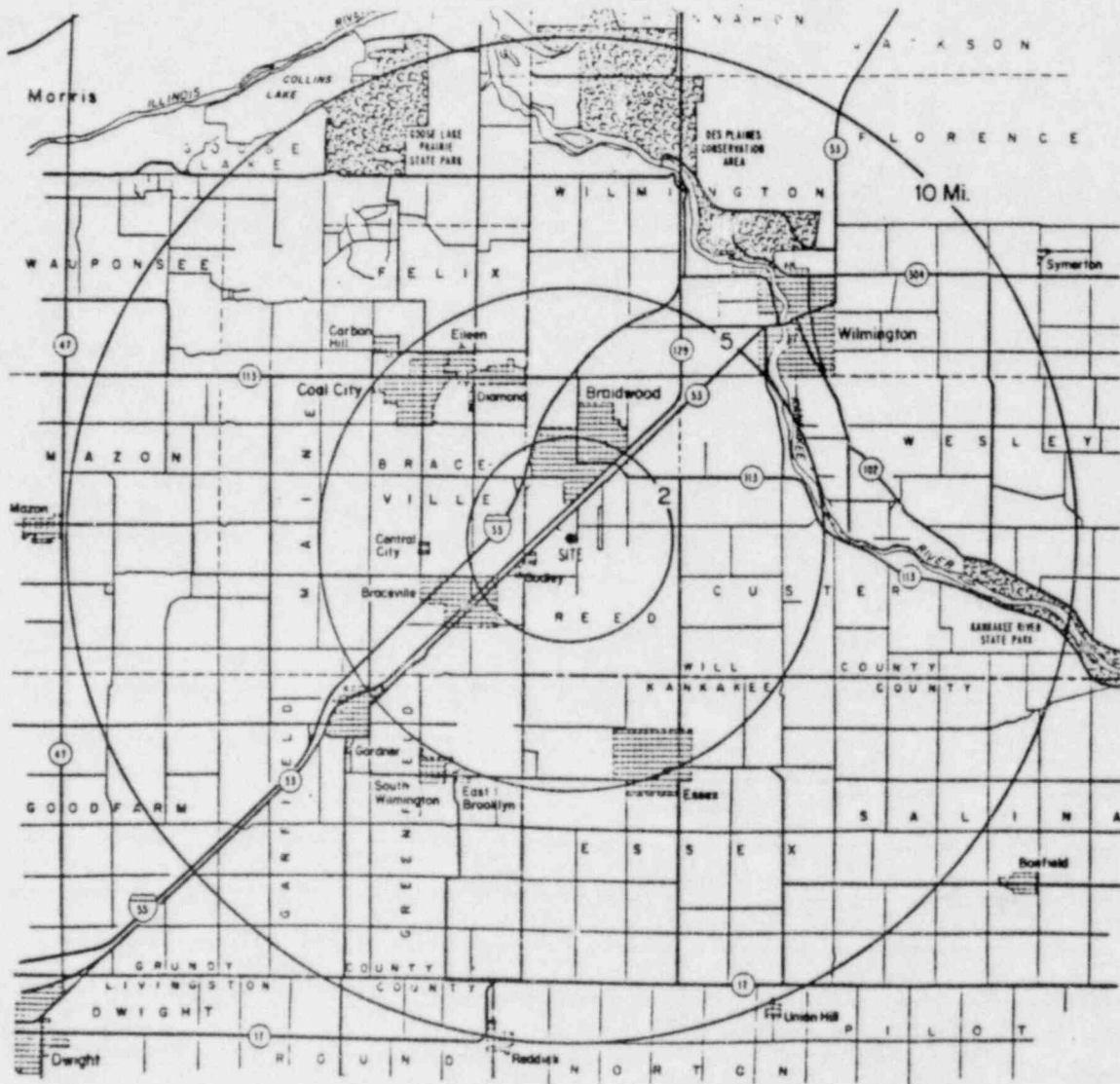
Refer to Table BWA 1-1 which lists the population distribution within a fifty mile radius of Braidwood Station.

#### 1.5 Emergency Planning Zone






The plume exposure Emergency Planning Zone (EPZ) for Braidwood Station shall be an area surrounding the Station with a radius of about ten miles. See Figure BWA 1-1.

The ingestion exposure Emergency Planning Zone (EPZ) for Braidwood Station shall be an area surrounding the Station with a radius of 50 miles. See Figure BWA 1-4.

FIGURE BWA 1-1  
LOCATION OF BRAIDWOOD STATION



LEGEND

-  STATE HIGHWAY
-  INTERSTATE HIGHWAY
-  INCORPORATED AREA (CITY OR VILLAGE)
-  TOWNSHIP BOUNDARY
-  COUNTY BOUNDARY

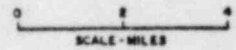


FIGURE BWA 1-2  
BRAIDWOOD STATION EXCLUSION AREA

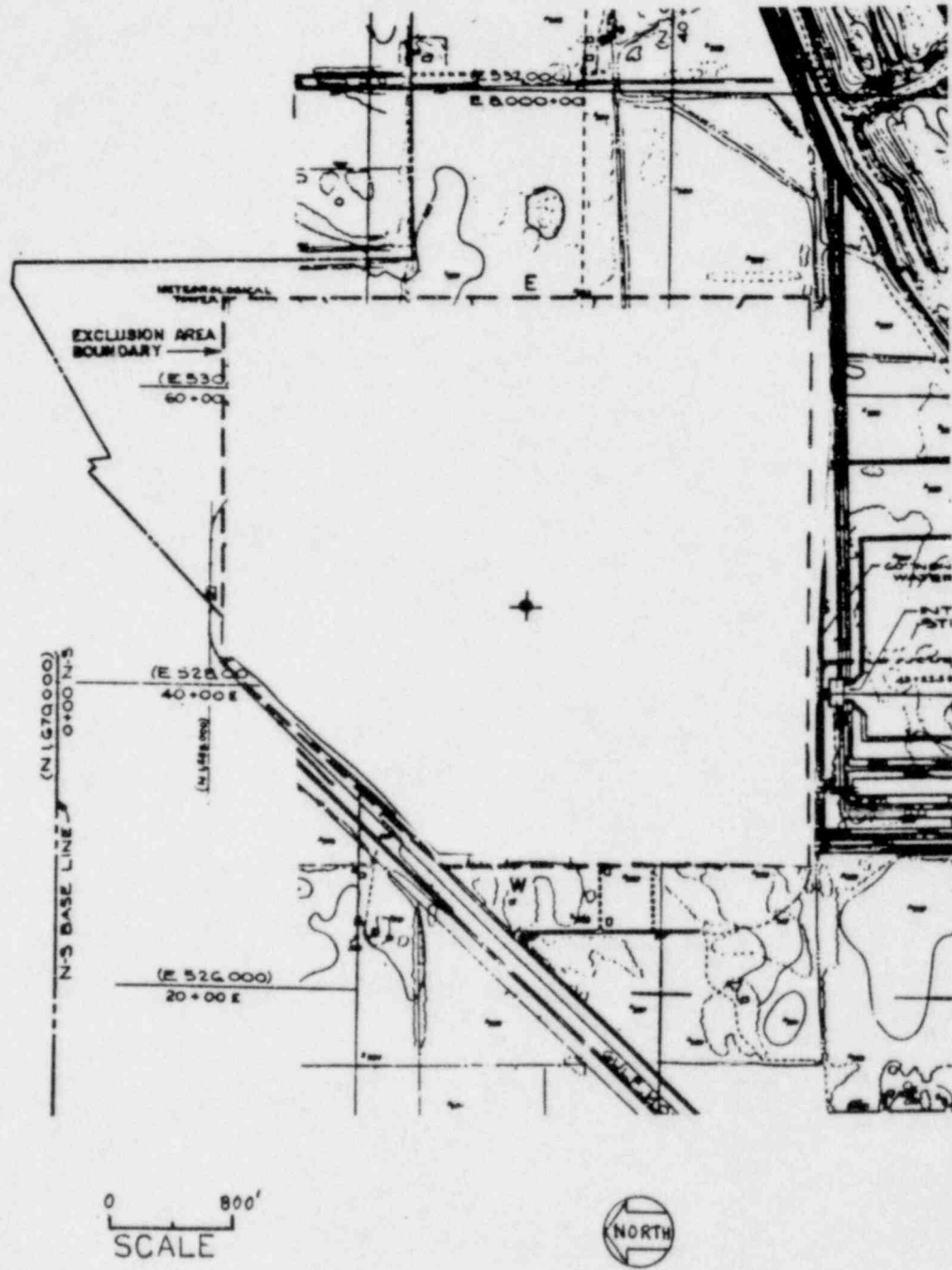


FIGURE BWA 1-3

MAJOR ROADS AND RAILROADS  
WITHIN 5 MILES OF THE STATION

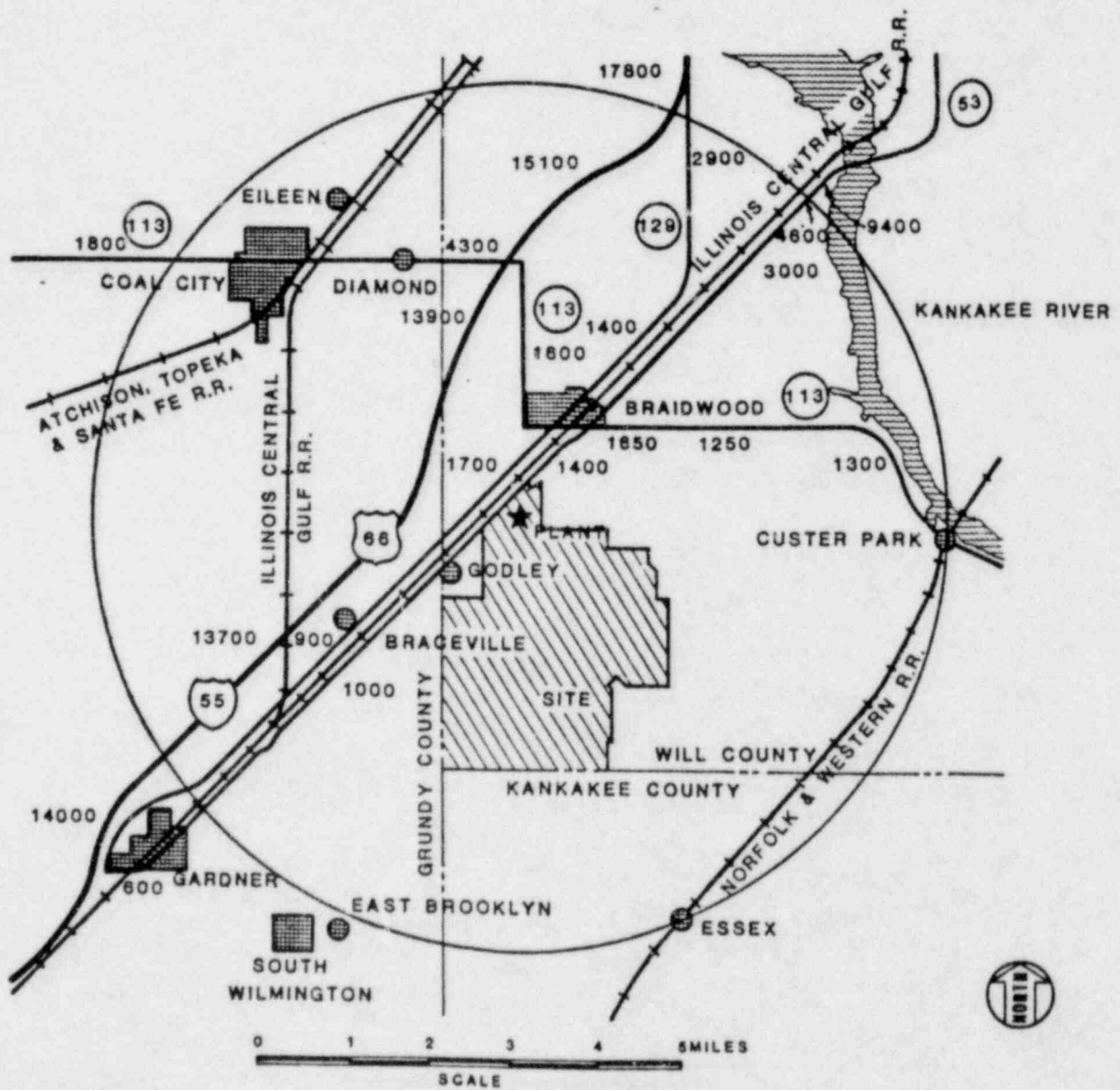


FIGURE BWA 1-4  
BRAIDWOOD STATION INGESTION EXPOSURE  
EMERGENCY PLANNING ZONE

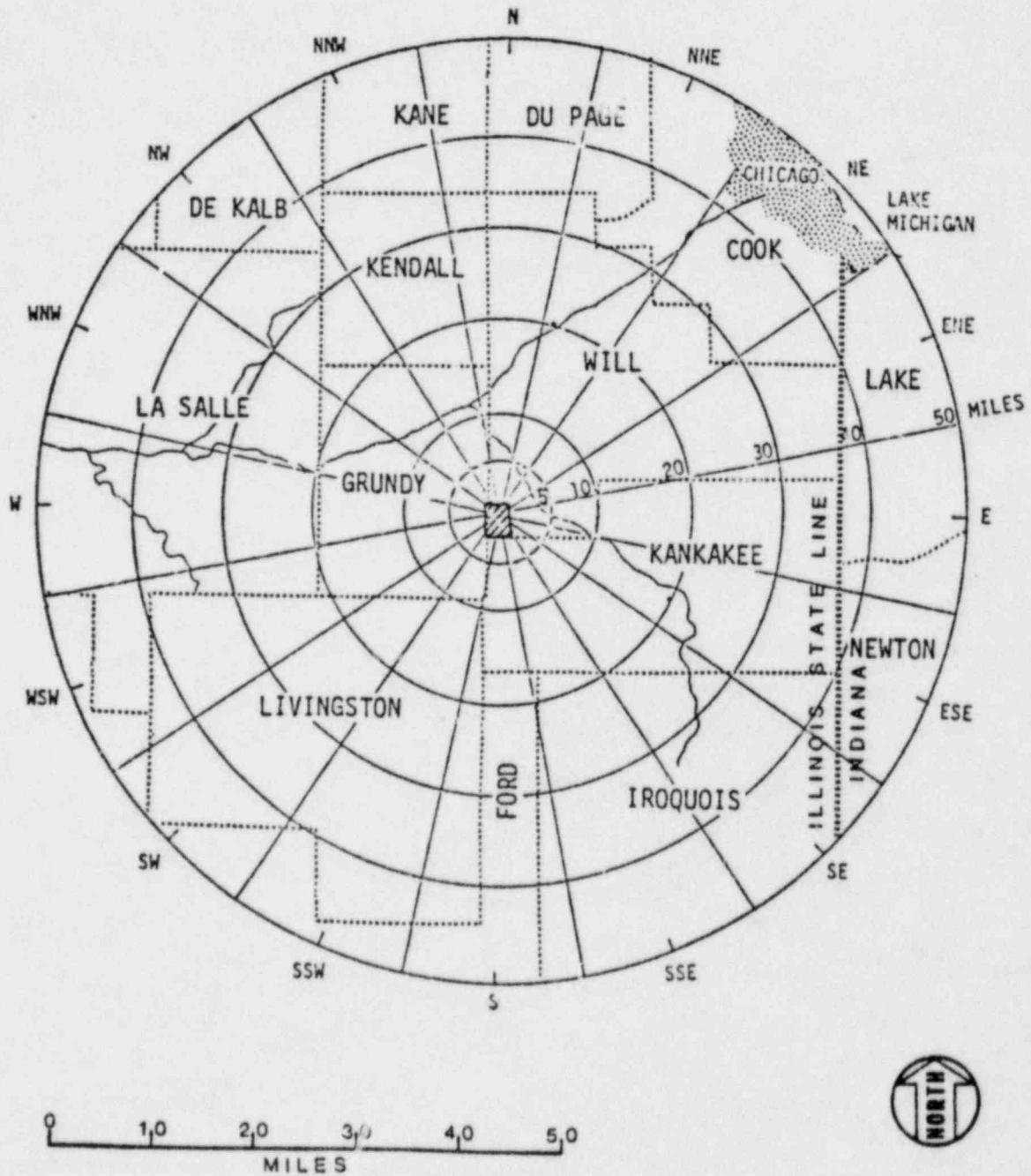


TABLE BWA 1-1

## SECTORS AND ZONE DESIGNATORS AND CALCULATED 1980 POPULATION DISTRIBUTION

## WITHIN 50 MILES OF THE BRAIDWOOD STATION

SECTOR CENTERLINE IN DEGREES FROM TRUE NORTH FROM FACILITY	22-1/2° SECTOR	MILES FROM FACILITY										SECTOR TOTAL
		0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50	
0 + 360	A	34	690	389	15	2	309	18,118	21,607	159,852	196,880	397,896
22-1/2	B	75	823	960	294	70	234	18,014	140,555	210,493	806,860	1,178,378
45	C	0	107	103	0	480	4,735	4,170	31,037	328,860	1,831,653	2,201,145
67-1/2	D	4	12	22	0	291	1,980	1,252	7,008	135,725	251,879	398,195
90	E	0	0	13	28	22	1,027	1,875	7,055	6,972	16,999	33,991
112-1/2	F	0	0	17	18	50	236	25,876	45,742	9,524	3,854	85,317
135	G	0	0	4	9	8	156	3,479	6,320	2,591	9,739	22,306
157-1/2	H	0	0	60	9	235	358	1,963	1,977	5,545	2,618	12,765
180	J	0	0	0	3	3	686	1,191	1,583	2,918	2,502	8,886
202-1/2	K	0	8	17	29	173	849	833	1,395	6,401	2,418	12,123
225	L	402	296	214	19	89	1,384	4,926	2,012	14,651	6,144	30,137
247-1/2	M	82	218	0	37	214	163	711	2,612	21,515	5,561	31,113
270	N	0	34	179	3	11	794	1,075	2,013	8,987	31,459	44,555
292-1/2	P	8	0	8	37	13	251	1,970	9,491	19,687	4,206	35,671
315	Q	4	25	42	1,499	1,340	928	11,138	3,675	12,042	4,979	35,672
337-1/2	R	6	256	119	1,692	526	920	1,840	6,195	29,119	11,818	52,491
RADIAL ZONE	TOTAL	615	2,469	2,147	3,714	3,527	15,010	98,431	290,277	974,882	3,189,569	4,580,641

Notes: 1. The 0-10 mile population estimates were based on a house count, 1981 - 1982 aerial photographs and a 1981 field survey.

2. The 10-50 mile population data represent the incorporated areas for which 1980 Census Bureau information was available and estimates of unincorporated area, which were derived on the basis of 1980 County Population minus the 1980 population data for the incorporated areas. Both incorporated and unincorporated areas were visually proportioned into each sector.

0320A/wjm

October, 1984  
Revision 0

BWA 1-10

2.0 DEFINITIONS

Terms used in this annex have the same meaning as those provided in Section 2.0 of the generic portion of the Commonwealth GSEP.

Abbreviations used in this annex that are site specific are as follows:

ANSI - American National Standards Institute  
ARM - Area Radiation Monitor  
BWPS - Braidwood Nuclear Power Station  
BTR - Boron Thermal Regeneration  
BWA - Braidwood Annex  
CASP - Containment Air Sample Panel  
CVCS - Chemical Volume and Control System  
DEG - Division of Emergency Government  
DNBR - Departure from Nucleate Boiling Ratio  
ESF - Engineered Safety Feature  
FSAR - Final Safety Analysis Report  
HRSS - High Radiation Sampling System  
HVAC - Heating, Ventilation and Air Conditioning  
MSL - Mean Sea Level  
NFPA - National Fire Protection Association  
RCC - Rod Cluster Control  
RMS - Radiation Monitoring System  
RHR - Residual Heat Removal  
VCT - Volume Control Tank



### 3.0 SUMMARY OF EMERGENCY PLAN

The Generating Stations Emergency Plan (GSEP) addresses Commonwealth's planning efforts for emergency situations at each of its nuclear generating stations. Both the generic GSEP and this site specific annex were prepared utilizing guidance provided by Regulatory Guide 1.101, Revision 2, and NUREG 0654, Revision 1. The Plan addresses:

- 1) Organizational control of emergencies;
- 2) Classification of emergency conditions;
- 3) Emergency response measures;
- 4) Emergency facilities and equipment; and
- 5) Maintaining emergency preparedness.

This GSEP annex provides specific planning information that was deemed inappropriate for inclusion into a generic plan but yet considered necessary for a full understanding and representation of the Station's emergency response capabilities.

This annex does not specifically address efforts for protecting the public from the effects of an accident. The State of Illinois has developed an "Illinois Plan for Radiological Accidents" and will coordinate implementation of all necessary protective actions for the public in Illinois. The Illinois Emergency Services and Disaster Agency will notify and coordinate with Indiana's Department of Civil Defense and Emergency Planning to implement all necessary protective actions in Braidwood Station's Ingestion Pathway Emergency Planning Zone. State emergency responses increase commensurate with the reported emergency.

#### 4.0 ORGANIZATIONAL CONTROL OF EMERGENCIES

The GSEP organization consists of two major groups. First, there is the Station Group, consisting of the directors and their associated staffs. Secondly, there is an offsite GSEP organization. For a full response situation, this group consists of twenty-nine directors and staff personnel. A detailed description of the total GSEP organization appears in Section 4.0 of the generic GSEP.

The purpose of this section is to provide specific information with regard to the Braidwood Station organization and governmental support agencies.

#### 4.1 Normal Plant Organization

The normal plant organization is basically the same for all Commonwealth nuclear stations. (Refer to Section 4.1 of the generic plan.)

##### 4.1.1 Station Superintendent

Braidwood Station is managed by a Station Superintendent who is responsible for direct management of the station including industrial relations, planning, coordination and direction of the operation, maintenance, refueling, and technical activities. During an emergency condition, the Station Superintendent is normally the GSEP Station Director. His specific responsibilities and duties are outlined in Table 4.2-1 of the generic GSEP. Those responsibilities of the Station Director that may not be delegated are as follows:

- 1) Declaration that an Unusual Event, Alert, Site Emergency, or General Emergency Condition exists. General categorization of emergencies may be done by other plant personnel in accordance with approved Station procedures. But the final decision to declare the emergency condition rests with the Station Director; and
- 2) Decision to notify and recommend protective actions to offsite authorities in the case where a Site Emergency or General Emergency condition exists and the Recovery Manager or Corporate Command Center Director have not been contacted or are not prepared to make an informed decision. In all other cases, the decision to notify and recommend protective actions to offsite authorities shall be made by the Recovery Manager or Corporate Command Center Director. This responsibility may not be delegated. Actual notification and transmittal of these recommendations may be delegated.

4.1.2

Shift Engineer

The Shift Engineer on duty is responsible for operating the plant in compliance with the station operating license and procedures. During his shift, the Shift Engineer is in charge of operating the entire plant in a safe and reliable condition.

A Shift Engineer is on duty 24 hours a day and is normally the initial GSEP Station Group Director and as such has the authority for declaring an emergency and recommending protective actions to local authorities.

4.1.3

Qualifications of Plant Personnel

The guidelines of ANSI N18.1-1971 are generally followed by Braidwood Station management for personnel selection and training. For some positions, alternate qualifications are utilized based upon operating experience.

4.1.4 Contractor Performance

Ultimate responsibility for contractor performance from support contractors rests with the Station Superintendent.

4.1.5 Minimum Shift Manning

The minimum staffing required at Braidwood Station is the same as is required at other Commonwealth two-unit nuclear stations. Refer to Figure 4.2-2 of the Generic GSEP.

4.1.6 Health Physics Organization

The Station Rad/Chem Supervisor is responsible for the health physics program and for handling and monitoring of radioactive materials. Normally reporting to the Rad/Chem Supervisor are health physicists, chemists, foremen and technicians. During an emergency situation, the Rad/Chem Supervisor normally acts as the GSEP Rad/Chem Director.

4.1.7 Augmentation of Plant Staffing During An Emergency

Braidwood Station is committed to augment its onsite organization under emergency conditions. The Station uses, as guidance, Figure 4.2-3 of the generic GSEP in planning for its augmentation of plant staffing during an emergency. To facilitate the augmentation of plant staffing, Braidwood Station has established a 24 hour duty call individual who would be notified first after a station emergency is declared. This individual would initiate a prioritized notification (call-list) procedure.

4.2 Non-Commonwealth Support Groups

Agreements exist on file at Braidwood Station with several support agencies. These agencies and their support roles are as follows:

- 1) The Will County Sheriff's Office provides services of law enforcement.
- 2) Braidwood Fire and Rescue provides fire protection and ambulance services.
- 3) St. Joseph Hospital in Joliet will serve as the supporting medical facility for BWPS.
- 4) The Emergency Services and Disaster Agency (ESDA) on the State, County, and municipal levels will implement protective actions for the public. Note: The agreement with the Illinois agencies that have a role in the Illinois Plan for Radiological Accidents.
5. The Department of Energy, Chicago Operations Office, will respond to requests for radiological assistance. This assistance will normally be limited to advice and emergency action essential for the control of the immediate hazards to health and safety.
6. Electric Utilities Involved in Transportation of Nuclear Materials (INPO) provide voluntary assistance in mitigating the consequences of nuclear transportation accidents.

Additionally, Commonwealth Edison Company has contractual agreements with several companies whose services would be available in the event of an emergency. These agencies and their available services are as follows:

- 1) Teledyne Isotopes Midwest Laboratories provides environmental radiological monitoring services and radiochemical analysis.
- 2) Radiation Management Corporation provides services of medical and health physics support.
- 3) Murray & Trettel, Inc. provides meteorological monitoring services.
- 4) Landauer, Inc. provides personnel dosimetry services.

#### 4.3 Coordination with Governmental Agencies

As stated in the generic plan, the State of Illinois has the statutory responsibility and authority for protecting the health and safety of the public in Illinois. Within the State of Illinois authority is delegated as follows:

- 1) The Governor has overall offsite command authority for the protection of the public.
- 2) The Illinois Emergency Services and Disaster Agency (ESDA) exercises command and coordination and has programmatic responsibility for the implementation of protective actions as recommended for the public by the Illinois Department of Nuclear Safety (DNS) and the Governor.
- 3) The Department of Nuclear Safety has both the command authority for radiological aspects of a nuclear accident and the responsibility for performing various radiological functions. During an accident situation, the IDNS will make protective action recommendations to the Governor and the Illinois ESDA.

The State of Illinois will develop an annex to its State plan which specifically addresses protective action for the Illinois portion of the Braidwood Station Emergency Planning Zones.

The State of Indiana is a contiguous state affected by the Braidwood Station Ingestion Pathway Emergency Planning Zone. Within the State of Indiana, the Indiana Department of Civil Defense and Emergency Management will coordinate and provide liaison with the Illinois ESDA and supporting Federal agencies to ensure effective responses and aid in emergencies involving Braidwood Station which affect Indiana.

## 5.0 CLASSIFICATION OF EMERGENCY CONDITIONS

The generic section of the GSEP provides for classification of emergencies into six (6) categories. The first category, Transportation Accident, concerns an emergency involving the transportation of radioactive or other hazardous material from a nuclear generating station. The next four (4) categories: Unusual Event; Alert; Site (Area) Emergency; and General Emergency address emergencies of increasing severity. The sixth category of emergencies is the Recovery Phase. It is the responsibility of the Recovery Manager to consider the criteria in Table 5.0-6 of the Generic GSEP and determine when the Recovery Phase can be established.

Table BWA 5-1 includes the specific initiating conditions for each emergency class at Braidwood Station. Where possible, these initiating conditions are related to plant instrumentation readings.

In the event of equipment installation or other requirements, it may be necessary to quickly change the GSEP Emergency Action Levels at Braidwood Station. This may be done by first changing the Station Emergency Procedure for EALs and then, as soon as practical, by changing Table BWA 5-1 of this annex.

In an emergency situation, if more than one distinctive EAL of different classification levels is reached, e.g., an EAL for Alert and an EAL for Site Emergency, the highest classification level reached shall be declared.

Similarly, if more than one distinctive EAL of the same classification level is reached, e.g., two EALs for Site Emergency, consideration shall be given for declaration of a higher classification.

TABLE BWA 5-1

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
Class Description	Events in progress or have occurred which indicate a potential degradation of the level of safety of the plant.	Events in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant.	Events in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public.	Events in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity.
1) Aircraft crash or missiles from whatever source.	Impacted on-site.	Impacted on-site and has degraded equipment described in the Technical Specifications such that a limiting condition for operation requires a shutdown.	A) Impacted on-site and has degraded equipment described in the Technical Specifications beyond the limiting condition for operation that requires a shutdown; or B) has exceeded a Technical Specification safety limit.	
2) Control Room Evacuation		When 10CFR20 exposure limits are expected to be exceeded.	Due to exceeding 10CFR20 exposure limits, evacuation is required and control is <u>not</u> established from Local Control Stations or from Remote Shutdown Panel within 15 minutes.	



TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
3) Earthquake (activation of seismic monitoring alarm with level verification, not spurious, or testing)	Seismic equipment is activated. (at level of 0.02g)	At a level greater than Operating Basis Earthquake (> 0.095g)	At a level greater than Safe Shutdown (> 0.21g)	
4) Unplanned Explosion	Onsite but not affecting plant operations.	Explosion onsite has degraded equipment described in the Technical Specifications such that a limiting condition for operation requires a shutdown.	A) Explosion has degraded equipment described in the Technical Specifications <u>beyond</u> the condition for operation that requires a shutdown; <u>or</u> B) has exceeded a Technical Specification safety limit.	
5) Fire (ongoing as described by observation or alarm, and verified by the fire brigade)	A) Fire requires NRC notification if not identified within 10 mins.; <u>or</u> B) Fire requiring offsite assistance but not affecting plant operation.	Fire requires off-site assistance <u>and</u> has degraded equipment described in the Technical Specifications such that a limiting condition for operation requires a shutdown.	A) Fire requires off-site assistance <u>and</u> has degraded equipment described in Technical Specifications <u>beyond</u> the limiting condition for operation that requires a shutdown; <u>or</u> B) has exceeded a Technical Specification safety limit.	

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
6) Flood <u>OR</u> Low Water Level	Cooling pond dike failure affecting offsite property.	Water at level of Probable Maximum Flood (Cooling Pond water level at $\geq$ 598.17 feet MSL). eg. precipitation $\geq$ the Probable Maximum Precipitation of 31.9 inches in 48 hrs	Water level at plant grade elevation ( $\geq$ 601 feet MSL). eg. rainfall in excess of Probable Maximum Precipitation	
		<u>OR</u>	<u>OR</u>	
		Cooling Pond water level $\leq$ 590 feet MSL with coincident cooling pond dike failure.	Cooling Pond water level $\leq$ 584 feet MSL with coincident cooling pond dike failure.	
7) Security Threat Definition: Acts which threaten the safety of station personnel or the security of the nuclear units or special nuclear material. This includes crowd disturbances or acts of sabotage.	The following events as described in the Security Plan: (1) Obvious attempt to sabotage. (2) Internal disturbance (disturbance which is not short lived or is not a harmless outburst involving one or more individuals within the protected area).	An ongoing security threat (event) of increasing severity that persists for more than 60 min.	An ongoing security threat (event) involving an imminent loss of physical control of the facility.	An ongoing security threat (event) involving a loss of physical control of the facility.

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

<u>CONDITIONS</u>	<u>UNUSUAL EVENT</u>	<u>ALERT</u>	<u>SITE EMERGENCY</u>	<u>GENERAL EMERGENCY</u>
7) Security Threat Definition: (cont'd)	(3) Bomb device discovered. (4) Hostage. (5) Civil disturbance (spontaneous collective group gathering which disrupts normal operations). (6) Armed or forced protected area intrusion. (7) Armed or forced vital area in- trusion.			

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

<u>CONDITIONS</u>	<u>UNUSUAL EVENT</u>	<u>ALERT</u>	<u>SITE EMERGENCY</u>	<u>GENERAL EMERGENCY</u>
8) Tornado or severe winds being experienced (Wind speed as indicated in Control Room is used to classify condition.)	A) Tornado near Facility (1) Control Room informed by Load Dispatcher <u>OR</u> (2) Station personnel have made visual sighting; <u>or</u> B) Sustained winds > 60 mph.	A) Tornado strikes Facility <u>or</u> B) Sustained winds > 75 mph	Sustained winds > 85 mph and either unit <u>not</u> in cold shutdown.	
9) Toxic Gas	Uncontrolled release of Toxic gas at life threatening levels near or onsite.	Entry of Toxic gas into the protected area.	Entry of Toxic Gas gas into vital areas affecting the safe shutdown of the plant.	
10) Loss of AC Power	Loss of all offsite AC power <u>or</u> loss of all onsite AC power required per unit.	Loss of all offsite AC power <u>and</u> loss of all onsite AC power required per unit.	Both ESP 4KV busses per unit deenergized for > 15 minutes.	Ongoing loss of power <u>and</u> total loss of feedwater makeup capability.

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
11) Loss of DC Power.	Loss of DC Power sources has degraded equipment described in the Technical Specifications such that a limiting condition for operation requires a shutdown.	Loss of all ESF DC power, per unit.	Busses 111 (211) and 112 (212) are <u>both</u> deenergized for 15 minutes.	
12) Plant Shutdown functions.		<p>A) Complete loss of any function needed to maintain cold shutdown (Both RH trains, <u>OR</u> both CC trains, <u>OR</u> both SX trains.)</p> <p style="text-align: center;"><u>OR</u></p> <p>B) Failure of the Reactor Protection System instrumentation to initiate and complete a reactor trip, which brings the reactor sub-critical once a limiting safety system setpoint has been exceeded.</p>	<p>A) Complete loss of any function needed to maintain hot shutdown. (If you do not have at least one operable S/G with wide range level <math>\geq</math> 65% <u>AND</u> ability to control steam release either by S/G PORV, <u>OR</u> steam dump capability to the condenser.)</p> <p style="text-align: center;"><u>OR</u></p> <p>B) Transient requiring operation of shutdown systems with failure to trip. (Power generation continues, but no core damage evident.)</p>	<p>Transient requiring operation of shutdown systems with failure to trip and core damage is evident.</p>

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
13) Loss of most or all alarm capability of annunciators.		In the Main Control Room.	In the Main Control Room <u>and</u> a plant transient in progress.	
14) Conditions or systems required by Technical Specifications (i.e. ECCS, fire protection, etc.)	Equipment described in the Technical Specifications is degraded such that a limiting condition for operation requires a shutdown.	A) Equipment described in the Technical Specifications is degraded beyond the limiting condition for operation that requires a shutdown;  <u>OR</u> B) Has exceeded a Technical Specification safety limit.		
15) Inadequate Core Coolant	> 650°F in average of 10 highest incore thermocouple readings  <u>OR</u> Subcooling < 25°F for 15 minutes.	Braidwood Status Tree's (BWST's) require entry into BWFR-C.2 Response to Degraded Core Cooling, based on subcooling, number of RCP's running, vessel level, and core exit thermocouples.	Braidwood Status Tree's (BWST's) require entry into BWFR-C.1 Response to Inadequate Core cooling based on subcooling, number of RCP's running, vessel level, and core exit thermocouples.	

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
16) Loss of Primary Coolant	<p>A) Failure of a primary system safety or relief valve to close, <u>OR</u> a primary PORV failure to close, and its block valve will not isolate.</p> <p>B) Exceeding Reactor coolant system leak rate as specified in Technical Specifications.</p>	A > 50 gpm leakage <u>increase</u> in a 4 hour period as indicated by either leak rate calculations, charging pump flow or VCT level changes.	Primary system leakage is beyond makeup capabilities of charging pumps.	<u>And</u> Failure to activate ECCS
17) Main Steam Line Break/Feed line Break	With zero or small primary to secondary leakage and/or small percentage of failed fuel.	With 1 gpm primary to secondary leakage and with 1% failed fuel.	Ten (10) gpm primary to secondary leakage <u>And</u> significant fuel damage.	
18) Loss of Heat Sink		Braidwood Status Tree's (BWST's) require entry into BWFR-H.1 Response to Loss of Secondary Heat Sink, based on total feedwater flow to the steam generators.	Alert condition is on going for 15 minutes. (Loss of all feedwater and all auxiliary feed water, and the residual heat removal system is not in operation.)	Alert condition is on going for 45 minutes. (Loss of all feedwater and all auxiliary feed water and the residual heat removal system is not in operation.)

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
19) Steam Generator Tube Rupture	Exceeding primary to secondary leakage rates as specified in Technical Specifications.	Entry into BWEP-3 Steam Generator Tube Rupture with the following: Reactor Trip/Safety Injection <u>AND</u> 1. High radiation in the condenser air removal system. <u>OR</u> 2. High radiation in steam generator blow- down. <u>OR</u> 3. Unexplained increase in any steam generator level.	Same conditions as Alert <u>and</u> loss of offsite power <u>OR</u> Tube(s) rupture is beyond the capability of the charging pumps.	
20) Inadvertent positive reactivity insertions due to rods or dilution.	A. Inadvertent dilution such that: 1) Technical Speci- fication shutdown margin requirements are violated. <u>OR</u> 2) The control bank low low insertion limit is reached. B. Uncontrolled rod withdrawal from subcriticality or power operation.			



TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

<u>CONDITIONS</u>	<u>UNUSUAL EVENT</u>	<u>ALERT</u>	<u>SITE EMERGENCY</u>	<u>GENERAL EMERGENCY</u>
21) Feedwater Malfunction	Any feedwater malfunction resulting in a sustained decrease in Feedwater temperature to the steam generators by >60°F.			
22) ECCS Actuation	ECCS initiation. (Non-Spurious) with flow into reactor coolant system.			
23) Turbine-Generator accident in which missiles are generated.	A turbine generator failure in which missiles are generated and <u>no</u> penetration of the casing occurs and normal reactor shutdown follows.	A turbine generator failure in which missiles are generated and penetration of the casing <u>does</u> occur; all possible impact areas containing essential equipment are protected and normal reactor shutdown follows.		

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
24) Loss of Fission Product Barriers		<p>A. <math>&gt; 2 \times 10^2</math>R/hr Primary Containment Radiation, <u>OR</u></p> <p>B. Loss of <u>1</u> of the following <u>3</u> fission product barriers:</p> <p>1) Cladding: grab sample results <math>&gt; 300</math> uCi/cc equivalent of I-131</p> <p>2) Reactor Coolant System: a) Containment press. <math>&gt; 5</math> psig <u>and</u> b) Containment temp. <math>&gt; 150^\circ\text{F}</math> <u>and</u> c) Containment humidity <math>&gt; 50\%</math></p> <p>3) Primary Containment a) Containment press. <math>&gt; 50</math> psig. <u>or</u> b) Containment temp. <math>&gt; 280^\circ\text{F}</math>, <u>or</u> c) Loss of containment integrity when containment integrity is required.</p>	<p>A. <math>&gt; 4 \times 10^2</math>R/hr Primary Containment Radiation, <u>OR</u></p> <p>B. Loss of <u>2</u> of the following <u>3</u> fission product barriers:</p> <p>1) Cladding: grab sample results <math>&gt; 300</math> uCi/cc equivalent of I-131</p> <p>2) Reactor Coolant System: a) Containment press. <math>&gt; 5</math> psig <u>and</u> b) Containment temp. <math>&gt; 150^\circ\text{F}</math> <u>and</u> c) Containment humidity <math>&gt; 50\%</math></p> <p>3) Primary Containment a) Containment press. <math>&gt; 50</math> psig. <u>or</u> b) Containment temp. <math>&gt; 280^\circ\text{F}</math> <u>or</u> c) Loss of containment integrity when containment integrity is required.</p>	<p>A. <math>&gt; 2 \times 10^3</math>R/hr Primary Containment Radiation, <u>AND</u></p> <p>B. Loss of <u>2</u> of the following <u>3</u> fission product barriers <u>with an imminent loss of the third barrier:</u></p> <p>1) Cladding: grab sample results <math>&gt; 300</math> uCi/cc equivalent of I-131</p> <p>2) Reactor Coolant System: a) Containment press. <math>&gt; 5</math> psig <u>and</u> b) Containment temp. <math>&gt; 150^\circ\text{F}</math> <u>and</u> c) Containment humidity <math>&gt; 50\%</math></p> <p>3) Primary Containment a) Containment press. <math>&gt; 50</math> psig. <u>or</u> b) Containment temp. <math>&gt; 280^\circ\text{F}</math> <u>or</u> c) Loss of containment integrity when containment integrity is required.</p>
	<p>Primary Containment Radiation is observed on the RM-11 display console for: 1(2)RE-AR020 <u>or</u> 1(2)RE-AR021</p>			

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
25) Fuel Handling Accident (Direct information from fuel handling personnel indicating that an irradiated fuel assembly has been damaged.)		Fuel Handling Building exhaust has been diverted through the charcoal filters.	A) Radiation levels in the Fuel Handling Building are > 100 mR/hr as observed on the RM-11 display console for ORE-AR055 or ORE-AR056, <u>OR</u> B) Fuel Handling Building exhaust charcoal filters are depleted <u>OR</u> inoperable and radioactivity is being released to the atmosphere.	
26) Elevated Area Rad Monitor readings	Unplanned increase by factor of 20 in any ARM.	Unplanned increase (Resulting from degradation in the control of radioactive material and confirmed by survey or redundant instrumentation) by a factor of 100 in any ARM.		

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
27) <u>Gaseous Radiation Releases**</u>				
A. Core Damage Suspected	No core damage event is postulated at the Unusual Event level.	Instantaneous release rate exceeds $1.8 \times 10^6$ uCi/sec	Release rate averaged for 2 minutes exceeds $>500$ mR/hr whole body at the site boundary ( $8.9 \times 10^6$ uCi/sec) <u>OR</u> Release rate averaged for 30 minutes exceeds $>50$ mR/hr whole body at the site boundary ( $8.9 \times 10^5$ uCi/sec)	Instantaneous release rate exceeds level corresponding to $>1$ rem/hr whole body at the site boundary under actual meteorology. This condition exists when $Q > 7 \times 10^6 \times U$ where Q = release rate in uCi/sec U = mean wind speed in meters/sec
B. NO Core Damage Suspected	Instantaneous release rate exceeds $1.8 \times 10^6$ uCi/sec Noble gas <u>OR</u> 30 uCi/sec Iodine <u>OR</u> 10 CFR 20.105 instantaneous release limits are exceeded.	Instantaneous release rate exceeds $1.8 \times 10^7$ uCi/sec Noble gas <u>OR</u> 300 uCi/sec Iodine <u>OR</u> 10 times 10CFR20.105 instantaneous release limits are exceeded.	Release rate averaged for 2 minutes exceeds $>500$ mR/hr whole body at the site boundary ( $1.6 \times 10^8$ uCi/sec) <u>OR</u> Release rate averaged for 30 min. exceeds $>50$ mR/hr whole body at the site boundary ( $1.6 \times 10^7$ uCi/sec)	Instantaneous release rate exceeds level corresponding to $>1$ rem/hr whole body at the site boundary under actual meteorology. This condition exists when: $Q > 1.3 \times 10^8 \times U$ where Q = release rate in uCi/sec U = mean wind speed in meters/sec

\*\*Monitored releases can be measured by effluent monitoring or counting instrumentation. For noble gases, effluent monitor 1(2)RE-PRO030, channel 4, displays the release rate in uCi/sec on the RM-11 display console. For iodines, effluent monitor 1(2)RE-PRO28 displays a concentration in uCi/cc that must be corrected for stack flow rate to obtain a release rate in uCi/sec.

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

CONDITIONS	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
28) <u>Liquid</u> Radiation Releases from the Plant as measured by counting instrumentation or effluent monitoring inst- rumentation. (Radiation re- leases are ob- served on the RM-11 display console for ORE-PRO10.)	1) Gross Beta >1 x 10 <sup>-7</sup> uCi/ml or 2) Tritium >3 x 10 <sup>-3</sup> uCi/ml	1) Gross Beta ≥ 1 x 10 <sup>-6</sup> uCi/ml or > 40 Ci total in 24 hours or 2) Tritium ≥ 3 x 10 <sup>-2</sup> uCi/ml or ≥ 500 Ci total in 24 hours.	1) Gross Beta ≥ 2,000 Ci total in 24 hours or 2) Tritium ≥ 2 x 10 <sup>4</sup> Ci total in 24 hrs.	1) Gross Beta ≥ 2 x 10 <sup>4</sup> Ci total in 24 hours or 2) Tritium ≥ 2 x 10 <sup>5</sup> Ci total in 24 hrs.
29) Personnel Injury	Transportation of a radioactivity con- taminated injured person to hospital			
30) Hazardous Materials	As a direct result of hazardous materials a person is killed or hospitalized or estimated property damage exceeds \$50,000.			

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

<u>CONDITIONS</u>	<u>UNUSUAL EVENT</u>	<u>ALERT</u>	<u>SITE EMERGENCY</u>	<u>GENERAL EMERGENCY</u>
31) Any other Conditions of equivalent magnitude to the criteria used to define the accident category as determined by the Station Director.*	Warrants increased awareness on the part of the state and/or local off-site officials..	Warrants activation of Technical Support Center	Warrants activation of the Emergency Operations Facility and monitoring teams; warrants notification of the public by State and local agencies.	Imminent Core Melt

\* Conditions that may or may not warrant classification under GSEP include:

- a. Incident reporting per 10CFR50.72.
- b. Incident reporting per 10CFR20.403 or Illinois Rules and Regulations, Part D.403.
- c. Discharges of oil or hazardous substances into waterways per 33CFR153.
- d. Security contingency events per the Station Security Plan.

The Station Director may, at his discretion, categorize the above situations as GSEP emergencies, depending upon the seriousness of the situation. (Refer to Section 9.3 of the generic plan for additional information.)

TABLE BWA 5-1 (cont'd)

BRAIDWOOD  
EMERGENCY ACTION LEVELS

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TRANSPORTATION ACCIDENT

- A. A vehicle transporting radioactive materials or non-radioactive Hazardous materials from a Commonwealth Edison generating station is involved in a situation in which:
1. Fire, breakage or suspected radioactive contamination occurs involving a shipment of radioactive material or;
  2. As a direct result of Hazardous materials,
    - (a) A person is killed; or
    - (b) A person receives injuries requiring hospitalization; or
    - (c) Estimated carrier or other property damage exceeds \$50,000.
- B. Any other condition involving Hazardous material transportation and equivalent to the criteria in Item A.
-

6.0 EMERGENCY MEASURES

Commonwealth Edison emergency response actions are basically the same for all nuclear stations and are thus covered by Section 6.1 of the generic plan.

6.1 Activation of the Emergency Organization

If the conditions at Braidwood Station indicate that one of the Emergency Action Levels in Table BWA 5-1 is exceeded, the Station Director declares and classifies the emergency. A Nuclear Accident Reporting System (NARS) Form is completed and the information contained on this form is conveyed to the System Power Dispatcher. In addition, the NRC Operations Center is notified of the emergency in accordance with 10 CFR 50.72. For the General Emergency, the Station Director is responsible for notifying the following Illinois Agencies of the emergency condition, as well as recommending initial protective actions for the offsite public:

- o Illinois ESDA in Springfield
- o Will County Sheriff's Office

When State and local agencies are notified of the emergency condition, they will take action in accordance with State and local emergency plans.



Figure 4.2-3 of the generic GSEP will be used by Braidwood Station in augmenting the Braidwood onsite emergency organization for declared GSEP emergencies. In addition, Braidwood Station has established an Onsite Technical Support Center and an Onsite Operational Support Center. These centers are activated (manned) for an Alert, Site Emergency, and General Emergency. Augmentation of plant staffing is achieved by implementing a prioritized notification procedure as described in Section 4.1.7.

#### 6.2 Assessment Actions

Throughout each emergency situation, continuing assessment will occur. Assessment actions at Braidwood Station may include an evaluation of plant conditions; inplant, onsite, and initial offsite radiological measurement; and initial estimates of offsite doses. To aid emergency personnel in an assessment of core damage during an emergency condition, a figure has been prepared which represents a plot of activity (Ci) versus containment radiation readings. Figure BWA 6-1 is simplistic in nature and is intended only to provide a preliminary estimate of primary containment activity, based on containment radiation readings.

#### 6.3 Protective Actions for the Offsite Public

Protective actions for the offsite public will be recommended and coordinated by the Illinois ESDA and Indiana Department of Civil Defense and Emergency Management in cooperation with local officials. The initial recommendation of protective actions will be issued to ESDA by Commonwealth Edison based on conditions at Braidwood Station. A notification capability to the population within the 10-mile EPZ

is available for the purpose of alerting the population of recommended protective actions. The notification system consists of three parts:

- 1) A permanently installed outdoor notification system within the 0 to 5 mile radius around the station. The 0 to 5 mile radius around the station is primarily an agricultural area with a population density well below 2000 persons per square mile. The installed notification system will essentially cover all inhabited areas with a minimum noise level of 60 db using an attenuation factor of 10 db loss per distance doubled. For the possibility of a dwelling not being exposed to a 60 db minimum noise level, a local coverage siren or an in-house warning receiver will be utilized.
- 2) A permanently installed outdoor notification system covering the heavily populated areas within the 5 to 10 miles radius. The area outside the five mile radius and inside the ten mile radius contains a number of communities that will be covered by installed notification systems. These systems will utilize existing sirens plus additional sirens to ensure complete coverage with either a 60 db minimum or 10 db above daytime background.
- 3) A mobile notification system for the remainder of the area within the 5 to 10 mile radius. The total 1980 population of the area outside the five mile radius and inside the ten mile radius is approximately 15,000. Of this total, that population residing in communities within the 5 to 10 mile radius will be covered by the installed notification system mentioned in part 2 above. The remaining population live in rural residences or farm steads and will be alerted by a mobile system including sirens and public address. The plan for a mobile notification system includes the use of law enforcement vehicles with siren and portable announcing systems. Contained in the Emergency Plans of each of the counties associated with Braidwood Station, will be the general guidance for early notification of the population within the county. The routing of law enforcement vehicles through the 5 to 10 mile EPZ will be accomplished by the County Sheriff Dispatcher aided by the State Police Dispatcher if needed. The purpose of the prompt notification system is to advise citizens either take shelter or evacuate and to instruct them to tune to designated emergency information radio stations.

Once the public has tuned to designated radio stations in an emergency, detailed instructional messages will be given to the public. State and local procedures provide for these messages.

Protective actions for the public may include:

- o Sheltering by remaining inside buildings or homes.
- o Evacuation from a potentially affected area and relocation to a preestablished registration/evacuation center.
- o Food, water and milk control by sampling, testing and restricting the consumption of these potentially affected items.
- o Access control by roadblocks and barriers to prevent entrance to potentially affected areas.

Sector evacuation times may be a factor in the recommended protective actions. Refer to Figure BWA 6-2 for a summary of evacuation time estimates for the ten-mile area surrounding Braidwood Nuclear Power Station.

#### 6.4 Protective Actions for Onsite Personnel

Braidwood Station has a siren system to warn onsite personnel of emergency conditions. Upon hearing a continuous two (2) minute siren all personnel within the protected area have been instructed to report to designated locations/assembly areas. Station GSEP directors initially report to the Onsite Operational Support Center. Personnel not having emergency assignments report to either one of two designated assembly areas. Permanent station personnel should normally report to the Service Building Machine Shop area. Contractors should normally assemble in the Unit #2 Turbine Building Trackway. (Note: While Unit 2 is under construction, the Unit 1 Turbine Building Trackway shall be utilized as an assembly area.) Refer to Figure BWA 6-3.

Accountability of site personnel will be the responsibility of the Braidwood Station Security Director using the computerized security control system.

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If a site evacuation is considered necessary by the Station Director, personnel will be relocated and monitored at one or more of the following locations:

- 1) Dresden Nuclear Generating Station, Morris, Illinois
- 2) La Salle Nuclear Generating Station, near Marseilles, Illinois
- 3) Joliet Generating Station, Joliet, Illinois

(with support coming from either Dresden Station or LaSalle Station)

Traffic control for onsite areas during an evacuation will be the responsibility of the Braidwood Station security force.

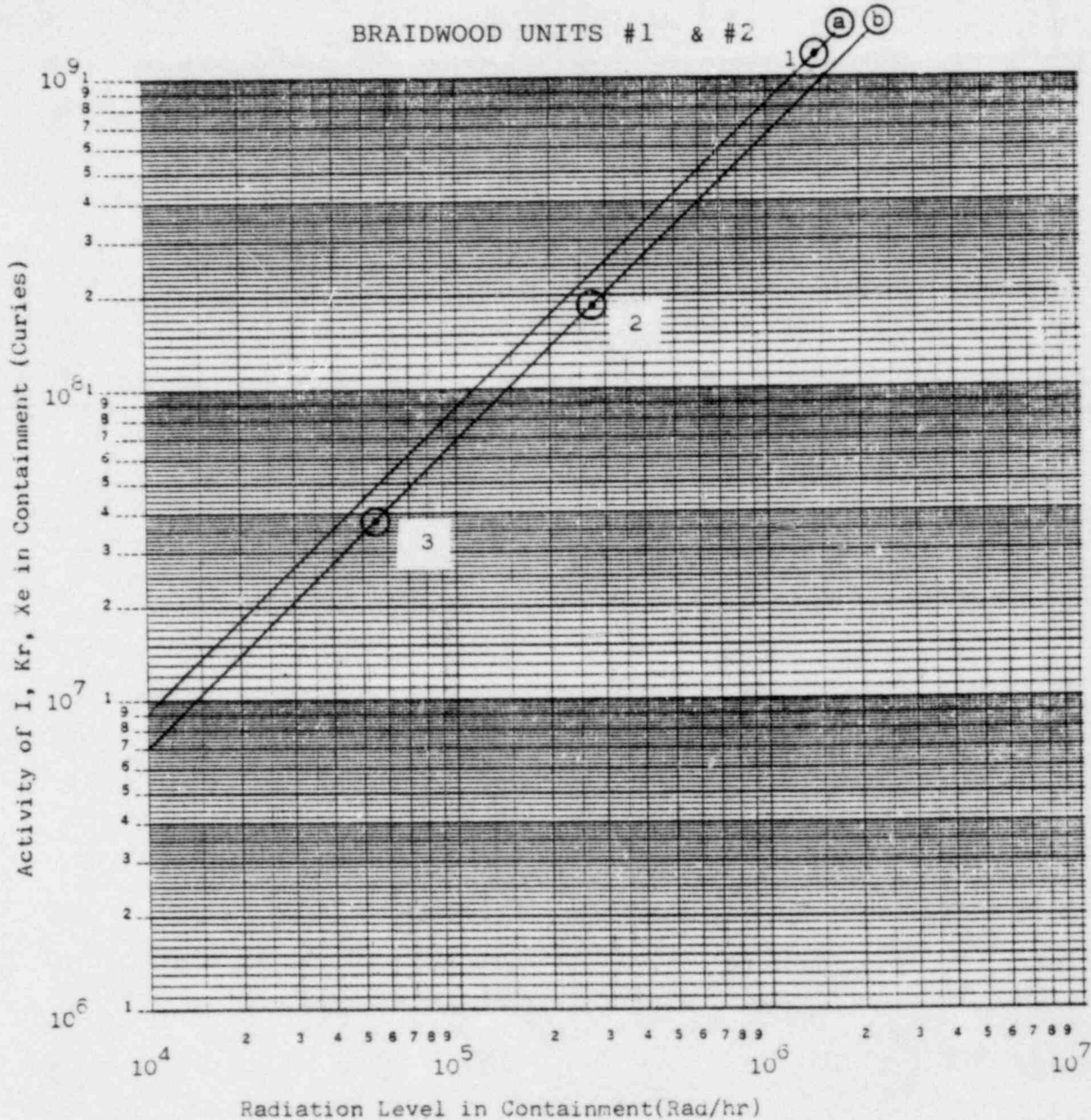
As necessary, equipment and personnel will be furnished by Braidwood Station to the relocation site(s) for monitoring, decontamination, and bioassay. Refer to Figure BWA 6-4 for evacuation routes to the relocation sites.

Other emergency measures are common to all nuclear station and are thus discussed in the generic plan.

FIGURE BWA 6-1

CORE DAMAGE ASSESSMENT

BRAIDWOOD UNITS #1 & #2

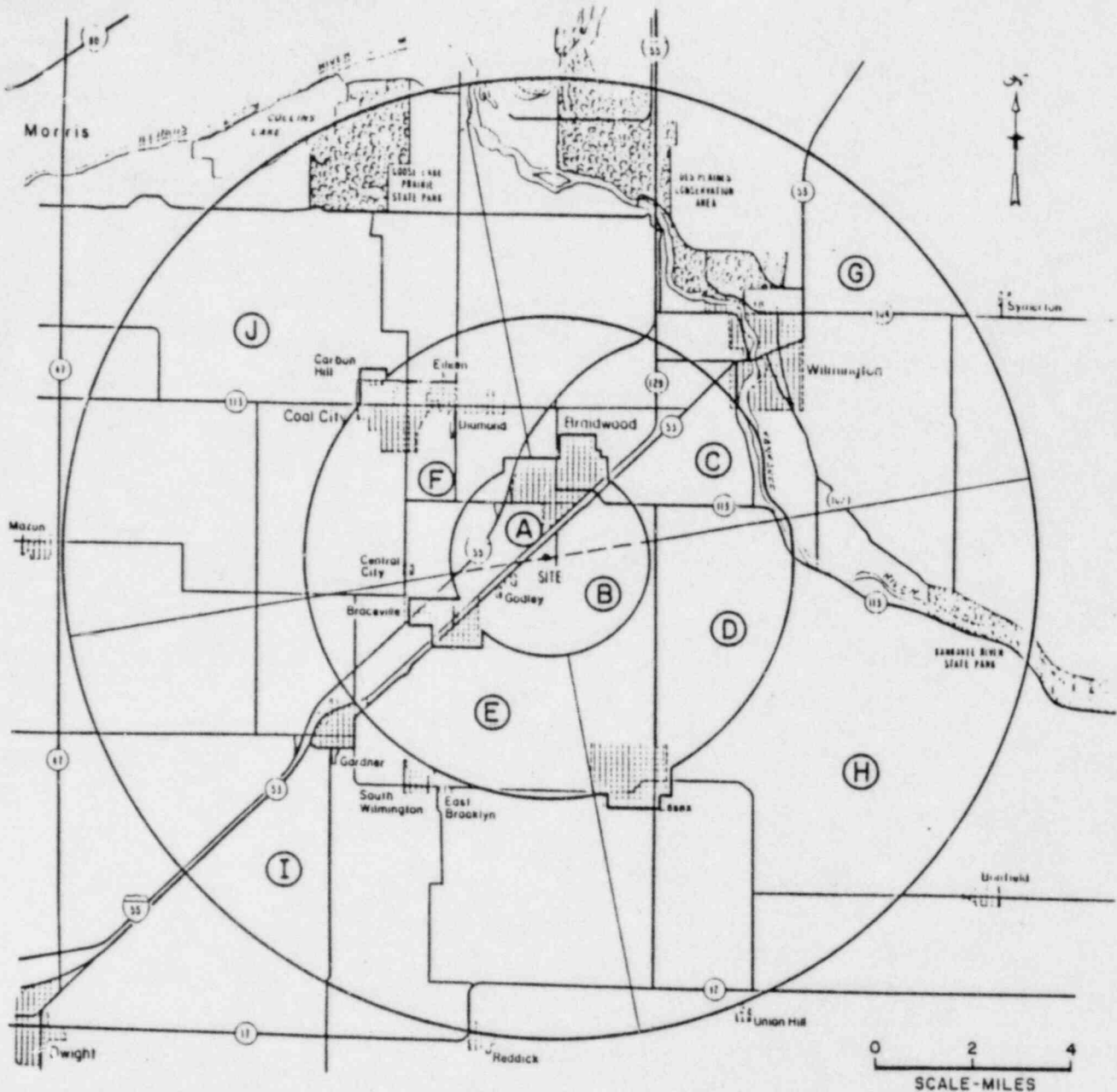


Curve (a) represents estimated activity levels in the containment following releases in which the ratio of the "% noble gases released to the core" to the "% iodines released from the core" is equal to 4. Curve (b) represents estimated activity levels in the containment following releases in which the above mentioned ratio is equal to one(1). Specifically, the following points are plotted on the curves:

- Point 1 ----100% noble gases released, 25% of iodines released
- Point 2 ----10% noble gases released, 10% of iodines released
- Point 3 ----2% noble gases released, 2% of iodines released

Total coolant activity(Iodines plus noble gases) is 700 curies. If this activity becomes airborne in the containment, the radiation level would be less than one rad/hr and thus is too low of an activity to be plotted on this graph.

BRAIDWOOD STATION EVACUATION TIME ESTIMATES



GENERAL POPULATION  
EVACUATION TIME ESTIMATES

ZONE	ESTIMATED EVACUATION TIME (HOURS)	
	NCRMAL WEATHER	ADVERSE WEATHER
A+B	3	4
A+B+C	3	4
A+B+D	3	4
A+B+E	3	4
A+B+F	3	4
A-F+G	3	4
A-F+H	3	4
A-F+I	3	4
A-F+J	3	4
A-J	3	4

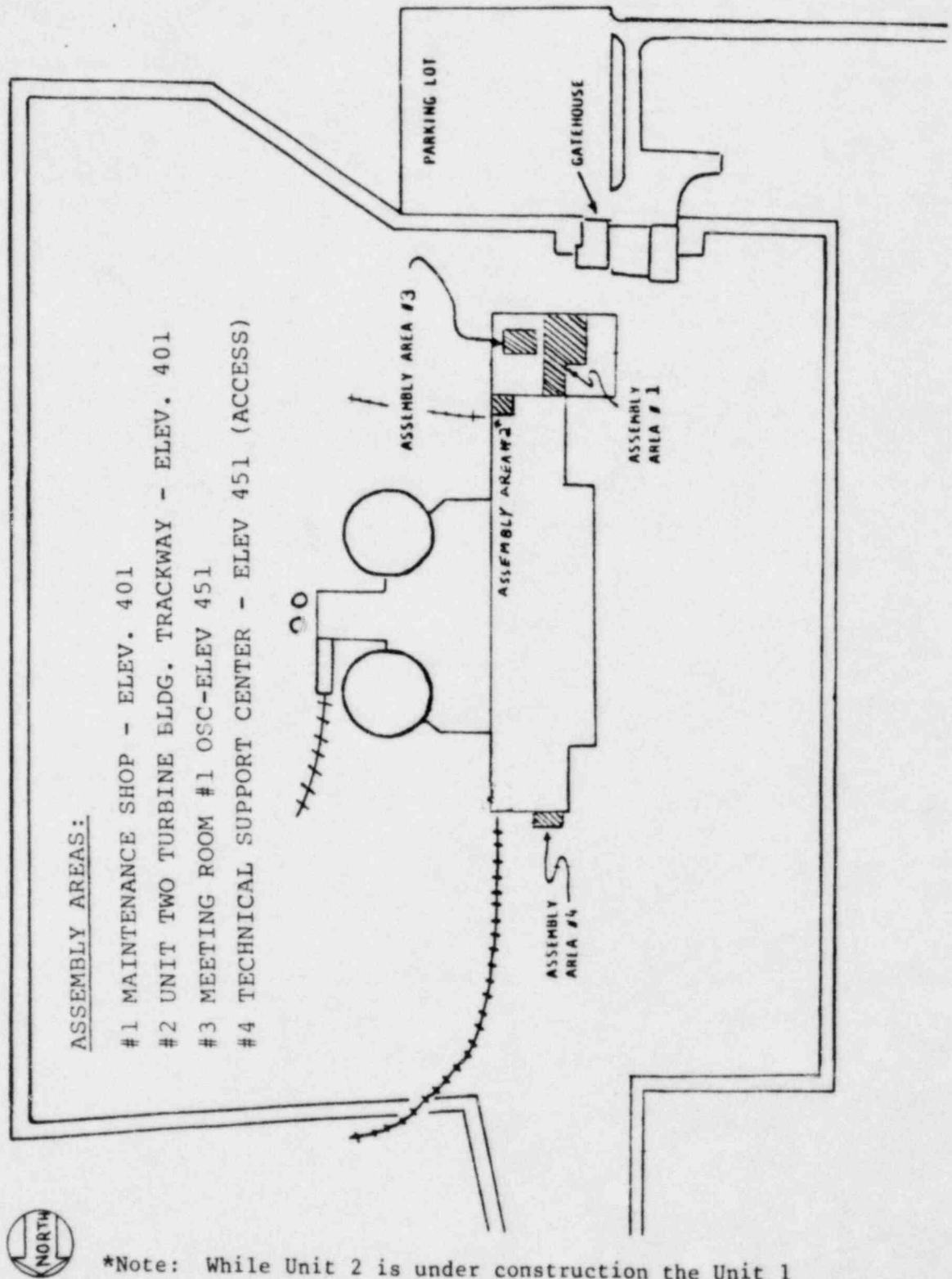
LEGEND

- STATE HIGHWAY
- INTERSTATE HIGHWAY
- INCORPORATED AREA (CITY OR VILLAGE)
- EVACUATION STUDY ZONE

NOTE: THIS FIGURE PRESENTS INFORMATION FROM THE "BRAIDWOOD EVACUATION TIME ESTIMATE STUDY" DATED SEPTEMBER 1984.

FIGURE BWA 6-2  
BRAIDWOOD STATION  
EVACUATION TIME ESTIMATES

FIGURE BWA 6-3  
ONSITE ASSEMBLY AREAS



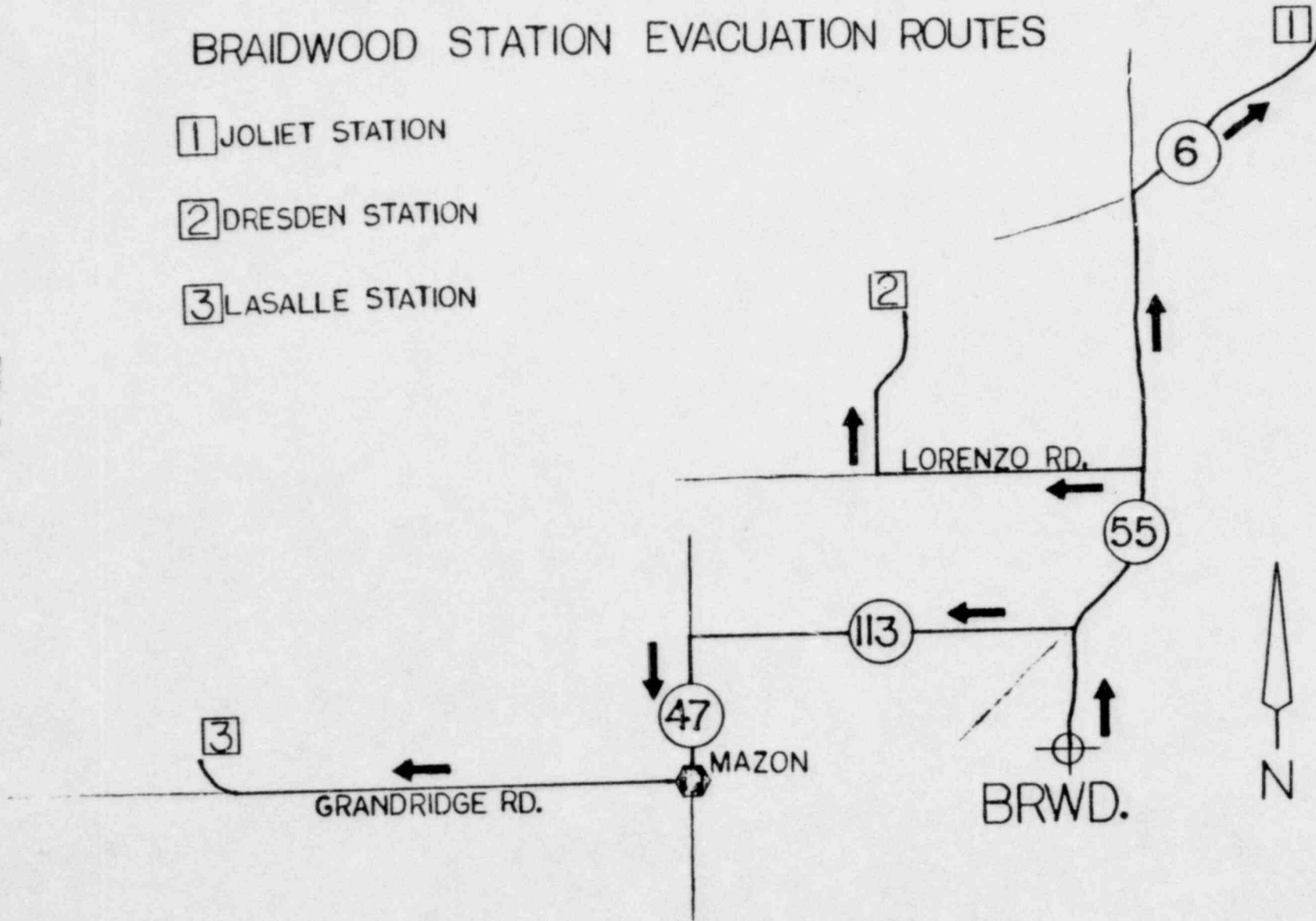
\*Note: While Unit 2 is under construction the Unit 1 Turbine Building Trackway shall also be utilized as an assembly area.

Figure BWA 6-4

# BRAIDWOOD STATION EVACUATION ROUTES

- 1 JOLIET STATION
- 2 DRESDEN STATION
- 3 LASALLE STATION

BWA 6-9





7.0 EMERGENCY FACILITIES AND EQUIPMENT

7.1 Emergency Control Centers

7.1.1 Station Control Room

The Braidwood Station Control Room is the initial onsite center of emergency control and is located on the 451-foot elevation of the Auxiliary Building. Refer to Figure BWA 7-1 for the relative location of the Control Room within the Station. Figure BWA 7-2 provides an approximate layout.

7.1.2 Onsite Technical Support Center (TSC)

Braidwood Station has designated an Onsite Technical Support Center which will exist at the north end of the Turbine Building, as shown in Figure BWA 7-1. The Onsite TSC will fully meet the requirements of Section 7.1.2 of the generic plan. Refer to Figure BWA 7-3 for an "as built" diagram of the Onsite TSC.

7.1.3 Onsite Operational Support Center (OSC)

Braidwood Station has designated a primary Onsite Operational Support Center. The Primary Onsite OSC is Meeting Room #1 on elevation 451' of the Service Building, as shown in Figure BWA 7-1. The Onsite OSC will conform to the requirements of Section 7.1.3 of the generic plan and will be the location to which operations support personnel will report during an emergency and from which they will be dispatched for assignments in support of emergency operations.

Refer to Figure BWA 7-4 for an "as built" diagram of the Onsite OSC. The backup Onsite OSC is the Shift Engineer's office on Elevation 451 of the Auxiliary Building.

7.1.4 Corporate Command Center (CCC)

The Corporate Command Center (CCC), located in the Edison Building, downtown Chicago, is the location from which the CCC Director will normally direct a staff in evaluating, coordinating, and directing company activities involved in coping with an emergency.

7.1.5 Emergency Operations Facility (EOF)

Braidwood Station has designated a Emergency Operations Facility. The EOF will be located at Mazon, Illinois, approximately 14 miles WNW of the Station. The EOF is the location where the GSEP Recovery Group would be activated, primarily for a Site or General Emergency. Refer to Figure 7-5 for an "as-built" drawing of the EOF. The designated EOF is greater than 10 miles from the Onsite TSC and therefore is exempt from habitability criteria.

7.2 Communications Systems

Dedicated communications systems at Braidwood Station allow effective coordination of any emergency response. These systems include:

- 1) A Nuclear Accident Reporting System (NARS) which links the Control Room, the Corporate Command Center, the Onsite TSC, the System Power Supply Office, the EOF, the Illinois ESDA (in Springfield), the IDNS (in Springfield), and selected local government agencies.

- 2) A microwave voice channel between the CCC and the Shift Engineer's Office, the Onsite TSC, and the EOF.
- 3) A telephone link that enables communication between the CCC, the Onsite TSC, and the EOF.
- 4) A telephone link that enables communication between the Control Room and the Onsite TSC.
- 5) A telephone link that enables communication between the Control Room and the Onsite OSC.
- 6) A telephone link that enables communication between the Onsite TSC and the Onsite OSC.
- 7) A radio voice channel between the CCC, the Shift Engineer's Office, the Onsite TSC, the EOF, mobile vehicles, and handi-talkies in the field.
- 8) An Emergency Notification System and a Health Physics Network that allow communications between the Station and the Nuclear Regulatory Commission.

The Braidwood Station dedicated communications systems comply with the requirements of Section 7.2 in the generic GSEP.

Following a GSEP declaration, Braidwood Station makes initial notifications in accordance with Section 6.1 of the generic GSEP and this annex. In addition, the Control Room shall establish a communications link with the Onsite TSC and the Onsite OSC when activated. As soon as the Onsite TSC is activated and manned, the Control Room shall be relieved of the responsibility for maintaining an open communications link with the NRC Operations Center. The Control Room will then maintain communications with only the Onsite TSC and the Onsite OSC. The Onsite TSC shall maintain communications with the NRC Operations Center, the Control Room, the CCC, and/or the EOF. Communications links that are not required to be maintained open shall be terminated as quickly as prudence dictates. Termination is accomplished to minimize the

number of personnel needed as communicators, to minimize confusion in control centers and to reduce the probability for promulgation of erroneous information. Communications initiated by interested outside parties, not specifically addressed in the GSEP, shall be referred to the Corporate Office. Such communications shall never be allowed to interfere with response to an emergency condition not with the implementation of the GSEP.

In addition to the dedicated GSEP communications described in this section, Braidwood Station has other reliable intraplant and plant-to-offsite communications. These communications include:

- o A public address system
- o A commercial phone system
- o Security/Operations radio consoles and handi-talkies
- o System Power Dispatcher microwave communications
- o Sound-powered phones
- o Vehicle radios
- o Microwave communications

The Station's communications systems will be further described in an Emergency Plan Implementing Procedure.

### 7.3 Assessment Facilities

#### 7.3.1 Onsite Seismic Monitoring Instrumentation

A central recording time-history accelerograph unit with strip chart recorder, indicator lights, and playback system is provided.

The lights indicate whether the system is triggered and whether the operating basis or safe shutdown maximum accelerations are exceeded in any one of the three

orthogonal directions in the basement of the containment structures. An acceleration of .02g in any direction activates the seismic switch which turns on the seismic monitors and lights up the seismic alarm lights at the central station panel.

7.3.2

Onsite Meteorological Monitoring Instrumentation

A 320-foot meteorological tower is located approximately 1880 feet northeast of the Braidwood Station Containment Buildings.

The Braidwood Station meteorological monitoring system is equipped to monitor the following parameters:

- 1) Temperature (at 30 feet)
- 2) Differential Temperature (between 30 and 199 ft)
- 3) Dew point (at 30 and 199 feet)
- 4) Wind speed and direction (at 34 and 203 feet)
- 5) Precipitation (ground level)

In addition to the above, sigma-sub-theta, a derived meteorological parameter, is computed and is available to the CCC Environmental Director.

Information gathered from the tower is recorded on chart recorders located in a building at the tower base.

These meteorological parameters will be provided as input to the station's process computer and will be available as up-to-the-minute data in the control room.

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The meteorological program at Braidwood Station provides information sufficient to assess local weather conditions and to determine the degree of atmospheric dispersion of airborne radioactive effluents from the station.

The Commonwealth Edison meteorological contractor maintains a comprehensive field program. Routine visits are made to each tower once a week to retrieve analog data and inspect equipment. These visits are directed towards ground based equipment, although a visual inspection of the tower sensing equipment is also made. Those instruments equipped with internal calibration capabilities are checked also. A log of the week's activities is filled out and kept on file both with the contractor and at the general office.

Besides the routine meteorological maintenance program, several independent methods are used to verify quality data transmissions and recovery from each meteorological tower. The corporate computer polls each meteorological tower throughout the day. Each day's data are screened by a validation program which flags all missing and/or suspect values. The meteorological contractor is notified of persistent outages and the proper restoration procedure is followed.

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As an independent method of data retrieval, the meteorological contractor also interrogates each meteorological tower during the day. Data are passed through a validation procedure, and suspect data closely examined. Field teams are then assigned for restoration of the system.

Cooperation between the corporate office and the meteorological contractor assures that a timely restoration of any outage can be made. Emergency field visits to the meteorological sites are made as quickly as possible after detection of a failure.

Should an event of sufficient magnitude occur to destroy the tower structure, a contract is maintained to have a temporary tower erected within 72 hours, weather conditions permitting. Further, the meteorological contractor maintains two levels of sensors (wind speed, wind direction and temperature) in a state of readiness for use on the temporary tower.

7.3.3 Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area radiation monitoring system; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and is described in the following subsections.

7.3.3.1 Radiation Monitoring System

Chapters 11 and 12 of the Braidwood FSAR describe the radiation monitoring system (RMS) in detail. The installed RMS is designed to continuously monitor the containment atmosphere plant effluents, and various in-plant locations.

The system includes Control Room readouts and recorders for each parameter that is monitored and an audible Control Room alarm when predetermined setpoints are exceeded. The system can be subdivided into process/effluent instrumentation and an area monitoring system.



- o The process/effluent instrumentation consists of pumps, filter samplers, detectors, and associated electronics to determine noble gas, iodine, and particulate concentrations in plant cubicles or liquid and gaseous effluents. Several monitored effluent pathways have control functions which will terminate the release at a predetermined setpoint. These setpoints are premised on compliance with federal regulations.
- o The area monitoring system provides information of existing radiation levels in various areas of the plant to ensure safe occupancy. It is equipped with Control Room and local readout and audible alarms to warn personnel of an increased radiation level. Some onsite equipment is particularly valuable for accident situations and is described in the following sections.

7.3.3.2 Post Accident Sampling Capability

The capability to obtain and perform radioisotopic and chemical analyses of the reactor coolant and containment atmosphere samples is provided by the high radiation sampling system (HRSS), the design of which is outlined in the following paragraphs.

The system is installed in the auxiliary building and consists of a liquid sampling subsystem and an air sampling subsystem. The major components of the system are:

- a. HRSS liquid sample panel,
- b. Liquid sample cooler rack,
- c. Chemical analysis panel,
- d. Chemical analysis monitor panel,
- e. HRSS auxiliaries control panel (liquid subsystem only),
- f. Waste drain tank and pumps,
- g. Containment air sample panel (CASP),
- h. CASP control panel, and
- i. Valves and piping for the system.

The liquid sampling subsystem is installed at elevation 401 feet in the auxiliary building except for the waste drain tank and pumps which are installed at elevation 383 feet. The air sampling subsystem is installed in the auxiliary building in proximity to the containment.

The HRSS liquid sampling is capable of  
sampling:

- a. Pressurizer steam space,
- b. Pressurizer liquid space,
- c. Each accumulator (emergency core cooling system),
- d. Reactor coolant hot leg loops 1 and 3,
- e. Reactor coolant cold leg loops 1 through 4,
- f. RHR heat exchangers A and B outlets,
- g. Reactor coolant letdown heat exchanger outlet,
- h. CVCS demineralizer outlet,
- i. BTR demineralizer outlet,
- j. Reactor coolant filter outlet,
- k. Auxiliary building floor drain tank A (B on Unit 2 panel),
- l. Auxiliary building equipment drain tank A (B on Unit 2 panel),
- m. Recycle holdup tank A (B on Unit 2 panel),
- n. HRSS waste drain tank,
- o. Containment floor drain sump,
- p. Chemical drain tank (Unit 1 panel only),
- q. Steam generator blowdown sample line, and,
- r. Regeneration waste drain tank (Unit 1 panel only).

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In addition to taking the above samples for onsite and/or offsite analysis, the HRSS liquid sampling panel is capable of routing the reactor coolant samples to the chemical analysis panel. The chemical analysis panel is capable of performing the on-line analysis of pH, dissolved oxygen, specific conductivity, chloride, and hydrogen. For boron and isotopic analysis, samples diluted by a factor of 1000 to one will be transferred to the onsite laboratory. Excessive exposure to the system operator is limited by:

- a. Lead shielding in the liquid sampling panel and the chemical analysis panel;
- b. Concrete shielding above, below, and around the sides of the panels to prevent radiation from scattering around the steel shielding;
- c. The optimized design and reduced amount of piping in the panels containing reactor coolant;
- d. A special cart equipped with a shielding cask to transport the radioactive sample to its destination and;
- e. A ventilation system drawing air out of the sampling panels and discharging into a remote HVAC train.

The containment air sampling panel is capable of sampling the primary containment atmosphere. The sample is drawn from the containment through a dedicated penetration.

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Once the interfacing valves are arranged and the the sampling programmer is initiated, the containment air sampling panel utilizes automatically sequenced sampling to trap the designated sample in a shielded cart. The air sample will then be analyzed onsite.

Excessive exposure to the operator is limited by:

- a. Steel shielding in the containment air sampling panel;
- b. Concrete shielding above, below, and around the sides of the panel to prevent radiation from scattering around the steel shielding;
- c. Automatic sampling;
- d. Special carts each equipped with a shielding cask to transport the radioactive sample to its destination; and,
- e. A ventilation system drawing air out of the sampling panels and discharging into a remote HVAC train.

Actual frequency of sampling shall be determined by station management; however, as a minimum the first sample can be taken within 1 hour from the time a decision is made to take a sample, continuing with at least one sample per day for the next 7 days and at least one sample per week thereafter. The time interval between taking a sample and receipt by plant management of the results of the analysis is estimated to be less than 2 hours.

7.3.3.3 Radiological Noble Gas Effluent Monitoring

Two General Atomic Company wide-range monitors will be installed on the auxiliary building vent stacks (final release points), one monitor per stack. The monitor has a range for radioactive gas concentration of  $1 \times 10^{-7}$  uCi/cc to  $1 \times 10^5$  uCi/cc. The monitor includes the following: two isokinetic nozzles, one for normal conditions operating at 2 ft<sup>3</sup>/min. and one for high range conditions operating at 0.06 ft<sup>3</sup>/min; sampling rack; sample conditioner, operating only at high range conditions to filter out large concentrations of radioiodine and particulates; and the wide-range gas detectors assembly, consisting of three radioactive gas detectors, a low-range detector, a high-range detector, and a wide-range detector. Each monitor system has a microprocessor which utilizes digital processing techniques to analyze data and control monitor functions. Control Room readouts include a chart recorder and an RM-23 remote display module for all monitored parameters.

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Four General Atomic Company RD-12 detectors will be provided for each of the four main steamlines upstream of the safety and relief valves. The range of the monitor is 1 mr/hr to  $10^5$  mr/hr. The monitors will be mounted external to the main steamline piping and corrections made for the loss of low energy gammas. Readouts in the control room will include strip chart recorders.

7.3.3.4 Radioiodine and Particulate Effluent Monitoring

The General Atomic Company wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which utilizes a Ge(Li) detector. The iodine cartridges are reverse blown for at least ten minutes to reduce the level of entrapped noble gases. In addition, silver zeolite cartridges are available to further reduce the interference of noble gases.

7.3.3.5 High-Range Containment Radiation Monitors

Two high range containment radiation monitors are installed for each operating reactor. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is 1 rad/hr to  $10^8$  rads/hr (beta-gamma) or alternatively, 1R/hr to  $10^7$  R/hr for gamma only.

7.3.3.6 In-Plant Iodine Instrumentation

Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using silver zeolite as a sample media. Braidwood Station has a Transportable Data Acquisition and Analysis System for analyzing samples that cannot be counted and analyzed in the normal Station counting room because of background problems. Auxiliary counting room locations have been identified within the Turbine Building. It is expected that a sample can be obtained, purged, and analyzed for iodine content within a two-hour time frame.



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#### 7.3.3.7 Station Survey and Counting Equipment

The Station maintains portable survey instrumentation to assess contamination levels, exposure rates, and gaseous, iodine, and particulate airborne radioactivity concentrations.

This equipment included G-M's, ion chambers, and air samplers. The equipment is operated and calibrated by Station personnel.

The Station counting room contains GeLi gamma spectrometer systems, gas-flow proportional counters for alpha and beta/gamma analysis, and liquid scintillators for tritium analysis.

The Station uses various combinations of film badges, TLDs, direct reading pocket ion chambers, and electronic dosimeters to monitor personnel exposures. In addition, a whole body counting system for bioassay determinations is located onsite.

#### 7.3.4 Monitoring for Vital Plant Parameters

Adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Byron/Braidwood FSAR. Instrumentation is installed to ensure monitoring of the following vital parameters:

INSTRUMENT

1. Containment Pressure
2. Reactor Coolant Outlet Temperature -  $T_{HOT}$  -  
Wide range
3. Reactor Coolant Inlet Temperature -  $T_{COLD}$  -  
Wide range
4. Reactor Coolant Pressure - Wide Range
5. Pressurizer Water Level
6. Steamline Pressure
7. Steam Generator Water Level - Narrow Range
8. Refueling Water Storage Tank Water Level
9. Boric Acid Storage Tank Level

A Braidwood Station Emergency Operating Procedure will aid personnel in recognizing inadequate core cooling. This procedure relies upon core exit thermocouples to indicate an inadequate core cooling condition.

7.3.5

Site Hydrological Characteristics

The hydrological characteristics of the Braidwood Station vicinity are described in Section 2.4 of the Braidwood FSAR. The river screen house is the only structure that could be affected by flooding on the Kankakee River. The controlling event for flooding at the site is the probable maximum flood for the cooling pond, resulting in a short term maximum water surface elevation of 600.6 ft in the immediate plant area.

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Although the plant grade elevation is 600 ft, the safety related facilities are situated at elevation 601 ft; 0.4 ft above the estimated maximum water surface elevation.

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Low flows in the Kankakee River cannot affect safety related facilities of the plant. In the unlikely event that emergency make-up water requirements cannot be satisfied by surface water withdrawals from the Kankakee River, the Cooling Lake will operate under a closed cycle system. Emergency shut down water is available from the cooling lake.

Because of the site hydrological characteristics given above, plant operation should not be affected by Kankakee River water level conditions and therefore, hydrological monitors have not been installed. The Kankakee River is not used for any public water supply, within 50 miles downstream of this site. There are no recorded plans for any future public water supply usage from the Kankakee River. The nearest surface water users downstream from Braidwood Station is Peoria, over 86 miles away. This allows for sufficient mixing that makes permanently installed hydrological monitors unnecessary. Provisions have been made for grab samples to establish release rates. In performing dose calculations from liquid releases, Braidwood Station uses a historical average river flow value, FW, as a parameter in the liquid release model.

7.3.6 Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable National Fire Protection Association (NFPA) Standards. The System is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection carbon dioxide, halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble.

In the event that a portion of the fire detection instrumentation is inoperable, an increased frequency of fire watches in affected areas is required.

7.3.7 Facilities and Equipment for Offsite Environmental Monitoring

As described in the generic GSEP, Commonwealth has contracted with a company to conduct an offsite environmental monitoring program at each nuclear station. Figure BWA 7-6 shows the locations of the fixed continuous air samplers. Figure BWA 7-7 shows the inner ring of TLD's in a 5-mile radius and Figure BWA 7-8 shows the outer ring of TLD's in a 5-mile radius.

Braidwood Station maintains a supply of emergency equipment and supplies for offsite monitoring and sampling. The supply includes the minimum requirements delineated by Figure 7.7-1 of the generic GSEP.

#### 7.4 Protective Facilities and Equipment

The principal onsite assembly areas for Braidwood Station are the Machine Shop on the 401-foot elevation of the Service Building and the Unit #2 Turbine Building trackway. These areas are suitable because:

- 1) They are large open areas suitable for assembling a large number of people in a short time;
- 2) They are relatively close to the Security Gatehouse;  
and
- 3) They have a low probability of being affected by a serious accident involving the NSSS.

The offsite evacuation/relocation areas for Braidwood Station are discussed in Section 6.0 of this annex. All three locations are suitable, depending on the emergency condition, with personnel, supplies and communications readily available.

#### 7.5 First Aid and Medical Facilities

Braidwood Station has an in-plant first aid/decontamination room on the 426 foot elevation of the auxiliary building near the station laboratory complex. This room is provided with a sink, a shower, a portable leaded glass shield, and a supply cabinet.

First aid kits, stretchers, sinks, eyewashes and emergency showers have been placed in strategic locations throughout the station.

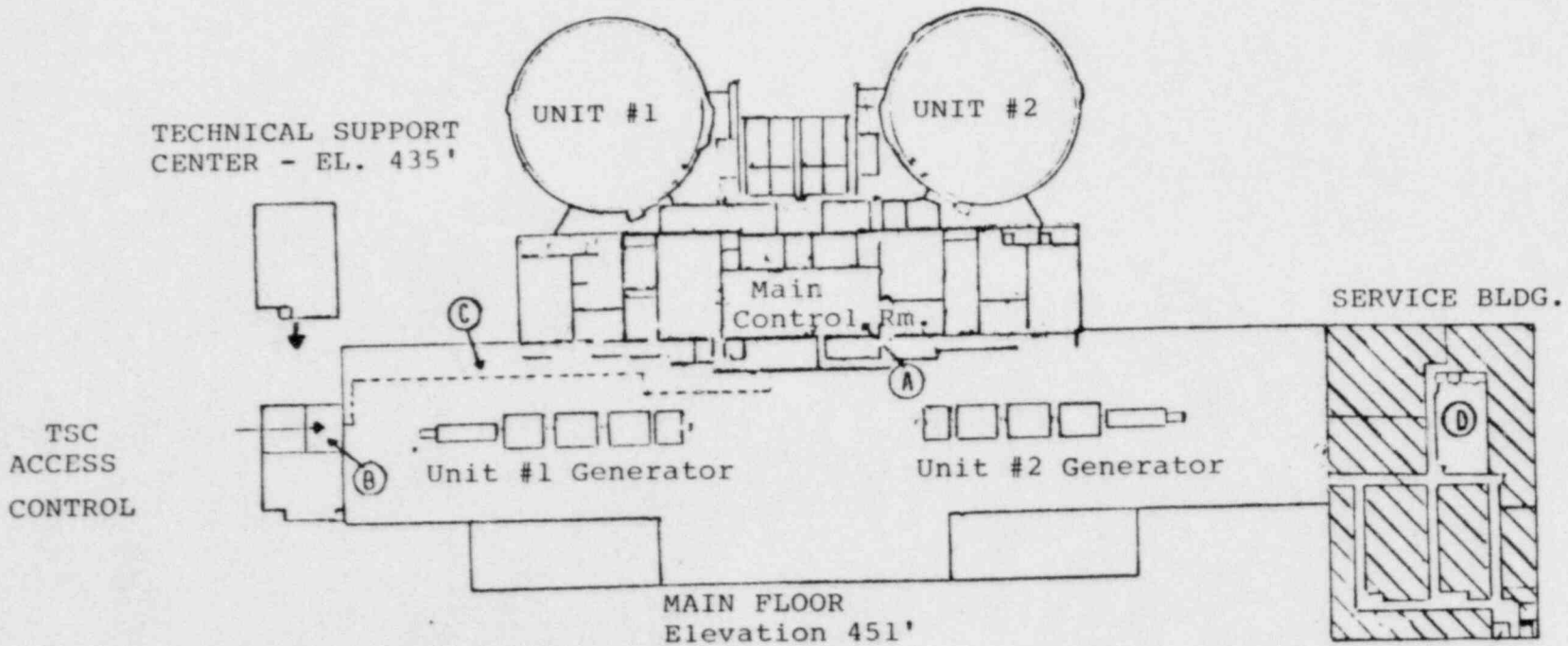
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As mentioned in the generic plan, medical treatment given to injured persons at the station is of a "first aid" nature. When more professional care is needed, injured persons are transported to a local hospital or clinic. St. Joseph Hospital in Joliet, Illinois is the designated hospital for handling contaminated injured personnel.


FIGURE DWA 7-1

LOCATION OF STATION EMERGENCY CONTROL CENTER

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- A - CONTROL ROOM
- B - TECHNICAL SUPPORT CENTER
- C - PATHWAY TO TECHNICAL SUPPORT CENTER
- D - OPERATIONAL SUPPORT CENTER

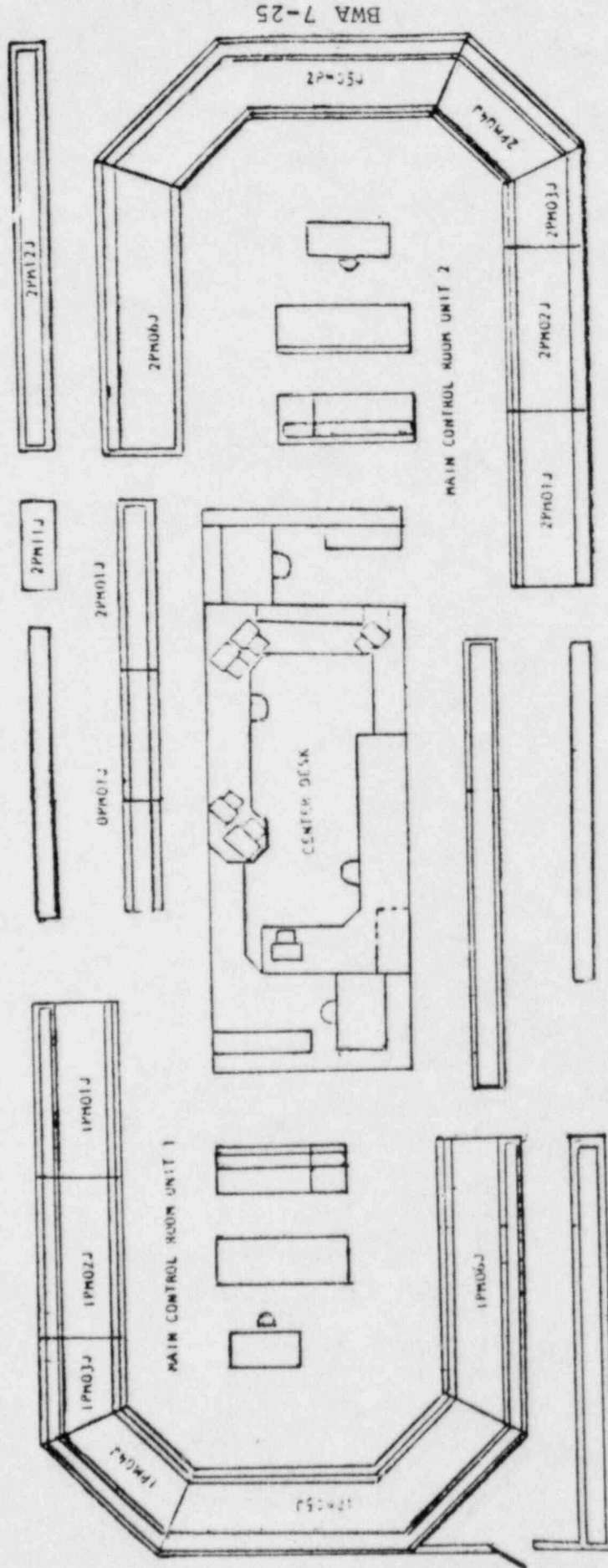
 HIGHLIGHTS LOCATION OF OSC AND HALLWAYS WHICH HAVE ACCESS TO THE OSC IN THE SERVICE BUILDING

BWA 7-24



FIGURE BWA - 7-2

APPROXIMATE CONTROL ROOM  
LAYOUT



Control Room - Elevation 451' Level

APPROXIMATE TECHNICAL SUPPORT CENTER LAYOUT

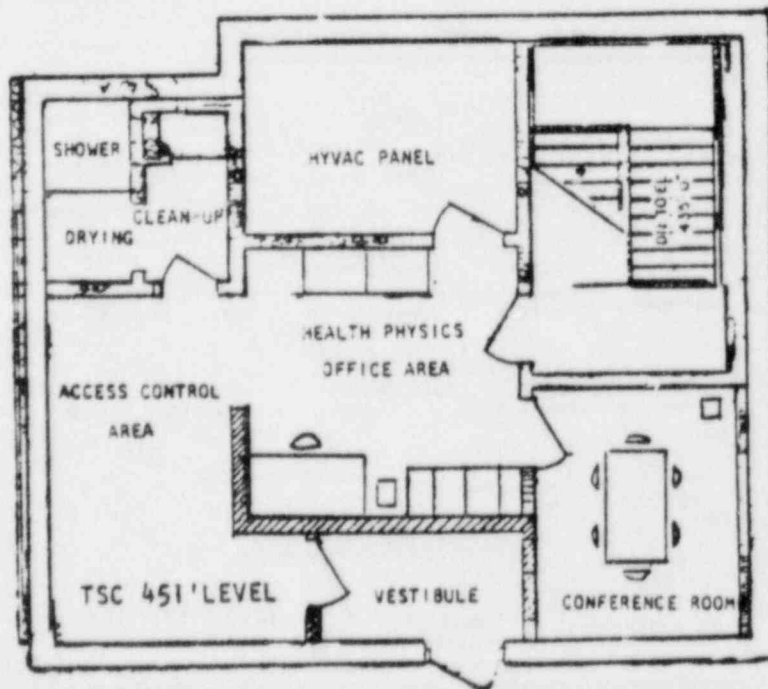
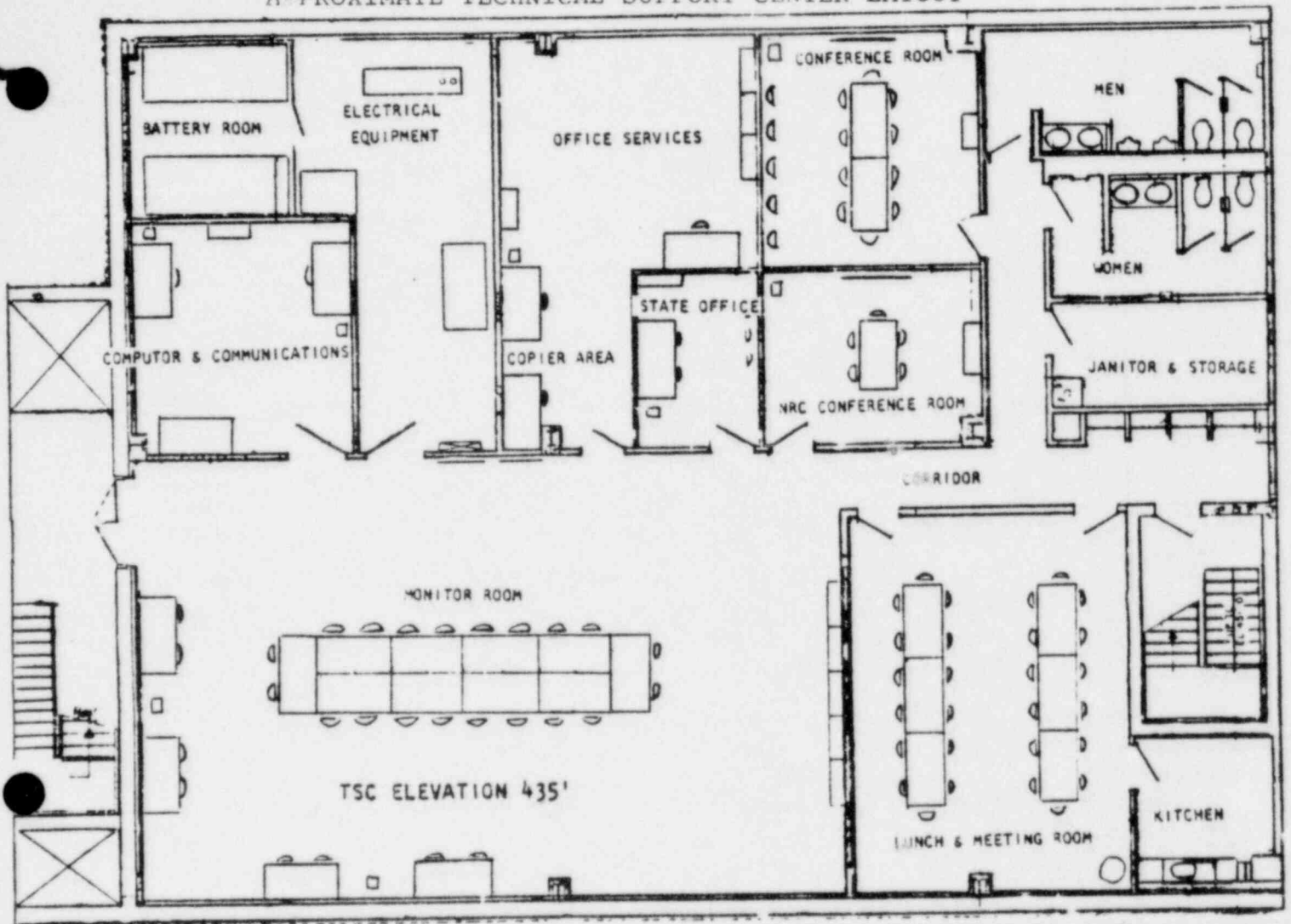
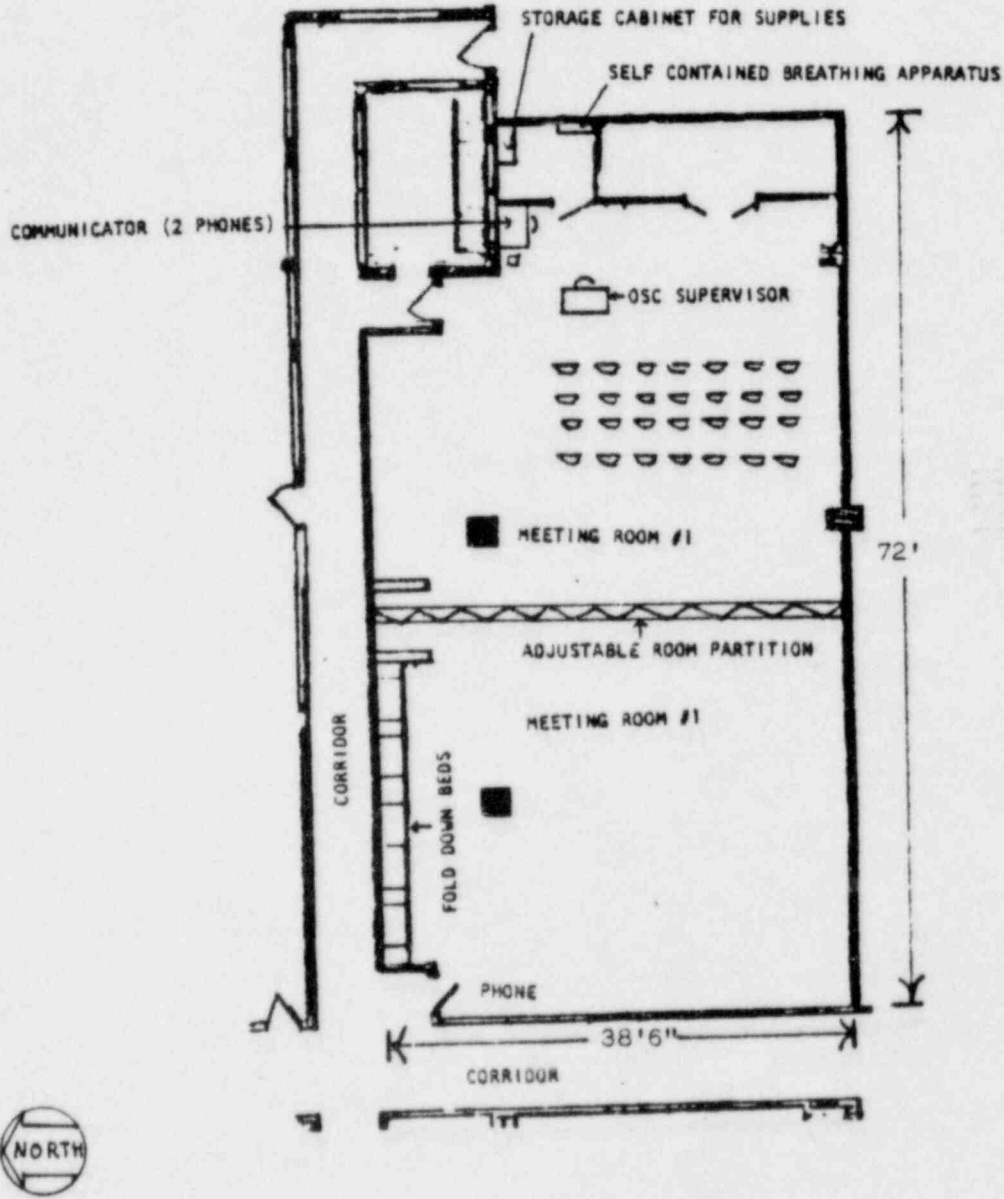


FIGURE BWA 7-4

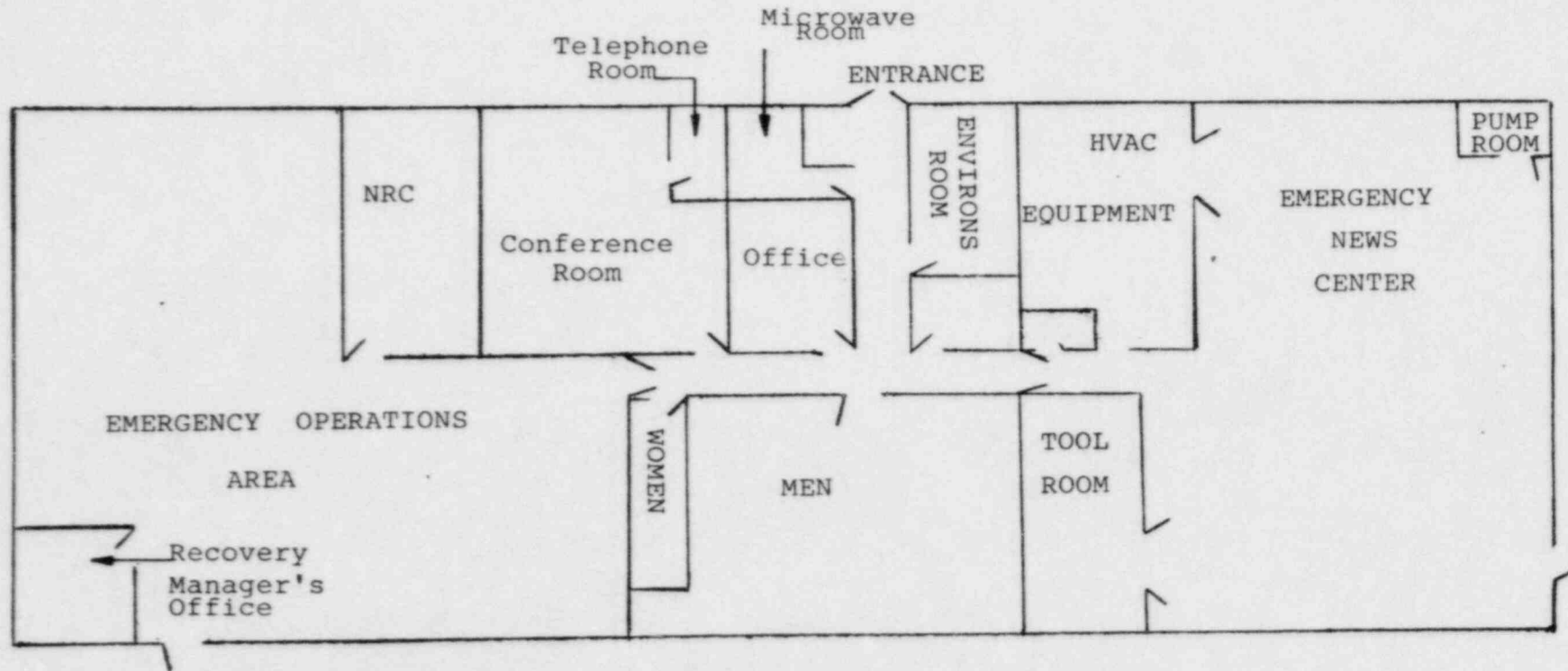
APPROXIMATE LAYOUT FOR BRAIDWOOD STATION OSC



OSC SERVICE BLDG. 451' LEVEL

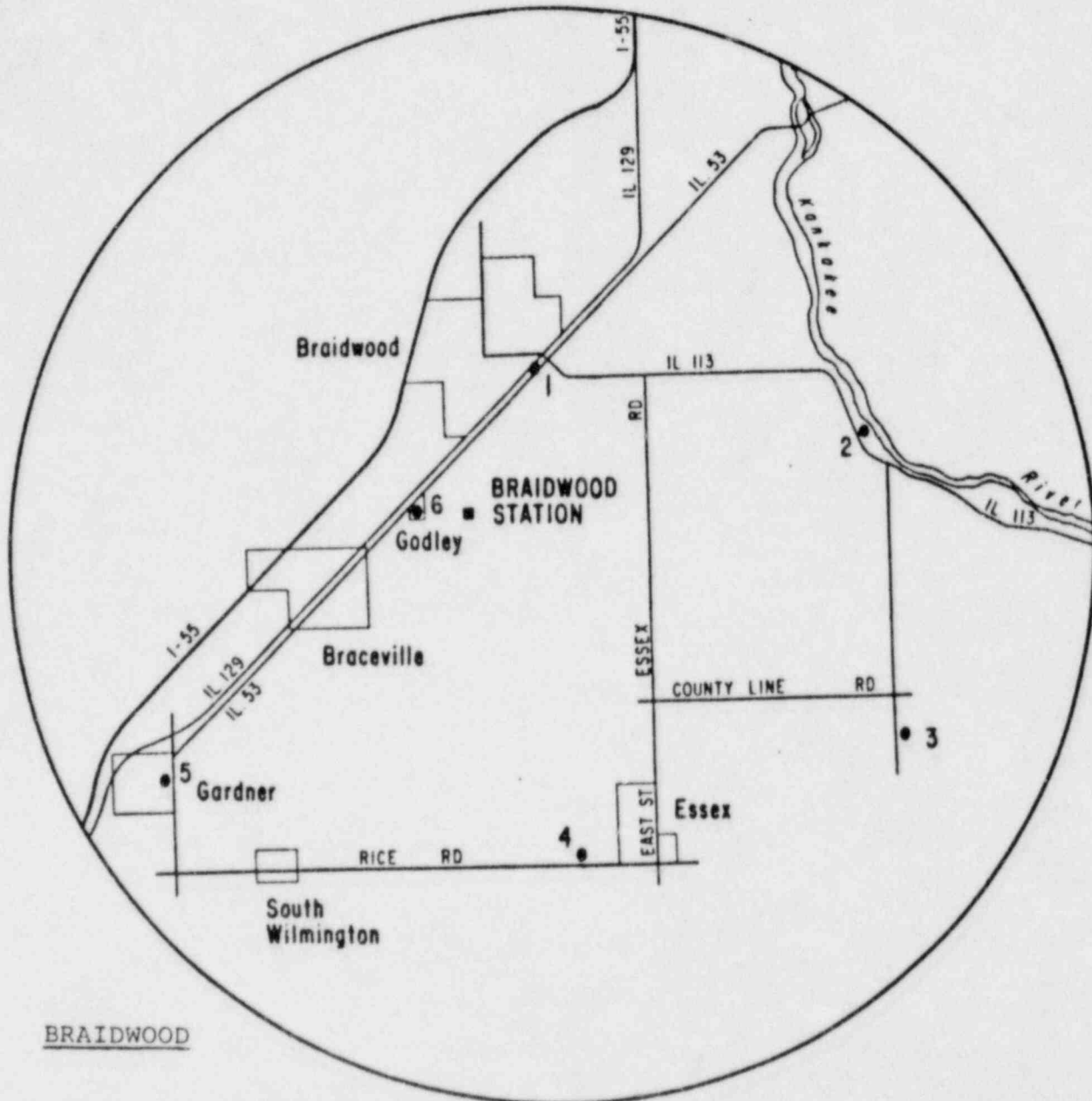
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FIGURE BWA 7 - 5  
APPROXIMATE LAYOUT FOR BRAIDWOOD EOF,  
MAZON, ILLINOIS

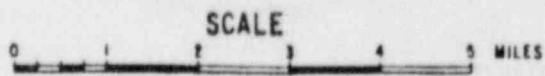


BWA 7-28

Locations of Fixed Environmental  
Radiological Monitoring Stations Air Samples

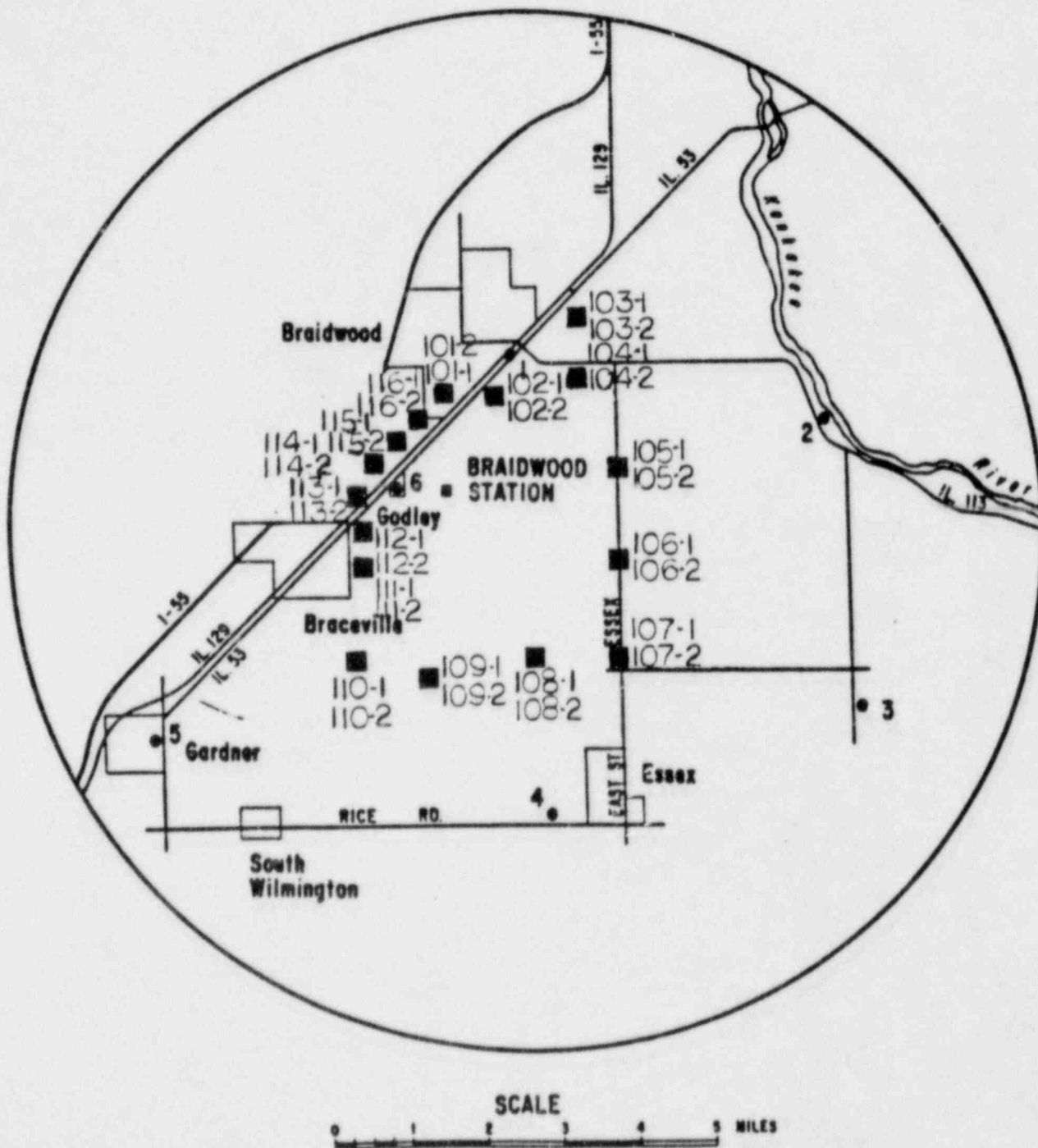


BRAIDWOOD

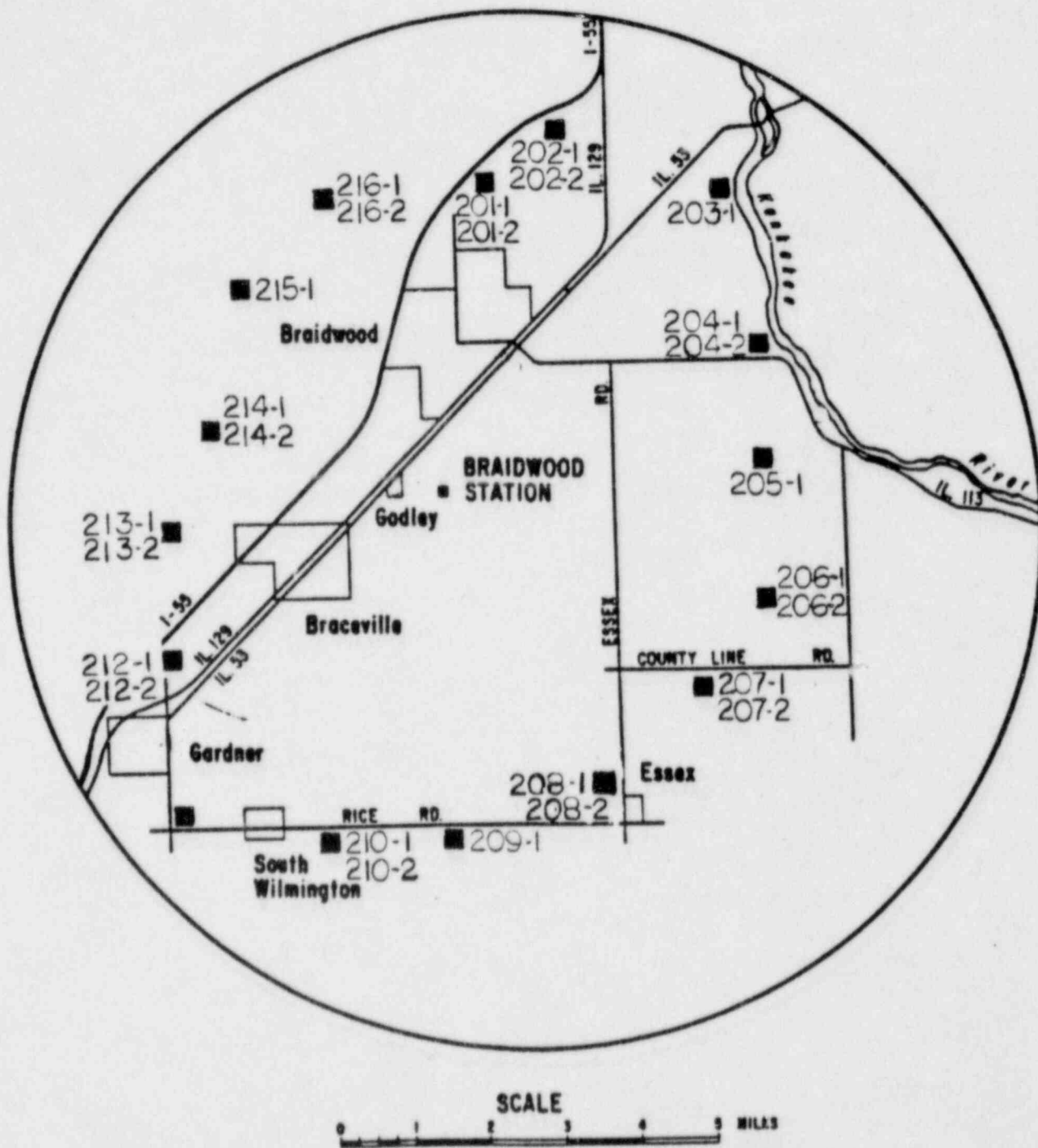


- BD-01 Braidwood
- BD-02 Custer Park
- BD-03 County Line Road
- BD-04 Essex
- BD-05 Gardner
- BD-06 Godley

Location of the Inner TLD Ring



Location of the Outer TLD Ring



## 8.0 MAINTAINING EMERGENCY PREPAREDNESS

### 8.1 General

As required by the generic GSEP, appropriate initial and annual retraining must be given to all Commonwealth Edison emergency personnel. The Commonwealth Production Training Department is responsible for ensuring that necessary training is given. As a matter of practice, the Station Training Department will actually perform the training of onsite emergency personnel, under the guidance of the Production Training Department. Station personnel who are assigned positions in the offsite GSEP organization will receive appropriate additional training from staff members of the Division Vice-President, Nuclear Stations.

Section 8.3 of the generic GSEP outlines the required schedule for exercises and drills. The Division Vice-President, Nuclear Stations and his staff are responsible for ensuring that the required exercises and drills are scheduled and conducted. (For the monthly NARS test and periodic fire drills, however, the Station is entirely responsible for completion.) The required exercises and drills include:

- 1) Annual exercises
- 2) Annual Communication Drills
- 3) Monthly NARS tests
- 4) Annual Environmental Monitoring drills
- 5) Semiannual Health Physics drills
- 6) Annual Medical drills
- 7) Annual Assembly and Accountability drills



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- 8) Annual Operator Response drills
- 9) Semi-annual Offshift Augmentation drills
- 10) Periodic Fire drills (in accordance with technical specification requirements.)

The augmentation drills are unannounced and involve implementation of the Station call-list procedure and documentation of the times when persons are notified. These drills will serve to demonstrate the capability to augment the onshift staff within a short period following an emergency declaration.

Communications with the NRC Region III Office and the NRC Operations Center will be tested monthly from the TSC, EOF, and Control Room. During all scheduled exercises and drills, the Station is responsible for supplying requested equipment, facilities and participants; the Station is also responsible for providing assistance in choosing exercise and drill dates that are suitable for all involved parties.

Commonwealth Edison is committed to offer and provide educational information to the local population, news media, and local support agencies. With regard to annual dissemination of information to the populace within the ten mile EPZ, the Commonwealth Public Affairs Department is responsible for mailing this information to city halls, gas stations, state parks, campgrounds, and other areas where a transient population may obtain a copy. The Commonwealth News Information Department will offer annual information

programs to local news media surrounding each nuclear station. The Station Superintendent is responsible for offering training to local support organizations as described in Section 8.1.2 of the generic GSEP.

8.2 Review and Updating of the Plan and Procedures

This Annex shall receive an annual review by Braidwood Station and shall be updated as required in order to keep it consistent with the generic plan and to incorporate significant changes in site specific equipment, procedures, local agencies, etc. Refer to the generic plan for other aspects of document control for the GSEP.

Emergency Plan Implementing Procedures shall be developed consistent with the GSEP, shall be reviewed annually,\* and shall address items discussed in Section 9.2 of the generic plan.

\*Reference: Braidwood FSAR Paragraph 13.3.16, Responsibility for Planning Effort, Paragraph 13.3.-10 and Paragraph 13.3.-11.