USEC
A Global Energy Company

September 14, 2006
GDP 06-0050

Mr. Jack R. Strosnider
Director, Office of Nuclear Material Safety and Safeguards
Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Paducah Gaseous Diffusion Plant (PGDP)
Docket No. 70-7001, Certificate No. GDP-1
Re-Transmittal of Revision 102 and 103 to Certification Application USEC-01

Dear Mr. Strosnider:

On August 17, 2006, USEC submitted Revisions 101, 102, 103 and 104 to the USEC-01 certification documents for the Paducah Gaseous Diffusion Plant (See the Reference). Due to a copying error, revised pages associated with Revision 102 and 103 transmitted by the referenced letter were subsequently found to be incomplete in that only one side of double sided pages to the Application were provided. The enclosure to this letter provides the correct double sided pages and is a complete replacement for the Revision 102 and 103 pages previously transmitted by the referenced letter. The Revision 101 and 104 pages submitted by the referenced letter were not affected.

Should you have any questions regarding this matter, please contact Mark Smith at (301) 564-3244. There are no new commitments contained in this submittal.

Sincerely,

S. A. Toelle

Steven A. Toelle
Director, Regulatory Affairs

Reference: Letter from Steven A. Toelle (USEC) to Mr. Jack R. Strosnider (NRC), "Transmittal of Revision 101, 102, 103 and 104 to Certification Application USEC-01", USEC Letter Number GDP 06-0047, dated August 17, 2006.

NMSS01

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Enclosure: USEC-01, Application for United States Nuclear Regulatory Commission Certification, Paducah Gaseous Diffusion Plant, Revision 102, and 103, Copy Numbers 1 through 6.

cc: R. DeVault, DOE	USEC-01, Copy Numbers 641
J. Henson, NRC Region II	USEC-01, Copy Numbers 442, 664
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D. Martin, NRC Project Manager – PGDP	(w/o)
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Enclosure 1 to
GDP 06-0050

USEC-01
Application for the United States
Nuclear Regulatory Commission Certification
Paducah Gaseous Diffusion Plant
Revision 102 and 103 (Re-Transmitted Pages)

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1.3 ANSI/ANS 3.1, Selection, Qualification, and Training of Personnel for Nuclear Power Plants, 1987 Edition

PGDP satisfies only the following section of this standard:

Section 4.3.3 - The qualifications of the Radiation Protection Manager identified in SAR Section 6.1 satisfy the requirements of this section of the standard.

1.4 ANSI/ANS 3.2, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, 1994 Edition

The extent to which PGDP satisfies the requirements of this standard is outlined in SAR Section 6.11.1 and Appendix B to SAR Section 6.11.

1.5 ANSI/ANS 8.1, Nuclear Criticality Safety in Operations With Fissionable Materials Outside Reactors, 1983 Edition

PGDP satisfies the requirements of this standard.

For references to this standard, see SAR Sections 4.3.2.6, 5.2.2.1, 5.2.2.3, 5.2.3.2, 5.2.4.1, and Table 6.9-1.

1.6 ANSI/ANS 8.3, Criticality Accident Alarm System, 1986 Edition

The recommendations of this standard were used as guidance only for the design of the CAAS. PGDP satisfies the requirements of this standard with the following exceptions:

Section 4.4.1 - The CAAS alarm is not audible in all permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

Section 4.4.2 - An alarm signal with a complex sound wave or modulation is not provided.

Section 5.3 - The CAAS is not designed to withstand seismic stresses.

Section 5.5 - Not all CAAS alarms are capable of producing the desired signal within one-half second of activation by the minimum accident of concern. All CAAS alarms are capable of producing the alarm signal within two seconds of activation by the minimum accident of concern.

Section 7.2.2 - Instead of acquainting all employees with the alarm signal by actual demonstration at their work location, a recording of the alarm signal will be used to familiarize employees.

For references to this standard, see SAR Sections 3.12.6, 3.15.7.1, and 4.3.2.6.

Each completed NCSA is issued as a controlled document. The permanent NCSAs are maintained in a controlled manual which is issued to the personnel who need access to the NCSAs. The temporary NCSAs are issued to the appropriate personnel performing the temporary operation. Approved NCSEs/NCSAs are quality records and are handled according to the plant's Document Control and Records Management Program described in Section 6.10. The NCSA/NCSE process provides assurance that operations will remain subcritical under both normal and credible abnormal conditions. A summary of the NCS controls and parameters controlled as well as the Active Engineered Features based on approved NCSAs/NCSEs are also presented in Appendix A.

There are three operations which do not meet the double contingency principle. These are product cylinder operations, operation of the enrichment cascade, and removal of large cascade equipment (e.g., compressor, convertor, G-17 valve, etc). These operations have been evaluated to be safe; summaries of the accident scenarios and NCS controls associated with the operation of the enrichment cascade, the removal of enrichment cascade equipment, and UF_6 product cylinder operations are provided in Appendix A. Any operations that do not comply with the double contingency principle are documented in NCSEs and Appendix A.

There are TSRs to ensure controls are in place for those operations identified above which do not meet double contingency. Sections 2.4 and 2.5 of the TSRs list controls for operation of the enrichment cascade and for removal and maintenance of enrichment cascade equipment, respectively. Section 2.3 of the TSRs provides the controls associated with ensuring moderation control for the product cylinders. Section 3.12 of the TSRs also contains controls within the fire protection program for ensuring moderation control for the enrichment cascade.

New operations and operations other than those identified as not meeting the double contingency principle in Appendix A shall comply with the double contingency principle. In the event future operations are found to not comply with the double contingency principle, Appendix A will be modified to address this issue and will be reviewed and approved as described in Section 6.3.

Emergencies arising from unforeseen circumstances can present the need for immediate action. If NCS expertise or guidance is needed immediately to avert the potential for a criticality accident, direction will be provided verbally or in writing. Such direction can include a stop work order or other appropriate instructions. A NCSA or other form of documentation will then be prepared to justify the actions taken once the emergency condition has been stabilized. This documentation shall be prepared within 48 hours following the stabilization of the emergency condition.

5.2.2.4 Design Philosophy and Review

Designs of new fissile material equipment and processes must be approved by the NCS Group before implementation and will include the use of favorable geometry or engineered controls on mass, moderation, volume, concentration, interaction, or neutron absorption, as the preferred approach over the use of administrative controls. Advantage will be taken for the nuclear and physical characteristics of process equipment and materials provided control is exercised to maintain them.

The preferred design approach includes two goals. The first is to design equipment with NCS independent of the amount of internal moderation or fissile concentrations, the degree of interspersed moderation between units, the thickness of reflectors, the fissile material density, and the fissile material chemical form. The second is to minimize the possibility of accumulating fissile material in inaccessible locations and, where practical, to use favorable geometry for those inaccessible locations. The adherence to this approach is determined during the preparation and technical review of the NCS evaluation performed to support the equipment design. This preferred design approach is implemented through adherence to plant NCS procedures.

Fissile material equipment designs and modifications are reviewed to ensure that favorable geometry and engineered controls are used to advantage. Administrative limits and controls will be implemented in NCSAs to satisfy the double contingency principle for those cases where the preferred design approach cannot be met. The basis for the decision to use administrative controls in lieu of engineered controls shall be documented in cases where: 1) new fissile material equipment and operations are evaluated, and 2) existing fissile material operations are revised and engineered controls are replaced by administrative controls.

5.2.2.5 Criticality Accident Alarm System Coverage

A CAAS is provided to alert personnel if a criticality accident should occur. The system utilizes a distinctive audible signal to notify personnel in the affected area and initiate evacuation, thereby reducing personnel exposure to emitted radiation. Audibility is not provided in permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. In these areas a "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

At PGDP, the CAAS detects gamma dose rate. The system uses clustered detectors. Each cluster contains three scintillation detectors. Activation of any two of the three detectors in a cluster will initiate evacuation alarms. The failure of any major component of the system will result in a notification that indicates the need for corrective maintenance. A more detailed discussion of the physical function of the CAAS system is provided in Section 3.12.6.

Operations involving fissile material are evaluated for NCS prior to initiation. The need for CAAS coverage is considered during the evaluation process. Coverage is provided unless it is determined that coverage is not required and that finding is documented in the NCSE. For example, areas containing no more than 700 g of ^{235}U, 50 g of ^{235}U in any square meter of floor or ground area, 5 g of ^{235}U in any 10-liter volume, or areas having material that is either packaged and stored in compliance with 10 CFR 71 or specifically exempt according to 10 CFR 71.15, can be shown by evaluation not to require alarm coverage. Areas that do not contain any operations involving uranium enriched to 1 wt % or higher ^{235}U and 15 g or more of ^{235}U do not require an NCSE and are not required to have CAAS coverage. 10 CFR 76.89(a) authorizes USEC to "describe for the approval of the Commission defined areas to be excluded from the monitoring requirement." This submittal to the NRC "must describe the measures that will be used to ensure against criticality including kinds and quantities of material that will be permitted and

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SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

LCO 2.6.4.1b: Criticality accident alarm shall be operable (audible).

APPLICABILITY: In areas in the facilities listed in 2.6.4.1a where the maximum foreseeable absorbed dose in free air exceeds 12 rad, except areas in permit-required confined spaces and localized areas of inaudibility. This LCO is applicable when the new criticality accident alarm system with air accumulators and/or electronic horns has been declared operable.

ACTIONS:

Condition	Required Action	Completion Time
A. Area does not have an audible criticality accident alarm.	A.1 Discontinue operations with fissile material. [Handling, transporting, analyzing, or processing of assay samples necessary for compliance with TSR 2.4.4.3 is not restricted by this action.]	Immediately
	AND	
	A.2.1 Evacuate area of inaudibility	Immediately
	AND	
	A.2.2 Restrict access to the area of inaudibility.	
	AND	
	A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification such as a device that will alarm on sensing a 10mr/hr dose rate, or a radio in constant communication with the Central Control Facility.	Immediately
B. Area does not have an audible criticality accident alarm.	B.1 Restore criticality accident alarm to operable status. TSR 1.6.2.2d is not applicable.	Prior to reinitiating activities

SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.6.4.1b-1	Test the CAAS and building horns.	Quarterly
SR 2.6.4.1b-2	Verify that the CAAS air accumulator supply pressure to the building horns is greater than or equal to that necessary to sound all building horns for at least 120 seconds based on the number of accumulators in service. C-400 Number of accumulators in service — Minimum pressure 2 — 125 psig 1 — 145 psig C-409 Number of accumulators in service — Minimum pressure 1 — 125 psig	Quarterly
SR 2.6.4.1b-3	Verify that the condition of the battery backups to the electronic horns are sufficient to power the horns for at least 120 seconds.	Annually

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. Audibility is not provided for areas in permit-required confined spaces and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate. One person remains outside the area and maintains contact with personnel in the area. Evacuation of the area of inaudibility and restricting access to those areas will eliminate the potential for increased consequences due to personnel not hearing an alarm. The design of the system, three detector modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the listed facilities are associated with the handling of fissile materials.

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6.5 OPERATIONS

This section describes personnel, practices, and key facilities associated with the continued operation of PGDP.

The site is large enough to provide a considerable buffer between the enrichment process and our rural neighbors. Plant operations are continuous with coordination of operations performed by the Plant Shift Superintendent (PSS) from a central control facility. The plant is protected on a continuous basis by fire services and security forces. Each significant building is equipped with fire alarms and water sprinklers as discussed in SAR Section 5.4.1.1. Emergency mutual assistance exercises are conducted biennially with the emergency forces of the state and of the surrounding communities.

There is a public warning system to alert neighbors in the event of any plant problem that might affect them. Spill control measures are in effect for all continuous liquid effluent discharge points. More information on waterborne effluent control is contained in SAR Section 5.1. There are also internal impoundment structures, spill control equipment, and monitoring stations with alarms. The principal toxic gases on the site are the uranium hexafluoride process gas, fluorine, chlorine trifluoride, chlorine, and hydrogen fluoride. Liquid hazardous chemicals include oil, nitric acid, sulfuric acid, and a variety of other chemicals in smaller amounts.

The plant is normally in one of three modes of operation, from a safety perspective.

Normal Operations

Most of the time is spent in normal operations; in this mode the following conditions apply:

- Operations are proceeding within expected parameters with no safety impacts from deviations,
- Technical Safety Requirements (TSRs) are in effect,
- Routine effluents or emissions are within permits and certificate conditions with no significant impact to the public or environment, and
- Personnel exposures are below 10 CFR 20 limits and OSHA requirements.

Off-normal (but not emergency) Operations

Occasionally, process upsets and/or equipment failures occur which result in "off-normal" conditions within localized areas of the plant; these "off-normal" modes are as follows:

- Small releases of UF_6 or other toxic gases (such as F_2, HF, CLF_3, Cl_2) that result in evacuation of the immediate area and monitoring for reentry, but do not affect other areas of operations of the plant and have no impact off site;
- Occupational safety injuries and/or illnesses with a response required to render aid or transport to the plant or off site medical facility;

- Small fires that are quickly extinguished;

- Unexpected radiological contamination that requires reporting of plant areas or additional employee protective measures.

These "off normal" conditions are managed by the PSS from the C-300 Plant Control Facility with involvement by plant shift emergency response and/or health physics personnel. It may involve call-in of Health and Safety personnel.

Emergency Operations

The third mode is an emergency, as described in the Emergency Plan, which involves an "Alert" or "Site Area Emergency" declaration and activation of the Emergency Operations Center.

The remainder of this section provides an overview of the major operating areas of PGDP with a brief discussion of the safety and safeguards risks and the controls and operational surveillances in place to manage these risks. A description of the plant and plant operations is provided in detail in Chapter 3; a detailed accident analysis and discussion of risks associated with plant operations is provided in Chapter 4.

6.5.1 Shift Operations

The gaseous diffusion process operates continuously. To support this continuous operation, a work force is required 24-hours per day.

The PGDP work force is divided into two primary groups, a day shift (management, support staff, service groups) working primarily Monday through Friday, and shifts that provide continuous coverage of plant operations. The day shift provides the administrative support, activities such as design and fabrication where continuation is not time constrained, procedure development, classroom training, planning, and preventive maintenance. Most of the plant staff is assigned to the day shift.

The shift organization has the prime responsibility for continued plant operation and the evolutions, exchange of information, and response to abnormal and unusual conditions necessary to ensure safe and efficient plant operation. Typical activities of the shift include provide oversight and direction for all plant operations, monitor systems and equipment for proper performance, conduct routine back shift maintenance and emergency equipment repair, prepare equipment for day shift repair/preventative maintenance functions, and respond to emergency situations.

Operational activities of the plant are controlled by the Plant Shift Superintendent (PSS) whose normal watch station is in the C-300 Central Control Facility (CCF). The PSS reports directly to the Shift Operations Manager. Upon recognition of an emergency, the PSS, or other qualified individual responds to the scene as Incident Commander. The PSS serves as Crisis Manager during a classified emergency (Alert or Site Area Emergency) until relieved by a manager designated in the emergency line of executive succession when the Emergency Operations Center becomes operational. Emergency command and control is described in the Emergency Plan.

The CCF is the hub of the plant operational activity. The overall UF_6 enrichment process is monitored at this location. Key plant operations can be performed remotely from the CCF, key alarm systems are monitored, and plant communications systems as well as off-site communications capabilities

are located in the CCF. The plant power system is monitored and controlled through a communication network with the power suppliers. Typical operational activities that are monitored and controlled from the CCF include determining and establishing optimal plant power level, executing or altering the maintenance work plan if necessary, and maintaining necessary manpower level to support plant operations.

Staffing levels for the shifts are not fixed but are based on the expected or planned activity for the shift period. Staffing levels take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and Technical Safety Requirement (TSR) specified staffing requirements. When special activities are included in the work plans, the staffing will be increased as required to perform the planned activity. The required minimum staffing level for Paducah is approximately 43 as detailed in Section 3 of the TSRs. This is a fraction of the normal average shift staffing of approximately 80 persons.

Each shift organization is composed of a PSS, a cascade coordinator (CC) who directs overall cascade activities; shift engineer; first-line managers for the cascade buildings, UF_6 handling facilities, security, fire services, maintenance and power operations and utility operations; health physics technicians; Security Shift Commander; Fire Services Shift Commander; and operators, instrument mechanics, Security Police officers, and firefighters. Less than this normal shift staffing is permitted for short periods with the concurrence of the PSS to allow for call-ins or other compensatory actions.

The PSS provides a direct chain of command from the Operations Manager, Shift Operations Manager, Plant Manager and General Manager to the shift operating staff and serves as the senior shift manager in directing activities and personnel. The operations line organization is accountable to the PSS for reporting plant status.

The CC provides managerial oversight, operations coordination, and assures adequate staffing for all cascade operations on a 24-hour basis. This person approves, directs, and integrates all significant cascade operational activities under the oversight of the PSS.

The remaining members of the shift organization provide the needed functions for round-the-clock operations. First-line managers provide management for, coordination of, and assurance for proper execution of assigned tasks. The shift engineer provides engineering support for technical issues involving operations. Health physics technicians provide support for 24-hour shift operations. The first-line manager for Security supervises the activities necessary to ensure the protection of plant facilities, government property, and classified information. The first-line manger for fire services supervises shift fire services work activities and responds to plant emergency events.

There are diverse systems for operational communications. Commercial telephones, an internal plant telephone system, radio network, a plant public address (PA) system, emergency signals, and a pager system are available to provide necessary communications in operating the plant. The CCF is the focal point for all emergency reporting and initiating of all emergency responses. A special emergency telephone network is available in the CCF. Fire alarm and sprinkler indicator systems, criticality alarm panel, seismic alarms as well as numerous operational alarms are monitored in the CCF. As described in the Emergency Plan, the PSS will initiate off-site notifications and plant personnel call-ins when required.

In accordance with the corrective action program, plant personnel are required to report abnormal events or conditions that may have the potential to harm the safety, health, or security of on-site personnel, the general public, or the environment. Plant personnel are also required to immediately report conditions which may require emergency response. The PSS reviews potentially reportable or inoperable safety system equipment reports and determines proper disposition.

6.5.2 Cascade Operations Organization and Administration

The cascade is the UF_6 enrichment portion of the plant. The cascade is composed of six major process buildings which houses two parallel enrichment cascades that share common product and tails withdrawal facilities. There are auxiliary facilities such as the recirculating water pump houses which are also under the direct control of cascade operations.

The Operations Manager is responsible for overall operations. This includes operation of cascade equipment, planning for power usage, control of feeds, product and tails material including sampling, operating plant utilities, radiological decontamination, equipment cleaning, uranium precipitation, waste management, and operation of plant laundry. The Operations Manager is supported by managers in the following groups: Shift Operations, Cascade, Chemical, Utilities, Power, and UF_6 Handling. These group managers have subordinate managers assigned to functional areas to provide oversight of the day shift operations.

The optimum cascade arrangement for specific power levels, cascade configuration, product and tails assay levels, and feed availabilities is determined by the technical staff. Recommendations for these operating conditions are made by the technical staff to appropriate Operations Management and implemented by the operations staff in conjunction with the shift organization. The shift organization follow daily instructions and work plans developed and communicated by Operations Management.

The Utilities Manager, in conjunction with key building managers, provides the plant with sanitary water, chilled water, steam, air, nitrogen, and sewer services. These must be supplied on a continuous basis to meet the cascade requirements. Any outage is coordinated with customers to assure proper planning to provide temporary services as necessary.

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4.1.12 Nuclear Safety and Quality Manager

The Nuclear Safety and Quality Manager is responsible for implementing and directing independent assessments, quality control, nuclear material control and accountability, and nuclear safety assurance.

4.1.13 Section Deleted

4.1.14 On-Duty PSS

As the senior manager on shift, the on-duty PSS represents the General Manager and managers and has the authority and responsibility to make decisions as necessary to ensure safe operation, including stopping work and placing the plant in a safe condition.

The on-duty PSS is responsible for making proper notification in regard to abnormal plant conditions, determining the severity of the event, declaring an emergency, and initiating appropriate response. The on-duty PSS may respond to an incident scene as the on-scene incident commander or dispatch other qualified individual in this capacity. The on-duty PSS is the crisis manager until relieved by a member of management designated in the emergency line of executive succession.

4.1.15 Section deleted.

4.1.16 GDP Procurement and Materials Manager

The GDP Procurement and Materials Manager is responsible for managing the projects, programs, and the activities related to packaging and transportation, material control, stores, shipping and receiving, and property disposition.

4.1.17 Nuclear Criticality Safety Manager

The Nuclear Criticality Safety Manager is responsible for implementing the nuclear criticality safety program. This position reports to the USEC NCS Manager, who is responsible for the nuclear criticality safety programs at both sites.

4.1.18 Scheduling Manager

The Scheduling Manager is responsible for production maintenance work scheduling.

4.2 ON-SITE EMERGENCY RESPONSE ORGANIZATION

The Emergency Response Organization (ERO) is responsible for taking immediate mitigative and corrective actions to minimize the consequences of an incident to workers, public health and safety, and the environment. The ERO is staffed with trained personnel who respond to events and are required to participate in formal training, drills, and exercises. The incident type and severity dictate the level of ERO activation.

The ERO has the following specific functions and responsibilities, depending on the incident and level of response needed to mitigate the problem: event categorization, determination of emergency class, notification, protective action recommendations, management and decision making, control of on-site emergency activities, consequence assessment, protective actions, medical support, public information, activation and coordination of on-site response resources, security, communications, administrative support, and coordination and liaison with off-site support and response organizations.

The ERO is divided into functional groups as follows:

1. Plant Emergency Squad,
2. EOC cadre, and
3. Joint Public Information Center (JPIC).

Members of these groups are assigned to on-scene response locations and emergency response centers, such as the EOC. Emergency assignments correspond as closely as possible to daily duties. Primary and alternate personnel are assigned to the ERO positions. Assignments are updated periodically. Management ERO positions in each group provide oversight and final authority in the group's decision-making process.

4.2.1 Direction and Coordination

The initial ERO consists of the plant emergency squad with the PSS, or other qualified individual as incident commander (IC) at the scene. Upon classification of the emergency as an Alert or SAE, the PSS becomes the CM and maintains overall control of the plant during the emergency until relieved. When the EOC is operational, a manager designated in the emergency line of executive succession relieves the PSS as CM and the overall control of the emergency shifts from the PSS to the CM.

The PSS conducts transition and turnover of command and control authority and responsibility of the CM function in a formal manner by use of specially developed procedural checklists and, if possible, face-to-face briefings. A primary and alternates are identified for the CM.

The order of succession for the CM position is identified in an EPIP and includes the following:

1. PSS
2. General Manager
3. Plant Manager
4. Others as designated by the General Manager and trained and qualified as CM

5. EMERGENCY RESPONSE MEASURES

Emergency measures must be taken in response to an emergency. Upon recognizing that an emergency exists, necessary portions of the emergency organization are activated. Once activation has taken place, assessments of the condition are made, corrective and protective actions are taken, and aid to affected persons is administered as required.

After becoming aware that an emergency exists, the PSS does the following:

1. Takes actions to ensure the safety of plant personnel and the general public,

2. Takes actions to ensure safe operation/activities of the plant,

3. Classifies the emergency and makes required notifications,

4. Performs assessment actions, and

5. Performs any other emergency actions as appropriate.

5.1 ACTIVATION OF EMERGENCY RESPONSE ORGANIZATION

Upon recognition of an emergency, the PSS, or other qualified individual responds to the incident scene as the IC. The IC determines appropriate immediate protective actions at the incident scene. The PSS classifies the event if applicable. If the emergency is classified as either an Alert or SAE, the PSS as CM activates the EOC. Minimum staffing requirements for activation and operation of the EOC are identified in an EPIP, and must be met prior to assumption of command and control by the crisis management team. CM responsibilities are assumed by a manager designated in the emergency line of executive succession when the EOC is operational. Methods for ERO notification/activation are the same regardless of the time of the emergency and include plant radios, emergency pager system, and telephones. When notified, EOC cadre members are required to respond immediately. ERO activation is accomplished through the appropriate EPIPs.

The CM delegates public information duties to the public information advisor, who, in concert with USEC headquarters, is responsible for activating the JPIC.

The IC maintains command and control over the specific area response and protective actions. The IC coordinates mitigation and protective action strategy and direction and keeps EOC informed of the incident status when the EOC is operational.

In the event that two or more emergencies occur simultaneously so that they cannot be managed effectively as a single incident scene, provisions in the appropriate EPIPs allow for the establishment of additional incident scenes, designation of multiple incident commanders, and division of response resources as necessary.

5.1.1 *Section deleted.*

5.1.2 ***Section deleted***

5.2 ASSESSMENT ACTIONS

This section describes the processes used for assessing the actual or potential on-site and off-site consequences of an emergency. Initial and continuing assessment actions are the responsibility of the CM. Post-accident assessments are a shared responsibility between the IC, the CM, and the recovery manager, if assigned.

Continuous assessment throughout the course of an emergency is necessary to effectively coordinate and direct the elements of the ERO. The initial assessment actions are dictated in part by the nature and severity of the emergency. Emergency assessment provides an indication of the vulnerability to life, the environment, and property injury or damage if an emergency occurs. The different assessment actions for Alert and SAEs are described in Sections 5.2.1 and 5.2.2. Equipment used to assess releases is described in Section 6.4.

5.2.1 Assessment Actions During an Alert

An Alert requires basic emergency assessments. Attention must be paid to parameters that may indicate a possible worsening of conditions (e.g., radioactive/hazardous materials releases). The existence of an Alert requires the following initial and ongoing assessment actions as applicable:

1. Increased surveillance of applicable plant instrumentation and visual observation of the incident conditions,

2. Determination of the resources necessary to mitigate the event from evaluation of reports of damage and injury or by on-scene inspection,

3. Monitoring event conditions for potential changes in emergency classification level.

5.2.2 Assessment Actions During an SAE

In the event of an SAE, assessment activities are more extensive than for an Alert. During a release of radiological/hazardous materials, assessment of on-site and off-site exposures are performed regularly to determine if and when on-site sheltering or evacuations or off-site sheltering may be required.
The results, including methods and assumptions, are communicated to appropriate off-site officials as off-site protective action recommendations. In addition to the activities that would be carried out during an Alert, the following activities are performed at the direction of the PSS or the CM when the EOC is operational, as appropriate:

1. Performing continuing emergency assessments for mitigating events and protective actions on-site, based on on-scene and field monitoring results, release information, and meteorological conditions for radiological/hazardous material releases, and

2. For off-site hazardous material releases, providing specific material information, release information, plume direction, projected plume location, appropriate meteorological information, and field monitoring results to responsible off-site authorities.

STEs provide secure voice communications to on-site and off-site users of other STE telephones. It can operate as a normal telephone in the "clear" mode.

Cellular telephone service is available from the plant site. The PSS response vehicles are equipped with cellular telephones. This system also provides backup for the plant telephone system.

6.2.1.2 PA System

A PA system is in place with the capability to cover most occupied site buildings. During emergencies, the system is not used for routine traffic. The system is tested daily. Two-way radios and runners are used to communicate with individuals that are not covered by the PA system.

6.2.1.3 Radio Systems

The plant radio network supports normal plant operations and, therefore, is effectively utilized daily. The PSS response vehicles are equipped with two-way radios. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating with responding units on the county emergency response frequency.

6.2.1.4 Pager System

Key EOC personnel have pagers which provide access from any tone-type telephone and can relay return telephone numbers or coded responses to the holder of the unit. EOC cadre pager drills are conducted at least quarterly. Pagers are used frequently for nonemergency uses, which enhances the regular testing program.

6.2.1.5 Facsimile Machines

The facsimile machines located in the EOC are used to communicate with USEC and federal, state, and local agencies.

6.2.2 Off-Site Communications

The plant uses the commercial telephone system for off-site emergency communications. Cellular telephones can be used as a backup to the commercial telephone system. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating on the county emergency response frequency.

The Public Warning System, consisting of outdoor warning sirens and emergency alert system announcements, is used to provide emergency notification. Operations testing of the Public Warning System sirens is conducted monthly.

6.3 ON-SITE MEDICAL FACILITIES

The plant maintains medical coverage consistent with the activities being conducted on-site. In an emergency, off-duty medical personnel are notified and directed to required locations as needed. The PSS notifications include alerting appropriate occupational health services and medical personnel in the event of emergencies ranging from industrial accidents to toxic or radiological releases. Letters of Agreement are maintained with area hospitals. These off-site hospitals also have facilities, equipment, and supplies for the treatment of contaminated individuals. A summary of the medical resources follows.

A plant medical facility is maintained on-site during the day shift excluding weekends and holidays. This facility has the supplies, equipment, and personnel to treat most injuries. This includes capabilities for the treatment of contaminated individuals including a shower for contaminated ambulatory patients, radiation survey instruments, and decontamination supplies. Medical personnel assess patient condition, provide necessary emergency care, and determine appropriate supplemental treatment.

Health Services personnel are available during the day shift hours with plant fire fighters providing emergency medical coverage the remainder of the time. Health Services personnel may be called on-site during off shifts, as deemed necessary.

Emergency medical technicians provide and staff ambulance service. Additional ambulance support is available from off-site.

6.4 EMERGENCY MONITORING EQUIPMENT

The plant maintains various radiation detection equipment on-site for normal and emergency response use. Criticality accident alarms have been placed in those areas and in facilities containing fissile material as described in Section 5.2 of the SAR. The criticality accident alarm system provides for radiation detection and an alarm system to alert plant personnel.

Persons requiring radiation exposure monitoring wear beta-gamma-sensitive dosimeters (TLDs), which are processed and evaluated by a processor holding current accreditation from the National Voluntary Laboratory Accreditation Program of the National Institute of Standards and Technology. These personnel exposure monitoring dosimeters are exchanged and analyzed in accordance with Section 5.3 of the SAR. As appropriate, other types of dosimeters, (e.g., finger rings, direct-reading dosimeters, and neutron dosimeters) are used.

Radiation dose rate and contamination survey instruments used are appropriate to measure the types and energies of radiation encountered at GDPs. Instruments capable of supporting radiography operations are also maintained in inventory. Instrumentation includes alpha/beta count rate and scaler instrumentation as well as ion chambers used to evaluate personnel exposure.

Designated plant emergency vehicles responding to the scene will contain necessary emergency equipment and supplies and ensure that radiological monitoring equipment is readily available to emergency personnel. Radiological monitoring equipment is also stored in Building C-300 for designated field monitoring personnel. Emergency equipment and its storage locations are identified in appropriate EPIPs.

10. COMPLIANCE WITH COMMUNITY RIGHT-TO-KNOW ACT

The plant complies with the EPA Superfund Amendments and Reauthorization Act (SARA) Title III regulations, also known as the Emergency Planning and Community Right to Know Act. Specific responsibilities include emergency response planning, emergency release reporting, hazardous chemical inventory reporting, and toxic chemical release reporting.

The Plan and appropriate EPIPs are used during any hazardous chemical release emergencies. Plant administrative procedures have been developed for hazardous materials releases that are not classified as emergencies to ensure that requirements of SARA Title III are met. MSDSs are maintained in several areas throughout the plant.

Hazardous materials spills or releases are reported to the PSS who responds to the incident scene as IC or dispatches other qualified individual in that capacity. The IC directs the emergency containment of spills. Actions to be implemented are described in appropriate EPIPs and include the following:

1. Establish command,
2. Evacuate/isolate the area of release/spill activity, as necessary, and determine areas of concern,
3. Classify the emergency, if appropriate,
4. Determine if activation of additional ERO personnel is necessary,
5. Take measures to minimize safety concerns,
6. Determine a course of action and personal protective equipment requirements,
7. Initiate containment procedures,
8. Terminate the source,
9. Make appropriate notifications to on-site and off-site officials,
10. Determine material disposal, and
11. Terminate the incident and enter recovery.

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Appendix D

DEFINITIONS/ACRONYMS

Accident — A deviation from normal operations or activities associated with a hazard that has the potential to result in an emergency.

ACR — Area Control Room.

ALARA — As Low as Reasonably Achievable.

Text deleted.

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

CAAS — Criticality Accident Alarm System.

CAS — Central Alarm Station.

CCF — Central Control Facility.

CM — Crisis Manager.

Consequence — The result or effect (especially projected doses or dose rates) of a release of radioactive or hazardous materials to the environment.

Corrective Actions — Those emergency measures taken to lessen the severity of or terminate an emergency situation at or near the source of the problem in order to prevent or control a release of radioactive material or to minimize the damage to plant equipment, e.g., shutting down equipment, fire fighting, repair, and damage control.

Decontamination — The removal of surface radioactive/hazardous material from individuals, equipment, surfaces, etc.

DOE — Department of Energy.

Drill — A supervised, hands-on instruction period intended to test, develop, or maintain a specific emergency response capability. A drill is often a component of an exercise.

EAS — Emergency Alert System

EMA — Emergency Management Agency.

Emergency — A sudden, usually unforeseen occurrence or occasion requiring time-urgent and immediate action/response. It may result from accidental causes, natural causes, or malicious man-made actions.

Appendix D (Continued)

Emergency Action Level (EAL) — Specific, predetermined, observable criteria used to detect, recognize, and determine the class of emergencies. An EAL can be an instrument reading, an equipment status indicator, a measurable parameter, on-site or off-site, a discrete, observable event, a result of analyses, or another observed phenomenon that indicates entry into a particular emergency class.

Emergency Operations Center (EOC) — An emergency response facility that accommodates personnel acting in support of the command and control functions but separate from the incident commander and on-scene command post. Under the guidance of the CM, these personnel supply in-depth strategic and corrective engineering and radiological, hazardous materials, and environmental support assistance to the incident scene.

Emergency Response Organization (ERO) — The designated group of personnel responsible for coping with and minimizing or mitigating the effects of any emergency.

Emergency Response Planning Guideline (ERPG) — A hazardous material personnel exposure level or range which, when exceeded by a short-term or acute exposure, will cause irreversible or other serious health effects in humans. The ERPGs are approved by a committee of the American Industrial Hygiene Association.

Deleted

EPA — Environmental Protection Agency.

EPIP — Emergency Plan Implementing Procedure.

Event — Any real-time occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect people, property, or the environment.

Exercise — A scheduled and planned large-scale activity that tests the integrated capability and most aspects of the emergency management program.

FAA — Federal Aviation Administration.

FBI — Federal Bureau of Investigation.

GDP — Gaseous Diffusion Plant.

Hazardous Material — Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment.

IC — Incident Commander.

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SECTION 3.0 ADMINISTRATIVE CONTROLS

Table 3.2.2.1 Minimum Staffing Requirements[a]

Facility Function	Mode/Operation	Staffing Requirements	Work Area Definition
C-300	All	3	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-360	1b, 3, 4, 5	1[b]	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	1a, 2, 6	2	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	7	2	At least one person in the Laboratory. One person in the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
C-333-A	1, 2, 5	2	Two persons in the operating facility or immediately surrounding grounds including the local cylinder yard.
C-337-A	3, 4	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-310	Product withdrawal 1, 2, 3, 4 Cascade 1, 3	2[c]	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-315	1, 2, 3, 4	2[c]	Two persons in the facility or immediately surrounding grounds including the local cylinder yard.
C-331 C-335	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	2	At least one person in the ACR.
C-333 C-337	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	3	At least one person in the ACR.
Health Physics	At all times	1	Onsite.
Power Operations	At all times	4	Onsite.
Utilities Operations	At all times	4	Onsite.
Fire Services	At all times	4[d]	Onsite[d].
Security Services	At all times	4	Onsite.

a. Staffing may be less than the minimum requirement listed for a period of a time not to exceed four hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift manning requirements to within the minimum requirements. The C-331, C-333, C-335, and C-337 ACRs shall always be manned. The ACRs for C-310, C-315, C-333-A, and C-337-A shall be manned when required by operating mode. Manning not required during emergency conditions requiring building/area evacuation.

b. Manning requirement is zero if all autoclaves are in MODE 6 (Not In Use for C-333-A and C-337-A) or MODE 8 (Not In Use for C-360) and the Transfer Station is in MODE 8 (Not in Use).

c. When withdrawal process equipment is brought below atmospheric pressure or to a UF_6 negative in the NOT IN USE (Mode 4) operating mode then the staffing requirements for the appropriate withdrawal facility do not apply.

d. In accordance with footnote "a", Fire Services personnel making an unexpected run to deliver an individual to a local hospital are allowed to be offsite and are considered to be on duty and available.

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1.3 ANSI/ANS 3.1, Selection, Qualification, and Training of Personnel for Nuclear Power Plants, 1987 Edition

PGDP satisfies only the following section of this standard:

Section 4.3.3 - The qualifications of the Radiation Protection Manager identified in SAR Section 6.1 satisfy the requirements of this section of the standard.

1.4 ANSI/ANS 3.2, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, 1994 Edition

The extent to which PGDP satisfies the requirements of this standard is outlined in SAR Section 6.11.1 and Appendix B to SAR Section 6.11.

1.5 ANSI/ANS 8.1, Nuclear Criticality Safety in Operations With Fissionable Materials Outside Reactors, 1983 Edition

PGDP satisfies the requirements of this standard.

For references to this standard, see SAR Sections 4.3.2.6, 5.2.2.1, 5.2.2.3, 5.2.3.2, 5.2.4.1, and Table 6.9-1.

1.6 ANSI/ANS 8.3, Criticality Accident Alarm System, 1986 Edition

The recommendations of this standard were used as guidance only for the design of the CAAS. PGDP satisfies the requirements of this standard with the following exceptions:

Section 4.4.1 - The CAAS alarm is not audible in all permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

Section 4.4.2 - An alarm signal with a complex sound wave or modulation is not provided.

Section 5.3 - The CAAS is not designed to withstand seismic stresses.

Section 5.5 - Not all CAAS alarms are capable of producing the desired signal within one-half second of activation by the minimum accident of concern. All CAAS alarms are capable of producing the alarm signal within two seconds of activation by the minimum accident of concern.

Section 7.2.2 - Instead of acquainting all employees with the alarm signal by actual demonstration at their work location, a recording of the alarm signal will be used to familiarize employees.

For references to this standard, see SAR Sections 3.12.6, 3.15.7.1, and 4.3.2.6.

Each completed NCSA is issued as a controlled document. The permanent NCSAs are maintained in a controlled manual which is issued to the personnel who need access to the NCSAs. The temporary NCSAs are issued to the appropriate personnel performing the temporary operation. Approved NCSEs/NCSAs are quality records and are handled according to the plant's Document Control and Records Management Program described in Section 6.10. The NCSA/NCSE process provides assurance that operations will remain subcritical under both normal and credible abnormal conditions. A summary of the NCS controls and parameters controlled as well as the Active Engineered Features based on approved NCSAs/NCSEs are also presented in Appendix A.

There are three operations which do not meet the double contingency principle. These are product cylinder operations, operation of the enrichment cascade, and removal of large cascade equipment (e.g., compressor, convertor, G-17 valve, etc). These operations have been evaluated to be safe; summaries of the accident scenarios and NCS controls associated with the operation of the enrichment cascade, the removal of enrichment cascade equipment, and UF_6 product cylinder operations are provided in Appendix A. Any operations that do not comply with the double contingency principle are documented in NCSEs and Appendix A.

There are TSRs to ensure controls are in place for those operations identified above which do not meet double contingency. Sections 2.4 and 2.5 of the TSRs list controls for operation of the enrichment cascade and for removal and maintenance of enrichment cascade equipment, respectively. Section 2.3 of the TSRs provides the controls associated with ensuring moderation control for the product cylinders. Section 3.12 of the TSRs also contains controls within the fire protection program for ensuring moderation control for the enrichment cascade.

New operations and operations other than those identified as not meeting the double contingency principle in Appendix A shall comply with the double contingency principle. In the event future operations are found to not comply with the double contingency principle, Appendix A will be modified to address this issue and will be reviewed and approved as described in Section 6.3.

Emergencies arising from unforeseen circumstances can present the need for immediate action. If NCS expertise or guidance is needed immediately to avert the potential for a criticality accident, direction will be provided verbally or in writing. Such direction can include a stop work order or other appropriate instructions. A NCSA or other form of documentation will then be prepared to justify the actions taken once the emergency condition has been stabilized. This documentation shall be prepared within 48 hours following the stabilization of the emergency condition.

5.2.2.4 Design Philosophy and Review

Designs of new fissile material equipment and processes must be approved by the NCS Group before implementation and will include the use of favorable geometry or engineered controls on mass, moderation, volume, concentration, interaction, or neutron absorption, as the preferred approach over the use of administrative controls. Advantage will be taken for the nuclear and physical characteristics of process equipment and materials provided control is exercised to maintain them.

The preferred design approach includes two goals. The first is to design equipment with NCS independent of the amount of internal moderation or fissile concentrations, the degree of interspersed moderation between units, the thickness of reflectors, the fissile material density, and the fissile material chemical form. The second is to minimize the possibility of accumulating fissile material in inaccessible locations and, where practical, to use favorable geometry for those inaccessible locations. The adherence to this approach is determined during the preparation and technical review of the NCS evaluation performed to support the equipment design. This preferred design approach is implemented through adherence to plant NCS procedures.

Fissile material equipment designs and modifications are reviewed to ensure that favorable geometry and engineered controls are used to advantage. Administrative limits and controls will be implemented in NCSAs to satisfy the double contingency principle for those cases where the preferred design approach cannot be met. The basis for the decision to use administrative controls in lieu of engineered controls shall be documented in cases where: 1) new fissile material equipment and operations are evaluated, and 2) existing fissile material operations are revised and engineered controls are replaced by administrative controls.

5.2.2.5 Criticality Accident Alarm System Coverage

A CAAS is provided to alert personnel if a criticality accident should occur. The system utilizes a distinctive audible signal to notify personnel in the affected area and initiate evacuation, thereby reducing personnel exposure to emitted radiation. Audibility is not provided in permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. In these areas a "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

At PGDP, the CAAS detects gamma dose rate. The system uses clustered detectors. Each cluster contains three scintillation detectors. Activation of any two of the three detectors in a cluster will initiate evacuation alarms. The failure of any major component of the system will result in a notification that indicates the need for corrective maintenance. A more detailed discussion of the physical function of the CAAS system is provided in Section 3.12.6.

Operations involving fissile material are evaluated for NCS prior to initiation. The need for CAAS coverage is considered during the evaluation process. Coverage is provided unless it is determined that coverage is not required and that finding is documented in the NCSE. For example, areas containing no more than 700 g of ^{235}U, 50 g of ^{235}U in any square meter of floor or ground area, 5 g of ^{235}U in any 10-liter volume, or areas having material that is either packaged and stored in compliance with 10 CFR 71 or specifically exempt according to 10 CFR 71.15, can be shown by evaluation not to require alarm coverage. Areas that do not contain any operations involving uranium enriched to 1 wt % or higher ^{235}U and 15 g or more of ^{235}U do not require an NCSE and are not required to have CAAS coverage. 10 CFR 76.89(a) authorizes USEC to "describe for the approval of the Commission defined areas to be excluded from the monitoring requirement." This submittal to the NRC "must describe the measures that will be used to ensure against criticality including kinds and quantities of material that will be permitted and

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2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

LCO 2.6.4.1b: Criticality accident alarm shall be operable (audible).

APPLICABILITY: In areas in the facilities listed in 2.6.4.1a where the maximum foreseeable absorbed dose in free air exceeds 12 rad, except areas in permit-required confined spaces and localized areas of inaudibility. This LCO is applicable when the new criticality accident alarm system with air accumulators and/or electronic horns has been declared operable.

ACTIONS:

Condition	Required Action	Completion Time
A. Area does not have an audible criticality accident alarm.	A.1 Discontinue operations with fissile material. [Handling, transporting, analyzing, or processing of assay samples necessary for compliance with TSR 2.4.4.3 is not restricted by this action.] AND A.2.1 Evacuate area of inaudibility AND A.2.2 Restrict access to the area of inaudibility. AND A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification such as a device that will alarm on sensing a 10mr/hr dose rate, or a radio in constant communication with the Central Control Facility.	Immediately Immediately Immediately
B. Area does not have an audible criticality accident alarm.	B.1 Restore criticality accident alarm to operable status. TSR 1.6.2.2d is not applicable.	Prior to reinitiating activities

SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.6.4.1b-1	Test the CAAS and building horns.	Quarterly
SR 2.6.4.1b-2	Verify that the CAAS air accumulator supply pressure to the building horns is greater than or equal to that necessary to sound all building horns for at least 120 seconds based on the number of accumulators in service. C-400 Number of accumulators in service — Minimum pressure 2 — 125 psig 1 — 145 psig C-409 Number of accumulators in service — Minimum pressure 1 — 125 psig	Quarterly
SR 2.6.4.1b-3	Verify that the condition of the battery backups to the electronic horns are sufficient to power the horns for at least 120 seconds.	Annually

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. Audibility is not provided for areas in permit-required confined spaces and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate. One person remains outside the area and maintains contact with personnel in the area. Evacuation of the area of inaudibility and restricting access to those areas will eliminate the potential for increased consequences due to personnel not hearing an alarm. The design of the system, three detector modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the listed facilities are associated with the handling of fissile materials.

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Emergency Plan: iii/iv, v/vi, 4-3/4-4, 5-1/5-2, 6-5/6-6, 10-1/10-2, D-1/D-2	**Emergency Plan:** iii/iv, v/vi, 4-3/4-4, 5-1/5-2, 6-5/6-6, 10-1/10-2, D-1/D-2
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6.5 OPERATIONS

This section describes personnel, practices, and key facilities associated with the continued operation of PGDP.

The site is large enough to provide a considerable buffer between the enrichment process and our rural neighbors. Plant operations are continuous with coordination of operations performed by the Plant Shift Superintendent (PSS) from a central control facility. The plant is protected on a continuous basis by fire services and security forces. Each significant building is equipped with fire alarms and water sprinklers as discussed in SAR Section 5.4.1.1. Emergency mutual assistance exercises are conducted biennially with the emergency forces of the state and of the surrounding communities.

There is a public warning system to alert neighbors in the event of any plant problem that might affect them. Spill control measures are in effect for all continuous liquid effluent discharge points. More information on waterborne effluent control is contained in SAR Section 5.1. There are also internal impoundment structures, spill control equipment, and monitoring stations with alarms. The principal toxic gases on the site are the uranium hexafluoride process gas, fluorine, chlorine trifluoride, chlorine, and hydrogen fluoride. Liquid hazardous chemicals include oil, nitric acid, sulfuric acid, and a variety of other chemicals in smaller amounts.

The plant is normally in one of three modes of operation, from a safety perspective.

Normal Operations

Most of the time is spent in normal operations; in this mode the following conditions apply:

- Operations are proceeding within expected parameters with no safety impacts from deviations,
- Technical Safety Requirements (TSRs) are in effect,
- Routine effluents or emissions are within permits and certificate conditions with no significant impact to the public or environment, and
- Personnel exposures are below 10 CFR 20 limits and OSHA requirements.

Off-normal (but not emergency) Operations

Occasionally, process upsets and/or equipment failures occur which result in "off-normal" conditions within localized areas of the plant; these "off-normal" modes are as follows:

- Small releases of UF_6 or other toxic gases (such as F_2, HF, CLF_3, Cl_2) that result in evacuation of the immediate area and monitoring for reentry, but do not affect other areas of operations of the plant and have no impact off site;
- Occupational safety injuries and/or illnesses with a response required to render aid or transport to the plant or off site medical facility;

- Small fires that are quickly extinguished;

- Unexpected radiological contamination that requires reporting of plant areas or additional employee protective measures.

These "off normal" conditions are managed by the PSS from the C-300 Plant Control Facility with involvement by plant shift emergency response and/or health physics personnel. It may involve call-in of Health and Safety personnel.

Emergency Operations

The third mode is an emergency, as described in the Emergency Plan, which involves an "Alert" or "Site Area Emergency" declaration and activation of the Emergency Operations Center.

The remainder of this section provides an overview of the major operating areas of PGDP with a brief discussion of the safety and safeguards risks and the controls and operational surveillances in place to manage these risks. A description of the plant and plant operations is provided in detail in Chapter 3; a detailed accident analysis and discussion of risks associated with plant operations is provided in Chapter 4.

6.5.1 Shift Operations

The gaseous diffusion process operates continuously. To support this continuous operation, a work force is required 24-hours per day.

The PGDP work force is divided into two primary groups, a day shift (management, support staff, service groups) working primarily Monday through Friday, and shifts that provide continuous coverage of plant operations. The day shift provides the administrative support, activities such as design and fabrication where continuation is not time constrained, procedure development, classroom training, planning, and preventive maintenance. Most of the plant staff is assigned to the day shift.

The shift organization has the prime responsibility for continued plant operation and the evolutions, exchange of information, and response to abnormal and unusual conditions necessary to ensure safe and efficient plant operation. Typical activities of the shift include provide oversight and direction for all plant operations, monitor systems and equipment for proper performance, conduct routine back shift maintenance and emergency equipment repair, prepare equipment for day shift repair/preventative maintenance functions, and respond to emergency situations.

Operational activities of the plant are controlled by the Plant Shift Superintendent (PSS) whose normal watch station is in the C-300 Central Control Facility (CCF). The PSS reports directly to the Shift Operations Manager. Upon recognition of an emergency, the PSS, or other qualified individual responds to the scene as Incident Commander. The PSS serves as Crisis Manager during a classified emergency (Alert or Site Area Emergency) until relieved by a manager designated in the emergency line of executive succession when the Emergency Operations Center becomes operational. Emergency command and control is described in the Emergency Plan.

The CCF is the hub of the plant operational activity. The overall UF_6 enrichment process is monitored at this location. Key plant operations can be performed remotely from the CCF, key alarm systems are monitored, and plant communications systems as well as off-site communications capabilities

are located in the CCF. The plant power system is monitored and controlled through a communication network with the power suppliers. Typical operational activities that are monitored and controlled from the CCF include determining and establishing optimal plant power level, executing or altering the maintenance work plan if necessary, and maintaining necessary manpower level to support plant operations.

Staffing levels for the shifts are not fixed but are based on the expected or planned activity for the shift period. Staffing levels take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and Technical Safety Requirement (TSR) specified staffing requirements. When special activities are included in the work plans, the staffing will be increased as required to perform the planned activity. The required minimum staffing level for Paducah is approximately 43 as detailed in Section 3 of the TSRs. This is a fraction of the normal average shift staffing of approximately 80 persons.

Each shift organization is composed of a PSS, a cascade coordinator (CC) who directs overall cascade activities; shift engineer; first-line managers for the cascade buildings, UF_6 handling facilities, security, fire services, maintenance and power operations and utility operations; health physics technicians; Security Shift Commander; Fire Services Shift Commander; and operators, instrument mechanics, Security Police officers, and firefighters. Less than this normal shift staffing is permitted for short periods with the concurrence of the PSS to allow for call-ins or other compensatory actions.

The PSS provides a direct chain of command from the Operations Manager, Shift Operations Manager, Plant Manager and General Manager to the shift operating staff and serves as the senior shift manager in directing activities and personnel. The operations line organization is accountable to the PSS for reporting plant status.

The CC provides managerial oversight, operations coordination, and assures adequate staffing for all cascade operations on a 24-hour basis. This person approves, directs, and integrates all significant cascade operational activities under the oversight of the PSS.

The remaining members of the shift organization provide the needed functions for round-the-clock operations. First-line managers provide management for, coordination of, and assurance for proper execution of assigned tasks. The shift engineer provides engineering support for technical issues involving operations. Health physics technicians provide support for 24-hour shift operations. The first-line manager for Security supervises the activities necessary to ensure the protection of plant facilities, government property, and classified information. The first-line manger for fire services supervises shift fire services work activities and responds to plant emergency events.

There are diverse systems for operational communications. Commercial telephones, an internal plant telephone system, radio network, a plant public address (PA) system, emergency signals, and a pager system are available to provide necessary communications in operating the plant. The CCF is the focal point for all emergency reporting and initiating of all emergency responses. A special emergency telephone network is available in the CCF. Fire alarm and sprinkler indicator systems, criticality alarm panel, seismic alarms as well as numerous operational alarms are monitored in the CCF. As described in the Emergency Plan, the PSS will initiate off-site notifications and plant personnel call-ins when required.

In accordance with the corrective action program, plant personnel are required to report abnormal events or conditions that may have the potential to harm the safety, health, or security of on-site personnel, the general public, or the environment. Plant personnel are also required to immediately report conditions which may require emergency response. The PSS reviews potentially reportable or inoperable safety system equipment reports and determines proper disposition.

6.5.2 Cascade Operations Organization and Administration

The cascade is the UF_6 enrichment portion of the plant. The cascade is composed of six major process buildings which houses two parallel enrichment cascades that share common product and tails withdrawal facilities. There are auxiliary facilities such as the recirculating water pump houses which are also under the direct control of cascade operations.

The Operations Manager is responsible for overall operations. This includes operation of cascade equipment, planning for power usage, control of feeds, product and tails material including sampling, operating plant utilities, radiological decontamination, equipment cleaning, uranium precipitation, waste management, and operation of plant laundry. The Operations Manager is supported by managers in the following groups: Shift Operations, Cascade, Chemical, Utilities, Power, and UF_6 Handling. These group managers have subordinate managers assigned to functional areas to provide oversight of the day shift operations.

The optimum cascade arrangement for specific power levels, cascade configuration, product and tails assay levels, and feed availabilities is determined by the technical staff. Recommendations for these operating conditions are made by the technical staff to appropriate Operations Management and implemented by the operations staff in conjunction with the shift organization. The shift organization follow daily instructions and work plans developed and communicated by Operations Management.

The Utilities Manager, in conjunction with key building managers, provides the plant with sanitary water, chilled water, steam, air, nitrogen, and sewer services. These must be supplied on a continuous basis to meet the cascade requirements. Any outage is coordinated with customers to assure proper planning to provide temporary services as necessary.

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4.1.12 Nuclear Safety and Quality Manager

The Nuclear Safety and Quality Manager is responsible for implementing and directing independent assessments, quality control, nuclear material control and accountability, and nuclear safety assurance.

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4.1.14 On-Duty PSS

As the senior manager on shift, the on-duty PSS represents the General Manager and managers and has the authority and responsibility to make decisions as necessary to ensure safe operation, including stopping work and placing the plant in a safe condition.

The on-duty PSS is responsible for making proper notification in regard to abnormal plant conditions, determining the severity of the event, declaring an emergency, and initiating appropriate response. The on-duty PSS may respond to an incident scene as the on-scene incident commander or dispatch other qualified individual in this capacity. The on-duty PSS is the crisis manager until relieved by a member of management designated in the emergency line of executive succession.

4.1.15 Section deleted.

4.1.16 GDP Procurement and Materials Manager

The GDP Procurement and Materials Manager is responsible for managing the projects, programs, and the activities related to packaging and transportation, material control, stores, shipping and receiving, and property disposition.

4.1.17 Nuclear Criticality Safety Manager

The Nuclear Criticality Safety Manager is responsible for implementing the nuclear criticality safety program. This position reports to the USEC NCS Manager, who is responsible for the nuclear criticality safety programs at both sites.

4.1.18 Scheduling Manager

The Scheduling Manager is responsible for production maintenance work scheduling.

4.2 ON-SITE EMERGENCY RESPONSE ORGANIZATION

The Emergency Response Organization (ERO) is responsible for taking immediate mitigative and corrective actions to minimize the consequences of an incident to workers, public health and safety, and the environment. The ERO is staffed with trained personnel who respond to events and are required to participate in formal training, drills, and exercises. The incident type and severity dictate the level of ERO activation.

The ERO has the following specific functions and responsibilities, depending on the incident and level of response needed to mitigate the problem: event categorization, determination of emergency class, notification, protective action recommendations, management and decision making, control of on-site emergency activities, consequence assessment, protective actions, medical support, public information, activation and coordination of on-site response resources, security, communications, administrative support, and coordination and liaison with off-site support and response organizations.

The ERO is divided into functional groups as follows:

1. Plant Emergency Squad,
2. EOC cadre, and
3. Joint Public Information Center (JPIC).

Members of these groups are assigned to on-scene response locations and emergency response centers, such as the EOC. Emergency assignments correspond as closely as possible to daily duties. Primary and alternate personnel are assigned to the ERO positions. Assignments are updated periodically. Management ERO positions in each group provide oversight and final authority in the group's decision-making process.

4.2.1 Direction and Coordination

The initial ERO consists of the plant emergency squad with the PSS, or other qualified individual as incident commander (IC) at the scene. Upon classification of the emergency as an Alert or SAE, the PSS becomes the CM and maintains overall control of the plant during the emergency until relieved. When the EOC is operational, a manager designated in the emergency line of executive succession relieves the PSS as CM and the overall control of the emergency shifts from the PSS to the CM.

The PSS conducts transition and turnover of command and control authority and responsibility of the CM function in a formal manner by use of specially developed procedural checklists and, if possible, face-to-face briefings. A primary and alternates are identified for the CM.

The order of succession for the CM position is identified in an EPIP and includes the following:

1. PSS
2. General Manager
3. Plant Manager
4. Others as designated by the General Manager and trained and qualified as CM

5. EMERGENCY RESPONSE MEASURES

Emergency measures must be taken in response to an emergency. Upon recognizing that an emergency exists, necessary portions of the emergency organization are activated. Once activation has taken place, assessments of the condition are made, corrective and protective actions are taken, and aid to affected persons is administered as required.

After becoming aware that an emergency exists, the PSS does the following:

1. Takes actions to ensure the safety of plant personnel and the general public,

2. Takes actions to ensure safe operation/activities of the plant,

3. Classifies the emergency and makes required notifications,

4. Performs assessment actions, and

5. Performs any other emergency actions as appropriate.

5.1 ACTIVATION OF EMERGENCY RESPONSE ORGANIZATION

Upon recognition of an emergency, the PSS, or other qualified individual responds to the incident scene as the IC. The IC determines appropriate immediate protective actions at the incident scene. The PSS classifies the event if applicable. If the emergency is classified as either an Alert or SAE, the PSS as CM activates the EOC. Minimum staffing requirements for activation and operation of the EOC are identified in an EPIP, and must be met prior to assumption of command and control by the crisis management team. CM responsibilities are assumed by a manager designated in the emergency line of executive succession when the EOC is operational. Methods for ERO notification/activation are the same regardless of the time of the emergency and include plant radios, emergency pager system, and telephones. When notified, EOC cadre members are required to respond immediately. ERO activation is accomplished through the appropriate EPIPs.

The CM delegates public information duties to the public information advisor, who, in concert with USEC headquarters, is responsible for activating the JPIC.

The IC maintains command and control over the specific area response and protective actions. The IC coordinates mitigation and protective action strategy and direction and keeps EOC informed of the incident status when the EOC is operational.

In the event that two or more emergencies occur simultaneously so that they cannot be managed effectively as a single incident scene, provisions in the appropriate EPIPs allow for the establishment of additional incident scenes, designation of multiple incident commanders, and division of response resources as necessary.

5.1.1 *Section deleted.*

5.1.2 ***Section deleted***

5.2 ASSESSMENT ACTIONS

This section describes the processes used for assessing the actual or potential on-site and off-site consequences of an emergency. Initial and continuing assessment actions are the responsibility of the CM. Post-accident assessments are a shared responsibility between the IC, the CM, and the recovery manager, if assigned.

Continuous assessment throughout the course of an emergency is necessary to effectively coordinate and direct the elements of the ERO. The initial assessment actions are dictated in part by the nature and severity of the emergency. Emergency assessment provides an indication of the vulnerability to life, the environment, and property injury or damage if an emergency occurs. The different assessment actions for Alert and SAEs are described in Sections 5.2.1 and 5.2.2. Equipment used to assess releases is described in Section 6.4.

5.2.1 Assessment Actions During an Alert

An Alert requires basic emergency assessments. Attention must be paid to parameters that may indicate a possible worsening of conditions (e.g., radioactive/hazardous materials releases). The existence of an Alert requires the following initial and ongoing assessment actions as applicable:

1. Increased surveillance of applicable plant instrumentation and visual observation of the incident conditions,

2. Determination of the resources necessary to mitigate the event from evaluation of reports of damage and injury or by on-scene inspection,

3. Monitoring event conditions for potential changes in emergency classification level.

5.2.2 Assessment Actions During an SAE

In the event of an SAE, assessment activities are more extensive than for an Alert. During a release of radiological/hazardous materials, assessment of on-site and off-site exposures are performed regularly to determine if and when on-site sheltering or evacuations or off-site sheltering may be required.
The results, including methods and assumptions, are communicated to appropriate off-site officials as off-site protective action recommendations. In addition to the activities that would be carried out during an Alert, the following activities are performed at the direction of the PSS or the CM when the EOC is operational, as appropriate:

1. Performing continuing emergency assessments for mitigating events and protective actions on-site, based on on-scene and field monitoring results, release information, and meteorological conditions for radiological/hazardous material releases, and

2. For off-site hazardous material releases, providing specific material information, release information, plume direction, projected plume location, appropriate meteorological information, and field monitoring results to responsible off-site authorities.

STEs provide secure voice communications to on-site and off-site users of other STE telephones. It can operate as a normal telephone in the "clear" mode.

Cellular telephone service is available from the plant site. The PSS response vehicles are equipped with cellular telephones. This system also provides backup for the plant telephone system.

6.2.1.2 PA System

A PA system is in place with the capability to cover most occupied site buildings. During emergencies, the system is not used for routine traffic. The system is tested daily. Two-way radios and runners are used to communicate with individuals that are not covered by the PA system.

6.2.1.3 Radio Systems

The plant radio network supports normal plant operations and, therefore, is effectively utilized daily. The PSS response vehicles are equipped with two-way radios. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating with responding units on the county emergency response frequency.

6.2.1.4 Pager System

Key EOC personnel have pagers which provide access from any tone-type telephone and can relay return telephone numbers or coded responses to the holder of the unit. EOC cadre pager drills are conducted at least quarterly. Pagers are used frequently for nonemergency uses, which enhances the regular testing program.

6.2.1.5 Facsimile Machines

The facsimile machines located in the EOC are used to communicate with USEC and federal, state, and local agencies.

6.2.2 Off-Site Communications

The plant uses the commercial telephone system for off-site emergency communications. Cellular telephones can be used as a backup to the commercial telephone system. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating on the county emergency response frequency.

The Public Warning System, consisting of outdoor warning sirens and emergency alert system announcements, is used to provide emergency notification. Operations testing of the Public Warning System sirens is conducted monthly.

6.3 ON-SITE MEDICAL FACILITIES

The plant maintains medical coverage consistent with the activities being conducted on-site. In an emergency, off-duty medical personnel are notified and directed to required locations as needed. The PSS notifications include alerting appropriate occupational health services and medical personnel in the event of emergencies ranging from industrial accidents to toxic or radiological releases. Letters of Agreement are maintained with area hospitals. These off-site hospitals also have facilities, equipment, and supplies for the treatment of contaminated individuals. A summary of the medical resources follows.

A plant medical facility is maintained on-site during the day shift excluding weekends and holidays. This facility has the supplies, equipment, and personnel to treat most injuries. This includes capabilities for the treatment of contaminated individuals including a shower for contaminated ambulatory patients, radiation survey instruments, and decontamination supplies. Medical personnel assess patient condition, provide necessary emergency care, and determine appropriate supplemental treatment.

Health Services personnel are available during the day shift hours with plant fire fighters providing emergency medical coverage the remainder of the time. Health Services personnel may be called on-site during off shifts, as deemed necessary.

Emergency medical technicians provide and staff ambulance service. Additional ambulance support is available from off-site.

6.4 EMERGENCY MONITORING EQUIPMENT

The plant maintains various radiation detection equipment on-site for normal and emergency response use. Criticality accident alarms have been placed in those areas and in facilities containing fissile material as described in Section 5.2 of the SAR. The criticality accident alarm system provides for radiation detection and an alarm system to alert plant personnel.

Persons requiring radiation exposure monitoring wear beta-gamma-sensitive dosimeters (TLDs), which are processed and evaluated by a processor holding current accreditation from the National Voluntary Laboratory Accreditation Program of the National Institute of Standards and Technology. These personnel exposure monitoring dosimeters are exchanged and analyzed in accordance with Section 5.3 of the SAR. As appropriate, other types of dosimeters, (e.g., finger rings, direct-reading dosimeters, and neutron dosimeters) are used.

Radiation dose rate and contamination survey instruments used are appropriate to measure the types and energies of radiation encountered at GDPs. Instruments capable of supporting radiography operations are also maintained in inventory. Instrumentation includes alpha/beta count rate and scaler instrumentation as well as ion chambers used to evaluate personnel exposure.

Designated plant emergency vehicles responding to the scene will contain necessary emergency equipment and supplies and ensure that radiological monitoring equipment is readily available to emergency personnel. Radiological monitoring equipment is also stored in Building C-300 for designated field monitoring personnel. Emergency equipment and its storage locations are identified in appropriate EPIPs.

10. COMPLIANCE WITH COMMUNITY RIGHT-TO-KNOW ACT

The plant complies with the EPA Superfund Amendments and Reauthorization Act (SARA) Title III regulations, also known as the Emergency Planning and Community Right to Know Act. Specific responsibilities include emergency response planning, emergency release reporting, hazardous chemical inventory reporting, and toxic chemical release reporting.

The Plan and appropriate EPIPs are used during any hazardous chemical release emergencies. Plant administrative procedures have been developed for hazardous materials releases that are not classified as emergencies to ensure that requirements of SARA Title III are met. MSDSs are maintained in several areas throughout the plant.

Hazardous materials spills or releases are reported to the PSS who responds to the incident scene as IC or dispatches other qualified individual in that capacity. The IC directs the emergency containment of spills. Actions to be implemented are described in appropriate EPIPs and include the following:

1. Establish command,
2. Evacuate/isolate the area of release/spill activity, as necessary, and determine areas of concern,
3. Classify the emergency, if appropriate,
4. Determine if activation of additional ERO personnel is necessary,
5. Take measures to minimize safety concerns,
6. Determine a course of action and personal protective equipment requirements,
7. Initiate containment procedures,
8. Terminate the source,
9. Make appropriate notifications to on-site and off-site officials,
10. Determine material disposal, and
11. Terminate the incident and enter recovery.

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Appendix D

DEFINITIONS/ACRONYMS

Accident — A deviation from normal operations or activities associated with a hazard that has the potential to result in an emergency.

ACR — Area Control Room.

ALARA — As Low as Reasonably Achievable.

Text deleted.

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

CAAS — Criticality Accident Alarm System.

CAS — Central Alarm Station.

CCF — Central Control Facility.

CM — Crisis Manager.

Consequence — The result or effect (especially projected doses or dose rates) of a release of radioactive or hazardous materials to the environment.

Corrective Actions — Those emergency measures taken to lessen the severity of or terminate an emergency situation at or near the source of the problem in order to prevent or control a release of radioactive material or to minimize the damage to plant equipment, e.g., shutting down equipment, fire fighting, repair, and damage control.

Decontamination — The removal of surface radioactive/hazardous material from individuals, equipment, surfaces, etc.

DOE — Department of Energy.

Drill — A supervised, hands-on instruction period intended to test, develop, or maintain a specific emergency response capability. A drill is often a component of an exercise.

EAS — Emergency Alert System

EMA — Emergency Management Agency.

Emergency — A sudden, usually unforeseen occurrence or occasion requiring time-urgent and immediate action/response. It may result from accidental causes, natural causes, or malicious man-made actions.

Appendix D (Continued)

Emergency Action Level (EAL) — Specific, predetermined, observable criteria used to detect, recognize, and determine the class of emergencies. An EAL can be an instrument reading, an equipment status indicator, a measurable parameter, on-site or off-site, a discrete, observable event, a result of analyses, or another observed phenomenon that indicates entry into a particular emergency class.

Emergency Operations Center (EOC) — An emergency response facility that accommodates personnel acting in support of the command and control functions but separate from the incident commander and on-scene command post. Under the guidance of the CM, these personnel supply in-depth strategic and corrective engineering and radiological, hazardous materials, and environmental support assistance to the incident scene.

Emergency Response Organization (ERO) — The designated group of personnel responsible for coping with and minimizing or mitigating the effects of any emergency.

Emergency Response Planning Guideline (ERPG) — A hazardous material personnel exposure level or range which, when exceeded by a short-term or acute exposure, will cause irreversible or other serious health effects in humans. The ERPGs are approved by a committee of the American Industrial Hygiene Association.

Deleted

EPA — Environmental Protection Agency.

EPIP — Emergency Plan Implementing Procedure.

Event — Any real-time occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect people, property, or the environment.

Exercise — A scheduled and planned large-scale activity that tests the integrated capability and most aspects of the emergency management program.

FAA — Federal Aviation Administration.

FBI — Federal Bureau of Investigation.

GDP — Gaseous Diffusion Plant.

Hazardous Material — Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment.

IC — Incident Commander.

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SECTION 3.0 ADMINISTRATIVE CONTROLS

Table 3.2.2.1 Minimum Staffing Requirements[a]

Facility Function	Mode/Operation	Staffing Requirements	Work Area Definition
C-300	All	3	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-360	1b, 3, 4, 5	1[b]	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	1a, 2, 6	2	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	7	2	At least one person in the Laboratory. One person in the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
C-333-A	1, 2, 5	2	Two persons in the operating facility or immediately surrounding grounds including the local cylinder yard.
C-337-A	3, 4	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-310	Product withdrawal 1, 2, 3, 4 Cascade 1, 3	2[c]	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-315	1, 2, 3, 4	2[c]	Two persons in the facility or immediately surrounding grounds including the local cylinder yard.
C-331	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	2	At least one person in the ACR.
C-335			
C-333	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	3	At least one person in the ACR.
C-337			
Health Physics	At all times	1	Onsite.
Power Operations	At all times	4	Onsite.
Utilities Operations	At all times	4	Onsite.
Fire Services	At all times	4[d]	Onsite[d].
Security Services	At all times	4	Onsite.

a. Staffing may be less than the minimum requirement listed for a period of a time not to exceed four hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift manning requirements to within the minimum requirements. The C-331, C-333, C-335, and C-337 ACRs shall always be manned. The ACRs for C-310, C-315, C-333-A, and C-337-A shall be manned when required by operating mode. Manning not required during emergency conditions requiring building/area evacuation.

b. Manning requirement is zero if all autoclaves are in MODE 6 (Not In Use for C-333-A and C-337-A) or MODE 8 (Not In Use for C-360) and the Transfer Station is in MODE 8 (Not in Use).

c. When withdrawal process equipment is brought below atmospheric pressure or to a UF_6 negative in the NOT IN USE (Mode 4) operating mode then the staffing requirements for the appropriate withdrawal facility do not apply.

d. In accordance with footnote "a", Fire Services personnel making an unexpected run to deliver an individual to a local hospital are allowed to be offsite and are considered to be on duty and available.

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1.3 ANSI/ANS 3.1, Selection, Qualification, and Training of Personnel for Nuclear Power Plants, 1987 Edition

PGDP satisfies only the following section of this standard:

Section 4.3.3 - The qualifications of the Radiation Protection Manager identified in SAR Section 6.1 satisfy the requirements of this section of the standard.

1.4 ANSI/ANS 3.2, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, 1994 Edition

The extent to which PGDP satisfies the requirements of this standard is outlined in SAR Section 6.11.1 and Appendix B to SAR Section 6.11.

1.5 ANSI/ANS 8.1, Nuclear Criticality Safety in Operations With Fissionable Materials Outside Reactors, 1983 Edition

PGDP satisfies the requirements of this standard.

For references to this standard, see SAR Sections 4.3.2.6, 5.2.2.1, 5.2.2.3, 5.2.3.2, 5.2.4.1, and Table 6.9-1.

1.6 ANSI/ANS 8.3, Criticality Accident Alarm System, 1986 Edition

The recommendations of this standard were used as guidance only for the design of the CAAS. PGDP satisfies the requirements of this standard with the following exceptions:

Section 4.4.1 - The CAAS alarm is not audible in all permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

Section 4.4.2 - An alarm signal with a complex sound wave or modulation is not provided.

Section 5.3 - The CAAS is not designed to withstand seismic stresses.

Section 5.5 - Not all CAAS alarms are capable of producing the desired signal within one-half second of activation by the minimum accident of concern. All CAAS alarms are capable of producing the alarm signal within two seconds of activation by the minimum accident of concern.

Section 7.2.2 - Instead of acquainting all employees with the alarm signal by actual demonstration at their work location, a recording of the alarm signal will be used to familiarize employees.

For references to this standard, see SAR Sections 3.12.6, 3.15.7.1, and 4.3.2.6.

Each completed NCSA is issued as a controlled document. The permanent NCSAs are maintained in a controlled manual which is issued to the personnel who need access to the NCSAs. The temporary NCSAs are issued to the appropriate personnel performing the temporary operation. Approved NCSEs/NCSAs are quality records and are handled according to the plant's Document Control and Records Management Program described in Section 6.10. The NCSA/NCSE process provides assurance that operations will remain subcritical under both normal and credible abnormal conditions. A summary of the NCS controls and parameters controlled as well as the Active Engineered Features based on approved NCSAs/NCSEs are also presented in Appendix A.

There are three operations which do not meet the double contingency principle. These are product cylinder operations, operation of the enrichment cascade, and removal of large cascade equipment (e.g., compressor, convertor, G-17 valve, etc). These operations have been evaluated to be safe; summaries of the accident scenarios and NCS controls associated with the operation of the enrichment cascade, the removal of enrichment cascade equipment, and UF_6 product cylinder operations are provided in Appendix A. Any operations that do not comply with the double contingency principle are documented in NCSEs and Appendix A.

There are TSRs to ensure controls are in place for those operations identified above which do not meet double contingency. Sections 2.4 and 2.5 of the TSRs list controls for operation of the enrichment cascade and for removal and maintenance of enrichment cascade equipment, respectively. Section 2.3 of the TSRs provides the controls associated with ensuring moderation control for the product cylinders. Section 3.12 of the TSRs also contains controls within the fire protection program for ensuring moderation control for the enrichment cascade.

New operations and operations other than those identified as not meeting the double contingency principle in Appendix A shall comply with the double contingency principle. In the event future operations are found to not comply with the double contingency principle, Appendix A will be modified to address this issue and will be reviewed and approved as described in Section 6.3.

Emergencies arising from unforeseen circumstances can present the need for immediate action. If NCS expertise or guidance is needed immediately to avert the potential for a criticality accident, direction will be provided verbally or in writing. Such direction can include a stop work order or other appropriate instructions. A NCSA or other form of documentation will then be prepared to justify the actions taken once the emergency condition has been stabilized. This documentation shall be prepared within 48 hours following the stabilization of the emergency condition.

5.2.2.4 Design Philosophy and Review

Designs of new fissile material equipment and processes must be approved by the NCS Group before implementation and will include the use of favorable geometry or engineered controls on mass, moderation, volume, concentration, interaction, or neutron absorption, as the preferred approach over the use of administrative controls. Advantage will be taken for the nuclear and physical characteristics of process equipment and materials provided control is exercised to maintain them.

The preferred design approach includes two goals. The first is to design equipment with NCS independent of the amount of internal moderation or fissile concentrations, the degree of interspersed moderation between units, the thickness of reflectors, the fissile material density, and the fissile material chemical form. The second is to minimize the possibility of accumulating fissile material in inaccessible locations and, where practical, to use favorable geometry for those inaccessible locations. The adherence to this approach is determined during the preparation and technical review of the NCS evaluation performed to support the equipment design. This preferred design approach is implemented through adherence to plant NCS procedures.

Fissile material equipment designs and modifications are reviewed to ensure that favorable geometry and engineered controls are used to advantage. Administrative limits and controls will be implemented in NCSAs to satisfy the double contingency principle for those cases where the preferred design approach cannot be met. The basis for the decision to use administrative controls in lieu of engineered controls shall be documented in cases where: 1) new fissile material equipment and operations are evaluated, and 2) existing fissile material operations are revised and engineered controls are replaced by administrative controls.

5.2.2.5 Criticality Accident Alarm System Coverage

A CAAS is provided to alert personnel if a criticality accident should occur. The system utilizes a distinctive audible signal to notify personnel in the affected area and initiate evacuation, thereby reducing personnel exposure to emitted radiation. Audibility is not provided in permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. In these areas a "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

At PGDP, the CAAS detects gamma dose rate. The system uses clustered detectors. Each cluster contains three scintillation detectors. Activation of any two of the three detectors in a cluster will initiate evacuation alarms. The failure of any major component of the system will result in a notification that indicates the need for corrective maintenance. A more detailed discussion of the physical function of the CAAS system is provided in Section 3.12.6.

Operations involving fissile material are evaluated for NCS prior to initiation. The need for CAAS coverage is considered during the evaluation process. Coverage is provided unless it is determined that coverage is not required and that finding is documented in the NCSE. For example, areas containing no more than 700 g of ^{235}U, 50 g of ^{235}U in any square meter of floor or ground area, 5 g of ^{235}U in any 10-liter volume, or areas having material that is either packaged and stored in compliance with 10 CFR 71 or specifically exempt according to 10 CFR 71.15, can be shown by evaluation not to require alarm coverage. Areas that do not contain any operations involving uranium enriched to 1 wt % or higher ^{235}U and 15 g or more of ^{235}U do not require an NCSE and are not required to have CAAS coverage. 10 CFR 76.89(a) authorizes USEC to "describe for the approval of the Commission defined areas to be excluded from the monitoring requirement." This submittal to the NRC "must describe the measures that will be used to ensure against criticality including kinds and quantities of material that will be permitted and

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SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

LCO 2.6.4.1b: Criticality accident alarm shall be operable (audible).

APPLICABILITY: In areas in the facilities listed in 2.6.4.1a where the maximum foreseeable absorbed dose in free air exceeds 12 rad, except areas in permit-required confined spaces and localized areas of inaudibility. This LCO is applicable when the new criticality accident alarm system with air accumulators and/or electronic horns has been declared operable.

ACTIONS:

Condition	Required Action	Completion Time
A. Area does not have an audible criticality accident alarm.	A.1 Discontinue operations with fissile material. [Handling, transporting, analyzing, or processing of assay samples necessary for compliance with TSR 2.4.4.3 is not restricted by this action.]	Immediately
	AND	
	A.2.1 Evacuate area of inaudibility	Immediately
	AND	
	A.2.2 Restrict access to the area of inaudibility.	
	AND	
	A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification such as a device that will alarm on sensing a 10mr/hr dose rate, or a radio in constant communication with the Central Control Facility.	Immediately
B. Area does not have an audible criticality accident alarm.	B.1 Restore criticality accident alarm to operable status. TSR 1.6.2.2d is not applicable.	Prior to reinitiating activities

SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

<table>
<tr><th colspan="2">Surveillance</th><th>Frequency</th></tr>
<tr><td>SR 2.6.4.1b-1</td><td>Test the CAAS and building horns.</td><td>Quarterly</td></tr>
<tr><td>SR 2.6.4.1b-2</td><td>Verify that the CAAS air accumulator supply pressure to the building horns is greater than or equal to that necessary to sound all building horns for at least 120 seconds based on the number of accumulators in service.

C-400
<u>Number of accumulators in service</u> — <u>Minimum pressure</u>
2 — 125 psig
1 — 145 psig

C-409
<u>Number of accumulators in service</u> — <u>Minimum pressure</u>
1 — 125 psig</td><td>Quarterly</td></tr>
<tr><td>SR 2.6.4.1b-3</td><td>Verify that the condition of the battery backups to the electronic horns are sufficient to power the horns for at least 120 seconds.</td><td>Annually</td></tr>
</table>

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. Audibility is not provided for areas in permit-required confined spaces and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate. One person remains outside the area and maintains contact with personnel in the area. Evacuation of the area of inaudibility and restricting access to those areas will eliminate the potential for increased consequences due to personnel not hearing an alarm. The design of the system, three detector modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the listed facilities are associated with the handling of fissile materials.

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6.5 OPERATIONS

This section describes personnel, practices, and key facilities associated with the continued operation of PGDP.

The site is large enough to provide a considerable buffer between the enrichment process and our rural neighbors. Plant operations are continuous with coordination of operations performed by the Plant Shift Superintendent (PSS) from a central control facility. The plant is protected on a continuous basis by fire services and security forces. Each significant building is equipped with fire alarms and water sprinklers as discussed in SAR Section 5.4.1.1. Emergency mutual assistance exercises are conducted biennially with the emergency forces of the state and of the surrounding communities.

There is a public warning system to alert neighbors in the event of any plant problem that might affect them. Spill control measures are in effect for all continuous liquid effluent discharge points. More information on waterborne effluent control is contained in SAR Section 5.1. There are also internal impoundment structures, spill control equipment, and monitoring stations with alarms. The principal toxic gases on the site are the uranium hexafluoride process gas, fluorine, chlorine trifluoride, chlorine, and hydrogen fluoride. Liquid hazardous chemicals include oil, nitric acid, sulfuric acid, and a variety of other chemicals in smaller amounts.

The plant is normally in one of three modes of operation, from a safety perspective.

Normal Operations

Most of the time is spent in normal operations; in this mode the following conditions apply:

- Operations are proceeding within expected parameters with no safety impacts from deviations,
- Technical Safety Requirements (TSRs) are in effect,
- Routine effluents or emissions are within permits and certificate conditions with no significant impact to the public or environment, and
- Personnel exposures are below 10 CFR 20 limits and OSHA requirements.

Off-normal (but not emergency) Operations

Occasionally, process upsets and/or equipment failures occur which result in "off-normal" conditions within localized areas of the plant; these "off-normal" modes are as follows:

- Small releases of UF_6 or other toxic gases (such as F_2, HF, CLF_3, Cl_2) that result in evacuation of the immediate area and monitoring for reentry, but do not affect other areas of operations of the plant and have no impact off site;
- Occupational safety injuries and/or illnesses with a response required to render aid or transport to the plant or off site medical facility;

- Small fires that are quickly extinguished;

- Unexpected radiological contamination that requires reporting of plant areas or additional employee protective measures.

These "off normal" conditions are managed by the PSS from the C-300 Plant Control Facility with involvement by plant shift emergency response and/or health physics personnel. It may involve call-in of Health and Safety personnel.

Emergency Operations

The third mode is an emergency, as described in the Emergency Plan, which involves an "Alert" or "Site Area Emergency" declaration and activation of the Emergency Operations Center.

The remainder of this section provides an overview of the major operating areas of PGDP with a brief discussion of the safety and safeguards risks and the controls and operational surveillances in place to manage these risks. A description of the plant and plant operations is provided in detail in Chapter 3; a detailed accident analysis and discussion of risks associated with plant operations is provided in Chapter 4.

6.5.1 Shift Operations

The gaseous diffusion process operates continuously. To support this continuous operation, a work force is required 24-hours per day.

The PGDP work force is divided into two primary groups, a day shift (management, support staff, service groups) working primarily Monday through Friday, and shifts that provide continuous coverage of plant operations. The day shift provides the administrative support, activities such as design and fabrication where continuation is not time constrained, procedure development, classroom training, planning, and preventive maintenance. Most of the plant staff is assigned to the day shift.

The shift organization has the prime responsibility for continued plant operation and the evolutions, exchange of information, and response to abnormal and unusual conditions necessary to ensure safe and efficient plant operation. Typical activities of the shift include provide oversight and direction for all plant operations, monitor systems and equipment for proper performance, conduct routine back shift maintenance and emergency equipment repair, prepare equipment for day shift repair/preventative maintenance functions, and respond to emergency situations.

Operational activities of the plant are controlled by the Plant Shift Superintendent (PSS) whose normal watch station is in the C-300 Central Control Facility (CCF). The PSS reports directly to the Shift Operations Manager. Upon recognition of an emergency, the PSS, or other qualified individual responds to the scene as Incident Commander. The PSS serves as Crisis Manager during a classified emergency (Alert or Site Area Emergency) until relieved by a manager designated in the emergency line of executive succession when the Emergency Operations Center becomes operational. Emergency command and control is described in the Emergency Plan.

The CCF is the hub of the plant operational activity. The overall UF_6 enrichment process is monitored at this location. Key plant operations can be performed remotely from the CCF, key alarm systems are monitored, and plant communications systems as well as off-site communications capabilities

are located in the CCF. The plant power system is monitored and controlled through a communication network with the power suppliers. Typical operational activities that are monitored and controlled from the CCF include determining and establishing optimal plant power level, executing or altering the maintenance work plan if necessary, and maintaining necessary manpower level to support plant operations.

Staffing levels for the shifts are not fixed but are based on the expected or planned activity for the shift period. Staffing levels take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and Technical Safety Requirement (TSR) specified staffing requirements. When special activities are included in the work plans, the staffing will be increased as required to perform the planned activity. The required minimum staffing level for Paducah is approximately 43 as detailed in Section 3 of the TSRs. This is a fraction of the normal average shift staffing of approximately 80 persons.

Each shift organization is composed of a PSS, a cascade coordinator (CC) who directs overall cascade activities; shift engineer; first-line managers for the cascade buildings, UF_6 handling facilities, security, fire services, maintenance and power operations and utility operations; health physics technicians; Security Shift Commander; Fire Services Shift Commander; and operators, instrument mechanics, Security Police officers, and firefighters. Less than this normal shift staffing is permitted for short periods with the concurrence of the PSS to allow for call-ins or other compensatory actions.

The PSS provides a direct chain of command from the Operations Manager, Shift Operations Manager, Plant Manager and General Manager to the shift operating staff and serves as the senior shift manager in directing activities and personnel. The operations line organization is accountable to the PSS for reporting plant status.

The CC provides managerial oversight, operations coordination, and assures adequate staffing for all cascade operations on a 24-hour basis. This person approves, directs, and integrates all significant cascade operational activities under the oversight of the PSS.

The remaining members of the shift organization provide the needed functions for round-the-clock operations. First-line managers provide management for, coordination of, and assurance for proper execution of assigned tasks. The shift engineer provides engineering support for technical issues involving operations. Health physics technicians provide support for 24-hour shift operations. The first-line manager for Security supervises the activities necessary to ensure the protection of plant facilities, government property, and classified information. The first-line manger for fire services supervises shift fire services work activities and responds to plant emergency events.

There are diverse systems for operational communications. Commercial telephones, an internal plant telephone system, radio network, a plant public address (PA) system, emergency signals, and a pager system are available to provide necessary communications in operating the plant. The CCF is the focal point for all emergency reporting and initiating of all emergency responses. A special emergency telephone network is available in the CCF. Fire alarm and sprinkler indicator systems, criticality alarm panel, seismic alarms as well as numerous operational alarms are monitored in the CCF. As described in the Emergency Plan, the PSS will initiate off-site notifications and plant personnel call-ins when required.

In accordance with the corrective action program, plant personnel are required to report abnormal events or conditions that may have the potential to harm the safety, health, or security of on-site personnel, the general public, or the environment. Plant personnel are also required to immediately report conditions which may require emergency response. The PSS reviews potentially reportable or inoperable safety system equipment reports and determines proper disposition.

6.5.2 Cascade Operations Organization and Administration

The cascade is the UF_6 enrichment portion of the plant. The cascade is composed of six major process buildings which houses two parallel enrichment cascades that share common product and tails withdrawal facilities. There are auxiliary facilities such as the recirculating water pump houses which are also under the direct control of cascade operations.

The Operations Manager is responsible for overall operations. This includes operation of cascade equipment, planning for power usage, control of feeds, product and tails material including sampling, operating plant utilities, radiological decontamination, equipment cleaning, uranium precipitation, waste management, and operation of plant laundry. The Operations Manager is supported by managers in the following groups: Shift Operations, Cascade, Chemical, Utilities, Power, and UF_6 Handling. These group managers have subordinate managers assigned to functional areas to provide oversight of the day shift operations.

The optimum cascade arrangement for specific power levels, cascade configuration, product and tails assay levels, and feed availabilities is determined by the technical staff. Recommendations for these operating conditions are made by the technical staff to appropriate Operations Management and implemented by the operations staff in conjunction with the shift organization. The shift organization follow daily instructions and work plans developed and communicated by Operations Management.

The Utilities Manager, in conjunction with key building managers, provides the plant with sanitary water, chilled water, steam, air, nitrogen, and sewer services. These must be supplied on a continuous basis to meet the cascade requirements. Any outage is coordinated with customers to assure proper planning to provide temporary services as necessary.

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4.1.12 Nuclear Safety and Quality Manager

The Nuclear Safety and Quality Manager is responsible for implementing and directing independent assessments, quality control, nuclear material control and accountability, and nuclear safety assurance.

4.1.13 Section Deleted

4.1.14 On-Duty PSS

As the senior manager on shift, the on-duty PSS represents the General Manager and managers and has the authority and responsibility to make decisions as necessary to ensure safe operation, including stopping work and placing the plant in a safe condition.

The on-duty PSS is responsible for making proper notification in regard to abnormal plant conditions, determining the severity of the event, declaring an emergency, and initiating appropriate response. The on-duty PSS may respond to an incident scene as the on-scene incident commander or dispatch other qualified individual in this capacity. The on-duty PSS is the crisis manager until relieved by a member of management designated in the emergency line of executive succession.

4.1.15 Section deleted.

4.1.16 GDP Procurement and Materials Manager

The GDP Procurement and Materials Manager is responsible for managing the projects, programs, and the activities related to packaging and transportation, material control, stores, shipping and receiving, and property disposition.

4.1.17 Nuclear Criticality Safety Manager

The Nuclear Criticality Safety Manager is responsible for implementing the nuclear criticality safety program. This position reports to the USEC NCS Manager, who is responsible for the nuclear criticality safety programs at both sites.

4.1.18 Scheduling Manager

The Scheduling Manager is responsible for production maintenance work scheduling.

4.2 ON-SITE EMERGENCY RESPONSE ORGANIZATION

The Emergency Response Organization (ERO) is responsible for taking immediate mitigative and corrective actions to minimize the consequences of an incident to workers, public health and safety, and the environment. The ERO is staffed with trained personnel who respond to events and are required to participate in formal training, drills, and exercises. The incident type and severity dictate the level of ERO activation.

The ERO has the following specific functions and responsibilities, depending on the incident and level of response needed to mitigate the problem: event categorization, determination of emergency class, notification, protective action recommendations, management and decision making, control of on-site emergency activities, consequence assessment, protective actions, medical support, public information, activation and coordination of on-site response resources, security, communications, administrative support, and coordination and liaison with off-site support and response organizations.

The ERO is divided into functional groups as follows:

1. Plant Emergency Squad,
2. EOC cadre, and
3. Joint Public Information Center (JPIC).

Members of these groups are assigned to on-scene response locations and emergency response centers, such as the EOC. Emergency assignments correspond as closely as possible to daily duties. Primary and alternate personnel are assigned to the ERO positions. Assignments are updated periodically. Management ERO positions in each group provide oversight and final authority in the group's decision-making process.

4.2.1 Direction and Coordination

The initial ERO consists of the plant emergency squad with the PSS, or other qualified individual as incident commander (IC) at the scene. Upon classification of the emergency as an Alert or SAE, the PSS becomes the CM and maintains overall control of the plant during the emergency until relieved. When the EOC is operational, a manager designated in the emergency line of executive succession relieves the PSS as CM and the overall control of the emergency shifts from the PSS to the CM.

The PSS conducts transition and turnover of command and control authority and responsibility of the CM function in a formal manner by use of specially developed procedural checklists and, if possible, face-to-face briefings. A primary and alternates are identified for the CM.

The order of succession for the CM position is identified in an EPIP and includes the following:

1. PSS
2. General Manager
3. Plant Manager
4. Others as designated by the General Manager and trained and qualified as CM

5. EMERGENCY RESPONSE MEASURES

Emergency measures must be taken in response to an emergency. Upon recognizing that an emergency exists, necessary portions of the emergency organization are activated. Once activation has taken place, assessments of the condition are made, corrective and protective actions are taken, and aid to affected persons is administered as required.

After becoming aware that an emergency exists, the PSS does the following:

1. Takes actions to ensure the safety of plant personnel and the general public,

2. Takes actions to ensure safe operation/activities of the plant,

3. Classifies the emergency and makes required notifications,

4. Performs assessment actions, and

5. Performs any other emergency actions as appropriate.

5.1 ACTIVATION OF EMERGENCY RESPONSE ORGANIZATION

Upon recognition of an emergency, the PSS, or other qualified individual responds to the incident scene as the IC. The IC determines appropriate immediate protective actions at the incident scene. The PSS classifies the event if applicable. If the emergency is classified as either an Alert or SAE, the PSS as CM activates the EOC. Minimum staffing requirements for activation and operation of the EOC are identified in an EPIP, and must be met prior to assumption of command and control by the crisis management team. CM responsibilities are assumed by a manager designated in the emergency line of executive succession when the EOC is operational. Methods for ERO notification/activation are the same regardless of the time of the emergency and include plant radios, emergency pager system, and telephones. When notified, EOC cadre members are required to respond immediately. ERO activation is accomplished through the appropriate EPIPs.

The CM delegates public information duties to the public information advisor, who, in concert with USEC headquarters, is responsible for activating the JPIC.

The IC maintains command and control over the specific area response and protective actions. The IC coordinates mitigation and protective action strategy and direction and keeps EOC informed of the incident status when the EOC is operational.

In the event that two or more emergencies occur simultaneously so that they cannot be managed effectively as a single incident scene, provisions in the appropriate EPIPs allow for the establishment of additional incident scenes, designation of multiple incident commanders, and division of response resources as necessary.

5.1.1 *Section deleted.*

5.1.2 ***Section deleted***

5.2 ASSESSMENT ACTIONS

This section describes the processes used for assessing the actual or potential on-site and off-site consequences of an emergency. Initial and continuing assessment actions are the responsibility of the CM. Post-accident assessments are a shared responsibility between the IC, the CM, and the recovery manager, if assigned.

Continuous assessment throughout the course of an emergency is necessary to effectively coordinate and direct the elements of the ERO. The initial assessment actions are dictated in part by the nature and severity of the emergency. Emergency assessment provides an indication of the vulnerability to life, the environment, and property injury or damage if an emergency occurs. The different assessment actions for Alert and SAEs are described in Sections 5.2.1 and 5.2.2. Equipment used to assess releases is described in Section 6.4.

5.2.1 Assessment Actions During an Alert

An Alert requires basic emergency assessments. Attention must be paid to parameters that may indicate a possible worsening of conditions (e.g., radioactive/hazardous materials releases). The existence of an Alert requires the following initial and ongoing assessment actions as applicable:

1. Increased surveillance of applicable plant instrumentation and visual observation of the incident conditions,

2. Determination of the resources necessary to mitigate the event from evaluation of reports of damage and injury or by on-scene inspection,

3. Monitoring event conditions for potential changes in emergency classification level.

5.2.2 Assessment Actions During an SAE

In the event of an SAE, assessment activities are more extensive than for an Alert. During a release of radiological/hazardous materials, assessment of on-site and off-site exposures are performed regularly to determine if and when on-site sheltering or evacuations or off-site sheltering may be required.
The results, including methods and assumptions, are communicated to appropriate off-site officials as off-site protective action recommendations. In addition to the activities that would be carried out during an Alert, the following activities are performed at the direction of the PSS or the CM when the EOC is operational, as appropriate:

1. Performing continuing emergency assessments for mitigating events and protective actions on-site, based on on-scene and field monitoring results, release information, and meteorological conditions for radiological/hazardous material releases, and

2. For off-site hazardous material releases, providing specific material information, release information, plume direction, projected plume location, appropriate meteorological information, and field monitoring results to responsible off-site authorities.

STEs provide secure voice communications to on-site and off-site users of other STE telephones. It can operate as a normal telephone in the "clear" mode.

Cellular telephone service is available from the plant site. The PSS response vehicles are equipped with cellular telephones. This system also provides backup for the plant telephone system.

6.2.1.2 PA System

A PA system is in place with the capability to cover most occupied site buildings. During emergencies, the system is not used for routine traffic. The system is tested daily. Two-way radios and runners are used to communicate with individuals that are not covered by the PA system.

6.2.1.3 Radio Systems

The plant radio network supports normal plant operations and, therefore, is effectively utilized daily. The PSS response vehicles are equipped with two-way radios. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating with responding units on the county emergency response frequency.

6.2.1.4 Pager System

Key EOC personnel have pagers which provide access from any tone-type telephone and can relay return telephone numbers or coded responses to the holder of the unit. EOC cadre pager drills are conducted at least quarterly. Pagers are used frequently for nonemergency uses, which enhances the regular testing program.

6.2.1.5 Facsimile Machines

The facsimile machines located in the EOC are used to communicate with USEC and federal, state, and local agencies.

6.2.2 Off-Site Communications

The plant uses the commercial telephone system for off-site emergency communications. Cellular telephones can be used as a backup to the commercial telephone system. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating on the county emergency response frequency.

The Public Warning System, consisting of outdoor warning sirens and emergency alert system announcements, is used to provide emergency notification. Operations testing of the Public Warning System sirens is conducted monthly.

6.3 ON-SITE MEDICAL FACILITIES

The plant maintains medical coverage consistent with the activities being conducted on-site. In an emergency, off-duty medical personnel are notified and directed to required locations as needed. The PSS notifications include alerting appropriate occupational health services and medical personnel in the event of emergencies ranging from industrial accidents to toxic or radiological releases. Letters of Agreement are maintained with area hospitals. These off-site hospitals also have facilities, equipment, and supplies for the treatment of contaminated individuals. A summary of the medical resources follows.

A plant medical facility is maintained on-site during the day shift excluding weekends and holidays. This facility has the supplies, equipment, and personnel to treat most injuries. This includes capabilities for the treatment of contaminated individuals including a shower for contaminated ambulatory patients, radiation survey instruments, and decontamination supplies. Medical personnel assess patient condition, provide necessary emergency care, and determine appropriate supplemental treatment.

Health Services personnel are available during the day shift hours with plant fire fighters providing emergency medical coverage the remainder of the time. Health Services personnel may be called on-site during off shifts, as deemed necessary.

Emergency medical technicians provide and staff ambulance service. Additional ambulance support is available from off-site.

6.4 EMERGENCY MONITORING EQUIPMENT

The plant maintains various radiation detection equipment on-site for normal and emergency response use. Criticality accident alarms have been placed in those areas and in facilities containing fissile material as described in Section 5.2 of the SAR. The criticality accident alarm system provides for radiation detection and an alarm system to alert plant personnel.

Persons requiring radiation exposure monitoring wear beta-gamma-sensitive dosimeters (TLDs), which are processed and evaluated by a processor holding current accreditation from the National Voluntary Laboratory Accreditation Program of the National Institute of Standards and Technology. These personnel exposure monitoring dosimeters are exchanged and analyzed in accordance with Section 5.3 of the SAR. As appropriate, other types of dosimeters, (e.g., finger rings, direct-reading dosimeters, and neutron dosimeters) are used.

Radiation dose rate and contamination survey instruments used are appropriate to measure the types and energies of radiation encountered at GDPs. Instruments capable of supporting radiography operations are also maintained in inventory. Instrumentation includes alpha/beta count rate and scaler instrumentation as well as ion chambers used to evaluate personnel exposure.

Designated plant emergency vehicles responding to the scene will contain necessary emergency equipment and supplies and ensure that radiological monitoring equipment is readily available to emergency personnel. Radiological monitoring equipment is also stored in Building C-300 for designated field monitoring personnel. Emergency equipment and its storage locations are identified in appropriate EPIPs.

10. COMPLIANCE WITH COMMUNITY RIGHT-TO-KNOW ACT

The plant complies with the EPA Superfund Amendments and Reauthorization Act (SARA) Title III regulations, also known as the Emergency Planning and Community Right to Know Act. Specific responsibilities include emergency response planning, emergency release reporting, hazardous chemical inventory reporting, and toxic chemical release reporting.

The Plan and appropriate EPIPs are used during any hazardous chemical release emergencies. Plant administrative procedures have been developed for hazardous materials releases that are not classified as emergencies to ensure that requirements of SARA Title III are met. MSDSs are maintained in several areas throughout the plant.

Hazardous materials spills or releases are reported to the PSS who responds to the incident scene as IC or dispatches other qualified individual in that capacity. The IC directs the emergency containment of spills. Actions to be implemented are described in appropriate EPIPs and include the following:

1. Establish command,
2. Evacuate/isolate the area of release/spill activity, as necessary, and determine areas of concern,
3. Classify the emergency, if appropriate,
4. Determine if activation of additional ERO personnel is necessary,
5. Take measures to minimize safety concerns,
6. Determine a course of action and personal protective equipment requirements,
7. Initiate containment procedures,
8. Terminate the source,
9. Make appropriate notifications to on-site and off-site officials,
10. Determine material disposal, and
11. Terminate the incident and enter recovery.

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Appendix D

DEFINITIONS/ACRONYMS

Accident — A deviation from normal operations or activities associated with a hazard that has the potential to result in an emergency.

ACR — Area Control Room.

ALARA — As Low as Reasonably Achievable.

Text deleted.

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

CAAS — Criticality Accident Alarm System.

CAS — Central Alarm Station.

CCF — Central Control Facility.

CM — Crisis Manager.

Consequence — The result or effect (especially projected doses or dose rates) of a release of radioactive or hazardous materials to the environment.

Corrective Actions — Those emergency measures taken to lessen the severity of or terminate an emergency situation at or near the source of the problem in order to prevent or control a release of radioactive material or to minimize the damage to plant equipment, e.g., shutting down equipment, fire fighting, repair, and damage control.

Decontamination — The removal of surface radioactive/hazardous material from individuals, equipment, surfaces, etc.

DOE — Department of Energy.

Drill — A supervised, hands-on instruction period intended to test, develop, or maintain a specific emergency response capability. A drill is often a component of an exercise.

EAS — Emergency Alert System

EMA — Emergency Management Agency.

Emergency — A sudden, usually unforeseen occurrence or occasion requiring time-urgent and immediate action/response. It may result from accidental causes, natural causes, or malicious man-made actions.

Appendix D (Continued)

Emergency Action Level (EAL) — Specific, predetermined, observable criteria used to detect, recognize, and determine the class of emergencies. An EAL can be an instrument reading, an equipment status indicator, a measurable parameter, on-site or off-site, a discrete, observable event, a result of analyses, or another observed phenomenon that indicates entry into a particular emergency class.

Emergency Operations Center (EOC) — An emergency response facility that accommodates personnel acting in support of the command and control functions but separate from the incident commander and on-scene command post. Under the guidance of the CM, these personnel supply in-depth strategic and corrective engineering and radiological, hazardous materials, and environmental support assistance to the incident scene.

Emergency Response Organization (ERO) — The designated group of personnel responsible for coping with and minimizing or mitigating the effects of any emergency.

Emergency Response Planning Guideline (ERPG) — A hazardous material personnel exposure level or range which, when exceeded by a short-term or acute exposure, will cause irreversible or other serious health effects in humans. The ERPGs are approved by a committee of the American Industrial Hygiene Association.

Deleted

EPA — Environmental Protection Agency.

EPIP — Emergency Plan Implementing Procedure.

Event — Any real-time occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect people, property, or the environment.

Exercise — A scheduled and planned large-scale activity that tests the integrated capability and most aspects of the emergency management program.

FAA — Federal Aviation Administration.

FBI — Federal Bureau of Investigation.

GDP — Gaseous Diffusion Plant.

Hazardous Material — Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment.

IC — Incident Commander.

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SECTION 3.0 ADMINISTRATIVE CONTROLS

Table 3.2.2.1 Minimum Staffing Requirements[a]

Facility Function	Mode/Operation	Staffing Requirements	Work Area Definition
C-300	All	3	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-360	1b, 3, 4, 5	1[b]	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	1a, 2, 6	2	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	7	2	At least one person in the Laboratory. One person in the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
C-333-A	1, 2, 5	2	Two persons in the operating facility or immediately surrounding grounds including the local cylinder yard.
C-337-A	3, 4	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-310	Product withdrawal 1, 2, 3, 4 Cascade 1, 3	2[c]	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-315	1, 2, 3, 4	2[c]	Two persons in the facility or immediately surrounding grounds including the local cylinder yard.
C-331	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	2	At least one person in the ACR.
C-335			
C-333	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	3	At least one person in the ACR.
C-337			
Health Physics	At all times	1	Onsite.
Power Operations	At all times	4	Onsite.
Utilities Operations	At all times	4	Onsite.
Fire Services	At all times	4[d]	Onsite[d].
Security Services	At all times	4	Onsite.

a. Staffing may be less than the minimum requirement listed for a period of a time not to exceed four hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift manning requirements to within the minimum requirements. The C-331, C-333, C-335, and C-337 ACRs shall always be manned. The ACRs for C-310, C-315, C-333-A, and C-337-A shall be manned when required by operating mode. Manning not required during emergency conditions requiring building/area evacuation.

b. Manning requirement is zero if all autoclaves are in MODE 6 (Not In Use for C-333-A and C-337-A) or MODE 8 (Not In Use for C-360) and the Transfer Station is in MODE 8 (Not in Use).

c. When withdrawal process equipment is brought below atmospheric pressure or to a UF_6 negative in the NOT IN USE (Mode 4) operating mode then the staffing requirements for the appropriate withdrawal facility do not apply.

d. In accordance with footnote "a", Fire Services personnel making an unexpected run to deliver an individual to a local hospital are allowed to be offsite and are considered to be on duty and available.

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1.3 ANSI/ANS 3.1, Selection, Qualification, and Training of Personnel for Nuclear Power Plants, 1987 Edition

PGDP satisfies only the following section of this standard:

Section 4.3.3 - The qualifications of the Radiation Protection Manager identified in SAR Section 6.1 satisfy the requirements of this section of the standard.

1.4 ANSI/ANS 3.2, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, 1994 Edition

The extent to which PGDP satisfies the requirements of this standard is outlined in SAR Section 6.11.1 and Appendix B to SAR Section 6.11.

1.5 ANSI/ANS 8.1, Nuclear Criticality Safety in Operations With Fissionable Materials Outside Reactors, 1983 Edition

PGDP satisfies the requirements of this standard.

For references to this standard, see SAR Sections 4.3.2.6, 5.2.2.1, 5.2.2.3, 5.2.3.2, 5.2.4.1, and Table 6.9-1.

1.6 ANSI/ANS 8.3, Criticality Accident Alarm System, 1986 Edition

The recommendations of this standard were used as guidance only for the design of the CAAS. PGDP satisfies the requirements of this standard with the following exceptions:

Section 4.4.1 - The CAAS alarm is not audible in all permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

Section 4.4.2 - An alarm signal with a complex sound wave or modulation is not provided.

Section 5.3 - The CAAS is not designed to withstand seismic stresses.

Section 5.5 - Not all CAAS alarms are capable of producing the desired signal within one-half second of activation by the minimum accident of concern. All CAAS alarms are capable of producing the alarm signal within two seconds of activation by the minimum accident of concern.

Section 7.2.2 - Instead of acquainting all employees with the alarm signal by actual demonstration at their work location, a recording of the alarm signal will be used to familiarize employees.

For references to this standard, see SAR Sections 3.12.6, 3.15.7.1, and 4.3.2.6.

Each completed NCSA is issued as a controlled document. The permanent NCSAs are maintained in a controlled manual which is issued to the personnel who need access to the NCSAs. The temporary NCSAs are issued to the appropriate personnel performing the temporary operation. Approved NCSEs/NCSAs are quality records and are handled according to the plant's Document Control and Records Management Program described in Section 6.10. The NCSA/NCSE process provides assurance that operations will remain subcritical under both normal and credible abnormal conditions. A summary of the NCS controls and parameters controlled as well as the Active Engineered Features based on approved NCSAs/NCSEs are also presented in Appendix A.

There are three operations which do not meet the double contingency principle. These are product cylinder operations, operation of the enrichment cascade, and removal of large cascade equipment (e.g., compressor, convertor, G-17 valve, etc). These operations have been evaluated to be safe; summaries of the accident scenarios and NCS controls associated with the operation of the enrichment cascade, the removal of enrichment cascade equipment, and UF_6 product cylinder operations are provided in Appendix A. Any operations that do not comply with the double contingency principle are documented in NCSEs and Appendix A.

There are TSRs to ensure controls are in place for those operations identified above which do not meet double contingency. Sections 2.4 and 2.5 of the TSRs list controls for operation of the enrichment cascade and for removal and maintenance of enrichment cascade equipment, respectively. Section 2.3 of the TSRs provides the controls associated with ensuring moderation control for the product cylinders. Section 3.12 of the TSRs also contains controls within the fire protection program for ensuring moderation control for the enrichment cascade.

New operations and operations other than those identified as not meeting the double contingency principle in Appendix A shall comply with the double contingency principle. In the event future operations are found to not comply with the double contingency principle, Appendix A will be modified to address this issue and will be reviewed and approved as described in Section 6.3.

Emergencies arising from unforeseen circumstances can present the need for immediate action. If NCS expertise or guidance is needed immediately to avert the potential for a criticality accident, direction will be provided verbally or in writing. Such direction can include a stop work order or other appropriate instructions. A NCSA or other form of documentation will then be prepared to justify the actions taken once the emergency condition has been stabilized. This documentation shall be prepared within 48 hours following the stabilization of the emergency condition.

5.2.2.4 Design Philosophy and Review

Designs of new fissile material equipment and processes must be approved by the NCS Group before implementation and will include the use of favorable geometry or engineered controls on mass, moderation, volume, concentration, interaction, or neutron absorption, as the preferred approach over the use of administrative controls. Advantage will be taken for the nuclear and physical characteristics of process equipment and materials provided control is exercised to maintain them.

The preferred design approach includes two goals. The first is to design equipment with NCS independent of the amount of internal moderation or fissile concentrations, the degree of interspersed moderation between units, the thickness of reflectors, the fissile material density, and the fissile material chemical form. The second is to minimize the possibility of accumulating fissile material in inaccessible locations and, where practical, to use favorable geometry for those inaccessible locations. The adherence to this approach is determined during the preparation and technical review of the NCS evaluation performed to support the equipment design. This preferred design approach is implemented through adherence to plant NCS procedures.

Fissile material equipment designs and modifications are reviewed to ensure that favorable geometry and engineered controls are used to advantage. Administrative limits and controls will be implemented in NCSAs to satisfy the double contingency principle for those cases where the preferred design approach cannot be met. The basis for the decision to use administrative controls in lieu of engineered controls shall be documented in cases where: 1) new fissile material equipment and operations are evaluated, and 2) existing fissile material operations are revised and engineered controls are replaced by administrative controls.

5.2.2.5 Criticality Accident Alarm System Coverage

A CAAS is provided to alert personnel if a criticality accident should occur. The system utilizes a distinctive audible signal to notify personnel in the affected area and initiate evacuation, thereby reducing personnel exposure to emitted radiation. Audibility is not provided in permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. In these areas a "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

At PGDP, the CAAS detects gamma dose rate. The system uses clustered detectors. Each cluster contains three scintillation detectors. Activation of any two of the three detectors in a cluster will initiate evacuation alarms. The failure of any major component of the system will result in a notification that indicates the need for corrective maintenance. A more detailed discussion of the physical function of the CAAS system is provided in Section 3.12.6.

Operations involving fissile material are evaluated for NCS prior to initiation. The need for CAAS coverage is considered during the evaluation process. Coverage is provided unless it is determined that coverage is not required and that finding is documented in the NCSE. For example, areas containing no more than 700 g of ^{235}U, 50 g of ^{235}U in any square meter of floor or ground area, 5 g of ^{235}U in any 10-liter volume, or areas having material that is either packaged and stored in compliance with 10 CFR 71 or specifically exempt according to 10 CFR 71.15, can be shown by evaluation not to require alarm coverage. Areas that do not contain any operations involving uranium enriched to 1 wt % or higher ^{235}U and 15 g or more of ^{235}U do not require an NCSE and are not required to have CAAS coverage. 10 CFR 76.89(a) authorizes USEC to "describe for the approval of the Commission defined areas to be excluded from the monitoring requirement." This submittal to the NRC "must describe the measures that will be used to ensure against criticality including kinds and quantities of material that will be permitted and

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SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

LCO 2.6.4.1b: Criticality accident alarm shall be operable (audible).

APPLICABILITY: In areas in the facilities listed in 2.6.4.1a where the maximum foreseeable absorbed dose in free air exceeds 12 rad, except areas in permit-required confined spaces and localized areas of inaudibility. This LCO is applicable when the new criticality accident alarm system with air accumulators and/or electronic horns has been declared operable.

ACTIONS:

Condition	Required Action	Completion Time
A. Area does not have an audible criticality accident alarm.	A.1 Discontinue operations with fissile material. [Handling, transporting, analyzing, or processing of assay samples necessary for compliance with TSR 2.4.4.3 is not restricted by this action.]	Immediately
	AND	
	A.2.1 Evacuate area of inaudibility	Immediately
	AND	
	A.2.2 Restrict access to the area of inaudibility.	
	AND	
	A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification such as a device that will alarm on sensing a 10mr/hr dose rate, or a radio in constant communication with the Central Control Facility.	Immediately
B. Area does not have an audible criticality accident alarm.	B.1 Restore criticality accident alarm to operable status. TSR 1.6.2.2d is not applicable.	Prior to reinitiating activities

SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.6.4.1b-1	Test the CAAS and building horns.	Quarterly
SR 2.6.4.1b-2	Verify that the CAAS air accumulator supply pressure to the building horns is greater than or equal to that necessary to sound all building horns for at least 120 seconds based on the number of accumulators in service. C-400 Number of accumulators in service — Minimum pressure 2 — 125 psig 1 — 145 psig C-409 Number of accumulators in service — Minimum pressure 1 — 125 psig	Quarterly
SR 2.6.4.1b-3	Verify that the condition of the battery backups to the electronic horns are sufficient to power the horns for at least 120 seconds.	Annually

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. Audibility is not provided for areas in permit-required confined spaces and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate. One person remains outside the area and maintains contact with personnel in the area. Evacuation of the area of inaudibility and restricting access to those areas will eliminate the potential for increased consequences due to personnel not hearing an alarm. The design of the system, three detector modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the listed facilities are associated with the handling of fissile materials.

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6.5 OPERATIONS

This section describes personnel, practices, and key facilities associated with the continued operation of PGDP.

The site is large enough to provide a considerable buffer between the enrichment process and our rural neighbors. Plant operations are continuous with coordination of operations performed by the Plant Shift Superintendent (PSS) from a central control facility. The plant is protected on a continuous basis by fire services and security forces. Each significant building is equipped with fire alarms and water sprinklers as discussed in SAR Section 5.4.1.1. Emergency mutual assistance exercises are conducted biennially with the emergency forces of the state and of the surrounding communities.

There is a public warning system to alert neighbors in the event of any plant problem that might affect them. Spill control measures are in effect for all continuous liquid effluent discharge points. More information on waterborne effluent control is contained in SAR Section 5.1. There are also internal impoundment structures, spill control equipment, and monitoring stations with alarms. The principal toxic gases on the site are the uranium hexafluoride process gas, fluorine, chlorine trifluoride, chlorine, and hydrogen fluoride. Liquid hazardous chemicals include oil, nitric acid, sulfuric acid, and a variety of other chemicals in smaller amounts.

The plant is normally in one of three modes of operation, from a safety perspective.

Normal Operations

Most of the time is spent in normal operations; in this mode the following conditions apply:

- Operations are proceeding within expected parameters with no safety impacts from deviations,
- Technical Safety Requirements (TSRs) are in effect,
- Routine effluents or emissions are within permits and certificate conditions with no significant impact to the public or environment, and
- Personnel exposures are below 10 CFR 20 limits and OSHA requirements.

Off-normal (but not emergency) Operations

Occasionally, process upsets and/or equipment failures occur which result in "off-normal" conditions within localized areas of the plant; these "off-normal" modes are as follows:

- Small releases of UF_6 or other toxic gases (such as F_2, HF, CLF_3, Cl_2) that result in evacuation of the immediate area and monitoring for reentry, but do not affect other areas of operations of the plant and have no impact off site;
- Occupational safety injuries and/or illnesses with a response required to render aid or transport to the plant or off site medical facility;

- Small fires that are quickly extinguished;

- Unexpected radiological contamination that requires reporting of plant areas or additional employee protective measures.

These "off normal" conditions are managed by the PSS from the C-300 Plant Control Facility with involvement by plant shift emergency response and/or health physics personnel. It may involve call-in of Health and Safety personnel.

Emergency Operations

The third mode is an emergency, as described in the Emergency Plan, which involves an "Alert" or "Site Area Emergency" declaration and activation of the Emergency Operations Center.

The remainder of this section provides an overview of the major operating areas of PGDP with a brief discussion of the safety and safeguards risks and the controls and operational surveillances in place to manage these risks. A description of the plant and plant operations is provided in detail in Chapter 3; a detailed accident analysis and discussion of risks associated with plant operations is provided in Chapter 4.

6.5.1 Shift Operations

The gaseous diffusion process operates continuously. To support this continuous operation, a work force is required 24-hours per day.

The PGDP work force is divided into two primary groups, a day shift (management, support staff, service groups) working primarily Monday through Friday, and shifts that provide continuous coverage of plant operations. The day shift provides the administrative support, activities such as design and fabrication where continuation is not time constrained, procedure development, classroom training, planning, and preventive maintenance. Most of the plant staff is assigned to the day shift.

The shift organization has the prime responsibility for continued plant operation and the evolutions, exchange of information, and response to abnormal and unusual conditions necessary to ensure safe and efficient plant operation. Typical activities of the shift include provide oversight and direction for all plant operations, monitor systems and equipment for proper performance, conduct routine back shift maintenance and emergency equipment repair, prepare equipment for day shift repair/preventative maintenance functions, and respond to emergency situations.

Operational activities of the plant are controlled by the Plant Shift Superintendent (PSS) whose normal watch station is in the C-300 Central Control Facility (CCF). The PSS reports directly to the Shift Operations Manager. Upon recognition of an emergency, the PSS, or other qualified individual responds to the scene as Incident Commander. The PSS serves as Crisis Manager during a classified emergency (Alert or Site Area Emergency) until relieved by a manager designated in the emergency line of executive succession when the Emergency Operations Center becomes operational. Emergency command and control is described in the Emergency Plan.

The CCF is the hub of the plant operational activity. The overall UF_6 enrichment process is monitored at this location. Key plant operations can be performed remotely from the CCF, key alarm systems are monitored, and plant communications systems as well as off-site communications capabilities

are located in the CCF. The plant power system is monitored and controlled through a communication network with the power suppliers. Typical operational activities that are monitored and controlled from the CCF include determining and establishing optimal plant power level, executing or altering the maintenance work plan if necessary, and maintaining necessary manpower level to support plant operations.

Staffing levels for the shifts are not fixed but are based on the expected or planned activity for the shift period. Staffing levels take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and Technical Safety Requirement (TSR) specified staffing requirements. When special activities are included in the work plans, the staffing will be increased as required to perform the planned activity. The required minimum staffing level for Paducah is approximately 43 as detailed in Section 3 of the TSRs. This is a fraction of the normal average shift staffing of approximately 80 persons.

Each shift organization is composed of a PSS, a cascade coordinator (CC) who directs overall cascade activities; shift engineer; first-line managers for the cascade buildings, UF_6 handling facilities, security, fire services, maintenance and power operations and utility operations; health physics technicians; Security Shift Commander; Fire Services Shift Commander; and operators, instrument mechanics, Security Police officers, and firefighters. Less than this normal shift staffing is permitted for short periods with the concurrence of the PSS to allow for call-ins or other compensatory actions.

The PSS provides a direct chain of command from the Operations Manager, Shift Operations Manager, Plant Manager and General Manager to the shift operating staff and serves as the senior shift manager in directing activities and personnel. The operations line organization is accountable to the PSS for reporting plant status.

The CC provides managerial oversight, operations coordination, and assures adequate staffing for all cascade operations on a 24-hour basis. This person approves, directs, and integrates all significant cascade operational activities under the oversight of the PSS.

The remaining members of the shift organization provide the needed functions for round-the-clock operations. First-line managers provide management for, coordination of, and assurance for proper execution of assigned tasks. The shift engineer provides engineering support for technical issues involving operations. Health physics technicians provide support for 24-hour shift operations. The first-line manager for Security supervises the activities necessary to ensure the protection of plant facilities, government property, and classified information. The first-line manger for fire services supervises shift fire services work activities and responds to plant emergency events.

There are diverse systems for operational communications. Commercial telephones, an internal plant telephone system, radio network, a plant public address (PA) system, emergency signals, and a pager system are available to provide necessary communications in operating the plant. The CCF is the focal point for all emergency reporting and initiating of all emergency responses. A special emergency telephone network is available in the CCF. Fire alarm and sprinkler indicator systems, criticality alarm panel, seismic alarms as well as numerous operational alarms are monitored in the CCF. As described in the Emergency Plan, the PSS will initiate off-site notifications and plant personnel call-ins when required.

In accordance with the corrective action program, plant personnel are required to report abnormal events or conditions that may have the potential to harm the safety, health, or security of on-site personnel, the general public, or the environment. Plant personnel are also required to immediately report conditions which may require emergency response. The PSS reviews potentially reportable or inoperable safety system equipment reports and determines proper disposition.

6.5.2 Cascade Operations Organization and Administration

The cascade is the UF_6 enrichment portion of the plant. The cascade is composed of six major process buildings which houses two parallel enrichment cascades that share common product and tails withdrawal facilities. There are auxiliary facilities such as the recirculating water pump houses which are also under the direct control of cascade operations.

The Operations Manager is responsible for overall operations. This includes operation of cascade equipment, planning for power usage, control of feeds, product and tails material including sampling, operating plant utilities, radiological decontamination, equipment cleaning, uranium precipitation, waste management, and operation of plant laundry. The Operations Manager is supported by managers in the following groups: Shift Operations, Cascade, Chemical, Utilities, Power, and UF_6 Handling. These group managers have subordinate managers assigned to functional areas to provide oversight of the day shift operations.

The optimum cascade arrangement for specific power levels, cascade configuration, product and tails assay levels, and feed availabilities is determined by the technical staff. Recommendations for these operating conditions are made by the technical staff to appropriate Operations Management and implemented by the operations staff in conjunction with the shift organization. The shift organization follow daily instructions and work plans developed and communicated by Operations Management.

The Utilities Manager, in conjunction with key building managers, provides the plant with sanitary water, chilled water, steam, air, nitrogen, and sewer services. These must be supplied on a continuous basis to meet the cascade requirements. Any outage is coordinated with customers to assure proper planning to provide temporary services as necessary.

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4.1.12 Nuclear Safety and Quality Manager

The Nuclear Safety and Quality Manager is responsible for implementing and directing independent assessments, quality control, nuclear material control and accountability, and nuclear safety assurance.

4.1.13 Section Deleted

4.1.14 On-Duty PSS

As the senior manager on shift, the on-duty PSS represents the General Manager and managers and has the authority and responsibility to make decisions as necessary to ensure safe operation, including stopping work and placing the plant in a safe condition.

The on-duty PSS is responsible for making proper notification in regard to abnormal plant conditions, determining the severity of the event, declaring an emergency, and initiating appropriate response. The on-duty PSS may respond to an incident scene as the on-scene incident commander or dispatch other qualified individual in this capacity. The on-duty PSS is the crisis manager until relieved by a member of management designated in the emergency line of executive succession.

4.1.15 Section deleted.

4.1.16 GDP Procurement and Materials Manager

The GDP Procurement and Materials Manager is responsible for managing the projects, programs, and the activities related to packaging and transportation, material control, stores, shipping and receiving, and property disposition.

4.1.17 Nuclear Criticality Safety Manager

The Nuclear Criticality Safety Manager is responsible for implementing the nuclear criticality safety program. This position reports to the USEC NCS Manager, who is responsible for the nuclear criticality safety programs at both sites.

4.1.18 Scheduling Manager

The Scheduling Manager is responsible for production maintenance work scheduling.

4.2 ON-SITE EMERGENCY RESPONSE ORGANIZATION

The Emergency Response Organization (ERO) is responsible for taking immediate mitigative and corrective actions to minimize the consequences of an incident to workers, public health and safety, and the environment. The ERO is staffed with trained personnel who respond to events and are required to participate in formal training, drills, and exercises. The incident type and severity dictate the level of ERO activation.

The ERO has the following specific functions and responsibilities, depending on the incident and level of response needed to mitigate the problem: event categorization, determination of emergency class, notification, protective action recommendations, management and decision making, control of on-site emergency activities, consequence assessment, protective actions, medical support, public information, activation and coordination of on-site response resources, security, communications, administrative support, and coordination and liaison with off-site support and response organizations.

The ERO is divided into functional groups as follows:

1. Plant Emergency Squad,
2. EOC cadre, and
3. Joint Public Information Center (JPIC).

Members of these groups are assigned to on-scene response locations and emergency response centers, such as the EOC. Emergency assignments correspond as closely as possible to daily duties. Primary and alternate personnel are assigned to the ERO positions. Assignments are updated periodically. Management ERO positions in each group provide oversight and final authority in the group's decision-making process.

4.2.1 Direction and Coordination

The initial ERO consists of the plant emergency squad with the PSS, or other qualified individual as incident commander (IC) at the scene. Upon classification of the emergency as an Alert or SAE, the PSS becomes the CM and maintains overall control of the plant during the emergency until relieved. When the EOC is operational, a manager designated in the emergency line of executive succession relieves the PSS as CM and the overall control of the emergency shifts from the PSS to the CM.

The PSS conducts transition and turnover of command and control authority and responsibility of the CM function in a formal manner by use of specially developed procedural checklists and, if possible, face-to-face briefings. A primary and alternates are identified for the CM.

The order of succession for the CM position is identified in an EPIP and includes the following:

1. PSS
2. General Manager
3. Plant Manager
4. Others as designated by the General Manager and trained and qualified as CM

5. EMERGENCY RESPONSE MEASURES

Emergency measures must be taken in response to an emergency. Upon recognizing that an emergency exists, necessary portions of the emergency organization are activated. Once activation has taken place, assessments of the condition are made, corrective and protective actions are taken, and aid to affected persons is administered as required.

After becoming aware that an emergency exists, the PSS does the following:

1. Takes actions to ensure the safety of plant personnel and the general public,

2. Takes actions to ensure safe operation/activities of the plant,

3. Classifies the emergency and makes required notifications,

4. Performs assessment actions, and

5. Performs any other emergency actions as appropriate.

5.1 ACTIVATION OF EMERGENCY RESPONSE ORGANIZATION

Upon recognition of an emergency, the PSS, or other qualified individual responds to the incident scene as the IC. The IC determines appropriate immediate protective actions at the incident scene. The PSS classifies the event if applicable. If the emergency is classified as either an Alert or SAE, the PSS as CM activates the EOC. Minimum staffing requirements for activation and operation of the EOC are identified in an EPIP, and must be met prior to assumption of command and control by the crisis management team. CM responsibilities are assumed by a manager designated in the emergency line of executive succession when the EOC is operational. Methods for ERO notification/activation are the same regardless of the time of the emergency and include plant radios, emergency pager system, and telephones. When notified, EOC cadre members are required to respond immediately. ERO activation is accomplished through the appropriate EPIPs.

The CM delegates public information duties to the public information advisor, who, in concert with USEC headquarters, is responsible for activating the JPIC.

The IC maintains command and control over the specific area response and protective actions. The IC coordinates mitigation and protective action strategy and direction and keeps EOC informed of the incident status when the EOC is operational.

In the event that two or more emergencies occur simultaneously so that they cannot be managed effectively as a single incident scene, provisions in the appropriate EPIPs allow for the establishment of additional incident scenes, designation of multiple incident commanders, and division of response resources as necessary.

5.1.1 *Section deleted.*

5.1.2 *Section deleted*

5.2 ASSESSMENT ACTIONS

This section describes the processes used for assessing the actual or potential on-site and off-site consequences of an emergency. Initial and continuing assessment actions are the responsibility of the CM. Post-accident assessments are a shared responsibility between the IC, the CM, and the recovery manager, if assigned.

Continuous assessment throughout the course of an emergency is necessary to effectively coordinate and direct the elements of the ERO. The initial assessment actions are dictated in part by the nature and severity of the emergency. Emergency assessment provides an indication of the vulnerability to life, the environment, and property injury or damage if an emergency occurs. The different assessment actions for Alert and SAEs are described in Sections 5.2.1 and 5.2.2. Equipment used to assess releases is described in Section 6.4.

5.2.1 Assessment Actions During an Alert

An Alert requires basic emergency assessments. Attention must be paid to parameters that may indicate a possible worsening of conditions (e.g., radioactive/hazardous materials releases). The existence of an Alert requires the following initial and ongoing assessment actions as applicable:

1. Increased surveillance of applicable plant instrumentation and visual observation of the incident conditions,

2. Determination of the resources necessary to mitigate the event from evaluation of reports of damage and injury or by on-scene inspection,

3. Monitoring event conditions for potential changes in emergency classification level.

5.2.2 Assessment Actions During an SAE

In the event of an SAE, assessment activities are more extensive than for an Alert. During a release of radiological/hazardous materials, assessment of on-site and off-site exposures are performed regularly to determine if and when on-site sheltering or evacuations or off-site sheltering may be required.
The results, including methods and assumptions, are communicated to appropriate off-site officials as off-site protective action recommendations. In addition to the activities that would be carried out during an Alert, the following activities are performed at the direction of the PSS or the CM when the EOC is operational, as appropriate:

1. Performing continuing emergency assessments for mitigating events and protective actions on-site, based on on-scene and field monitoring results, release information, and meteorological conditions for radiological/hazardous material releases, and

2. For off-site hazardous material releases, providing specific material information, release information, plume direction, projected plume location, appropriate meteorological information, and field monitoring results to responsible off-site authorities.

STEs provide secure voice communications to on-site and off-site users of other STE telephones. It can operate as a normal telephone in the "clear" mode.

Cellular telephone service is available from the plant site. The PSS response vehicles are equipped with cellular telephones. This system also provides backup for the plant telephone system.

6.2.1.2 PA System

A PA system is in place with the capability to cover most occupied site buildings. During emergencies, the system is not used for routine traffic. The system is tested daily. Two-way radios and runners are used to communicate with individuals that are not covered by the PA system.

6.2.1.3 Radio Systems

The plant radio network supports normal plant operations and, therefore, is effectively utilized daily. The PSS response vehicles are equipped with two-way radios. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating with responding units on the county emergency response frequency.

6.2.1.4 Pager System

Key EOC personnel have pagers which provide access from any tone-type telephone and can relay return telephone numbers or coded responses to the holder of the unit. EOC cadre pager drills are conducted at least quarterly. Pagers are used frequently for nonemergency uses, which enhances the regular testing program.

6.2.1.5 Facsimile Machines

The facsimile machines located in the EOC are used to communicate with USEC and federal, state, and local agencies.

6.2.2 Off-Site Communications

The plant uses the commercial telephone system for off-site emergency communications. Cellular telephones can be used as a backup to the commercial telephone system. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating on the county emergency response frequency.

The Public Warning System, consisting of outdoor warning sirens and emergency alert system announcements, is used to provide emergency notification. Operations testing of the Public Warning System sirens is conducted monthly.

6.3 ON-SITE MEDICAL FACILITIES

The plant maintains medical coverage consistent with the activities being conducted on-site. In an emergency, off-duty medical personnel are notified and directed to required locations as needed. The PSS notifications include alerting appropriate occupational health services and medical personnel in the event of emergencies ranging from industrial accidents to toxic or radiological releases. Letters of Agreement are maintained with area hospitals. These off-site hospitals also have facilities, equipment, and supplies for the treatment of contaminated individuals. A summary of the medical resources follows.

A plant medical facility is maintained on-site during the day shift excluding weekends and holidays. This facility has the supplies, equipment, and personnel to treat most injuries. This includes capabilities for the treatment of contaminated individuals including a shower for contaminated ambulatory patients, radiation survey instruments, and decontamination supplies. Medical personnel assess patient condition, provide necessary emergency care, and determine appropriate supplemental treatment.

Health Services personnel are available during the day shift hours with plant fire fighters providing emergency medical coverage the remainder of the time. Health Services personnel may be called on-site during off shifts, as deemed necessary.

Emergency medical technicians provide and staff ambulance service. Additional ambulance support is available from off-site.

6.4 EMERGENCY MONITORING EQUIPMENT

The plant maintains various radiation detection equipment on-site for normal and emergency response use. Criticality accident alarms have been placed in those areas and in facilities containing fissile material as described in Section 5.2 of the SAR. The criticality accident alarm system provides for radiation detection and an alarm system to alert plant personnel.

Persons requiring radiation exposure monitoring wear beta-gamma-sensitive dosimeters (TLDs), which are processed and evaluated by a processor holding current accreditation from the National Voluntary Laboratory Accreditation Program of the National Institute of Standards and Technology. These personnel exposure monitoring dosimeters are exchanged and analyzed in accordance with Section 5.3 of the SAR. As appropriate, other types of dosimeters, (e.g., finger rings, direct-reading dosimeters, and neutron dosimeters) are used.

Radiation dose rate and contamination survey instruments used are appropriate to measure the types and energies of radiation encountered at GDPs. Instruments capable of supporting radiography operations are also maintained in inventory. Instrumentation includes alpha/beta count rate and scaler instrumentation as well as ion chambers used to evaluate personnel exposure.

Designated plant emergency vehicles responding to the scene will contain necessary emergency equipment and supplies and ensure that radiological monitoring equipment is readily available to emergency personnel. Radiological monitoring equipment is also stored in Building C-300 for designated field monitoring personnel. Emergency equipment and its storage locations are identified in appropriate EPIPs.

10. COMPLIANCE WITH COMMUNITY RIGHT-TO-KNOW ACT

The plant complies with the EPA Superfund Amendments and Reauthorization Act (SARA) Title III regulations, also known as the Emergency Planning and Community Right to Know Act. Specific responsibilities include emergency response planning, emergency release reporting, hazardous chemical inventory reporting, and toxic chemical release reporting.

The Plan and appropriate EPIPs are used during any hazardous chemical release emergencies. Plant administrative procedures have been developed for hazardous materials releases that are not classified as emergencies to ensure that requirements of SARA Title III are met. MSDSs are maintained in several areas throughout the plant.

Hazardous materials spills or releases are reported to the PSS who responds to the incident scene as IC or dispatches other qualified individual in that capacity. The IC directs the emergency containment of spills. Actions to be implemented are described in appropriate EPIPs and include the following:

1. Establish command,
2. Evacuate/isolate the area of release/spill activity, as necessary, and determine areas of concern,
3. Classify the emergency, if appropriate,
4. Determine if activation of additional ERO personnel is necessary,
5. Take measures to minimize safety concerns,
6. Determine a course of action and personal protective equipment requirements,
7. Initiate containment procedures,
8. Terminate the source,
9. Make appropriate notifications to on-site and off-site officials,
10. Determine material disposal, and
11. Terminate the incident and enter recovery.

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Appendix D

DEFINITIONS/ACRONYMS

Accident — A deviation from normal operations or activities associated with a hazard that has the potential to result in an emergency.

ACR — Area Control Room.

ALARA — As Low as Reasonably Achievable.

Text deleted.

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

CAAS — Criticality Accident Alarm System.

CAS — Central Alarm Station.

CCF — Central Control Facility.

CM — Crisis Manager.

Consequence — The result or effect (especially projected doses or dose rates) of a release of radioactive or hazardous materials to the environment.

Corrective Actions — Those emergency measures taken to lessen the severity of or terminate an emergency situation at or near the source of the problem in order to prevent or control a release of radioactive material or to minimize the damage to plant equipment, e.g., shutting down equipment, fire fighting, repair, and damage control.

Decontamination — The removal of surface radioactive/hazardous material from individuals, equipment, surfaces, etc.

DOE — Department of Energy.

Drill — A supervised, hands-on instruction period intended to test, develop, or maintain a specific emergency response capability. A drill is often a component of an exercise.

EAS — Emergency Alert System

EMA — Emergency Management Agency.

Emergency — A sudden, usually unforeseen occurrence or occasion requiring time-urgent and immediate action/response. It may result from accidental causes, natural causes, or malicious man-made actions.

Appendix D (Continued)

Emergency Action Level (EAL) — Specific, predetermined, observable criteria used to detect, recognize, and determine the class of emergencies. An EAL can be an instrument reading, an equipment status indicator, a measurable parameter, on-site or off-site, a discrete, observable event, a result of analyses, or another observed phenomenon that indicates entry into a particular emergency class.

Emergency Operations Center (EOC) — An emergency response facility that accommodates personnel acting in support of the command and control functions but separate from the incident commander and on-scene command post. Under the guidance of the CM, these personnel supply in-depth strategic and corrective engineering and radiological, hazardous materials, and environmental support assistance to the incident scene.

Emergency Response Organization (ERO) — The designated group of personnel responsible for coping with and minimizing or mitigating the effects of any emergency.

Emergency Response Planning Guideline (ERPG) — A hazardous material personnel exposure level or range which, when exceeded by a short-term or acute exposure, will cause irreversible or other serious health effects in humans. The ERPGs are approved by a committee of the American Industrial Hygiene Association.

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EPA — Environmental Protection Agency.

EPIP — Emergency Plan Implementing Procedure.

Event — Any real-time occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect people, property, or the environment.

Exercise — A scheduled and planned large-scale activity that tests the integrated capability and most aspects of the emergency management program.

FAA — Federal Aviation Administration.

FBI — Federal Bureau of Investigation.

GDP — Gaseous Diffusion Plant.

Hazardous Material — Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment.

IC — Incident Commander.

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SECTION 3.0 ADMINISTRATIVE CONTROLS

Table 3.2.2.1 Minimum Staffing Requirements[a]

Facility Function	Mode/Operation	Staffing Requirements	Work Area Definition
C-300	All	3	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-360	1b, 3, 4, 5	1[b]	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	1a, 2, 6	2	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	7	2	At least one person in the Laboratory. One person in the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
C-333-A	1, 2, 5	2	Two persons in the operating facility or immediately surrounding grounds including the local cylinder yard.
C-337-A	3, 4	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-310	Product withdrawal 1, 2, 3, 4 Cascade 1, 3	2[c]	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-315	1, 2, 3, 4	2[c]	Two persons in the facility or immediately surrounding grounds including the local cylinder yard.
C-331	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	2	At least one person in the ACR.
C-335			
C-333	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	3	At least one person in the ACR.
C-337			
Health Physics	At all times	1	Onsite.
Power Operations	At all times	4	Onsite.
Utilities Operations	At all times	4	Onsite.
Fire Services	At all times	4[d]	Onsite[d].
Security Services	At all times	4	Onsite.

a. Staffing may be less than the minimum requirement listed for a period of a time not to exceed four hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift manning requirements to within the minimum requirements. The C-331, C-333, C-335, and C-337 ACRs shall always be manned. The ACRs for C-310, C-315, C-333-A, and C-337-A shall be manned when required by operating mode. Manning not required during emergency conditions requiring building/area evacuation.

b. Manning requirement is zero if all autoclaves are in MODE 6 (Not In Use for C-333-A and C-337-A) or MODE 8 (Not In Use for C-360) and the Transfer Station is in MODE 8 (Not in Use).

c. When withdrawal process equipment is brought below atmospheric pressure or to a UF_6 negative in the NOT IN USE (Mode 4) operating mode then the staffing requirements for the appropriate withdrawal facility do not apply.

d. In accordance with footnote "a", Fire Services personnel making an unexpected run to deliver an individual to a local hospital are allowed to be offsite and are considered to be on duty and available.

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1.3 ANSI/ANS 3.1, Selection, Qualification, and Training of Personnel for Nuclear Power Plants, 1987 Edition

PGDP satisfies only the following section of this standard:

Section 4.3.3 - The qualifications of the Radiation Protection Manager identified in SAR Section 6.1 satisfy the requirements of this section of the standard.

1.4 ANSI/ANS 3.2, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, 1994 Edition

The extent to which PGDP satisfies the requirements of this standard is outlined in SAR Section 6.11.1 and Appendix B to SAR Section 6.11.

1.5 ANSI/ANS 8.1, Nuclear Criticality Safety in Operations With Fissionable Materials Outside Reactors, 1983 Edition

PGDP satisfies the requirements of this standard.

For references to this standard, see SAR Sections 4.3.2.6, 5.2.2.1, 5.2.2.3, 5.2.3.2, 5.2.4.1, and Table 6.9-1.

1.6 ANSI/ANS 8.3, Criticality Accident Alarm System, 1986 Edition

The recommendations of this standard were used as guidance only for the design of the CAAS. PGDP satisfies the requirements of this standard with the following exceptions:

Section 4.4.1 - The CAAS alarm is not audible in all permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

Section 4.4.2 - An alarm signal with a complex sound wave or modulation is not provided.

Section 5.3 - The CAAS is not designed to withstand seismic stresses.

Section 5.5 - Not all CAAS alarms are capable of producing the desired signal within one-half second of activation by the minimum accident of concern. All CAAS alarms are capable of producing the alarm signal within two seconds of activation by the minimum accident of concern.

Section 7.2.2 - Instead of acquainting all employees with the alarm signal by actual demonstration at their work location, a recording of the alarm signal will be used to familiarize employees.

For references to this standard, see SAR Sections 3.12.6, 3.15.7.1, and 4.3.2.6.

Each completed NCSA is issued as a controlled document. The permanent NCSAs are maintained in a controlled manual which is issued to the personnel who need access to the NCSAs. The temporary NCSAs are issued to the appropriate personnel performing the temporary operation. Approved NCSEs/NCSAs are quality records and are handled according to the plant's Document Control and Records Management Program described in Section 6.10. The NCSA/NCSE process provides assurance that operations will remain subcritical under both normal and credible abnormal conditions. A summary of the NCS controls and parameters controlled as well as the Active Engineered Features based on approved NCSAs/NCSEs are also presented in Appendix A.

There are three operations which do not meet the double contingency principle. These are product cylinder operations, operation of the enrichment cascade, and removal of large cascade equipment (e.g., compressor, convertor, G-17 valve, etc). These operations have been evaluated to be safe; summaries of the accident scenarios and NCS controls associated with the operation of the enrichment cascade, the removal of enrichment cascade equipment, and UF_6 product cylinder operations are provided in Appendix A. Any operations that do not comply with the double contingency principle are documented in NCSEs and Appendix A.

There are TSRs to ensure controls are in place for those operations identified above which do not meet double contingency. Sections 2.4 and 2.5 of the TSRs list controls for operation of the enrichment cascade and for removal and maintenance of enrichment cascade equipment, respectively. Section 2.3 of the TSRs provides the controls associated with ensuring moderation control for the product cylinders. Section 3.12 of the TSRs also contains controls within the fire protection program for ensuring moderation control for the enrichment cascade.

New operations and operations other than those identified as not meeting the double contingency principle in Appendix A shall comply with the double contingency principle. In the event future operations are found to not comply with the double contingency principle, Appendix A will be modified to address this issue and will be reviewed and approved as described in Section 6.3.

Emergencies arising from unforeseen circumstances can present the need for immediate action. If NCS expertise or guidance is needed immediately to avert the potential for a criticality accident, direction will be provided verbally or in writing. Such direction can include a stop work order or other appropriate instructions. A NCSA or other form of documentation will then be prepared to justify the actions taken once the emergency condition has been stabilized. This documentation shall be prepared within 48 hours following the stabilization of the emergency condition.

5.2.2.4 Design Philosophy and Review

Designs of new fissile material equipment and processes must be approved by the NCS Group before implementation and will include the use of favorable geometry or engineered controls on mass, moderation, volume, concentration, interaction, or neutron absorption, as the preferred approach over the use of administrative controls. Advantage will be taken for the nuclear and physical characteristics of process equipment and materials provided control is exercised to maintain them.

The preferred design approach includes two goals. The first is to design equipment with NCS independent of the amount of internal moderation or fissile concentrations, the degree of interspersed moderation between units, the thickness of reflectors, the fissile material density, and the fissile material chemical form. The second is to minimize the possibility of accumulating fissile material in inaccessible locations and, where practical, to use favorable geometry for those inaccessible locations. The adherence to this approach is determined during the preparation and technical review of the NCS evaluation performed to support the equipment design. This preferred design approach is implemented through adherence to plant NCS procedures.

Fissile material equipment designs and modifications are reviewed to ensure that favorable geometry and engineered controls are used to advantage. Administrative limits and controls will be implemented in NCSAs to satisfy the double contingency principle for those cases where the preferred design approach cannot be met. The basis for the decision to use administrative controls in lieu of engineered controls shall be documented in cases where: 1) new fissile material equipment and operations are evaluated, and 2) existing fissile material operations are revised and engineered controls are replaced by administrative controls.

5.2.2.5 Criticality Accident Alarm System Coverage

A CAAS is provided to alert personnel if a criticality accident should occur. The system utilizes a distinctive audible signal to notify personnel in the affected area and initiate evacuation, thereby reducing personnel exposure to emitted radiation. Audibility is not provided in permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. In these areas a "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

At PGDP, the CAAS detects gamma dose rate. The system uses clustered detectors. Each cluster contains three scintillation detectors. Activation of any two of the three detectors in a cluster will initiate evacuation alarms. The failure of any major component of the system will result in a notification that indicates the need for corrective maintenance. A more detailed discussion of the physical function of the CAAS system is provided in Section 3.12.6.

Operations involving fissile material are evaluated for NCS prior to initiation. The need for CAAS coverage is considered during the evaluation process. Coverage is provided unless it is determined that coverage is not required and that finding is documented in the NCSE. For example, areas containing no more than 700 g of ^{235}U, 50 g of ^{235}U in any square meter of floor or ground area, 5 g of ^{235}U in any 10-liter volume, or areas having material that is either packaged and stored in compliance with 10 CFR 71 or specifically exempt according to 10 CFR 71.15, can be shown by evaluation not to require alarm coverage. Areas that do not contain any operations involving uranium enriched to 1 wt % or higher ^{235}U and 15 g or more of ^{235}U do not require an NCSE and are not required to have CAAS coverage. 10 CFR 76.89(a) authorizes USEC to "describe for the approval of the Commission defined areas to be excluded from the monitoring requirement." This submittal to the NRC "must describe the measures that will be used to ensure against criticality including kinds and quantities of material that will be permitted and

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SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

LCO 2.6.4.1b: Criticality accident alarm shall be operable (audible).

APPLICABILITY: In areas in the facilities listed in 2.6.4.1a where the maximum foreseeable absorbed dose in free air exceeds 12 rad, except areas in permit-required confined spaces and localized areas of inaudibility. This LCO is applicable when the new criticality accident alarm system with air accumulators and/or electronic horns has been declared operable.

ACTIONS:

Condition	Required Action	Completion Time
A. Area does not have an audible criticality accident alarm.	A.1 Discontinue operations with fissile material. [Handling, transporting, analyzing, or processing of assay samples necessary for compliance with TSR 2.4.4.3 is not restricted by this action.] AND A.2.1 Evacuate area of inaudibility AND A.2.2 Restrict access to the area of inaudibility. AND A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification such as a device that will alarm on sensing a 10mr/hr dose rate, or a radio in constant communication with the Central Control Facility.	Immediately Immediately Immediately
B. Area does not have an audible criticality accident alarm.	B.1 Restore criticality accident alarm to operable status. TSR 1.6.2.2d is not applicable.	Prior to reinitiating activities

SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

<table>
<tr><th colspan="2">Surveillance</th><th>Frequency</th></tr>
<tr><td>SR 2.6.4.1b-1</td><td>Test the CAAS and building horns.</td><td>Quarterly</td></tr>
<tr><td>SR 2.6.4.1b-2</td><td>Verify that the CAAS air accumulator supply pressure to the building horns is greater than or equal to that necessary to sound all building horns for at least 120 seconds based on the number of accumulators in service.

C-400
<u>Number of accumulators in service</u> — <u>Minimum pressure</u>
2 — 125 psig
1 — 145 psig

C-409
<u>Number of accumulators in service</u> — <u>Minimum pressure</u>
1 — 125 psig</td><td>Quarterly</td></tr>
<tr><td>SR 2.6.4.1b-3</td><td>Verify that the condition of the battery backups to the electronic horns are sufficient to power the horns for at least 120 seconds.</td><td>Annually</td></tr>
</table>

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. Audibility is not provided for areas in permit-required confined spaces and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate. One person remains outside the area and maintains contact with personnel in the area. Evacuation of the area of inaudibility and restricting access to those areas will eliminate the potential for increased consequences due to personnel not hearing an alarm. The design of the system, three detector modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the listed facilities are associated with the handling of fissile materials.

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6.5 OPERATIONS

This section describes personnel, practices, and key facilities associated with the continued operation of PGDP.

The site is large enough to provide a considerable buffer between the enrichment process and our rural neighbors. Plant operations are continuous with coordination of operations performed by the Plant Shift Superintendent (PSS) from a central control facility. The plant is protected on a continuous basis by fire services and security forces. Each significant building is equipped with fire alarms and water sprinklers as discussed in SAR Section 5.4.1.1. Emergency mutual assistance exercises are conducted biennially with the emergency forces of the state and of the surrounding communities.

There is a public warning system to alert neighbors in the event of any plant problem that might affect them. Spill control measures are in effect for all continuous liquid effluent discharge points. More information on waterborne effluent control is contained in SAR Section 5.1. There are also internal impoundment structures, spill control equipment, and monitoring stations with alarms. The principal toxic gases on the site are the uranium hexafluoride process gas, fluorine, chlorine trifluoride, chlorine, and hydrogen fluoride. Liquid hazardous chemicals include oil, nitric acid, sulfuric acid, and a variety of other chemicals in smaller amounts.

The plant is normally in one of three modes of operation, from a safety perspective.

Normal Operations

Most of the time is spent in normal operations; in this mode the following conditions apply:

- Operations are proceeding within expected parameters with no safety impacts from deviations,
- Technical Safety Requirements (TSRs) are in effect,
- Routine effluents or emissions are within permits and certificate conditions with no significant impact to the public or environment, and
- Personnel exposures are below 10 CFR 20 limits and OSHA requirements.

Off-normal (but not emergency) Operations

Occasionally, process upsets and/or equipment failures occur which result in "off-normal" conditions within localized areas of the plant; these "off-normal" modes are as follows:

- Small releases of UF_6 or other toxic gases (such as F_2, HF, CLF_3, Cl_2) that result in evacuation of the immediate area and monitoring for reentry, but do not affect other areas of operations of the plant and have no impact off site;
- Occupational safety injuries and/or illnesses with a response required to render aid or transport to the plant or off site medical facility;

- Small fires that are quickly extinguished;

- Unexpected radiological contamination that requires reporting of plant areas or additional employee protective measures.

These "off normal" conditions are managed by the PSS from the C-300 Plant Control Facility with involvement by plant shift emergency response and/or health physics personnel. It may involve call-in of Health and Safety personnel.

Emergency Operations

The third mode is an emergency, as described in the Emergency Plan, which involves an "Alert" or "Site Area Emergency" declaration and activation of the Emergency Operations Center.

The remainder of this section provides an overview of the major operating areas of PGDP with a brief discussion of the safety and safeguards risks and the controls and operational surveillances in place to manage these risks. A description of the plant and plant operations is provided in detail in Chapter 3; a detailed accident analysis and discussion of risks associated with plant operations is provided in Chapter 4.

6.5.1 Shift Operations

The gaseous diffusion process operates continuously. To support this continuous operation, a work force is required 24-hours per day.

The PGDP work force is divided into two primary groups, a day shift (management, support staff, service groups) working primarily Monday through Friday, and shifts that provide continuous coverage of plant operations. The day shift provides the administrative support, activities such as design and fabrication where continuation is not time constrained, procedure development, classroom training, planning, and preventive maintenance. Most of the plant staff is assigned to the day shift.

The shift organization has the prime responsibility for continued plant operation and the evolutions, exchange of information, and response to abnormal and unusual conditions necessary to ensure safe and efficient plant operation. Typical activities of the shift include provide oversight and direction for all plant operations, monitor systems and equipment for proper performance, conduct routine back shift maintenance and emergency equipment repair, prepare equipment for day shift repair/preventative maintenance functions, and respond to emergency situations.

Operational activities of the plant are controlled by the Plant Shift Superintendent (PSS) whose normal watch station is in the C-300 Central Control Facility (CCF). The PSS reports directly to the Shift Operations Manager. Upon recognition of an emergency, the PSS, or other qualified individual responds to the scene as Incident Commander. The PSS serves as Crisis Manager during a classified emergency (Alert or Site Area Emergency) until relieved by a manager designated in the emergency line of executive succession when the Emergency Operations Center becomes operational. Emergency command and control is described in the Emergency Plan.

The CCF is the hub of the plant operational activity. The overall UF_6 enrichment process is monitored at this location. Key plant operations can be performed remotely from the CCF, key alarm systems are monitored, and plant communications systems as well as off-site communications capabilities

are located in the CCF. The plant power system is monitored and controlled through a communication network with the power suppliers. Typical operational activities that are monitored and controlled from the CCF include determining and establishing optimal plant power level, executing or altering the maintenance work plan if necessary, and maintaining necessary manpower level to support plant operations.

Staffing levels for the shifts are not fixed but are based on the expected or planned activity for the shift period. Staffing levels take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and Technical Safety Requirement (TSR) specified staffing requirements. When special activities are included in the work plans, the staffing will be increased as required to perform the planned activity. The required minimum staffing level for Paducah is approximately 43 as detailed in Section 3 of the TSRs. This is a fraction of the normal average shift staffing of approximately 80 persons.

Each shift organization is composed of a PSS, a cascade coordinator (CC) who directs overall cascade activities; shift engineer; first-line managers for the cascade buildings, UF_6 handling facilities, security, fire services, maintenance and power operations and utility operations; health physics technicians; Security Shift Commander; Fire Services Shift Commander; and operators, instrument mechanics, Security Police officers, and firefighters. Less than this normal shift staffing is permitted for short periods with the concurrence of the PSS to allow for call-ins or other compensatory actions.

The PSS provides a direct chain of command from the Operations Manager, Shift Operations Manager, Plant Manager and General Manager to the shift operating staff and serves as the senior shift manager in directing activities and personnel. The operations line organization is accountable to the PSS for reporting plant status.

The CC provides managerial oversight, operations coordination, and assures adequate staffing for all cascade operations on a 24-hour basis. This person approves, directs, and integrates all significant cascade operational activities under the oversight of the PSS.

The remaining members of the shift organization provide the needed functions for round-the-clock operations. First-line managers provide management for, coordination of, and assurance for proper execution of assigned tasks. The shift engineer provides engineering support for technical issues involving operations. Health physics technicians provide support for 24-hour shift operations. The first-line manager for Security supervises the activities necessary to ensure the protection of plant facilities, government property, and classified information. The first-line manger for fire services supervises shift fire services work activities and responds to plant emergency events.

There are diverse systems for operational communications. Commercial telephones, an internal plant telephone system, radio network, a plant public address (PA) system, emergency signals, and a pager system are available to provide necessary communications in operating the plant. The CCF is the focal point for all emergency reporting and initiating of all emergency responses. A special emergency telephone network is available in the CCF. Fire alarm and sprinkler indicator systems, criticality alarm panel, seismic alarms as well as numerous operational alarms are monitored in the CCF. As described in the Emergency Plan, the PSS will initiate off-site notifications and plant personnel call-ins when required.

In accordance with the corrective action program, plant personnel are required to report abnormal events or conditions that may have the potential to harm the safety, health, or security of on-site personnel, the general public, or the environment. Plant personnel are also required to immediately report conditions which may require emergency response. The PSS reviews potentially reportable or inoperable safety system equipment reports and determines proper disposition.

6.5.2 Cascade Operations Organization and Administration

The cascade is the UF_6 enrichment portion of the plant. The cascade is composed of six major process buildings which houses two parallel enrichment cascades that share common product and tails withdrawal facilities. There are auxiliary facilities such as the recirculating water pump houses which are also under the direct control of cascade operations.

The Operations Manager is responsible for overall operations. This includes operation of cascade equipment, planning for power usage, control of feeds, product and tails material including sampling, operating plant utilities, radiological decontamination, equipment cleaning, uranium precipitation, waste management, and operation of plant laundry. The Operations Manager is supported by managers in the following groups: Shift Operations, Cascade, Chemical, Utilities, Power, and UF_6 Handling. These group managers have subordinate managers assigned to functional areas to provide oversight of the day shift operations.

The optimum cascade arrangement for specific power levels, cascade configuration, product and tails assay levels, and feed availabilities is determined by the technical staff. Recommendations for these operating conditions are made by the technical staff to appropriate Operations Management and implemented by the operations staff in conjunction with the shift organization. The shift organization follow daily instructions and work plans developed and communicated by Operations Management.

The Utilities Manager, in conjunction with key building managers, provides the plant with sanitary water, chilled water, steam, air, nitrogen, and sewer services. These must be supplied on a continuous basis to meet the cascade requirements. Any outage is coordinated with customers to assure proper planning to provide temporary services as necessary.

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4.1.12 Nuclear Safety and Quality Manager

The Nuclear Safety and Quality Manager is responsible for implementing and directing independent assessments, quality control, nuclear material control and accountability, and nuclear safety assurance.

4.1.13 Section Deleted

4.1.14 On-Duty PSS

As the senior manager on shift, the on-duty PSS represents the General Manager and managers and has the authority and responsibility to make decisions as necessary to ensure safe operation, including stopping work and placing the plant in a safe condition.

The on-duty PSS is responsible for making proper notification in regard to abnormal plant conditions, determining the severity of the event, declaring an emergency, and initiating appropriate response. The on-duty PSS may respond to an incident scene as the on-scene incident commander or dispatch other qualified individual in this capacity. The on-duty PSS is the crisis manager until relieved by a member of management designated in the emergency line of executive succession.

4.1.15 Section deleted.

4.1.16 GDP Procurement and Materials Manager

The GDP Procurement and Materials Manager is responsible for managing the projects, programs, and the activities related to packaging and transportation, material control, stores, shipping and receiving, and property disposition.

4.1.17 Nuclear Criticality Safety Manager

The Nuclear Criticality Safety Manager is responsible for implementing the nuclear criticality safety program. This position reports to the USEC NCS Manager, who is responsible for the nuclear criticality safety programs at both sites.

4.1.18 Scheduling Manager

The Scheduling Manager is responsible for production maintenance work scheduling.

4.2 ON-SITE EMERGENCY RESPONSE ORGANIZATION

The Emergency Response Organization (ERO) is responsible for taking immediate mitigative and corrective actions to minimize the consequences of an incident to workers, public health and safety, and the environment. The ERO is staffed with trained personnel who respond to events and are required to participate in formal training, drills, and exercises. The incident type and severity dictate the level of ERO activation.

The ERO has the following specific functions and responsibilities, depending on the incident and level of response needed to mitigate the problem: event categorization, determination of emergency class, notification, protective action recommendations, management and decision making, control of on-site emergency activities, consequence assessment, protective actions, medical support, public information, activation and coordination of on-site response resources, security, communications, administrative support, and coordination and liaison with off-site support and response organizations.

The ERO is divided into functional groups as follows:

1. Plant Emergency Squad,
2. EOC cadre, and
3. Joint Public Information Center (JPIC).

Members of these groups are assigned to on-scene response locations and emergency response centers, such as the EOC. Emergency assignments correspond as closely as possible to daily duties. Primary and alternate personnel are assigned to the ERO positions. Assignments are updated periodically. Management ERO positions in each group provide oversight and final authority in the group's decision-making process.

4.2.1 Direction and Coordination

The initial ERO consists of the plant emergency squad with the PSS, or other qualified individual as incident commander (IC) at the scene. Upon classification of the emergency as an Alert or SAE, the PSS becomes the CM and maintains overall control of the plant during the emergency until relieved. When the EOC is operational, a manager designated in the emergency line of executive succession relieves the PSS as CM and the overall control of the emergency shifts from the PSS to the CM.

The PSS conducts transition and turnover of command and control authority and responsibility of the CM function in a formal manner by use of specially developed procedural checklists and, if possible, face-to-face briefings. A primary and alternates are identified for the CM.

The order of succession for the CM position is identified in an EPIP and includes the following:

1. PSS
2. General Manager
3. Plant Manager
4. Others as designated by the General Manager and trained and qualified as CM

5. EMERGENCY RESPONSE MEASURES

Emergency measures must be taken in response to an emergency. Upon recognizing that an emergency exists, necessary portions of the emergency organization are activated. Once activation has taken place, assessments of the condition are made, corrective and protective actions are taken, and aid to affected persons is administered as required.

After becoming aware that an emergency exists, the PSS does the following:

1. Takes actions to ensure the safety of plant personnel and the general public,

2. Takes actions to ensure safe operation/activities of the plant,

3. Classifies the emergency and makes required notifications,

4. Performs assessment actions, and

5. Performs any other emergency actions as appropriate.

5.1 ACTIVATION OF EMERGENCY RESPONSE ORGANIZATION

Upon recognition of an emergency, the PSS, or other qualified individual responds to the incident scene as the IC. The IC determines appropriate immediate protective actions at the incident scene. The PSS classifies the event if applicable. If the emergency is classified as either an Alert or SAE, the PSS as CM activates the EOC. Minimum staffing requirements for activation and operation of the EOC are identified in an EPIP, and must be met prior to assumption of command and control by the crisis management team. CM responsibilities are assumed by a manager designated in the emergency line of executive succession when the EOC is operational. Methods for ERO notification/activation are the same regardless of the time of the emergency and include plant radios, emergency pager system, and telephones. When notified, EOC cadre members are required to respond immediately. ERO activation is accomplished through the appropriate EPIPs.

The CM delegates public information duties to the public information advisor, who, in concert with USEC headquarters, is responsible for activating the JPIC.

The IC maintains command and control over the specific area response and protective actions. The IC coordinates mitigation and protective action strategy and direction and keeps EOC informed of the incident status when the EOC is operational.

In the event that two or more emergencies occur simultaneously so that they cannot be managed effectively as a single incident scene, provisions in the appropriate EPIPs allow for the establishment of additional incident scenes, designation of multiple incident commanders, and division of response resources as necessary.

5.1.1 *Section deleted.*

5.1.2 ***Section deleted***

5.2 ASSESSMENT ACTIONS

This section describes the processes used for assessing the actual or potential on-site and off-site consequences of an emergency. Initial and continuing assessment actions are the responsibility of the CM. Post-accident assessments are a shared responsibility between the IC, the CM, and the recovery manager, if assigned.

Continuous assessment throughout the course of an emergency is necessary to effectively coordinate and direct the elements of the ERO. The initial assessment actions are dictated in part by the nature and severity of the emergency. Emergency assessment provides an indication of the vulnerability to life, the environment, and property injury or damage if an emergency occurs. The different assessment actions for Alert and SAEs are described in Sections 5.2.1 and 5.2.2. Equipment used to assess releases is described in Section 6.4.

5.2.1 Assessment Actions During an Alert

An Alert requires basic emergency assessments. Attention must be paid to parameters that may indicate a possible worsening of conditions (e.g., radioactive/hazardous materials releases). The existence of an Alert requires the following initial and ongoing assessment actions as applicable:

1. Increased surveillance of applicable plant instrumentation and visual observation of the incident conditions,

2. Determination of the resources necessary to mitigate the event from evaluation of reports of damage and injury or by on-scene inspection,

3. Monitoring event conditions for potential changes in emergency classification level.

5.2.2 Assessment Actions During an SAE

In the event of an SAE, assessment activities are more extensive than for an Alert. During a release of radiological/hazardous materials, assessment of on-site and off-site exposures are performed regularly to determine if and when on-site sheltering or evacuations or off-site sheltering may be required.
The results, including methods and assumptions, are communicated to appropriate off-site officials as off-site protective action recommendations. In addition to the activities that would be carried out during an Alert, the following activities are performed at the direction of the PSS or the CM when the EOC is operational, as appropriate:

1. Performing continuing emergency assessments for mitigating events and protective actions on-site, based on on-scene and field monitoring results, release information, and meteorological conditions for radiological/hazardous material releases, and

2. For off-site hazardous material releases, providing specific material information, release information, plume direction, projected plume location, appropriate meteorological information, and field monitoring results to responsible off-site authorities.

STEs provide secure voice communications to on-site and off-site users of other STE telephones. It can operate as a normal telephone in the "clear" mode.

Cellular telephone service is available from the plant site. The PSS response vehicles are equipped with cellular telephones. This system also provides backup for the plant telephone system.

6.2.1.2 PA System

A PA system is in place with the capability to cover most occupied site buildings. During emergencies, the system is not used for routine traffic. The system is tested daily. Two-way radios and runners are used to communicate with individuals that are not covered by the PA system.

6.2.1.3 Radio Systems

The plant radio network supports normal plant operations and, therefore, is effectively utilized daily. The PSS response vehicles are equipped with two-way radios. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating with responding units on the county emergency response frequency.

6.2.1.4 Pager System

Key EOC personnel have pagers which provide access from any tone-type telephone and can relay return telephone numbers or coded responses to the holder of the unit. EOC cadre pager drills are conducted at least quarterly. Pagers are used frequently for nonemergency uses, which enhances the regular testing program.

6.2.1.5 Facsimile Machines

The facsimile machines located in the EOC are used to communicate with USEC and federal, state, and local agencies.

6.2.2 Off-Site Communications

The plant uses the commercial telephone system for off-site emergency communications. Cellular telephones can be used as a backup to the commercial telephone system. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating on the county emergency response frequency.

The Public Warning System, consisting of outdoor warning sirens and emergency alert system announcements, is used to provide emergency notification. Operations testing of the Public Warning System sirens is conducted monthly.

6.3 ON-SITE MEDICAL FACILITIES

The plant maintains medical coverage consistent with the activities being conducted on-site. In an emergency, off-duty medical personnel are notified and directed to required locations as needed. The PSS notifications include alerting appropriate occupational health services and medical personnel in the event of emergencies ranging from industrial accidents to toxic or radiological releases. Letters of Agreement are maintained with area hospitals. These off-site hospitals also have facilities, equipment, and supplies for the treatment of contaminated individuals. A summary of the medical resources follows.

A plant medical facility is maintained on-site during the day shift excluding weekends and holidays. This facility has the supplies, equipment, and personnel to treat most injuries. This includes capabilities for the treatment of contaminated individuals including a shower for contaminated ambulatory patients, radiation survey instruments, and decontamination supplies. Medical personnel assess patient condition, provide necessary emergency care, and determine appropriate supplemental treatment.

Health Services personnel are available during the day shift hours with plant fire fighters providing emergency medical coverage the remainder of the time. Health Services personnel may be called on-site during off shifts, as deemed necessary.

Emergency medical technicians provide and staff ambulance service. Additional ambulance support is available from off-site.

6.4 EMERGENCY MONITORING EQUIPMENT

The plant maintains various radiation detection equipment on-site for normal and emergency response use. Criticality accident alarms have been placed in those areas and in facilities containing fissile material as described in Section 5.2 of the SAR. The criticality accident alarm system provides for radiation detection and an alarm system to alert plant personnel.

Persons requiring radiation exposure monitoring wear beta-gamma-sensitive dosimeters (TLDs), which are processed and evaluated by a processor holding current accreditation from the National Voluntary Laboratory Accreditation Program of the National Institute of Standards and Technology. These personnel exposure monitoring dosimeters are exchanged and analyzed in accordance with Section 5.3 of the SAR. As appropriate, other types of dosimeters, (e.g., finger rings, direct-reading dosimeters, and neutron dosimeters) are used.

Radiation dose rate and contamination survey instruments used are appropriate to measure the types and energies of radiation encountered at GDPs. Instruments capable of supporting radiography operations are also maintained in inventory. Instrumentation includes alpha/beta count rate and scaler instrumentation as well as ion chambers used to evaluate personnel exposure.

Designated plant emergency vehicles responding to the scene will contain necessary emergency equipment and supplies and ensure that radiological monitoring equipment is readily available to emergency personnel. Radiological monitoring equipment is also stored in Building C-300 for designated field monitoring personnel. Emergency equipment and its storage locations are identified in appropriate EPIPs.

10. COMPLIANCE WITH COMMUNITY RIGHT-TO-KNOW ACT

The plant complies with the EPA Superfund Amendments and Reauthorization Act (SARA) Title III regulations, also known as the Emergency Planning and Community Right to Know Act. Specific responsibilities include emergency response planning, emergency release reporting, hazardous chemical inventory reporting, and toxic chemical release reporting.

The Plan and appropriate EPIPs are used during any hazardous chemical release emergencies. Plant administrative procedures have been developed for hazardous materials releases that are not classified as emergencies to ensure that requirements of SARA Title III are met. MSDSs are maintained in several areas throughout the plant.

Hazardous materials spills or releases are reported to the PSS who responds to the incident scene as IC or dispatches other qualified individual in that capacity. The IC directs the emergency containment of spills. Actions to be implemented are described in appropriate EPIPs and include the following:

1. Establish command,
2. Evacuate/isolate the area of release/spill activity, as necessary, and determine areas of concern,
3. Classify the emergency, if appropriate,
4. Determine if activation of additional ERO personnel is necessary,
5. Take measures to minimize safety concerns,
6. Determine a course of action and personal protective equipment requirements,
7. Initiate containment procedures,
8. Terminate the source,
9. Make appropriate notifications to on-site and off-site officials,
10. Determine material disposal, and
11. Terminate the incident and enter recovery.

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Appendix D

DEFINITIONS/ACRONYMS

Accident — A deviation from normal operations or activities associated with a hazard that has the potential to result in an emergency.

ACR — Area Control Room.

ALARA — As Low as Reasonably Achievable.

Text deleted.

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

CAAS — Criticality Accident Alarm System.

CAS — Central Alarm Station.

CCF — Central Control Facility.

CM — Crisis Manager.

Consequence — The result or effect (especially projected doses or dose rates) of a release of radioactive or hazardous materials to the environment.

Corrective Actions — Those emergency measures taken to lessen the severity of or terminate an emergency situation at or near the source of the problem in order to prevent or control a release of radioactive material or to minimize the damage to plant equipment, e.g., shutting down equipment, fire fighting, repair, and damage control.

Decontamination — The removal of surface radioactive/hazardous material from individuals, equipment, surfaces, etc.

DOE — Department of Energy.

Drill — A supervised, hands-on instruction period intended to test, develop, or maintain a specific emergency response capability. A drill is often a component of an exercise.

EAS — Emergency Alert System

EMA — Emergency Management Agency.

Emergency — A sudden, usually unforeseen occurrence or occasion requiring time-urgent and immediate action/response. It may result from accidental causes, natural causes, or malicious man-made actions.

Appendix D (Continued)

Emergency Action Level (EAL) — Specific, predetermined, observable criteria used to detect, recognize, and determine the class of emergencies. An EAL can be an instrument reading, an equipment status indicator, a measurable parameter, on-site or off-site, a discrete, observable event, a result of analyses, or another observed phenomenon that indicates entry into a particular emergency class.

Emergency Operations Center (EOC) — An emergency response facility that accommodates personnel acting in support of the command and control functions but separate from the incident commander and on-scene command post. Under the guidance of the CM, these personnel supply in-depth strategic and corrective engineering and radiological, hazardous materials, and environmental support assistance to the incident scene.

Emergency Response Organization (ERO) — The designated group of personnel responsible for coping with and minimizing or mitigating the effects of any emergency.

Emergency Response Planning Guideline (ERPG) — A hazardous material personnel exposure level or range which, when exceeded by a short-term or acute exposure, will cause irreversible or other serious health effects in humans. The ERPGs are approved by a committee of the American Industrial Hygiene Association.

Deleted

EPA — Environmental Protection Agency.

EPIP — Emergency Plan Implementing Procedure.

Event — Any real-time occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect people, property, or the environment.

Exercise — A scheduled and planned large-scale activity that tests the integrated capability and most aspects of the emergency management program.

FAA — Federal Aviation Administration.

FBI — Federal Bureau of Investigation.

GDP — Gaseous Diffusion Plant.

Hazardous Material — Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment.

IC — Incident Commander.

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SECTION 3.0 ADMINISTRATIVE CONTROLS

Table 3.2.2.1 Minimum Staffing Requirements[a]

Facility Function	Mode/Operation	Staffing Requirements	Work Area Definition
C-300	All	3	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-360	1b, 3, 4, 5	1[b]	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	1a, 2, 6	2	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	7	2	At least one person in the Laboratory. One person in the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
C-333-A	1, 2, 5	2	Two persons in the operating facility or immediately surrounding grounds including the local cylinder yard.
C-337-A	3, 4	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-310	Product withdrawal 1, 2, 3, 4 Cascade 1, 3	2[c]	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-315	1, 2, 3, 4	2[c]	Two persons in the facility or immediately surrounding grounds including the local cylinder yard.
C-331	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	2	At least one person in the ACR.
C-335			
C-333	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	3	At least one person in the ACR.
C-337			
Health Physics	At all times	1	Onsite.
Power Operations	At all times	4	Onsite.
Utilities Operations	At all times	4	Onsite.
Fire Services	At all times	4[d]	Onsite[d].
Security Services	At all times	4	Onsite.

a. Staffing may be less than the minimum requirement listed for a period of a time not to exceed four hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift manning requirements to within the minimum requirements. The C-331, C-333, C-335, and C-337 ACRs shall always be manned. The ACRs for C-310, C-315, C-333-A, and C-337-A shall be manned when required by operating mode. Manning not required during emergency conditions requiring building/area evacuation.

b. Manning requirement is zero if all autoclaves are in MODE 6 (Not In Use for C-333-A and C-337-A) or MODE 8 (Not In Use for C-360) and the Transfer Station is in MODE 8 (Not in Use).

c. When withdrawal process equipment is brought below atmospheric pressure or to a UF_6 negative in the NOT IN USE (Mode 4) operating mode then the staffing requirements for the appropriate withdrawal facility do not apply.

d. In accordance with footnote "a", Fire Services personnel making an unexpected run to deliver an individual to a local hospital are allowed to be offsite and are considered to be on duty and available.

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1.3 ANSI/ANS 3.1, Selection, Qualification, and Training of Personnel for Nuclear Power Plants, 1987 Edition

PGDP satisfies only the following section of this standard:

Section 4.3.3 - The qualifications of the Radiation Protection Manager identified in SAR Section 6.1 satisfy the requirements of this section of the standard.

1.4 ANSI/ANS 3.2, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, 1994 Edition

The extent to which PGDP satisfies the requirements of this standard is outlined in SAR Section 6.11.1 and Appendix B to SAR Section 6.11.

1.5 ANSI/ANS 8.1, Nuclear Criticality Safety in Operations With Fissionable Materials Outside Reactors, 1983 Edition

PGDP satisfies the requirements of this standard.

For references to this standard, see SAR Sections 4.3.2.6, 5.2.2.1, 5.2.2.3, 5.2.3.2, 5.2.4.1, and Table 6.9-1.

1.6 ANSI/ANS 8.3, Criticality Accident Alarm System, 1986 Edition

The recommendations of this standard were used as guidance only for the design of the CAAS. PGDP satisfies the requirements of this standard with the following exceptions:

Section 4.4.1 - The CAAS alarm is not audible in all permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

Section 4.4.2 - An alarm signal with a complex sound wave or modulation is not provided.

Section 5.3 - The CAAS is not designed to withstand seismic stresses.

Section 5.5 - Not all CAAS alarms are capable of producing the desired signal within one-half second of activation by the minimum accident of concern. All CAAS alarms are capable of producing the alarm signal within two seconds of activation by the minimum accident of concern.

Section 7.2.2 - Instead of acquainting all employees with the alarm signal by actual demonstration at their work location, a recording of the alarm signal will be used to familiarize employees.

For references to this standard, see SAR Sections 3.12.6, 3.15.7.1, and 4.3.2.6.

Each completed NCSA is issued as a controlled document. The permanent NCSAs are maintained in a controlled manual which is issued to the personnel who need access to the NCSAs. The temporary NCSAs are issued to the appropriate personnel performing the temporary operation. Approved NCSEs/NCSAs are quality records and are handled according to the plant's Document Control and Records Management Program described in Section 6.10. The NCSA/NCSE process provides assurance that operations will remain subcritical under both normal and credible abnormal conditions. A summary of the NCS controls and parameters controlled as well as the Active Engineered Features based on approved NCSAs/NCSEs are also presented in Appendix A.

There are three operations which do not meet the double contingency principle. These are product cylinder operations, operation of the enrichment cascade, and removal of large cascade equipment (e.g., compressor, convertor, G-17 valve, etc). These operations have been evaluated to be safe; summaries of the accident scenarios and NCS controls associated with the operation of the enrichment cascade, the removal of enrichment cascade equipment, and UF_6 product cylinder operations are provided in Appendix A. Any operations that do not comply with the double contingency principle are documented in NCSEs and Appendix A.

There are TSRs to ensure controls are in place for those operations identified above which do not meet double contingency. Sections 2.4 and 2.5 of the TSRs list controls for operation of the enrichment cascade and for removal and maintenance of enrichment cascade equipment, respectively. Section 2.3 of the TSRs provides the controls associated with ensuring moderation control for the product cylinders. Section 3.12 of the TSRs also contains controls within the fire protection program for ensuring moderation control for the enrichment cascade.

New operations and operations other than those identified as not meeting the double contingency principle in Appendix A shall comply with the double contingency principle. In the event future operations are found to not comply with the double contingency principle, Appendix A will be modified to address this issue and will be reviewed and approved as described in Section 6.3.

Emergencies arising from unforeseen circumstances can present the need for immediate action. If NCS expertise or guidance is needed immediately to avert the potential for a criticality accident, direction will be provided verbally or in writing. Such direction can include a stop work order or other appropriate instructions. A NCSA or other form of documentation will then be prepared to justify the actions taken once the emergency condition has been stabilized. This documentation shall be prepared within 48 hours following the stabilization of the emergency condition.

5.2.2.4 Design Philosophy and Review

Designs of new fissile material equipment and processes must be approved by the NCS Group before implementation and will include the use of favorable geometry or engineered controls on mass, moderation, volume, concentration, interaction, or neutron absorption, as the preferred approach over the use of administrative controls. Advantage will be taken for the nuclear and physical characteristics of process equipment and materials provided control is exercised to maintain them.

The preferred design approach includes two goals. The first is to design equipment with NCS independent of the amount of internal moderation or fissile concentrations, the degree of interspersed moderation between units, the thickness of reflectors, the fissile material density, and the fissile material chemical form. The second is to minimize the possibility of accumulating fissile material in inaccessible locations and, where practical, to use favorable geometry for those inaccessible locations. The adherence to this approach is determined during the preparation and technical review of the NCS evaluation performed to support the equipment design. This preferred design approach is implemented through adherence to plant NCS procedures.

Fissile material equipment designs and modifications are reviewed to ensure that favorable geometry and engineered controls are used to advantage. Administrative limits and controls will be implemented in NCSAs to satisfy the double contingency principle for those cases where the preferred design approach cannot be met. The basis for the decision to use administrative controls in lieu of engineered controls shall be documented in cases where: 1) new fissile material equipment and operations are evaluated, and 2) existing fissile material operations are revised and engineered controls are replaced by administrative controls.

5.2.2.5 Criticality Accident Alarm System Coverage

A CAAS is provided to alert personnel if a criticality accident should occur. The system utilizes a distinctive audible signal to notify personnel in the affected area and initiate evacuation, thereby reducing personnel exposure to emitted radiation. Audibility is not provided in permit-required confined spaces, cell housings associated with cells that are running, and localized areas of inaudibility resulting from temporary activities that generate high noise levels. In these areas a "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate.

At PGDP, the CAAS detects gamma dose rate. The system uses clustered detectors. Each cluster contains three scintillation detectors. Activation of any two of the three detectors in a cluster will initiate evacuation alarms. The failure of any major component of the system will result in a notification that indicates the need for corrective maintenance. A more detailed discussion of the physical function of the CAAS system is provided in Section 3.12.6.

Operations involving fissile material are evaluated for NCS prior to initiation. The need for CAAS coverage is considered during the evaluation process. Coverage is provided unless it is determined that coverage is not required and that finding is documented in the NCSE. For example, areas containing no more than 700 g of ^{235}U, 50 g of ^{235}U in any square meter of floor or ground area, 5 g of ^{235}U in any 10-liter volume, or areas having material that is either packaged and stored in compliance with 10 CFR 71 or specifically exempt according to 10 CFR 71.15, can be shown by evaluation not to require alarm coverage. Areas that do not contain any operations involving uranium enriched to 1 wt % or higher ^{235}U and 15 g or more of ^{235}U do not require an NCSE and are not required to have CAAS coverage. 10 CFR 76.89(a) authorizes USEC to "describe for the approval of the Commission defined areas to be excluded from the monitoring requirement." This submittal to the NRC "must describe the measures that will be used to ensure against criticality including kinds and quantities of material that will be permitted and

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SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

LCO 2.6.4.1b: Criticality accident alarm shall be operable (audible).

APPLICABILITY: In areas in the facilities listed in 2.6.4.1a where the maximum foreseeable absorbed dose in free air exceeds 12 rad, except areas in permit-required confined spaces and localized areas of inaudibility. This LCO is applicable when the new criticality accident alarm system with air accumulators and/or electronic horns has been declared operable.

ACTIONS:

Condition	Required Action	Completion Time
A. Area does not have an audible criticality accident alarm.	A.1 Discontinue operations with fissile material. [Handling, transporting, analyzing, or processing of assay samples necessary for compliance with TSR 2.4.4.3 is not restricted by this action.]	Immediately
	AND	
	A.2.1 Evacuate area of inaudibility	Immediately
	AND	
	A.2.2 Restrict access to the area of inaudibility.	
	AND	
	A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification such as a device that will alarm on sensing a 10mr/hr dose rate, or a radio in constant communication with the Central Control Facility.	Immediately
B. Area does not have an audible criticality accident alarm.	B.1 Restore criticality accident alarm to operable status. TSR 1.6.2.2d is not applicable.	Prior to reinitiating activities

SECTION 2.6 SPECIFIC TSRs FOR CAAS (NON-CASCADE FACILITIES)

2.6.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.6.4.1 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.6.4.1b-1	Test the CAAS and building horns.	Quarterly
SR 2.6.4.1b-2	Verify that the CAAS air accumulator supply pressure to the building horns is greater than or equal to that necessary to sound all building horns for at least 120 seconds based on the number of accumulators in service. C-400 Number of accumulators in service — Minimum pressure 2 — 125 psig 1 — 145 psig C-409 Number of accumulators in service — Minimum pressure 1 — 125 psig	Quarterly
SR 2.6.4.1b-3	Verify that the condition of the battery backups to the electronic horns are sufficient to power the horns for at least 120 seconds.	Annually

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. Audibility is not provided for areas in permit-required confined spaces and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate. One person remains outside the area and maintains contact with personnel in the area. Evacuation of the area of inaudibility and restricting access to those areas will eliminate the potential for increased consequences due to personnel not hearing an alarm. The design of the system, three detector modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the listed facilities are associated with the handling of fissile materials.

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6.5 OPERATIONS

This section describes personnel, practices, and key facilities associated with the continued operation of PGDP.

The site is large enough to provide a considerable buffer between the enrichment process and our rural neighbors. Plant operations are continuous with coordination of operations performed by the Plant Shift Superintendent (PSS) from a central control facility. The plant is protected on a continuous basis by fire services and security forces. Each significant building is equipped with fire alarms and water sprinklers as discussed in SAR Section 5.4.1.1. Emergency mutual assistance exercises are conducted biennially with the emergency forces of the state and of the surrounding communities.

There is a public warning system to alert neighbors in the event of any plant problem that might affect them. Spill control measures are in effect for all continuous liquid effluent discharge points. More information on waterborne effluent control is contained in SAR Section 5.1. There are also internal impoundment structures, spill control equipment, and monitoring stations with alarms. The principal toxic gases on the site are the uranium hexafluoride process gas, fluorine, chlorine trifluoride, chlorine, and hydrogen fluoride. Liquid hazardous chemicals include oil, nitric acid, sulfuric acid, and a variety of other chemicals in smaller amounts.

The plant is normally in one of three modes of operation, from a safety perspective.

Normal Operations

Most of the time is spent in normal operations; in this mode the following conditions apply:

- Operations are proceeding within expected parameters with no safety impacts from deviations,
- Technical Safety Requirements (TSRs) are in effect,
- Routine effluents or emissions are within permits and certificate conditions with no significant impact to the public or environment, and
- Personnel exposures are below 10 CFR 20 limits and OSHA requirements.

Off-normal (but not emergency) Operations

Occasionally, process upsets and/or equipment failures occur which result in "off-normal" conditions within localized areas of the plant; these "off-normal" modes are as follows:

- Small releases of UF_6 or other toxic gases (such as F_2, HF, CLF_3, Cl_2) that result in evacuation of the immediate area and monitoring for reentry, but do not affect other areas of operations of the plant and have no impact off site;
- Occupational safety injuries and/or illnesses with a response required to render aid or transport to the plant or off site medical facility;

- Small fires that are quickly extinguished;

- Unexpected radiological contamination that requires reporting of plant areas or additional employee protective measures.

These "off normal" conditions are managed by the PSS from the C-300 Plant Control Facility with involvement by plant shift emergency response and/or health physics personnel. It may involve call-in of Health and Safety personnel.

Emergency Operations

The third mode is an emergency, as described in the Emergency Plan, which involves an "Alert" or "Site Area Emergency" declaration and activation of the Emergency Operations Center.

The remainder of this section provides an overview of the major operating areas of PGDP with a brief discussion of the safety and safeguards risks and the controls and operational surveillances in place to manage these risks. A description of the plant and plant operations is provided in detail in Chapter 3; a detailed accident analysis and discussion of risks associated with plant operations is provided in Chapter 4.

6.5.1 Shift Operations

The gaseous diffusion process operates continuously. To support this continuous operation, a work force is required 24-hours per day.

The PGDP work force is divided into two primary groups, a day shift (management, support staff, service groups) working primarily Monday through Friday, and shifts that provide continuous coverage of plant operations. The day shift provides the administrative support, activities such as design and fabrication where continuation is not time constrained, procedure development, classroom training, planning, and preventive maintenance. Most of the plant staff is assigned to the day shift.

The shift organization has the prime responsibility for continued plant operation and the evolutions, exchange of information, and response to abnormal and unusual conditions necessary to ensure safe and efficient plant operation. Typical activities of the shift include provide oversight and direction for all plant operations, monitor systems and equipment for proper performance, conduct routine back shift maintenance and emergency equipment repair, prepare equipment for day shift repair/preventative maintenance functions, and respond to emergency situations.

Operational activities of the plant are controlled by the Plant Shift Superintendent (PSS) whose normal watch station is in the C-300 Central Control Facility (CCF). The PSS reports directly to the Shift Operations Manager. Upon recognition of an emergency, the PSS, or other qualified individual responds to the scene as Incident Commander. The PSS serves as Crisis Manager during a classified emergency (Alert or Site Area Emergency) until relieved by a manager designated in the emergency line of executive succession when the Emergency Operations Center becomes operational. Emergency command and control is described in the Emergency Plan.

The CCF is the hub of the plant operational activity. The overall UF_6 enrichment process is monitored at this location. Key plant operations can be performed remotely from the CCF, key alarm systems are monitored, and plant communications systems as well as off-site communications capabilities

are located in the CCF. The plant power system is monitored and controlled through a communication network with the power suppliers. Typical operational activities that are monitored and controlled from the CCF include determining and establishing optimal plant power level, executing or altering the maintenance work plan if necessary, and maintaining necessary manpower level to support plant operations.

Staffing levels for the shifts are not fixed but are based on the expected or planned activity for the shift period. Staffing levels take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and Technical Safety Requirement (TSR) specified staffing requirements. When special activities are included in the work plans, the staffing will be increased as required to perform the planned activity. The required minimum staffing level for Paducah is approximately 43 as detailed in Section 3 of the TSRs. This is a fraction of the normal average shift staffing of approximately 80 persons.

Each shift organization is composed of a PSS, a cascade coordinator (CC) who directs overall cascade activities; shift engineer; first-line managers for the cascade buildings, UF_6 handling facilities, security, fire services, maintenance and power operations and utility operations; health physics technicians; Security Shift Commander; Fire Services Shift Commander; and operators, instrument mechanics, Security Police officers, and firefighters. Less than this normal shift staffing is permitted for short periods with the concurrence of the PSS to allow for call-ins or other compensatory actions.

The PSS provides a direct chain of command from the Operations Manager, Shift Operations Manager, Plant Manager and General Manager to the shift operating staff and serves as the senior shift manager in directing activities and personnel. The operations line organization is accountable to the PSS for reporting plant status.

The CC provides managerial oversight, operations coordination, and assures adequate staffing for all cascade operations on a 24-hour basis. This person approves, directs, and integrates all significant cascade operational activities under the oversight of the PSS.

The remaining members of the shift organization provide the needed functions for round-the-clock operations. First-line managers provide management for, coordination of, and assurance for proper execution of assigned tasks. The shift engineer provides engineering support for technical issues involving operations. Health physics technicians provide support for 24-hour shift operations. The first-line manager for Security supervises the activities necessary to ensure the protection of plant facilities, government property, and classified information. The first-line manger for fire services supervises shift fire services work activities and responds to plant emergency events.

There are diverse systems for operational communications. Commercial telephones, an internal plant telephone system, radio network, a plant public address (PA) system, emergency signals, and a pager system are available to provide necessary communications in operating the plant. The CCF is the focal point for all emergency reporting and initiating of all emergency responses. A special emergency telephone network is available in the CCF. Fire alarm and sprinkler indicator systems, criticality alarm panel, seismic alarms as well as numerous operational alarms are monitored in the CCF. As described in the Emergency Plan, the PSS will initiate off-site notifications and plant personnel call-ins when required.

In accordance with the corrective action program, plant personnel are required to report abnormal events or conditions that may have the potential to harm the safety, health, or security of on-site personnel, the general public, or the environment. Plant personnel are also required to immediately report conditions which may require emergency response. The PSS reviews potentially reportable or inoperable safety system equipment reports and determines proper disposition.

6.5.2 Cascade Operations Organization and Administration

The cascade is the UF_6 enrichment portion of the plant. The cascade is composed of six major process buildings which houses two parallel enrichment cascades that share common product and tails withdrawal facilities. There are auxiliary facilities such as the recirculating water pump houses which are also under the direct control of cascade operations.

The Operations Manager is responsible for overall operations. This includes operation of cascade equipment, planning for power usage, control of feeds, product and tails material including sampling, operating plant utilities, radiological decontamination, equipment cleaning, uranium precipitation, waste management, and operation of plant laundry. The Operations Manager is supported by managers in the following groups: Shift Operations, Cascade, Chemical, Utilities, Power, and UF_6 Handling. These group managers have subordinate managers assigned to functional areas to provide oversight of the day shift operations.

The optimum cascade arrangement for specific power levels, cascade configuration, product and tails assay levels, and feed availabilities is determined by the technical staff. Recommendations for these operating conditions are made by the technical staff to appropriate Operations Management and implemented by the operations staff in conjunction with the shift organization. The shift organization follow daily instructions and work plans developed and communicated by Operations Management.

The Utilities Manager, in conjunction with key building managers, provides the plant with sanitary water, chilled water, steam, air, nitrogen, and sewer services. These must be supplied on a continuous basis to meet the cascade requirements. Any outage is coordinated with customers to assure proper planning to provide temporary services as necessary.

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4.1.12 Nuclear Safety and Quality Manager

The Nuclear Safety and Quality Manager is responsible for implementing and directing independent assessments, quality control, nuclear material control and accountability, and nuclear safety assurance.

4.1.13 Section Deleted

4.1.14 On-Duty PSS

As the senior manager on shift, the on-duty PSS represents the General Manager and managers and has the authority and responsibility to make decisions as necessary to ensure safe operation, including stopping work and placing the plant in a safe condition.

The on-duty PSS is responsible for making proper notification in regard to abnormal plant conditions, determining the severity of the event, declaring an emergency, and initiating appropriate response. The on-duty PSS may respond to an incident scene as the on-scene incident commander or dispatch other qualified individual in this capacity. The on-duty PSS is the crisis manager until relieved by a member of management designated in the emergency line of executive succession.

4.1.15 Section deleted.

4.1.16 GDP Procurement and Materials Manager

The GDP Procurement and Materials Manager is responsible for managing the projects, programs, and the activities related to packaging and transportation, material control, stores, shipping and receiving, and property disposition.

4.1.17 Nuclear Criticality Safety Manager

The Nuclear Criticality Safety Manager is responsible for implementing the nuclear criticality safety program. This position reports to the USEC NCS Manager, who is responsible for the nuclear criticality safety programs at both sites.

4.1.18 Scheduling Manager

The Scheduling Manager is responsible for production maintenance work scheduling.

4.2 ON-SITE EMERGENCY RESPONSE ORGANIZATION

The Emergency Response Organization (ERO) is responsible for taking immediate mitigative and corrective actions to minimize the consequences of an incident to workers, public health and safety, and the environment. The ERO is staffed with trained personnel who respond to events and are required to participate in formal training, drills, and exercises. The incident type and severity dictate the level of ERO activation.

The ERO has the following specific functions and responsibilities, depending on the incident and level of response needed to mitigate the problem: event categorization, determination of emergency class, notification, protective action recommendations, management and decision making, control of on-site emergency activities, consequence assessment, protective actions, medical support, public information, activation and coordination of on-site response resources, security, communications, administrative support, and coordination and liaison with off-site support and response organizations.

The ERO is divided into functional groups as follows:

1. Plant Emergency Squad,
2. EOC cadre, and
3. Joint Public Information Center (JPIC).

Members of these groups are assigned to on-scene response locations and emergency response centers, such as the EOC. Emergency assignments correspond as closely as possible to daily duties. Primary and alternate personnel are assigned to the ERO positions. Assignments are updated periodically. Management ERO positions in each group provide oversight and final authority in the group's decision-making process.

4.2.1 Direction and Coordination

The initial ERO consists of the plant emergency squad with the PSS, or other qualified individual as incident commander (IC) at the scene. Upon classification of the emergency as an Alert or SAE, the PSS becomes the CM and maintains overall control of the plant during the emergency until relieved. When the EOC is operational, a manager designated in the emergency line of executive succession relieves the PSS as CM and the overall control of the emergency shifts from the PSS to the CM.

The PSS conducts transition and turnover of command and control authority and responsibility of the CM function in a formal manner by use of specially developed procedural checklists and, if possible, face-to-face briefings. A primary and alternates are identified for the CM.

The order of succession for the CM position is identified in an EPIP and includes the following:

1. PSS
2. General Manager
3. Plant Manager
4. Others as designated by the General Manager and trained and qualified as CM

5. EMERGENCY RESPONSE MEASURES

Emergency measures must be taken in response to an emergency. Upon recognizing that an emergency exists, necessary portions of the emergency organization are activated. Once activation has taken place, assessments of the condition are made, corrective and protective actions are taken, and aid to affected persons is administered as required.

After becoming aware that an emergency exists, the PSS does the following:

1. Takes actions to ensure the safety of plant personnel and the general public,

2. Takes actions to ensure safe operation/activities of the plant,

3. Classifies the emergency and makes required notifications,

4. Performs assessment actions, and

5. Performs any other emergency actions as appropriate.

5.1 ACTIVATION OF EMERGENCY RESPONSE ORGANIZATION

Upon recognition of an emergency, the PSS, or other qualified individual responds to the incident scene as the IC. The IC determines appropriate immediate protective actions at the incident scene. The PSS classifies the event if applicable. If the emergency is classified as either an Alert or SAE, the PSS as CM activates the EOC. Minimum staffing requirements for activation and operation of the EOC are identified in an EPIP, and must be met prior to assumption of command and control by the crisis management team. CM responsibilities are assumed by a manager designated in the emergency line of executive succession when the EOC is operational. Methods for ERO notification/activation are the same regardless of the time of the emergency and include plant radios, emergency pager system, and telephones. When notified, EOC cadre members are required to respond immediately. ERO activation is accomplished through the appropriate EPIPs.

The CM delegates public information duties to the public information advisor, who, in concert with USEC headquarters, is responsible for activating the JPIC.

The IC maintains command and control over the specific area response and protective actions. The IC coordinates mitigation and protective action strategy and direction and keeps EOC informed of the incident status when the EOC is operational.

In the event that two or more emergencies occur simultaneously so that they cannot be managed effectively as a single incident scene, provisions in the appropriate EPIPs allow for the establishment of additional incident scenes, designation of multiple incident commanders, and division of response resources as necessary.

5.1.1 *Section deleted.*

5.1.2 ***Section deleted***

5.2 ASSESSMENT ACTIONS

This section describes the processes used for assessing the actual or potential on-site and off-site consequences of an emergency. Initial and continuing assessment actions are the responsibility of the CM. Post-accident assessments are a shared responsibility between the IC, the CM, and the recovery manager, if assigned.

Continuous assessment throughout the course of an emergency is necessary to effectively coordinate and direct the elements of the ERO. The initial assessment actions are dictated in part by the nature and severity of the emergency. Emergency assessment provides an indication of the vulnerability to life, the environment, and property injury or damage if an emergency occurs. The different assessment actions for Alert and SAEs are described in Sections 5.2.1 and 5.2.2. Equipment used to assess releases is described in Section 6.4.

5.2.1 Assessment Actions During an Alert

An Alert requires basic emergency assessments. Attention must be paid to parameters that may indicate a possible worsening of conditions (e.g., radioactive/hazardous materials releases). The existence of an Alert requires the following initial and ongoing assessment actions as applicable:

1. Increased surveillance of applicable plant instrumentation and visual observation of the incident conditions,

2. Determination of the resources necessary to mitigate the event from evaluation of reports of damage and injury or by on-scene inspection,

3. Monitoring event conditions for potential changes in emergency classification level.

5.2.2 Assessment Actions During an SAE

In the event of an SAE, assessment activities are more extensive than for an Alert. During a release of radiological/hazardous materials, assessment of on-site and off-site exposures are performed regularly to determine if and when on-site sheltering or evacuations or off-site sheltering may be required.
The results, including methods and assumptions, are communicated to appropriate off-site officials as off-site protective action recommendations. In addition to the activities that would be carried out during an Alert, the following activities are performed at the direction of the PSS or the CM when the EOC is operational, as appropriate:

1. Performing continuing emergency assessments for mitigating events and protective actions on-site, based on on-scene and field monitoring results, release information, and meteorological conditions for radiological/hazardous material releases, and

2. For off-site hazardous material releases, providing specific material information, release information, plume direction, projected plume location, appropriate meteorological information, and field monitoring results to responsible off-site authorities.

STEs provide secure voice communications to on-site and off-site users of other STE telephones. It can operate as a normal telephone in the "clear" mode.

Cellular telephone service is available from the plant site. The PSS response vehicles are equipped with cellular telephones. This system also provides backup for the plant telephone system.

6.2.1.2 PA System

A PA system is in place with the capability to cover most occupied site buildings. During emergencies, the system is not used for routine traffic. The system is tested daily. Two-way radios and runners are used to communicate with individuals that are not covered by the PA system.

6.2.1.3 Radio Systems

The plant radio network supports normal plant operations and, therefore, is effectively utilized daily. The PSS response vehicles are equipped with two-way radios. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating with responding units on the county emergency response frequency.

6.2.1.4 Pager System

Key EOC personnel have pagers which provide access from any tone-type telephone and can relay return telephone numbers or coded responses to the holder of the unit. EOC cadre pager drills are conducted at least quarterly. Pagers are used frequently for nonemergency uses, which enhances the regular testing program.

6.2.1.5 Facsimile Machines

The facsimile machines located in the EOC are used to communicate with USEC and federal, state, and local agencies.

6.2.2 Off-Site Communications

The plant uses the commercial telephone system for off-site emergency communications. Cellular telephones can be used as a backup to the commercial telephone system. The PSS and fire service response vehicles, including the plant ambulances, each have the capability of communicating on the county emergency response frequency.

The Public Warning System, consisting of outdoor warning sirens and emergency alert system announcements, is used to provide emergency notification. Operations testing of the Public Warning System sirens is conducted monthly.

6.3 ON-SITE MEDICAL FACILITIES

The plant maintains medical coverage consistent with the activities being conducted on-site. In an emergency, off-duty medical personnel are notified and directed to required locations as needed. The PSS notifications include alerting appropriate occupational health services and medical personnel in the event of emergencies ranging from industrial accidents to toxic or radiological releases. Letters of Agreement are maintained with area hospitals. These off-site hospitals also have facilities, equipment, and supplies for the treatment of contaminated individuals. A summary of the medical resources follows.

A plant medical facility is maintained on-site during the day shift excluding weekends and holidays. This facility has the supplies, equipment, and personnel to treat most injuries. This includes capabilities for the treatment of contaminated individuals including a shower for contaminated ambulatory patients, radiation survey instruments, and decontamination supplies. Medical personnel assess patient condition, provide necessary emergency care, and determine appropriate supplemental treatment.

Health Services personnel are available during the day shift hours with plant fire fighters providing emergency medical coverage the remainder of the time. Health Services personnel may be called on-site during off shifts, as deemed necessary.

Emergency medical technicians provide and staff ambulance service. Additional ambulance support is available from off-site.

6.4 EMERGENCY MONITORING EQUIPMENT

The plant maintains various radiation detection equipment on-site for normal and emergency response use. Criticality accident alarms have been placed in those areas and in facilities containing fissile material as described in Section 5.2 of the SAR. The criticality accident alarm system provides for radiation detection and an alarm system to alert plant personnel.

Persons requiring radiation exposure monitoring wear beta-gamma-sensitive dosimeters (TLDs), which are processed and evaluated by a processor holding current accreditation from the National Voluntary Laboratory Accreditation Program of the National Institute of Standards and Technology. These personnel exposure monitoring dosimeters are exchanged and analyzed in accordance with Section 5.3 of the SAR. As appropriate, other types of dosimeters, (e.g., finger rings, direct-reading dosimeters, and neutron dosimeters) are used.

Radiation dose rate and contamination survey instruments used are appropriate to measure the types and energies of radiation encountered at GDPs. Instruments capable of supporting radiography operations are also maintained in inventory. Instrumentation includes alpha/beta count rate and scaler instrumentation as well as ion chambers used to evaluate personnel exposure.

Designated plant emergency vehicles responding to the scene will contain necessary emergency equipment and supplies and ensure that radiological monitoring equipment is readily available to emergency personnel. Radiological monitoring equipment is also stored in Building C-300 for designated field monitoring personnel. Emergency equipment and its storage locations are identified in appropriate EPIPs.

10. COMPLIANCE WITH COMMUNITY RIGHT-TO-KNOW ACT

The plant complies with the EPA Superfund Amendments and Reauthorization Act (SARA) Title III regulations, also known as the Emergency Planning and Community Right to Know Act. Specific responsibilities include emergency response planning, emergency release reporting, hazardous chemical inventory reporting, and toxic chemical release reporting.

The Plan and appropriate EPIPs are used during any hazardous chemical release emergencies. Plant administrative procedures have been developed for hazardous materials releases that are not classified as emergencies to ensure that requirements of SARA Title III are met. MSDSs are maintained in several areas throughout the plant.

Hazardous materials spills or releases are reported to the PSS who responds to the incident scene as IC or dispatches other qualified individual in that capacity. The IC directs the emergency containment of spills. Actions to be implemented are described in appropriate EPIPs and include the following:

1. Establish command,
2. Evacuate/isolate the area of release/spill activity, as necessary, and determine areas of concern,
3. Classify the emergency, if appropriate,
4. Determine if activation of additional ERO personnel is necessary,
5. Take measures to minimize safety concerns,
6. Determine a course of action and personal protective equipment requirements,
7. Initiate containment procedures,
8. Terminate the source,
9. Make appropriate notifications to on-site and off-site officials,
10. Determine material disposal, and
11. Terminate the incident and enter recovery.

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Appendix D

DEFINITIONS/ACRONYMS

Accident — A deviation from normal operations or activities associated with a hazard that has the potential to result in an emergency.

ACR — Area Control Room.

ALARA — As Low as Reasonably Achievable.

Text deleted.

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

CAAS — Criticality Accident Alarm System.

CAS — Central Alarm Station.

CCF — Central Control Facility.

CM — Crisis Manager.

Consequence — The result or effect (especially projected doses or dose rates) of a release of radioactive or hazardous materials to the environment.

Corrective Actions — Those emergency measures taken to lessen the severity of or terminate an emergency situation at or near the source of the problem in order to prevent or control a release of radioactive material or to minimize the damage to plant equipment, e.g., shutting down equipment, fire fighting, repair, and damage control.

Decontamination — The removal of surface radioactive/hazardous material from individuals, equipment, surfaces, etc.

DOE — Department of Energy.

Drill — A supervised, hands-on instruction period intended to test, develop, or maintain a specific emergency response capability. A drill is often a component of an exercise.

EAS — Emergency Alert System

EMA — Emergency Management Agency.

Emergency — A sudden, usually unforeseen occurrence or occasion requiring time-urgent and immediate action/response. It may result from accidental causes, natural causes, or malicious man-made actions.

Appendix D (Continued)

Emergency Action Level (EAL) — Specific, predetermined, observable criteria used to detect, recognize, and determine the class of emergencies. An EAL can be an instrument reading, an equipment status indicator, a measurable parameter, on-site or off-site, a discrete, observable event, a result of analyses, or another observed phenomenon that indicates entry into a particular emergency class.

Emergency Operations Center (EOC) — An emergency response facility that accommodates personnel acting in support of the command and control functions but separate from the incident commander and on-scene command post. Under the guidance of the CM, these personnel supply in-depth strategic and corrective engineering and radiological, hazardous materials, and environmental support assistance to the incident scene.

Emergency Response Organization (ERO) — The designated group of personnel responsible for coping with and minimizing or mitigating the effects of any emergency.

Emergency Response Planning Guideline (ERPG) — A hazardous material personnel exposure level or range which, when exceeded by a short-term or acute exposure, will cause irreversible or other serious health effects in humans. The ERPGs are approved by a committee of the American Industrial Hygiene Association.

Deleted

EPA — Environmental Protection Agency.

EPIP — Emergency Plan Implementing Procedure.

Event — Any real-time occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect people, property, or the environment.

Exercise — A scheduled and planned large-scale activity that tests the integrated capability and most aspects of the emergency management program.

FAA — Federal Aviation Administration.

FBI — Federal Bureau of Investigation.

GDP — Gaseous Diffusion Plant.

Hazardous Material — Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment.

IC — Incident Commander.

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SECTION 3.0 ADMINISTRATIVE CONTROLS

Table 3.2.2.1 Minimum Staffing Requirements[a]

Facility Function	Mode/Operation	Staffing Requirements	Work Area Definition
C-300	All	3	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-360	1b, 3, 4, 5	1[b]	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	1a, 2, 6	2	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	7	2	At least one person in the Laboratory. One person in the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
C-333-A	1, 2, 5	2	Two persons in the operating facility or immediately surrounding grounds including the local cylinder yard.
C-337-A	3, 4	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-310	Product withdrawal 1, 2, 3, 4 Cascade 1, 3	2[c]	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-315	1, 2, 3, 4	2[c]	Two persons in the facility or immediately surrounding grounds including the local cylinder yard.
C-331	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	2	At least one person in the ACR.
C-335			
C-333	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	3	At least one person in the ACR.
C-337			
Health Physics	At all times	1	Onsite.
Power Operations	At all times	4	Onsite.
Utilities Operations	At all times	4	Onsite.
Fire Services	At all times	4[d]	Onsite[d].
Security Services	At all times	4	Onsite.

a. Staffing may be less than the minimum requirement listed for a period of a time not to exceed four hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift manning requirements to within the minimum requirements. The C-331, C-333, C-335, and C-337 ACRs shall always be manned. The ACRs for C-310, C-315, C-333-A, and C-337-A shall be manned when required by operating mode. Manning not required during emergency conditions requiring building/area evacuation.

b. Manning requirement is zero if all autoclaves are in MODE 6 (Not In Use for C-333-A and C-337-A) or MODE 8 (Not In Use for C-360) and the Transfer Station is in MODE 8 (Not in Use).

c. When withdrawal process equipment is brought below atmospheric pressure or to a UF_6 negative in the NOT IN USE (Mode 4) operating mode then the staffing requirements for the appropriate withdrawal facility do not apply.

d. In accordance with footnote "a", Fire Services personnel making an unexpected run to deliver an individual to a local hospital are allowed to be offsite and are considered to be on duty and available.