Nebraska Public Power District
Nebraska's Energy Leader

NLS2001040
April 4, 2001

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

Subject: Emergency Plan Implementing Procedures
Cooper Nuclear Station, NRC Docket 50-298, DPR-46

Pursuant to the requirements of 10 CFR 50, Appendix E, Section V, "Implementing Procedures," Nebraska Public Power District is transmitting the following Emergency Plan Implementing Procedures (EPIPs):

EPIP 5.7.7	Revision 26	"Activation of TSC"
EPIP 5.7.8	Revision 20	"Activation of OSC"
EPIP 5.7.9	Revision 20	"Activation of EOF"
EPIP 5.7.10	Revision 22	"Personnel Assembly and Accountability"
EPIP 5.7.14	Revision 11	"Stable Iodine Thyroid Blocking (KI)"
EPIP 5.7.15	Revision 15	"OSC Team Dispatch"
EPIP 5.7.16	Revision 21	"Release Rate Determination"
EPIP 5.7.20	Revision 13	"Protective Action Recommendations"
EPIP 5.7.26	Revision 7	"Long-Term Environmental Monitoring"

Should you have any questions concerning this matter, please contact me.

Sincerely,

R. L. Zipfel
Emergency Preparedness Manager

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The following table identifies those actions committed to by the District in this document. Any other actions discussed in the submittal represent intended or planned actions by the District. They are described for information only and are not regulatory commitments. Please notify the NL&S Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITTED DATE OR OUTAGE
None	

1. PURPOSE

This procedure describes the activation and subsequent operation of the Operations Support Center (OSC) in the event of an ALERT or higher classification.

2. PRECAUTIONS AND LIMITATIONS

[ ] 2.1 If the Area Radiation Monitor alarms, an area habitability survey should be conducted immediately.

[ ] 2.2 If the OSC becomes uninhabitable, OSC personnel and equipment will relocate to the Alternate OSC as per Procedure 5.7.8.1.

[ ] 2.3 The OSC shall be activated within ~ 1 hour of the declaration of an ALERT or higher classification.

3. ACTIVATION AND OPERATION OF THE OSC

[ ] 3.1 Upon declaration of an ALERT or higher classification, OSC personnel shall report to the OSC. ERO positions assigned a Positional Instruction Manual (PIM), as defined below, shall obtain their PIM when reporting to the OSC and follow instructions contained within.

[ ] 3.2 OSC Supervisor and OSC Lead personnel shall report to the OSC and obtain their PIMs.

[ ] 3.3 The OSC Supervisor is responsible for:

[ ] 3.3.1 Managing the OSC to ensure accident mitigation activities are performed in a safe and expeditious manner.

[ ] 3.3.2 Ensuring equipment repair and restoration priorities established by the TSC are being followed.

[ ] 3.3.3 Coordinating OSC tasks.

[ ] 3.3.4 Resolving resource allocation conflicts.

[ ] 3.3.5 Ensuring periodic communication with the Team Leader in the field is accomplished.

[ ] 3.4 Chemistry/Radiological Protection Lead is responsible for:

[ ] 3.4.1 Interfacing with the OSC Supervisor and Chemistry/Radiological Protection Coordinator to coordinate Chemistry/Radiological Protection coverage for OSC Teams.

[ ] 3.4.2 Evaluating tasks and selecting team personnel.

[ ] 3.4.3 Reviewing missions to determine Radiological Protection (RP) coverage, protective equipment requirements, etc.

[ ] 3.4.4 If Chemistry/Radiological Protection Coordinator determines that SCBAs need to be used, verify team members are respirator qualified per the appropriate Radiological Protection Procedure.

[ ] 3.4.5 Participating in the team briefing prior to team being dispatched. Items to be discussed should include:

[ ] 3.4.5.1 Team destination and objectives.

[ ] 3.4.5.2 Identification of Team Leader.

[ ] 3.4.5.3 Radiological/protective actions to be taken.

[ ] 3.4.5.4 Primary and backup methods of communication.

[ ] 3.4.5.5 Procedures required.

[ ] 3.4.5.6 Tools required.

[ ] 3.4.5.7 Protective equipment needed.

[ ] 3.4.6 Completing Section 1 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.4.7 Communicating with the Team Leaders to determine team status.

[ ] 3.4.8 Advising the OSC Supervisor of the teams status.

[ ] 3.4.9 Participating in team debriefings, as appropriate, of a dispatched OSC Team upon its return to the OSC and recording debriefing information in Section 2 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.4.10 Maintaining continuous accountability for all Chem/RP personnel assigned to the OSC responding to the emergency.

[ ] 3.5 Mechanical Lead is responsible for:

[ ] 3.5.1 Interfacing with the OSC Supervisor with regard to the need for OSC Teams of a mechanical nature.

[ ] 3.5.2 Evaluating repair tasks and selecting team personnel.

[ ] 3.5.3 Participating in the team briefing prior to team being dispatched if Mechanical systems are affected. Items to be discussed should include:

[ ] 3.5.3.1 Team destination and objectives.

[ ] 3.5.3.2 Identification of Team Leader.

[ ] 3.5.3.3 Primary and backup methods of communication.

[ ] 3.5.3.4 Procedures required.

[ ] 3.5.3.5 Tools required.

[ ] 3.5.3.6 Protective equipment needed.

[ ] 3.5.4 Completing Section 1 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.5.5 Communicating with the Team Leaders to determine team status.

[ ] 3.5.6 Participating in the debriefing, as appropriate, of a dispatched OSC Team upon its return to the OSC and recording debriefing information in Section 2 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.5.7 Advising the OSC Supervisor of the teams status.

[ ] 3.5.8 Maintaining continuous accountability for all mechanical personnel assigned to the OSC responding to the emergency.

[ ] 3.6 I&C Lead is responsible for:

[ ] 3.6.1 Interfacing with the OSC Supervisor with regard to the need for OSC Teams of an I&C nature.

[ ] 3.6.2 Evaluating repair tasks and selecting team personnel.

[ ] 3.6.3 Participating in the team briefing prior to team being dispatched if I&C systems are affected. Items to be discussed should include:

[ ] 3.6.3.1 Team destination and objectives.

[ ] 3.6.3.2 Identification of Team Leader.

[ ] 3.6.3.3 Primary and backup methods of communication.

[ ] 3.6.3.4 Procedures required.

[ ] 3.6.3.5 Tools required.

[ ] 3.6.3.6 Protective equipment needed.

[ ] 3.6.4 Completing Section 1 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.6.5 Communicating with the Team Leaders to determine team status.

[ ] 3.6.6 Participating in the debriefing, as appropriate, of dispatched OSC Team upon its return to the OSC and recording debriefing information in Section 2 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.6.7 Advising OSC Supervisor of the teams status.

[ ] 3.6.8 Maintaining continuous accountability for all I&C Technicians assigned to the OSC responding to the emergency.

[ ] 3.7 Electrical Lead is responsible for:

[ ] 3.7.1 Interfacing with the OSC Supervisor with regard to the need for OSC Teams of an electrical nature.

[ ] 3.7.2 Evaluating repair tasks and selecting team personnel.

[ ] 3.7.3 Participating in the team briefing prior to team being dispatched if electrical systems are affected. Items to be discussed should include:

[ ] 3.7.3.1 Team destination and objectives.

[ ] 3.7.3.2 Identification of Team Leader.

[ ] 3.7.3.3 Primary and backup methods of communication.

[ ] 3.7.3.4 Procedures required.

[ ] 3.7.3.5 Tools required.

[ ] 3.7.3.6 Protective equipment needed.

[ ] 3.7.4 Completing Section 1 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.7.5 Communicating with the Team Leaders to determine team status.

[ ] 3.7.6 Participating in the debriefing, as appropriate, of dispatched OSC Team upon its return to the OSC and recording debriefing information in Section 2 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.7.7 Advising the OSC Supervisor of the teams status.

[ ] 3.7.8 Maintaining continuous accountability for all Electricians assigned to the OSC responding to the emergency.

[ ] 3.8 Utility Lead is responsible for:

[ ] 3.8.1 Interfacing with the OSC Supervisor with regard to the need for OSC Teams of a utility nature.

[ ] 3.8.2 Evaluating repair tasks and selecting team personnel.

[ ] 3.8.3 Participating in the team briefing prior to team being dispatched. Items to be discussed should include:

[ ] 3.8.3.1 Team destination and objectives.

[ ] 3.8.3.2 Identification of Team Leader.

[ ] 3.8.3.3 Primary and backup methods of communication.

[ ] 3.8.3.4 Procedures required.

[ ] 3.8.3.5 Protective equipment needed.

[ ] 3.8.4 Completing Section 1 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.8.5 Communicating with the Team Leaders to determine team status.

[ ] 3.8.6 Participating in the debriefing, as appropriate, of a dispatched OSC Team upon its return to the OSC and recording debriefing information in Section 2 of the Team Dispatch/Tracking Form per Procedure 5.7.15.

[ ] 3.8.7 Advising OSC Supervisor of the teams status.

[ ] 3.8.8 Maintaining continuous accountability for all utility personnel assigned to the OSC responding to the emergency.

1. DISCUSSION

1.1 The OSC Staff may consist of trained, designated personnel from the following CNS Departments:

1.1.1 *Chemistry/Radiological Protection (six minimum).

1.1.1.1 Radiological Protection Technicians.

1.1.1.2 Chemistry Technicians.

1.1.2 Maintenance.

1.1.2.1 *Mechanics (two minimum).

1.1.2.2 Welders.

1.1.2.3 Machinists.

1.1.2.4 *Electricians (two minimum).

1.1.2.5 Utility men.

1.1.2.6 *I&C Technicians (two minimum).

1.1.3 Others.

1.1.3.1 Warehouse Personnel.

1.1.3.2 Operations Personnel.

1.1.3.3 Engineering Personnel.

* Required to declare facility operational.

1.2 Repair, rescue, and radiological monitoring team members are chosen from the OSC Staff by the OSC Lead personnel which in their opinion are best suited for a particular team mission. The OSC leaders shall brief the team members on the task assignment.

1.3 The OSC is located on the 903' elevation of the Administration Building near the TSC. The OSC is the designated assembly area for initial accountability for the OSC Staff.

1.4 Positional Instruction Manuals (PIMs) contain positional checklists for the activation and operation of the OSC. PIMs are numbered and controlled by the Emergency Preparedness Department, labeled by ERO position, and are located in the OSC.

1.4.1 OSC Supervisor - PIM #1.

1.4.2 Chemistry/Radiological Protection OSC Lead - PIM #2.

1.4.3 Mechanical OSC Lead - PIM #3.

1.4.4 Electrical OSC Lead - PIM #4.

1.4.5 I&C OSC Lead - PIM #5.

1.4.6 Utility Lead - PIM #6.

1.4.7 Warehouse Personnel - PIM #7.

1.4.8 OSC Clerk - PIM #8.

1.5 If emergency conditions dictate relocation from the OSC, emergency repair or rescue activities will be accomplished from the Alternate OSC. The Alternate OSC is located on the 932' level of the Turbine Building (I&C Shop). Activation of the alternate OSC shall be accomplished per Procedure 5.7.8.1.

2. REFERENCES

2.1 CODES AND STANDARDS

2.1.1 NPPD Emergency Plan for CNS.

2.1.2 NUREG 0654, Revision 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

2.2 PROCEDURES

2.2.1 Emergency Plan Implementing Procedure 5.7.1, Emergency Classification.

2.2.2 Emergency Plan Implementing Procedure 5.7.8.1, Activation of Alternate OSC.

2.2.3 Emergency Plan Implementing Procedure 5.7.15, OSC Team Dispatch.

2.2.4 Emergency Plan Implementing Procedure 5.7.21, Emergency Equipment Inventory.

2.2.5 Emergency Plan Implementing Procedure 5.7.22, Communications.

1. PURPOSE

[ ] 1.1 This procedure describes the activation and subsequent operation of the Technical Support Center in the event of an ALERT or higher classification.

[ ] 1.2 The topics addressed are:

[ ] 1.2.1 Functions of the TSC and its interface with other on-site Emergency Response Facilities.

[ ] 1.2.2 Activation criteria, including a list of positions and their associated responsibilities.

2. PRECAUTIONS AND LIMITATIONS

[ ] 2.1 If the Area Radiation Monitor and/or the Continuous Air Monitor alarms, an area habitability survey should be conducted.

[ ] 2.2 If the Chemistry/Radiological Protection Coordinator determines that the TSC is uninhabitable, the TSC function shall be transferred to the Control Room.

[ ] 2.3 The TSC shall be activated in ~ 1 hour from the time of declaration of an ALERT or higher classification.

3. ACTIVATION AND OPERATION OF THE TSC

[ ] 3.1 Upon declaration of an ALERT or higher classification, TSC personnel shall report to the TSC. ERO positions assigned a Positional Instruction Manual (PIM) as defined below shall obtain their PIM when reporting to the TSC and follow instructions contained within.

[ ] 3.1.1 TSC Director is responsible for:

[ ] 3.1.1.1 Taking charge of all TSC functions and activities and coordinating the in-plant emergency response.

[ ] 3.1.1.2 Providing technical assistance and recommendations to the Control Room to mitigate emergency conditions.

[ ] 3.1.1.3 Ensuring proper priority is established for repair activities.

[ ] 3.1.1.4 Directing on-site protective actions for Emergency Response Organization Personnel.

[ ] 3.1.1.5 Ensuring Emergency Director is kept informed of current plant status and potential changes in emergency classification.

[ ] 3.1.2 Operations Coordinator is responsible for:

[ ] 3.1.2.1 Providing a liaison between the Control Room and the TSC/OSC Staffs on personnel, technical, and administrative issues related to plant operations.

[ ] 3.1.2.2 Keeping the TSC Director and TSC Staff informed of any significant changes in plant conditions.

[ ] 3.1.2.3 Informing the Control Room of changing radiological conditions and on-going TSC activities.

[ ] 3.1.2.4 Evaluate and provide technical input on repair missions including Control Room clearances.

[ ] 3.1.3 Engineering Coordinator is responsible for:

[ ] 3.1.3.1 Directing the efforts of the Engineering Group through the Engineering Team Leader.

[ ] 3.1.3.2 Maintaining liaison with General Electric, Burns & Roe, Inc., Institute of Nuclear Power Operations, and other contract support groups.

[ ] 3.1.3.3 Developing Special Procedures and modifications which may be needed.

[ ] 3.1.3.4 Ensuring the TSC Staff is kept informed of Engineering efforts and activities.

[ ] 3.1.4 Maintenance Coordinator is responsible for:

[ ] 3.1.4.1 Analyzing the status of damaged or inoperable plant systems. Provide repair options to TSC Management on restoration of equipment to operational status along with realistic repair times.

[ ] 3.1.4.2 Assisting the TSC Director to establish priorities for repair and maintenance activities.

[ ] 3.1.4.3 Communicating repair and maintenance priorities to the OSC Supervisor.

[ ] 3.1.4.4 Briefing the TSC Director on repair/re-entry team status.

[ ] 3.1.5 Chemistry/Radiological Protection Coordinator is responsible for:

[ ] 3.1.5.1 Assessing radiological doses, recommending radiation protection measures, directing radiological surveys and decontamination actions, and assisting in assessment of off-site consequences.

[ ] 3.1.5.2 Providing chemical analyses for the evaluation of station systems and provide data to aid in the determination of reactor core conditions and release potentials.

[ ] 3.1.5.3 Providing technical expertise on release rates and dose projections.

[ ] 3.1.5.4 Determining the status of TSC/OSC habitability.

[ ] 3.1.5.5 Briefing the TSC Director on in-plant radiological concerns.

[ ] 3.1.6 Operations/EOP Advisor is responsible for:

[ ] 3.1.6.1 Providing operational information to the TSC Director.

[ ] 3.1.6.2 Monitoring EALs for potential upgrades in emergency classification.

[ ] 3.1.6.3 Monitoring EOPs to ensure the TSC Staff is aware of current and future plant activities and needs with respect to potential EOP implementation.

[ ] 3.1.6.4 Maintaining an open communication line with the Control Room and the EOF.

[ ] 3.1.7 ENS Communicator is responsible for providing continuous communication with the NRC, when requested.

[ ] 3.1.8 Security Coordinator is responsible for:

[ ] 3.1.8.1 Maintaining site security per the Site Security Plan.

[ ] 3.1.8.2 Providing specific direction to the Security Shift Supervisor during emergency events.

[ ] 3.1.8.3 Coordinating personnel assembly and accountability, evacuation of personnel from the site, and maintaining site access control during emergency events.

[ ] 3.1.8.4 Providing security for the Emergency Response Facilities.

[ ] 3.1.8.5 Acting as a liaison with State and Local Law Enforcement Agencies arriving at the site.

[ ] 3.1.9 Administrative Assistant is responsible for providing support while the TSC is operational.

[ ] 3.1.10 TSC Logkeeper is responsible for maintaining a log of all TSC activities.

[ ] 3.1.11 Engineering Team Leader is responsible for:

[ ] 3.1.11.1 Ensuring proper Engineering staffing.

[ ] 3.1.11.2 Assigning Engineering Staff tasks based on the priorities set by the Engineering Coordinator.

[ ] 3.1.11.3 Ensuring trending of key plant parameters is being performed.

[ ] 3.1.11.4 Communicate Engineering analyses and solutions to the Engineering Coordinator.

[ ] 3.1.12 Control Parameter Assessment Engineer is responsible for evaluating the availability of instrumentation used to determine values of the Emergency Operation Procedures/Severe Accident Guideline control parameters.

[ ] 3.1.13 Functional Status Assessment Engineer is responsible for evaluating the availability of plant systems which may be used to perform functions specified in the Plant Specific Technical Guidelines/Severe Accident Technical Guidelines.

1. DISCUSSION

1.1 FUNCTIONS OF TSC

1.1.1 TSC provides facilities, communications, and technical data to support the CNS Emergency Response Organization. TSC personnel shall research drawings, specifications, test data, and other Engineering data as required to:

1.1.1.1 Provide Technical Support to Control Room Operations Personnel by:

a. Recommending courses of action which may be taken to mitigate the consequences of the event.

b. Evaluating the effects of abnormal system configuration on future operational evolutions and to assure such evolutions are properly planned.

c. Diagnosing station conditions and performing trending of key parameters to ensure technical evaluations are being conducted with the most current information.

1.1.2 TSC also:

1.1.2.1 Directs accident mitigation activities by:

a. Ensuring proper priority is established for repair activities.

b. Developing special procedures and system modifications that may be needed.

1.1.2.2 Provides up-to-date information to the NRC via a continuously manned communications link.

1.1.2.3 Provides for the safety of on-site Emergency Response personnel.

1.2 The TSC is located on the 903' level of the Administration Building south of the main RCA entrance.

1.2.1 If emergency conditions dictate evacuation of the TSC, relocation of the TSC will be to the EOF where the TSC functions will be performed.

1.2.2 TSC personnel should take the necessary materials from the TSC with them when relocating so they can perform their TSC duties in the EOF.

1.3 STAFFING OF TSC

1.3.1 Positional Instruction Manuals (PIMs) contain positional checklists for the activation and operation of the TSC. PIMs are numbered and controlled by the Emergency Preparedness department, labeled by ERO position, and are located in the TSC.

1.3.2 When fully manned, the TSC is staffed with the following personnel:

1.3.2.1 *TSC Director - PIM #01.

1.3.2.2 *Engineering Coordinator - PIM #02.

1.3.2.3 *Maintenance Coordinator - PIM #03.

1.3.2.4 *Chemistry/Radiological Protection Coordinator - PIM #04.

1.3.2.5 Operations/Emergency Operating Procedure Advisor - PIM #05.

1.3.2.6 ENS Communicator - PIM #07.

1.3.2.7 Security Coordinator - PIM #08.

1.3.2.8 Administrative Assistant - PIM #09.

1.3.2.9 TSC Logkeeper - PIM #10.

1.3.2.10 Engineering Team Leader - PIM #11.

1.3.2.11 *Operations Coordinator - PIM #12.

1.3.2.12 Electrical Engineer - PIM #13.

1.3.2.13 Mechanical Engineer - PIM #14.

1.3.2.14 Reactor Engineer - PIM #15.

1.3.2.15 Civil Engineer - PIM #16.

1.3.2.16 Control Status Assessment Engineer - PIM #17.

1.3.2.17 Function Status Assessment Engineer - PIM #18.

*Minimum staff required for activation.

2. REFERENCES

2.1 CODES AND STANDARDS

2.1.1 NPPD Emergency Plan for CNS.

2.1.2 NUREG 0654, Revision 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

2.2 PROCEDURES

2.2.1 Emergency Plan Implementing Procedure 5.7.1, Emergency Classification.

2.2.2 Emergency Plan Implementing Procedure 5.7.10, Personnel Assembly and Accountability.

2.2.3 Emergency Plan Implementing Procedure 5.7.11, Evacuation of Non-Designated Site Personnel.

2.2.4 Emergency Plan Implementing Procedure 5.7.21, Emergency Equipment Inventory.

2.2.5 Emergency Plan Implementing Procedure 5.7.22, Communications.

2.3 MISCELLANEOUS

2.3.1 QA Audit 86-06.

2.3.2 NRC Inspection Report 91-12, Emergency Preparedness Annual Inspection Report.

2.3.3 NRC Inspection Report 92-14, Accident Management Techniques.

2.3.4 QA Audit 93-05.

2.3.5 NRC Inspection Report 93-24, Emergency Preparedness Exercise Report.

ACTIVATION OF EOF

1. PURPOSE

[ ] 1.1 This procedure describes the sequence of events and requirements for the activation of the Emergency Operations Facility (EOF) in the event of an ALERT or higher classification.

[ ] 1.2 The topics addressed are:

[ ] 1.2.1 Functions of the EOF and its interface with both on-site and off-site emergency organizations.

[ ] 1.2.2 Activation criteria, including a roster of personnel and their associated responsibilities.

2. PRECAUTIONS AND LIMITATIONS

[ ] 2.1 Upon activation of the EOF, ensure Security is upgraded to allow access to only those personnel assigned to this facility.

[ ] 2.2 If Area Radiation Monitor or Continuous Air Monitor alarms, an area habitability survey should be conducted.

[ ] 2.3 In the event that the environment in the EOF becomes uninhabitable, EOF personnel will be evacuated to the AEOF.

[ ] 2.4 The EOF shall be activated within ~ 1 hour of declaration of an ALERT, SITE AREA EMERGENCY, or GENERAL EMERGENCY declaration.

3. ACTIVATION AND OPERATION OF THE EOF

[ ] 3.1 Upon declaration of an ALERT or higher classification, EOF personnel shall report to the EOF. ERO positions assigned a Positional Instruction Manual (PIM), as defined below, shall obtain their PIM when reporting to the EOF and follow instructions contained within. The responsibilities of EOF ERO personnel are as follows:

[ ] 3.1.1 Emergency Director is responsible for:

[ ] 3.1.1.1 In all accident classifications, the Emergency Director is in charge of the Emergency Response Organization. He is the individual assigned the authority and responsibility to immediately and unilaterally initiate emergency response actions. The Emergency Director may not delegate the following:

[ ] a. Event declaration.

[ ] b. The decision to notify authorities responsible for off-site emergency measures.

[ ] c. The recommendation of protective actions to authorities responsible for off-site emergency measures.

[ ] 3.1.1.2 Verifying NPPD on-site and off-site emergency response functions are being performed in a timely manner.

[ ] 3.1.1.3 Ensuring adequate technical and logistical support is available to the station emergency organization.

[ ] 3.1.1.4 Ensuring continuity of emergency response resources.

[ ] 3.1.1.5 Ensuring interface functions between NPPD and governmental organizations are being properly executed per the respective Emergency Plans.

[ ] 3.1.2 EOF Director is responsible for:

[ ] 3.1.2.1 Ensuring the EOF provides the necessary off-site support to the CNS response organization.

[ ] 3.1.2.2 Ensuring contact with federal, state, and local officials is made to inform them of the current situation at CNS.

[ ] 3.1.2.3 Ensuring communications are established between the EOF, TSC, Control Room, and the Joint Information Center (JIC).

[ ] 3.1.2.4 Providing guidance to the Radiological Control Technical Information Coordinator and other key members of the EOF Staff and to inform the Emergency Director of significant activities in the EOF.

[ ] 3.1.3 Radiological Control Manager is responsible for:

[ ] 3.1.3.1 Directing the activities of the Radiological Assessment Supervisor, off-site survey teams, and the site boundary survey team (outside the Protected Area).

[ ] 3.1.3.2 Ensuring dose assessment is performed.

[ ] 3.1.3.3 Providing assistance to the Emergency Director in the formulation of Protective Action Recommendations.

[ ] 3.1.3.4 Monitoring radiological conditions and advising the Emergency Director on when to issue Potassium Iodide (KI).

[ ] 3.1.3.5 Interfacing with appropriate state and local dose assessment groups.

[ ] 3.1.4 Operations/EOP Advisor is responsible for:

[ ] 3.1.4.1 Providing technical assistance and operational information to the Emergency Director and/or EOF Director.

[ ] 3.1.4.2 Monitoring plant conditions in regard to EALs. Recommends changes in emergency classification to Emergency Director if warranted.

[ ] 3.1.4.3 Providing assistance to the Emergency Director in the formulation of Protective Action Recommendations.

[ ] 3.1.4.4 Monitoring event mitigation activities with respect to EOPs. Provides current and future status of EOP implementation.

[ ] 3.1.4.5 Assisting the Technical Information Coordinator by reviewing technical information for transmission to the JIC.

[ ] 3.1.5 Emergency Preparedness Coordinator is responsible for:

[ ] 3.1.5.1 Assisting with activation of the Emergency Response Facilities.

[ ] 3.1.5.2 Ensuring ERO personnel are performing their duties as defined by the appropriate EPIPs.

[ ] 3.1.6 Off-site Communicator is responsible for gathering and disseminating information to appropriate off-site agencies per the EPIPs.

[ ] 3.1.7 Radiological Assessment Supervisor is responsible for:

[ ] 3.1.7.1 Developing Protective Action Recommendations.

[ ] 3.1.7.2 Coordinating the activities of the Field Monitoring Teams.

[ ] 3.1.8 Logistics Coordinator is responsible for:

[ ] 3.1.8.1 Assisting in obtaining additional off-site support:

[ ] a. Personnel.

[ ] b. Equipment.

[ ] c. Arrange for specialized contractor assistance as required. Arrange for training of contractor personnel. Use CNS and Corporate resources to carry out these responsibilities (i.e., GE, Burns & Roe, INPO, etc.).

[ ] d. Developing a 24 hour schedule for EOF personnel.

[ ] e. Ensure financial support is available to the EOF. POs EP1001 through EP1050 are approved for use.

[ ] 3.1.8.2 Food/lodging/transportation support.

[ ] 3.1.9 Dose Assessment Coordinator is responsible for assisting the Radiological Assessment Supervisor by maintaining status boards and coordinating dose projections.

[ ] 3.1.10 Field Team Coordinator is responsible for movement and sampling activities of the CNS downwind survey field teams as directed by the Radiological Assessment Supervisor.

[ ] 3.1.11 Technical Information Coordinator is responsible for gathering technical information to be transmitted to the JIC.

[ ] 3.1.12 Clerical Coordinator is responsible for ensuring sufficient clerical support exists in the EOF to adequately support EOF personnel.

[ ] 3.1.13 Dose Assessment Clerk is responsible for operating the dose assessment model.

[ ] 3.1.14 EOF Logkeeper is responsible for maintaining EOF log.

[ ] 3.1.15 EOF Radiation Protection Pool Personnel are responsible for:

[ ] 3.1.15.1 Conducting plume-tracking activities.

[ ] 3.1.15.2 Performing in-field sampling activities as requested.

[ ] 3.1.15.3 Habitability surveys in the EOF as directed by the Radiological Assessment Supervisor.

4. EVACUATION OF EOF

[ ] 4.1 In the event the EOF must be evacuated, responsibilities will be formally turned over to the TSC.

[ ] 4.2 Evacuation of EOF to AEOF shall be conducted using Procedures 5.7.9.1, 5.7.11, and 5.7.13 as guidelines.

1. DISCUSSION

1.1 FUNCTIONS OF EOF

1.1.1 Provides overall off-site management of NPPD emergency response and resources.

1.1.2 Provides coordination of off-site radiological assessment and recommendations for the protection of the public.

1.1.3 Provides coordination of off-site emergency response activities with Local, State, and Federal organizations.

1.1.4 Provides guidance and instructions to Off-Site Radiological Emergency Survey Teams.

1.1.5 Disseminates emergency status information to the Joint Information Center (JIC).

1.2 The EOF is located adjacent to the Security Building outside the Protected Area.

1.3 If emergency conditions dictate relocation from the EOF, emergency evaluation and coordination activities will be accomplished from the Alternate Emergency Operations Facility (AEOF). The AEOF is located in the town of Auburn, Nebraska, housed in the former Auburn National Guard Armory. Activation of the AEOF shall be accomplished per Procedure 5.7.9.1.

1.4 STAFFING OF EOF

1.4.1 Positional Instruction Manuals (PIMs) contain positional checklists for the activation and operation of the EOF. PIMs are numbered and controlled by the Emergency Preparedness Department, labeled by ERO position, and are located in the EOF.

1.4.1.1 The EOF is staffed with the following personnel:

a. *Emergency Director - PIM #01.

b. *EOF Director - PIM #02.

c. *Radiological Control Manager - PIM #03.

d. Operations/Emergency Operating Procedure Advisor - PIM #04.

e. Emergency Preparedness Coordinator - PIM #05.

f. *Off-Site Communicator - PIM #06.

g. *Radiological Assessment Supervisor - PIM #07.

h. Logistics Coordinator - PIM #08.

i. Dose Assessment Coordinator - PIM #09.

j. Technical Information Coordinator - PIM #10.

k. Clerical Coordinator - PIM #12.

l. Dose Assessment Clerk - PIM #13.

m. EOF Logkeeper - PIM #14.

n. EOF RP Pool - PIM #16.

o. Down Wind Driver - PIM #17

p. Field Team Coordinator - PIM #18.

* Minimum staff required for activation.

2. REFERENCES

2.1 CODES AND STANDARDS

2.1.1 NPPD Emergency Plan for CNS.

2.1.2 NUREG 0654, Revision 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

2.2 PROCEDURES

2.2.1 Emergency Plan Implementing Procedure 5.7.1, Emergency Classification.

2.2.2 Emergency Plan Implementing Procedure 5.7.9.1, Activation of Alternate EOF.

2.2.3 Emergency Plan Implementing Procedure 5.7.11, Evacuation of Non-Essential Site Personnel.

2.2.4 Emergency Plan Implementing Procedure 5.7.13, Personnel Monitoring and Decontamination.

2.2.5 Emergency Plan Implementing Procedure 5.7.21, Emergency Equipment Inventory.

2.2.6 Emergency Plan Implementing Procedure 5.7.22, Communications.

2.3 MISCELLANEOUS

2.3.1 QA Audit 86-06.

2.3.2 NRC Inspection Report 89-35.

2.3.3 NRC Inspection Report 92-14, Accident Management Techniques.

2.3.4 QA Audit 93-05.

1. PURPOSE

[ ] 1.1 This procedure describes required actions and provides specific instructions to CNS personnel to implement personnel assembly and accountability.

[ ] 1.2 This procedure provides a means to ascertain the names of missing individuals within the Protected Area within 30 minutes of the declaration of an ALERT or higher emergency classification and account for all on-site individuals continuously thereafter.

2. PRECAUTIONS AND LIMITATIONS

[ ] 2.1 Specific routes to be traveled or areas to be avoided should be included in the emergency announcement, if appropriate.

[ ] 2.2 The names of missing individuals within the Protected Area shall be ascertained within 30 minutes of the declaration of the emergency and accounted for continuously thereafter.

3. REQUIREMENTS

[ ] 3.1 The Emergency Director declares an ALERT, or higher classification, as defined in Procedure 5.7.1, or otherwise determines personnel assembly and accountability is required.

4. PERSONNEL ASSEMBLY

[ ] 4.1 The Emergency Director ensures the emergency alarm is activated and the appropriate announcement provided. If personnel assembly and accountability is desired at a Notification of Unusual Event, a similar message format with appropriate information will be used.

[ ] 4.2 Personnel escorting visitors or tours shall take them immediately to the exit turnstile and direct them to report to Training Building Classrooms "J", "H", or "I" for assembly. Escorts will then report to their own Designated Assembly Area.

[ ] **NOTE** - Operations personnel who are in remote areas of the station and are in the immediate process of maintaining or restoring the plant to a safe condition shall not be expected to physically assemble in the Control Room. Operations personnel in these situations shall communicate their status and location to the Control Room. Such personnel shall be defined as "missing" on the initial Security Computer Report and shall be accounted for by the Security Coordinator through communications with the Control Room.

[ ] 4.3 On-duty ERO personnel upon hearing the emergency alarm and associated announcement shall immediately report to their respective Emergency Response Facilities unless otherwise instructed by the announcement. On-duty is defined as follows:

[ ] 4.3.1 On-Shift Operations Crew personnel shall report to the Control Room.

[ ] 4.3.2 Operations personnel acting as Relief Crew shall report to the Control Room.

[ ] 4.3.3 Radiological Protection Technicians, Chemistry Technicians, Mechanics, Electricians, and Instrument & Control Technicians shall report to the OSC.

[ ] 4.3.4 ERO Team personnel who are standing ERO Duty watch (ERO Team 1, 2, 3, or 4) shall report to the Control Room, TSC, OSC, or EOF.

[ ] **NOTE** - Disregard the following step if the emergency is security related and reference the Security Plan and Procedures.

[ ] 4.3.5 On-duty Security personnel, except those manning CAS, SAS, ACCESS CONTROL, CONTROL ROOM, and compensatory posts, report to the Security Building Lunch Room behind CAS.

[ ] 4.4 Off-duty ERO personnel and non-ERO personnel outside the Protected Area shall remain at or proceed to an area where they can monitor the station gaitronics system for additional information and/or instructions. A designated assembly area outside the Protected Area is any work area or community area such as a lunchroom or conference room where personnel can monitor the station gaitronics system for additional information and/or instructions.

[ ] 4.5 Off-duty ERO personnel within the Protected Area shall exit the Protected Area and assemble in Classrooms "J", "H", or "I" in the Training Building. Monitor the area station gaitronics system for additional information and/or instructions.

[ ] 4.6 Non-ERO personnel within the Protected Area shall exit the Protected Area and assemble in Classrooms "J", "H", or "I" in the Training Building. Monitor the area station gaitronics system for additional information and/or instructions.

[ ] 4.7 Other - Personnel may be assigned to other temporary assembly areas within the Protected Area, as construction, maintenance and refueling outages, etc., dictate.

[ ] 4.7.1 A list of any such temporary assembly areas shall be posted in the TSC at the Security Coordinator's desk.

[ ] 4.8 Personnel reporting to a Designated Assembly Area within the Protected Area shall card a security badge reader with their security badge which has been designated for accountability purposes as listed below:

[ ] 4.8.1 Control Room - Control Room Door Badge Reader.

[ ] 4.8.2 TSC/OSC - The badge reader outside the TSC Door labeled "TSC/OSC Emergency Accountability Reader".

[ ] 4.8.3 CAS/SAS/Access Control - The CAS, SAS, and Access Control Door Badge Readers.

[ ] 4.8.4 Security Building Lunch Room - The CAS or Access Control Door Badge Reader.

[ ] **NOTE** - In the absence of the Designated Assembly Area Supervisor (DAAS) listed in Section 7, anyone reporting to their Designated Assembly Area may fulfill DAAS duties.

[ ] 4.9 The DAAS in the EOF shall obtain copies of the Accountability Sign-in Sheet, Attachment 1, and circulate it for all assembled personnel to sign.

[ ] 4.10 All personnel assembling in the EOF shall sign in on Attachment 1, providing their security badge number, name, and time of assembly.

5. INITIAL ACCOUNTABILITY OF PERSONNEL

[ ] 5.1 The on-duty Security Shift Supervisor shall ensure Access Control is manned and access to the Protected Area is controlled per Step 5.3.1.

[ ] **NOTE** - The on-duty Security Shift Supervisor shall assume the duties of the Security Coordinator during times other than normal working hours until relieved by another qualified Security Coordinator.

[ ] 5.2 Upon the activation of the Emergency Alarm and the instructions announced for personnel to perform assembly and accountability, the Security Shift Supervisor shall instruct CAS to immediately initiate an "Accountability" command in the Security Computer System.

[ ] 5.3 Access Control personnel shall inform the Security Coordinator when the flow of people through the exit turnstile has stopped. The Security Coordinator in the TSC shall print an Accountability Report to the TSC Security System printer. If the Security System printer in the TSC is inoperable, the report shall be printed in CAS or SAS. The Security Coordinator shall notify Access Control and the Security Coordinator when the printout is started and Access Control shall secure access to the Protected Area.

[ ] 5.3.1 Permission to enter shall be obtained from the Security Coordinator. A list of personnel entering or exiting the Protected Area will be kept by Access Control. This list should be maintained on Attachment 1 if available.

[ ] 5.3.2 The on-duty Security Shift Supervisor shall direct the CAS/SAS Operator to survey the Owner Controlled Area (OCA) with the closed circuit television camera, for personnel (farmers, boaters, line crews, etc.).

[ ] 5.3.2.1 Any activity shall be reported to the Security Coordinator.

[ ] 5.3.2.2 Individuals in the OCA or entering the OCA will be requested to depart the area, if conditions dictate.

[ ] 5.3.3 Upon its completion, the Security Coordinator shall obtain the Accountability Report from the TSC Security computer system printer.

[ ] 5.3.3.1 If the Accountability Report is printed on the SAS or CAS printer, upon its completion, the Security Shift Supervisor shall ensure it is immediately delivered to the Security Coordinator in the TSC.

[ ] 5.3.4 Those persons whose names appear on the Accountability Report are missing.

[ ] 5.3.5 Initial accountability is complete when the Security Coordinator has the Accountability Report in his possession and is aware of the names on it.

[ ] **NOTE** - The on-duty Shift Supervisor (Emergency Director) performs the duties of the TSC Director until the TSC is activated.

[ ] 5.3.6 The Security Coordinator shall notify the TSC Director when initial on-site accountability is complete.

[ ] 5.3.7 The Security Coordinator shall attempt to locate missing personnel using the security computer system and any other available means including paging them over the Gaitronics System, calling other Designated Assembly Areas, or calling their normal work location. If these individuals are not located, the Security Coordinator shall report the names of these individuals to the TSC Director as unaccounted-for.

[ ] 5.3.8 The TSC Director shall report the results of personnel accountability to the Emergency Director.

[ ] 5.3.9 The TSC Director shall initiate a rescue and re-entry operation per Procedure 5.7.15 to locate and/or assist unaccounted-for personnel.

[ ] 5.3.10 If ERO Management determines that additional or specific ERO personnel are needed to mitigate the event, the Security Coordinator or Logistics Coordinator shall contact the individuals directly at their normal work location or their Designated Assembly Area. Chosen individuals shall be instructed to report to a particular Emergency Response Facility and specific instructions shall be provided to the additional responders at the time of contact.

6. CONTINUOUS ACCOUNTABILITY

[ ] **CAUTION** - Conditions resulting in declared emergencies may also create high radiation and/or contamination. Personnel safety/risk shall always be weighed against the task to be accomplished.

[ ] **NOTE 1** - During the initial accountability phase, movement between facilities and into the plant should be restricted to that required for immediate emergency response.

[ ] **NOTE 2** - Continuous accountability will be coordinated by a Security Coordinator after arrival on-site during backshift, weekends, or holidays.

[ ] 6.1 Maintain a written record of your movement into and out of Emergency Response Facilities by signing in and out on Attachment 1, Accountability Log.

[ ] 6.1.1 The Control Room, TSC, and EOF will have Security personnel present to perform accountability duties, unless pre-emptied by security contingencies.

[ ] 6.2 All teams entering the plant shall be tracked in the OSC by the OSC Supervisor.

[ ] 6.3 A primary and alternate method of notification/communication with an emergency response facility should be established prior to entry into areas of the plant affected by emergency conditions.

[ ] 6.4 Information concerning any unusual or dangerous condition encountered should immediately be relayed to an emergency response facility. High radiation levels and locations should also be relayed.

[ ] 6.5 All on-shift Station Operators, Licensed Operators, and Shift Technical Engineers needed for response to plant conditions remain under the control of the Shift Supervisor.

[ ] 6.6 Extra Operations personnel not needed in the Control Room for immediate emergency response may be relocated to the OSC after initial accountability for assignment to Repair/Rescue/Monitoring Teams. This decision to relocate Operations personnel is made by the Shift Supervisor and shall be communicated to the Emergency Director, TSC Director, and OSC Supervisor.

[ ] 6.7 Personnel shall be granted access to the Protected Area only on the authorization of the Security Coordinator.

7. DESIGNATED ASSEMBLY AREA SUPERVISORS

[ ] **NOTE** - In the absence of the Designated Assembly Area Supervisors listed below, anyone reporting to their Designated Assembly Area may fulfill DAAS duties.

[ ] 7.1 The people listed below are assigned as the Designated Assembly Area Supervisor and alternate for each respective assembly area.

[ ] 7.2 CONTROL ROOM

[ ] 7.2.1 Security personnel (the written record of movement required in Step 6.3 shall be performed by Security personnel unless pre-emptied by security contingencies).

[ ] 7.2.2 Shift Supervisor.

[ ] 7.2.3 Station Operator.

[ ] 7.3 TSC

[ ] 7.3.1 Security Coordinator.

[ ] 7.3.2 TSC Director.

[ ] 7.4 OSC

[ ] 7.4.1 OSC Supervisor.

[ ] 7.4.2 OSC Leads.

[ ] 7.5 SECURITY BUILDING LUNCH ROOM

[ ] 7.5.1 Security Shift Supervisor.

[ ] 7.5.2 CAS Specialist.

[ ] 7.6 EOF

[ ] 7.6.1 Logistics Coordinator.

[ ] 7.6.2 Security personnel.

[ ] 7.6.3 Emergency Preparedness Coordinator.

[ ] 7.7 OTHER

[ ] 7.7.1 On-Site Assembly Areas, as needed, because of construction, outage, etc. shall be designated by the Emergency Preparedness Manager.

8. MISCELLANEOUS

[ ] 8.1 Personnel who are off-site at the time of the emergency and are notified to report to the site shall report to their normal Designated Assembly Area unless given other specific instructions.

ATTACHMENT 1 CONTINUOUS ACCOUNTABILITY LOG SHEET

DESIGNATED ASSEMBLY AREA: ______________________ SUPERVISOR: ____________ DATE: ______

NOTE 1 - Sign in or out EVERY TIME you enter or leave an Emergency Response Facility.

NOTE 2 - Notify Designated Assembly Area Supervisor every time you enter or leave an Emergency Response Facility.

Initial Accountability Complete: ______ (Time)

BADGE NUMBER	NAME (PRINT)	TIME IN FACILITY	TIME OUT FACILITY	DESTINATION

1. DISCUSSION

1.1 In the event of an emergency at CNS, it is necessary that all personnel are notified of the situation, their whereabouts identified for safety and security purposes if within the Protected Area, and they respond in a coordinated effort to the emergency.

1.2 CNS visitors shall receive instructions from their escort explaining what they are to do and where they are to go in the event of the sounding of the Emergency Alarm. It is the responsibility of each Supervisor to know the general location of his subordinates at any time.

1.3 An emergency signal, activated manually from the Control Room, is provided to alert all personnel in the vicinity of the plant an emergency exists. The emergency alarm consists of a distinct steady-tone sounded through the station intercom system. The alarm shall be sounded and appropriate announcements made to station personnel per Procedure 5.7.2.

1.4 All ERO personnel reporting to a Designated Assembly Area within the Protected Area (PA) shall use their security badge to card a Security System badge reader for accountability purposes at that area. A report generated by the Security Computer shall identify all personnel who are missing.

2. REFERENCES

2.1 CODES AND STANDARDS

2.1.1 NPPD Emergency Plan for CNS.

2.1.2 NUREG 0654/FEMA-REP-1, Revision 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

2.2 PROCEDURES

2.2.1 Emergency Plan Implementing Procedure 5.7.1, Emergency Classification.

2.2.2 Emergency Plan Implementing Procedure 5.7.2, Shift Supervisor EPIP.

2.2.3 Emergency Plan Implementing Procedure 5.7.15, OSC Team Dispatch.

1. PURPOSE

This procedure defines who has the authority to distribute Potassium Iodide (KI), under what emergency conditions KI should be distributed, and method used to distribute KI.

2. PRECAUTIONS AND LIMITATIONS

[ ] 2.1 KI should not be taken by persons allergic to iodine.

[ ] 2.2 Do <u>not</u> take more than the recommended dose of KI.

[ ] 2.3 KI shall only be taken on a voluntary basis.

[ ] 2.4 KI should not be distributed for more than 10 days.

3. REQUIREMENTS

[ ] 3.1 Ensure following equipment and materials are available, as needed:

- [ ] 3.1.1 Bottles of 130 mg KI tablets.
- [ ] 3.1.2 Patient Package Inserts.

[ ] 3.2 A calculated dose of ≥ 25 rem (0.25 Sv) to the thyroid (CDE) is likely to be received; or life-saving operation is to be undertaken where high levels of radioiodine are suspected and no current air analysis is available; or fuel cladding has been determined to be lost per Procedure 5.7.1, Attachment 3.

4. INSTRUCTIONS

[ ] 4.1 Only the Emergency Director, normally acting on the recommendations of the Radiological Control Manager or Chem/RP Coordinator, may designate when and to whom KI shall be distributed.

[ ] 4.2 When authorized by the Emergency Director, the Radiological Control Manager, Chem/RP Coordinator, or designee, shall obtain Patient Package Inserts and bottles of 130 mg KI tablets from the Control Room, TSC, EOF, AEOF, and/or OSC and distribute as follows:

[ ] **NOTE** - Potassium Iodide (KI) is a drug. This drug is provided by NPPD as a thyroid blocking measure. Taking KI is voluntary.

[ ] 4.2.1 Each person designated to receive KI shall be given a Patient Package Insert for KI and individually asked if they are allergic to iodine or Potassium Iodide (KI).

[ ] 4.2.1.1 If response is YES (they are allergic to iodine or KI), do not dispense KI to them.

[ ] 4.2.1.2 Record names of individuals that are allergic on Attachment 2. Have them sign and date Attachment 2.

[ ] 4.2.1.3 Advise Emergency Director of their names so that alternate protective measures may be provided or their emergency duties appropriately reassigned.

[ ] 4.2.2 Each person designated to receive KI shall individually be asked if he or she voluntarily refuses to accept distribution of the drug Potassium Iodide (KI).

[ ] 4.2.2.1 If response is YES (they voluntarily refuse to accept KI), do not dispense KI to them.

[ ] 4.2.2.2 Record names of individuals refusing to accept distribution on Attachment 2. Have them sign and date Attachment 2.

[ ] 4.2.2.3 Advise Emergency Director of their names so that alternate protective measures may be provided or their emergency duties appropriately reassigned.

[ ] 4.2.3 Distribute KI and a Patient Package Insert to designated individuals not allergic and not refusing distribution.

[ ] 4.2.3.1 Record names of persons to whom KI was distributed on Attachment 1. Have them sign and date Attachment 1.

[ ] 4.3 KI may also be provided to non-NPPD emergency response organizations for distribution to their emergency workers. Administration of KI to non-NPPD personnel shall be the responsibility of the organizations to which these personnel belong.

NOTE 1 - Before dispensing KI to individuals, verify that they are not allergic. Do not dispense KI to persons who are allergic to it. Report to Emergency Director names of those persons allergic to KI.

NOTE 2 - When dispensing KI, ensure each individual also receives a copy of the Patient Package Insert. Tear a sheet from the pad, located with the KI in each facility, and hand it out with the drug.

NOTE 3 - Signature below signifies receipt of one bottle (containing fourteen (14), 130 mg tablets) of the drug KI (Potassium Iodide) intended to reduce the radiological dose to the thyroid organ from radioiodine in the air. Signature also acknowledges receipt of a copy of the Patient Package Insert for this drug.

DATE/TIME	NAME (print)	SIGNATURE

ATTACHMENT 2	RECORD OF KNOWN ALLERGY TO OR VOLUNTARY REFUSAL TO TAKE POTASSIUM IODIDE (KI)

Signature below signifies that I have been offered, and have either a known allergy or refused acceptance of the drug KI (Potassium Iodide) intended to reduce the radiological dose to the thyroid organ. Signature also acknowledges receipt of a copy of Patient Package Insert for the offered drug.

DATE/TIME	NAME (Print)	SIGNATURE	REASON (Optional)

1. DISCUSSION

1.1 EFFECTIVENESS

1.1.1 In the event of an accidental radiological release, emergency workers at the site, as well as within the vicinity of a radioactive airborne plume, could possibly be exposed to radioactive iodine. To reduce exposure of emergency workers to radioiodine, KI is stocked in on-site and off-site Emergency Response Facilities for voluntary use when authorized by the Emergency Director. Because KI is a radioprotective drug, with possible side effects, it's use will only be recommended. Ingestion will always be a voluntary act of the user.

1.1.2 KI is an effective means of blocking radioiodine from accumulating in the thyroid gland. Potassium Iodide should be taken ~ 1/2 hour to 1 day before exposure to radioiodine for maximum blockage. Final uptake of radioiodine is halved if KI is taken within 3 to 4 hours after exposure. Little benefit is gained if it is taken more than 10 to 12 hours after exposure.

1.2 DOSAGE

1.2.1 Dosage is one (130 mg) tablet per day. Once KI has been taken by an individual and radioactive iodine has been determined to be present by field measurements or estimated by dose calculations, tablets should be taken for 10 days post-exposure. If the absence of radioactive iodine in the body can be confirmed, KI treatment should be discontinued. Individuals having radioiodine exposure should receive thyroid bio-assay analysis on a regular basis throughout the KI treatment period to verify effectiveness of treatment and to estimate dose.

1.3 PRECAUTIONS/SIDE EFFECTS

1.3.1 KI should not be used by individuals allergic to iodine. Usually side effects occur when the dose is higher than that recommended or the treatment period is longer than recommended. Possible side effects include skin rashes, swelling of the salivary glands, and <u>iodism</u> (metallic taste, burning mouth and throat, sore teeth and gums, symptoms of a head cold, and sometimes stomach upset and diarrhea). Some people could experience an allergic reaction with more severe symptoms such as fever and joint pains, swelling of parts of the face and body, severe shortness of breath. If the side effects are severe, stop taking KI, and seek immediate medical attention.

2. REFERENCES

2.1 CODES AND STANDARDS

2.1.1 NPPD Emergency Plan for CNS.

2.1.2 NUREG 0654/FEMA-REP-1, Revision 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

2.1.3 NCRP 55, Protection of the Thyroid Gland in the Event of Release of Radioiodine, National Council on Radiation Protection and Measurements, 1977.

2.1.4 Environmental Protection Agency EPA 400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, May 1992.

2.2 PROCEDURES

2.2.1 Emergency Plan Implementing Procedure 5.7.1, Emergency Classification.

2.3 MISCELLANEOUS

2.3.1 QA Observation 93-05A.

1. PURPOSE

[ ] 1.1 This procedure provides guidance to dispatch survey, repair, and rescue teams while maintaining personnel accountability and safety.

[ ] 1.2 Topics covered are:

[ ] 1.2.1 Dispatch and control of survey, repair, and rescue teams.

[ ] 1.2.2 Precautions to be observed by survey, repair, and rescue teams.

[ ] 1.2.3 Equipment to be carried during survey, repair, or rescue operations.

[ ] **CAUTION** - During any emergency involving radiological hazards, exposure to personnel should be minimized, consistent with the nature of emergency response required.

[ ] **NOTE 1** - All team members who may exceed 25 rem must be volunteers and be briefed on the hazards of radiation exposures in excess of 25 rem.

[ ] **NOTE 2** - The Chemistry/Radiological Protection (Chem/RP) Coordinator shall make a determination, based on current available information and future trends, as to the need for Radiological Protection (RP) Technicians to accompany each team.

2. REPAIR ACTIVITIES

[ ] 2.1 TEAMS DISPATCHED THROUGH OPERATIONS SUPPORT CENTER (OSC)

[ ] 2.1.1 The Maintenance Coordinator shall:

[ ] 2.1.1.1 Obtain specifics concerning the problem, location, and corrective actions to be taken from the TSC Director.

[ ] 2.1.1.2 Brief the OSC Supervisor on tasks to be accomplished and their respective priority.

[ ] 2.1.1.3 Provide TSC Director with team progress reports.

[ ] 2.1.2 OSC Supervisor shall:

[ ] 2.1.2.1 Initiate Team Dispatch/Tracking Form (Attachment 1).

[ ] 2.1.2.2 Contact the appropriate OSC Lead or Engineering Lead personnel with task assignments.

[ ] 2.1.2.3 Provide Maintenance Coordinator with team progress reports.

[ ] 2.1.2.4 Resolve any resource allocation conflicts that may arise.

[ ] 2.1.2.5 Continuously account for OSC personnel.

[ ] 2.1.3 OSC Lead and Engineering Lead personnel shall:

[ ] 2.1.3.1 Select team members for the assigned task.

[ ] 2.1.3.2 Brief teams per Attachment 2.

[ ] 2.1.3.3 Complete Section 1.0 of Team Dispatch/Tracking Form.

[ ] 2.1.3.4 Contact the Team Leader periodically to check the work in progress and team safety.

[ ] 2.1.3.5 Debrief team members when they return to the OSC and complete Section 2.0 of the Team Dispatch/Tracking Form.

[ ] 2.1.3.6 Inform the OSC Supervisor of the Team's status.

[ ] 2.1.4 Team Leader shall:

[ ] 2.1.4.1 Receive a copy of Team Dispatch/Tracking Form from OSC Lead.

[ ] 2.1.4.2 Pick up and test radio from the OSC, if instructed.

[ ] 2.1.4.3 Report arrival time at work site.

[ ] 2.1.4.4 Report work status as required.

[ ] 2.1.4.5 Return to the OSC.

[ ] 2.1.4.6 Debrief with the OSC Lead.

[ ] 2.1.5 Chem/RP Coordinator shall keep the Chem/RP OSC Lead informed of any changing radiological conditions that may affect team safety (i.e., High Area Radiation Alarms, steam leaks, etc.).

[ ] 2.2 TEAM DISPATCHED FROM CONTROL ROOM

[ ] 2.2.1 When Operators are going to be dispatched directly from the Control Room, the Shift Supervisor shall contact the Chem/RP Coordinator to determine if RP support is required.

[ ] 2.2.2 If RP support is not required, the Shift Supervisor dispatches the Operator following station procedures.

[ ] 2.2.3 If RP support is required, the Shift Supervisor shall instruct the Operator to meet the RP Technician at a pre-determined location.

[ ] 2.2.4 Chem/RP Coordinator shall:

[ ] 2.2.4.1 Contact Chem/RP OSC Lead and direct him to assign RP Technician to meet the Operator at the pre-determined location.

[ ] 2.2.5 Chem/RP OSC Lead shall:

[ ] 2.2.5.1 Complete Section 1.0 of Team Dispatch/Tracking Form (i.e., team designation, personnel, time briefed, destination, objectives).

[ ] a. Give a copy to the RP.

[ ] b. Post a copy of form on the Team Tracking Status Board.

[ ] 2.2.5.2 Notify the OSC Supervisor that an RP Technician has been assigned to an operator for a particular task.

[ ] 2.2.5.3 File completed Team Dispatch/Tracking Form with the OSC Supervisor.

[ ] 2.2.6 RP Technician shall:

[ ] 2.2.6.1 Receive a copy of team dispatch/tracking form from Chem/RP OSC Lead.

[ ] 2.2.6.2 Pick up and test radio from TSC, if instructed.

[ ] 2.2.6.3 Meet Operator at pre-determined location.

[ ] 2.2.6.4 Report arrival/departure times at work site.

[ ] 2.2.6.5 Inform Chem/RP OSC Lead of task completion.

[ ] 2.2.6.6 Return to the OSC.

3. PERSONNEL SEARCH AND/OR RESCUE

[ ] 3.1 Upon identifying missing personnel after the accountability check, the Security Coordinator shall attempt to determine if missing personnel are injured or isolated in some area of the plant or plant site. If the missing individuals cannot be found:

[ ] 3.1.1 The TSC Director shall direct the Chem/RP Coordinator and Maintenance Coordinator to assemble a OSC Rescue Team.

[ ] 3.1.2 The OSC Rescue Team will assemble at the OSC for a briefing.

[ ] 3.1.3 If time allows, Attachment 1 should be completed by the OSC Lead and be utilized to document the search and rescue effort.

[ ] 3.1.4 The OSC Rescue Team will conduct a search, keeping all members of the team in the same general area (i.e., frequent visual checks, each searching independently).

[ ] 3.1.5 When a victim or victims are located, the team will notify the OSC immediately, unless directed otherwise.

[ ] 3.1.5.1 This should be followed up with additional relevant information (i.e., nature and extent of injuries, dose rates encountered, etc.) as this information develops.

[ ] 3.1.6 The exposure of rescuers shall be limited to as low as reasonably achievable.

[ ] 3.1.7 Treat victims per Procedure 5.7.24, if required.

[ ] 3.2 IMMEDIATE LIFE-SAVING RESCUE REQUIRED

[ ] 3.2.1 Within the limits allowed by the urgency of the situation, make every reasonable effort to obtain:

[ ] 3.2.1.1 Pertinent information (i.e., what happened, what may happen, what hazards are present, what can be done, etc.).

[ ] 3.2.1.2 Available protective and monitoring equipment and rescue devices.

[ ] 3.2.1.3 Assistance from others nearby.

[ ] 3.2.2 Evaluate available information and discuss best apparent rescue approach with the Chem/RP Coordinator prior to the rescue attempt if practical.

[ ] 3.2.3 If time allows, Attachment 1 should be completed by an OSC Lead and be utilized to document the rescue.

[ ] 3.2.4 If available, other personnel in the area should render assistance and monitor the team exposure time in a High Radiation Area.

[ ] 3.2.5 Perform rescue mission consistent with good first aid practices and as dictated by dose rates encountered and the limits discussed above.

[ ] 3.2.6 Attempt to limit exposure of Rescuers to as low as reasonably achievable.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
TEAM DISPATCH/TRACKING FORM

1.0 DISPATCHING

Date:______________________ Team Designation:______________________

Time:______________________ Briefed By:______________________

Team Personnel:____

____

____

Destination:____

Precautions:____

____

____

Work To Be Performed:____

____

____

____

____

SAMPLE

2.0 DEBRIEFING

Debriefing Time:______________

Team Findings/Comments:____

____

____

____

____

OSC Phone Numbers: Chem/RP x5630 Maintenace x5623 I&C x5619 Elec x5091

5-7-15.SCAN

Team Number: _______

NOTE - All Team members must be volunteers if the exposure will exceed 25 rem. Volunteers shall be briefed on the possible effects of such exposure.

- Early Affects: Possible vomiting, nausea, diarrhea.
- Late Affects: Possible increase in cancer probability. Possible decrease in total life expectancy.

Pre-Job Work Briefing

YES	NO	
[ ]	[ ]	Team Destination
[ ]	[ ]	Work To Be Performed
[ ]	[ ]	Team Leader
[ ]	[ ]	Copy of Team Dispatch Tracking Form
[ ]	[ ]	Radio/Cell Phone
[ ]	[ ]	Keys
[ ]	[ ]	Flashlights
[ ]	[ ]	Tools
[ ]	[ ]	Procedures Required
[ ]	[ ]	TCCs
[ ]	[ ]	Clearance Order
[ ]	[ ]	Personnel Safety Equipment
[ ]	[ ]	Equipment Safety
[ ]	[ ]	Drawings

Radiation Protection Briefing

YES	NO	
[ ]	[ ]	Dose Limits
[ ]	[ ]	Protective Clothing
[ ]	[ ]	Respirator Requirements
[ ]	[ ]	Potassium Iodide (KI)
[ ]	[ ]	Dosimetry
[ ]	[ ]	RWP
[ ]	[ ]	Air Sampler
[ ]	[ ]	Survey Instruments
[ ]	[ ]	Keys (High Rad Area)
[ ]	[ ]	Procedures
[ ]	[ ]	Radiological Areas To Avoid

1. DISCUSSION

1.1 During a station emergency, abnormally high levels of radiation and/or radioactivity may be encountered. These levels may range from slightly above those experienced during normal station operation to life-endangering levels of several hundred rem in a short period of time. Under all emergency situations, whether it is immediate action to regain control of the emergency or for life-saving purposes, care should be taken to minimize exposure from external and internal sources of radiation.

1.2 Attachment 1, which is an example of the Team Dispatch/Tracking Form, shall be used to carry out the purpose of this procedure.©

2. REFERENCES

2.1 CODES AND STANDARDS

2.1.1 10CFR20.

2.1.2 NPPD Emergency Plan for CNS.

2.1.3 NUREG-0654/FEMA-REP-1, Revision 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

2.1.4 Environmental Protection Agency EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, May 1992.

2.2 PROCEDURES

2.2.1 Emergency Plan Implementing Procedure 5.7.14, Stable Iodine Thyroid Blocking (KI).

2.2.2 Emergency Plan Implementing Procedure 5.7.24, Medical Emergency.

2.2.3 Radiological Protection Procedure 9.RESP.1, Respiratory Protection Program.

2.3 MISCELLANEOUS

2.3.1 © NRC Inspection Report 91-12, Emergency Preparedness Annual Inspection Report. Affected Step 1.2 on Attachment 3.

2.3.2 NRC Inspection Report 93-24.

1. PURPOSE

This procedure describes methodology for the manual determination of airborne radioactive release rates from the Elevated Release Point (ERP), Reactor Building, Turbine Building, and Radwaste Building vents, utilizing process monitor or other readings.

2. PRECAUTIONS AND LIMITATIONS

[ ] 2.1 Determination of ERP release rate using the primary containment monitors (Section 6) should be used only if the calculation cannot be performed utilizing the ERP noble gas effluent monitor readings.

[ ] 2.1.1 The ERP releases can be calculated by correlating the exposure rates on the high range radiation monitors in the Drywell to those which have been calculated assuming a Design Basis Loss of Coolant Accident (DBA-LOCA). The DBA-LOCA calculations are based on the NUREG-0737 assumptions of; maximum full power equilibrium isotopic inventories, 100% of the noble gases, 25% of the halogens, and 1% of the remaining radionuclides are instantaneously released to the atmosphere of the primary containment. The leak rate from the primary containment is assumed to be 0.105 volume/day (10.6 cfm). The secondary containment purge rate is assumed to be 100% volume/day. The entire release is assumed to be through the SGT System and out the ERP.

[ ] 2.2 Dose projections should be compared to field monitoring data, release point sample collection data, and other relevant data as it becomes available.

[ ] 2.3 Release rate should be recalculated upon changes ± 20% in monitor readings and at a minimum of every hour for effective ages 0 to 10 hours and every 10 hours for effective ages 10 to 100 hours.

3. REQUIREMENTS

[ ] 3.1 Ensure following equipment and materials are available, as needed:

[ ] 3.1.1 Effluent monitors.

[ ] 3.1.2 In-containment high radiation area monitors.

[ ] 3.1.3 Scientific calculator.

[ ] 3.1.4 Steam jet air ejector monitors.

[ ] 3.2 An actual or projected release of radioactive material to the environment in excess of Off-Site Dose Assessment limits.

[ ] **NOTE 1** - If effluent release rate reading is available on a KAMAN display, use Section 4.

[ ] **NOTE 2** - For ERP release rate determination using Steam Jet Air Ejector monitor readings, use Section 5.

[ ] **NOTE 3** - For ERP release rate determination using in-containment radiation monitor, use Section 6.

[ ] **NOTE 4** - For ERP release rate determination using Drywell curie content and vent flow rate, use Section 7.

[ ] **NOTE 5** - For liquid release curie content calculations, use Section 8.

4. EFFLUENT RELEASE RATE READING AVAILABLE ON KAMAN DISPLAY

[ ] **NOTE** - The readings on the Kaman monitors will be erroneous if the respective exhaust fans are not running.

[ ] 4.1 Ensure KAMAN display is displaying release rate in units of microcuries per second (μCi/sec). This is Parameter #49.

[ ] 4.2 If KAMAN display is displaying the effluent release rate in μCi/sec, no further action is required in this procedure to perform initial dose assessments. Take KAMAN value and proceed to Procedure 5.7.17.

5. ERP EFFLUENT RELEASE RATE DETERMINATION USING SJAE MONITOR READING (RELEASE PATHWAY THROUGH SJAE)

[ ] 5.1 Determine the time after shutdown (effective age) in hours and record in Column 1 of Attachment 1.

[ ] 5.2 Record the highest SJAE monitor mrem/hr reading in Column 2 of Attachment 1.

[ ] 5.3 Obtain from Chemistry the current SJAE conversion factor (mrem/hr to μCi/sec/cfm) and record in Column 3 of Attachment 1.

[ ] 5.4 Record the combined SJAE flow rate (cfm) in Column 4 of Attachment 1.

[ ] 5.5 Compute noble gases release rate and record in Column 5 of Attachment 1.

(Column 2) x (Column 3) x (Column 4)

[ ] 5.6 No further action is required in this procedure to perform initial dose assessments. Take the value from Column 5 of Attachment 1 and proceed to Procedure 5.7.17.

6. ERP RELEASE RATE DETERMINATION USING PRIMARY CONTAINMENT MONITOR WITH PRIMARY CONTAINMENT INTACT

[ ] **NOTE 1** - Determination of ERP release rates using the primary containment monitors should only be used if the calculation cannot be performed utilizing the ERP noble gas effluent monitor (Kaman) readings in Section 4.

[ ] **NOTE 2** - Only use this section for ERP release rate determination when primary containment is intact and no vent from primary containment is occurring or anticipated.

[ ] **NOTE 3** - Release rate determination per this section assumes an intact primary containment and a nominal primary to secondary leak rate of 10.6 cfm. The curve in Attachment 5 represents a complex calculation of diffusion into and dilution by the reactor building air volume, minus what SBGT is removing, over time.

[ ] 6.1 Determine the effective age in hours and record in Column 1 of Attachment 2.

[ ] 6.2 Determine the highest exposure rate of the high range in-containment radiation monitor in rem/hr and record in Column 2 of Attachment 2. In-containment monitor readouts are located in the Control Room.

[ ] 6.3 Determine the projected DBA-LOCA exposure rate as a function of effective age from Attachment 4 and record this value in Column 3 of Attachment 2.

[ ] **NOTE** - Dividing Column 2 by Column 3 will yield the fraction of the DBA-LOCA which has occurred.

[ ] 6.4 Determine the projected DBA-LOCA noble gas release rate as a function of effective age from Attachment 5 and record this value on Attachment 2, Column 4.

[ ] 6.5 Compute the noble gas release rate and record in Column 6 of Attachment 2.

$$\frac{(\text{Column 2})}{(\text{Column 3})} \times (\text{Column 4}) \times (\text{Column 5})$$

[ ] 6.6 No further action is required in this procedure to perform initial dose assessments. Take the value from Column 6 of Attachment 2 and proceed to Procedure 5.7.17.

7. RELEASE RATE DETERMINATION BASED ON DRYWELL CURIE CONTENT AND VENT FLOW RATE

[ ] **NOTE 1** - This section describes release rate determination using the primary containment radiation monitors to determine the Drywell curie content.

[ ] **NOTE 2** - This section may be used whether a release is in progress or projected and whether the vent (release) rate is controllable or uncontrollable; however, a vent (release) flow rate must be determined whether actual or estimated.

[ ] 7.1 Determine the time after shutdown (effective age) in hours and record in Column 1 of Attachment 3.

[ ] 7.2 Determine the highest exposure rate on the high range in-containment radiation monitors in rem/hr and record in Column 2 of Attachment 3.

[ ] 7.3 Determine the projected DBA-LOCA exposure rate as a function of effective age from Attachment 4 and record in Column 3 of Attachment 3.

[ ] **NOTE** - Dividing Column 2 by Column 3 will determine what fraction of the DBA-LOCA has occurred.

[ ] 7.4 Determine the projected DBA-LOCA noble gas Drywell curie content as a function of effective age from Attachment 6 and record in Column 4 of Attachment 3.

[ ] 7.5 Compute the estimated Drywell noble gas curie content and record in Column 5 of Attachment 3.

$$\frac{(\text{Column 2})}{(\text{Column 3})} \times (\text{Column 4})$$

[ ] 7.6 Compute the noble gas concentration and record in Column 7 of Attachment 3.

$$(\text{Column 5}) \div (\text{Column 6})$$

[ ] 7.7 Determine the venting flow rate in cfm and record in Column 8 of Attachment 3.

[ ] 7.7.1 If venting through the normal paths of PC-MO-1308 and PC-MO-305 for the Torus or PC-MO-1310 and PC-MO-306 for the Drywell, the calculated maximum flow per line is 319 cfm at 65 psid. Exact calculations at other pressures are not available. Based upon this known maximum, make a conservative flow estimate.

[ ] 7.7.2 If venting through the Torus Hard Pipe Vent, the calculated maximum flow is 12,067 cfm at 65 psid (12,002 cfm at 53.8 psid). Exact calculations at other pressures are not available. Based upon these known flow rates, make a conservative flow estimate.

[ ] 7.8 Compute the noble gas release rate and record in Column 10 of Attachment 3.

(Column 7) x (Column 8) x (Column 9)

[ ] 7.9 No further action is required in this procedure to perform initial dose assessments. Take the value from Column 10 of Attachment 3 and proceed to Procedure 5.7.17.

8. LIQUID RELEASE CURIE CONTENT CALCULATION

[ ] **NOTE** - This section must be completed in order to estimate total curies released off-site. Initial values for sample activity calculated by the on-duty Chemistry/Radiological Protection Technician may by validated or revised by responding Chemists as more accurate sample analysis is performed.

[ ] 8.1 Determine the gross activity of liquid being released in µCi/ml and record in Column 1 of Attachment 7.

[ ] 8.1.1 For south condensate storage tank only, a default value of 1.0E-2 µCi/ml may be used if the plant was operating normally prior to the release.

[ ] 8.2 Compute gross activity of liquid in µCi/gal and record in Column 3 of Attachment 7.

(Column 1) x (Column 2)

[ ] 8.3 Determine the volume of the tank in percent prior to release and record in Column 4 of Attachment 7. If the volume of the tank prior to release cannot be determined, assume the tank was full and enter 100%.

[ ] 8.4 Determine the volume of the tank in percent after the release was terminated and record in Column 5 of Attachment 7. If volume of the tank after the release was terminated cannot be determined, assume the tank is empty and enter 0%.

[ ] 8.5 Compute the volume released and record in Column 6 of Attachment 7.

(Column 4) - (Column 5)

[ ] 8.6 Determine the capacity of the tank and record in Column 8 of Attachment 7. Capacities of most tanks potentially containing contaminated liquid are listed in Table 1 of Attachment 7.

[ ] 8.7 Compute the gallons released and record in Column 9 of Attachment 7.

(Column 6) x (Column 7) x (Column 8)

[ ] 8.8 Compute the total release in μCi and record in Column 10 of Attachment 7.

(Column 3) x (Column 9)

[ ] 8.9 Compute the total release in curies and record in Column 12 of Attachment 7.

(Column 10) x (Column 11)

[ ] 8.10 Use the value in Column 12 to complete the Off-Site Notification Form per Procedure 5.7.6.

[ ] 8.11 Activity levels used in Column 1 (μCi/ml), except for the default value for the south condensate storage tank, will also be input to the EFFECTS computer program to calculate downstream concentrations, dose rates, doses, and relationship to Off-Site Dose Assessment Manual release limits. This will be done by Chemistry personnel. The Environmental Affairs group at the Columbus General Office also has methodology programs for calculating exposures for liquid discharges.

9. EMERGENCY SAMPLING FOR RELEASE RATE ACTIVITY

[ ] 9.1 Noble gas, particulate, and iodine release rates may be determined by sample collections from the effluent release path and subsequent analysis of these samples in the Radiochemistry Laboratory (refer to Procedure 8.4.1.2). Approval from the Chemistry/Radiological Protection Coordinator shall be obtained before Procedure 8.4.1.2 may be implemented.

[ ] 9.2 In-containment activities, both liquid and gaseous, may also be obtained to determine release concentration if the release path is from containment (refer to Procedure 8.4.1.1). Approval from the Chemistry/Radiological Protection Coordinator shall be obtained before Procedure 8.4.1.2 may be implemented.

ATTACHMENT 1 RELEASE RATE USING STEAM JET AIR EJECTOR MONITORS

NOTE - Conversion factor (Column 3) will change as fuel degrades. Obtain current conversion factor from Chemistry.

(1) EFFECTIVE AGE (hours)	(2) SJAE MONITOR (mrem/hr)	(3) CONVERSION FACTOR (mrem/hr to μCi/sec/cfm)	(4) COMBINED SJAE FLOW RATE (cfm)	(5) NOBLE GAS RELEASE RATE (μCi/sec) (2) x (3) x (4)

Completed By: ______________________________ Date: __________

NOTE - Use this attachment only if Primary Containment is intact and no vent from Primary Containment is occurring or is anticipated.

(1) EFFECTIVE AGE (hours)	(2) ACTUAL CONTAINMENT EXPOSURE RATE (rem/hr)	(3) PROJECTED DBA-LOCA EXPOSURE RATE AT EFFECTIVE AGE (rem/hr) (from Att. 4)	(4) PROJECTED DBA-LOCA NOBLE GAS RELEASE RATE (Ci/sec) (from Att. 5)	(5) CONVERSION FACTOR (Ci to μCi)	(6) NOBLE GAS RELEASE RATE (μCi/sec) $\frac{(2)}{(3)} \times (4) \times (5)$
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	
				1E6	

Completed By: ______________________________ Date: __________

ATTACHMENT 3 RELEASE RATE DETERMINATION BASED ON DRYWELL CURIE CONTENT AND VENT FLOW RATE

(1) EFFECTIVE AGE (hours)	(2) ACTUAL CONT. EXPOSURE RATE (rem/hr)	(3) PROJECTED DBA-LOCA EXPOSURE RATE AT EFFECTIVE AGE (rem/hr) (from Att. 4)	(4) PROJECTED DBA-LOCA NOBLE GAS CURIE CONTENT (Ci) (from Att. 6)	(5) ESTIMATED DRYWELL NOBLE GAS CURIE CONTENT (Ci) $\frac{(2)}{(3)} \times (4)$	(6) D/W VOLUME (ft^3)	(7) NOBLE GAS CONC. (Ci/ft^3) (5) ÷ (6)	(8) DRYWELL VENTING FLOW RATE (cfm)	(9) CONV. FACTOR (Ci/min to μCi/sec)	(10) NOBLE GAS RELEASE RATE (μCi/sec) (7) x (8) x (9)
					1.45E5			1.67E4	
					1.45E5			1.67E4	
					1.45E5			1.67E4	
					1.45E5			1.67E4	
					1.45E5			1.67E4	
					1.45E5			1.67E4	
					1.45E5			1.67E4	
					1.45E5			1.67E4	
					1.45E5			1.67E4	
					1.45E5			1.67E4	

Completed By: ______________________________ Date: __________

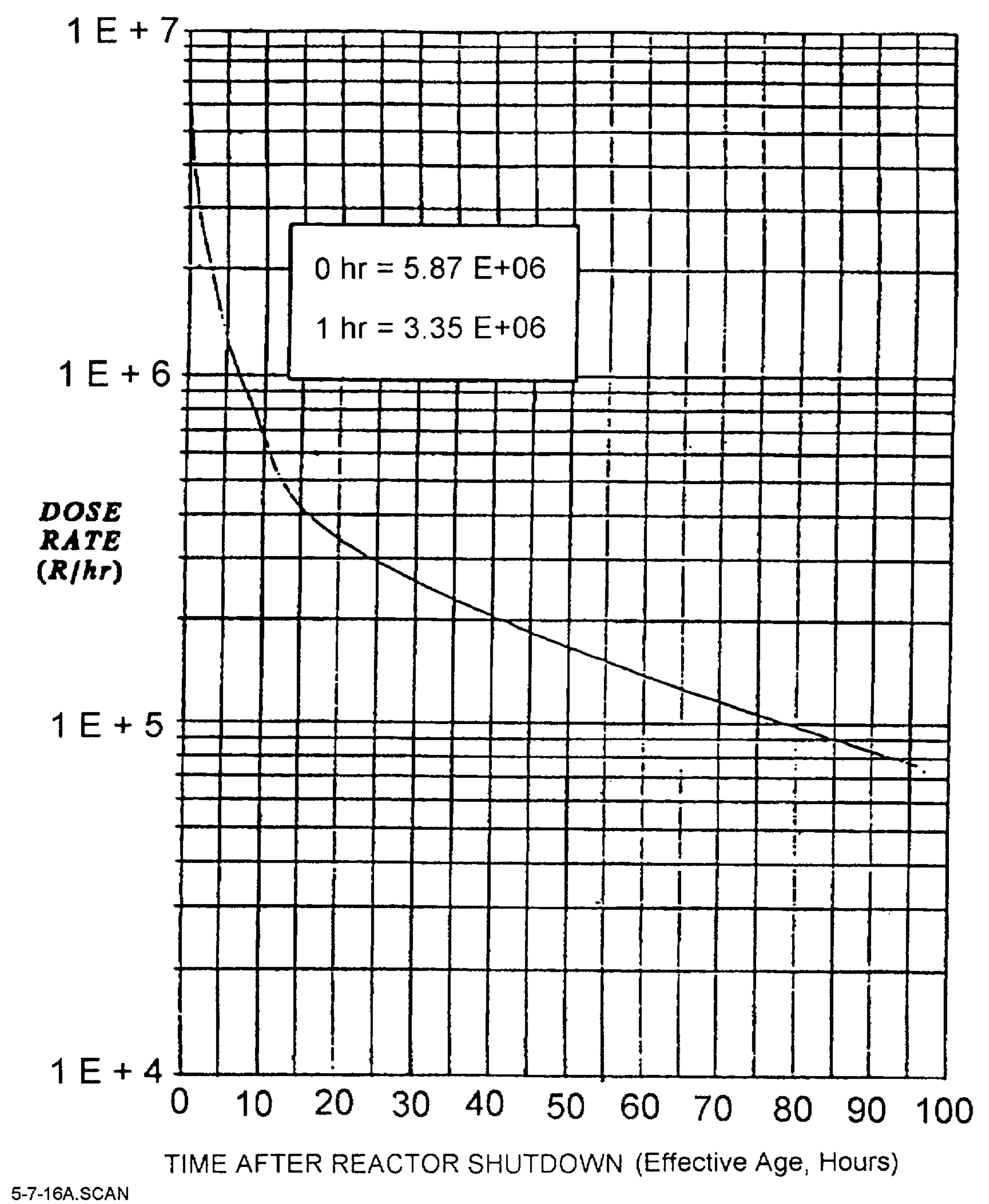

0 hr = 5.87 E+06
1 hr = 3.35 E+06
1 E + 7
1 E + 6
1 E + 5
1 E + 4
DOSE RATE (R/hr)
0
10
20
30
40
50
60
70
80
90
100
TIME AFTER REACTOR SHUTDOWN (Effective Age, Hours)
5-7-16A.SCAN

Figure 1

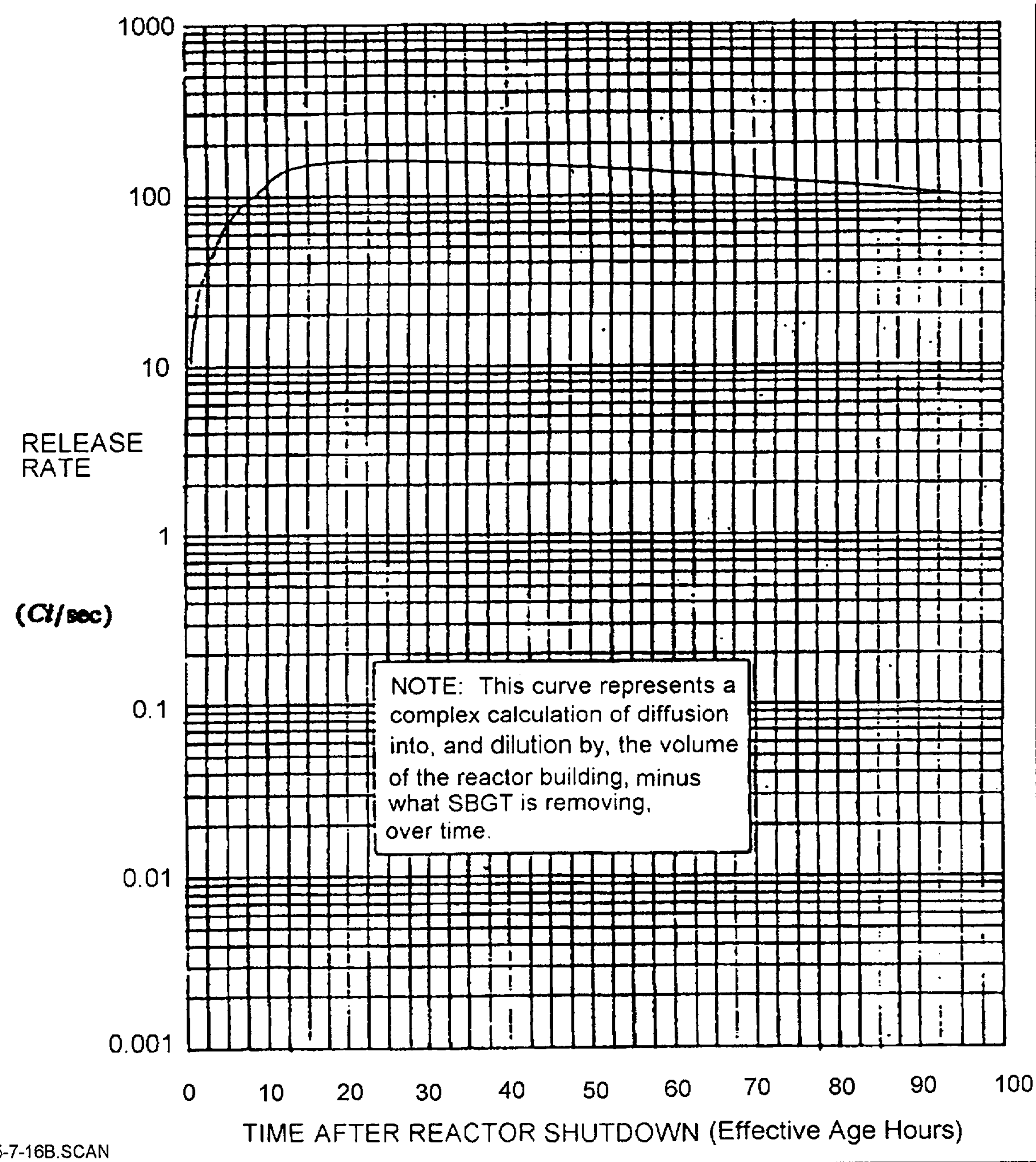

1000
100
10
RELEASE RATE
1
(Ci/sec)
0.1
0.01
0.001
NOTE: This curve represents a complex calculation of diffusion into, and dilution by, the volume of the reactor building, minus what SBGT is removing, over time.
0
10
20
30
40
50
60
70
80
90
100
TIME AFTER REACTOR SHUTDOWN (Effective Age Hours)
5-7-16B.SCAN

Figure 2

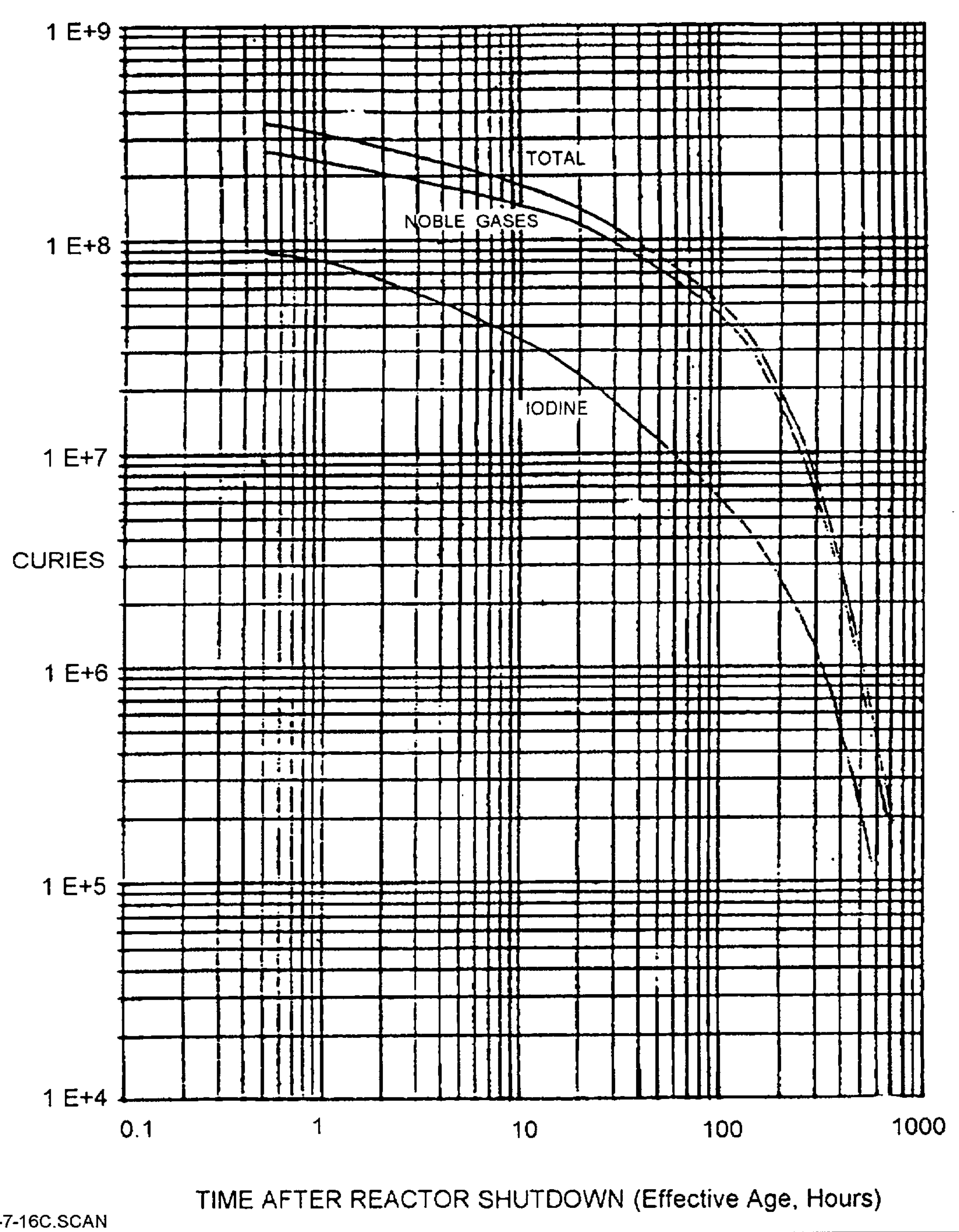

1 E+9
1 E+8
1 E+7
1 E+6
1 E+5
1 E+4
CURIES
TOTAL
NOBLE GASES
IODINE
0.1
1
10
100
1000
TIME AFTER REACTOR SHUTDOWN (Effective Age, Hours)
5-7-16C.SCAN

Figure 3

(1) GROSS ACTIVITY OF LIQUID (µCi/ml)	(2) CONVERSION FACTOR (ml to gal)	(3) GROSS ACTIVITY OF LIQUID (µCi/gal) (1) x (2)	(4) BEGINNING TANK VOLUME (%) (if <u>not</u> known, use 100%)	(5) ENDING TANK VOLUME (%) (if <u>not</u> known, use 0%)	(6) VOLUME RELEASED (%) (4) - (5)
	3785				

(7) CONVERSION FACTOR (% to decimal)	(8) TANK CAPACITY (gal) (see Table 1)	(9) GALLONS RELEASED (gal) (6) x (7) x (8)	(10) TOTAL µCi RELEASED (µCi) (3) x (9)	(11) CONVERSION FACTOR (µCi to Ci)	(12) TOTAL CURIES RELEASED (Ci) (10) x (11)
0.01				1E-6	

Completed By: ____________________ Date: __________

TABLE 1 - CAPACITY OF TANKS (GALLONS) CONTAINING POTENTIALLY CONTAMINATED LIQUIDS

South Condensate Storage Tank	450,000
North Condensate Storage Tank	700,000
Floor Drain Sample Tank	20,000
Waste Sample Tank (each)	22,000
Waste Surge Tank	65,000
Waste Collector Tank	22,000
Floor Drain Collector Tank	20,000
Lab Drain Tank (each)	500
Chemical Waste Tank	5,200

Condensate Backwash Tank	12,500
Condensate Phase Separators (each)	12,500
Waste Sludge Tank	17,000
RWCU Phase Separators (each)	4,500
Spent Resin Tank	2,000
Torus/Suppression Pool	700,000

1. DISCUSSION

1.1 Upon determination of release rates, actual or projected plume exposure doses may be calculated per Procedure 5.7.17. These doses provide a basis for relating plume exposure doses to the EPA Protective Action Guides (PAGs) per Procedure 5.7.20.

1.2 This procedure outlines the steps for determining release rates from the ERP, Reactor Building, Turbine Building, and Radwaste Building using effluent monitoring data. The Kaman monitors are the preferred means to determine airborne radioactive release rates and should be utilized if they can be restored to service.

1.3 This procedure also outlines steps for determining release rates at the ERP if the ERP monitor becomes inoperable by using in-containment radiation monitors or by steam jet air ejector monitor readings, if SJAEs are in the release path. Other sampling procedures for determining release rates are also referenced in this procedure. Section 8 discusses liquid release activity calculation.

2. REFERENCES

2.1 CODES AND STANDARDS

2.1.1 NPPD Emergency Plan for CNS.

2.1.2 NUREG-0654/FEMA-REP-1, Revision 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

2.1.3 NUREG-0737, Clarification of TMI Action Plan Requirements, November 1980.

2.1.4 Environmental Protection Agency EPA 400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, May 1992.

2.2 PROCEDURES

2.2.1 Emergency Plan Implementing Procedure 5.7.6, Notification.

2.2.2 Emergency Plan Implementing Procedure 5.7.17, Dose Assessment.

2.2.3 Emergency Plan Implementing Procedure 5.7.20, Protective Action Recommendation.

2.2.4 Chemistry Procedure 8.4.1.1, Post-Accident Sampling System.

2.2.5 Chemistry Procedure 8.4.1.2, Gaseous Releases Emergency Sampling.

2.3 MISCELLANEOUS

2.3.1 NEDC 90-027, Flow Through 1" Vent Lines from the Drywell and Torus at 65 psi Delta P.

2.3.2 NEDC 92-092, Review of Nutech Calculation of THPV Flow Rate and Vent Pipe Size.

2.3.3 NEDC 92-094, Review of Nutech Calculation of Hard Pipe Vent Pressure/Temperature Profile.

1. PURPOSE

Methods to be used for evaluating long-term environmental consequences and analysis of trends involving key isotopes of radioactive material released from CNS are described in this procedure. Immediate collection and analysis of samples from impacted areas following release shall be conducted per Procedure 5.7.18, Off-Site and Site Boundary Monitoring. Long-term environmental monitoring and trend analyses shall be conducted per procedure. Appropriate protective measures are discussed.

2. PRECAUTIONS AND LIMITATIONS

[ ] 2.1 Use appropriate protective clothing and equipment.

3. REQUIREMENTS

[ ] 3.1 Ensure following equipment and materials are available, as needed:

[ ] 3.1.1 Environmental monitoring equipment, as required.

[ ] 3.2 A radioactive materials release has occurred and it is necessary to monitor the long-term environmental hazards.

4. LONG-TERM ENVIRONMENTAL MONITORING

[ ] 4.1 The NPPD Environmental Division with support from the Radiological Assessment Supervisor shall be responsible for:

[ ] 4.1.1 Ensuring environmental samples of impacted areas are gathered.

[ ] 4.1.2 Sample analysis.

[ ] 4.1.3 Identification of trends involving key isotopes.

[ ] 4.1.4 Calculating actual or potential doses associated with:

[ ] 4.1.4.1 Human intake of key isotopes via the terrestrial food chain.

[ ] 4.1.4.2 Inhalation dose rates.

[ ] 4.1.4.3 External dose rates from ground deposition.

[ ] 4.1.5 Maintenance of records.

[ ] 4.2 Off-site Monitoring Teams are under the direction of the Radiological Assessment Supervisor. Teams may be assigned one or more of the following sampling or computation tasks:

[ ] 4.2.1 Collection and analysis of samples per normal CNS Environmental Sample Program and Procedure 5.7.18.

[ ] 4.2.2 Survey of external dose rate and count 3' and 3" above the ground. This information may be used to determine:

[ ] 4.2.2.1 Whole body dose.

[ ] a. Whole body dose from dose rate measurements can be determined by using the equation:

$$D = (DR) \times \Delta t_{Exp}$$

Where:

D = gamma dose (mr or rem)

(DR) = gamma dose rate (mr/hr or rem/hr)

Δt_{Exp} = exposure time (hr)

[ ] 4.2.2.2 Noble gas airborne activity concentrations.

[ ] a. If the gamma dose rate is known, one can estimate the airborne activity concentration. If the airborne activity concentration is known, one can estimate the gamma dose rate. The following equation is used:

$$(DR) = 0.95 \times 10^6 (E) X$$

Where:

(DR) = gamma dose rate at the location of interest (mr/hr)

E = average gamma decay energy (MeV/dis) for the isotopic mixture in the cloud, Attachment 4

X = noble gas airborne concentration at the location of interest (Ci/m^3 or $\mu Ci/cc$)

0.95×10^6 = dose conversion factor (DCF)

[ ] b. If the noble gas air concentration is known, the integrated exposure at the location of interest may be estimated utilizing the equation:

$$D = 0.95 \times 10^6 (E) \Delta t_{Exp} X$$

Where:

D = total gamma dose at the location of interest (mr)

Δt_{Exp} = duration of exposure to the plume (hr)

0.95×10^6 = DCF

[ ] c. Utilizing Attachment 4, Average Gamma Decay Energy, the above equations may be used for any mixture of gamma emitting isotopes. These equations are based upon a <u>semi-infinite</u> cloud.

[ ] 4.2.2.3 Estimate of the ground deposition.

[ ] a. Knowing the gamma dose rate at 3", the ground deposition can be estimated by utilizing the equation:

GD = Ki (DR)

Where:

GD = ground deposition ($\mu Ci/m^2$)

(DR) = gamma dose rate at 3' above the ground

Ki = conversion factor ($\mu Ci/m^2$)/(mr/hr) for isotope i

[ ] **NOTE** - After the first week use Ki = Cs-137. Since we are dealing with external dose rates, knowledge of the isotopes is often unimportant since the actual dose rate can be measured by the monitoring teams.

Where:

ISOTOPE	Ki ($\mu Ci/m^2$)/(mr/hr)
Te-132	35
I-131	200
Cs-137	130

[ ] 4.3 Determination of thyroid dose due to inhalation and/or consumption of contaminated foods.

[ ] **NOTE** - The half lives of isotopes I-132, I-133, I-134, and I-135 are relatively short; thereby effectively decreasing the X concentration value. If the effective age of the mixture is > 24 hours, the thyroid dose is primarily from I-131.

[ ] 4.3.1 If the airborne I-131 concentration or the gross iodine concentration is known and the duration of the exposure is known, the thyroid dose is readily determined.

[ ] 4.3.1.1 General dose equations for adults.

[ ] a. The inhalation dose equations (for adults) from the various iodine isotopes are given below (for exposure time ≤ 8 hours):

$$D_{131} = (1.9 \times 10^6)\ (X\ 131)\ (\Delta t_{Exp})$$

$$D_{132} = (1.8 \times 10^4)\ (X\ 132)\ (\Delta t_{Exp})$$

$$D_{133} = (3.2 \times 10^5)\ (X\ 133)\ (\Delta t_{Exp})$$

$$D_{134} = (2.1 \times 10^3)\ (X\ 134)\ (\Delta t_{Exp})$$

$$D_{135} = (6.0 \times 10^4)\ (X\ 135)\ (\Delta t_{Exp})$$

Where:

D_i = thyroid dose from isotope i (rem) due to inhalation

X_i = concentration of isotope i (μCi/cc or Ci/m^3)

Δt_{Exp} = exposure (breathing) time (hr)

[ ] 4.3.2 Adult thyroid dose for an unknown isotopic mixture may be estimated using Attachment 3 if the I-131 air concentration is known.

[ ] 4.3.3 Inhalation thyroid dose to children.

[ ] 4.3.3.1 The most critical age is 6 months to 1 year old. The dose at this age from a given exposure is about seven times higher than that calculated for an adult.

[ ] 4.3.4 Determination of thyroid dose from food chains.

[ ] **NOTE** - Both iodine and particulates settle out of a plume and result in ground contamination. They enter the various food chains when either animals or humans eat contaminated food-stuffs. This results in irradiation of all organs, but the thyroid dose from iodine is usually the limiting factor. This section discusses the estimation of thyroid dose from iodine via the various food chains.

[ ] 4.3.4.1 Grass-cow-milk-human chain.

[ ] **NOTE** - This chain represents the limiting case. Once deposition has occurred, the iodine concentration in milk slowly increases until it reaches maximum concentrations 2 days later. The iodine concentration in milk gradually decreases to zero over a 3 week period. If the milk from this source is banned within 2 days, 90% of this dose can be prevented.

[ ] a. The approximate relationship between ground deposition and peak iodine concentration in milk is:

$$\frac{\mu\text{Ci of Iodine}}{\text{Liter of Milk}} = \frac{\mu\text{Ci of Iodine}}{8\ \text{m}^2\ \text{of Pasture}}$$

[ ] **NOTE** - A ground survey will yield gross contamination rather than I-131 contamination. It is recommended that the gross contamination data be assumed to be entirely I-131 for purposes of these calculations.

[ ] b. Specific doses may be calculated in accordance with NRC Regulatory Guide 1.109, March 1976. Doses will be calculated for 7 month old infants (heaviest milk drinkers) assuming milk was consumed exclusively from cows which grazed on the contaminated land.

[ ] 4.3.4.2 Feed-chicken-egg-human chain.

[ ] **NOTE** - Consumption of eggs from chickens which feed on the contaminated ground is another potential dose pathway. Approximately 90% of this dose can be eliminated if the eggs are banned within 5 days.

[ ] a. Doses may be calculated in accordance with NRC Regulatory Guide 1.109.

[ ] 4.3.4.3 Vegetable-human or feed-cow chain.

[ ] a. This path represents another potential dose pathway. The dose from this source may be reduced by 90% if the consumption of contaminated crops is banned within 1 day.

[ ] 4.4 Determination of radiological effects of particulates.

[ ] 4.4.1 Because the particulates vary so widely in their radiological and metabolic characteristics, the exact interpretation of particulate results requires that the isotopes be identified.

[ ] 4.4.2 The only isotopes ingested to any significant degree via the food chain pathways are Sr-89, Sr-90, I-131, I-133, Cs-134, and Cs-137. Estimates of amounts of various types of food actually ingested and doses should be determined in accordance with NRC Regulatory Guide 1.109 or Health Physics Journal, November, 1981, Volume 41 #5, Page 735.

[ ] 4.4.3 Dose calculations should be determined assuming all ingested food is from the contaminated area unless the following data is available:

[ ] 4.4.3.1 Contamination level of particular food-stuff (μCi/gm) determined per Procedure 5.7.18, Off-Site and Site Boundary Monitoring.

[ ] 4.4.3.2 Actual daily intake of particular food-stuffs is known (if unknown, refer to Regulatory Guide 1.109).

[ ] 4.4.3.3 Dose calculation factors for ingestion and inhalation of various isotopes are summarized in Attachments 1 and 2.

TOTAL DOSE CONVERSION FACTORS
(Rem/Ci/INGESTED)

ISOTOPE THYROID	BONE MARROW	LUNG	GI TRACT
C-58 ---------	---------	---------	---------
C-60 ---------	---------	---------	---------
Sr-89 5.81×10^2	5.26×10^3	5.81×10^2	8.53×10^4
Sr-90 3.26×10^3	2.87×10^5	3.74×10^3	8.12×10
Ru-10 ---------	---------	---------	---------
Ru-106 ---------	---------	---------	---------
Te-132 ---------	---------	---------	---------
I-131 1.68×10^6	2.87×10^2	3.56×10^2	1.91×10^3
I-132 ---------	---------	---------	---------
I-133 3.21×10^5	1.48×10^2	1.58×10^2	1.82×10^2
I-135 ---------	---------	---------	---------
Cs-134 7.33×10^4	7.34×10^4	7.31×10^4	9.33×10^4
Cs-137 5.55×10^4	5.61×10^4	5.59×10^4	6.64×10^4
Ba-140 ---------	---------	---------	---------

ISOTOPE	WHOLE BODY DCF[a] (Rem/Ci)		THYROID DCF[a] (Rem/Ci)		LUNG DCF (Rem/Ci)	
	ADULT	INFANT	ADULT	INFANT	ADULT	INFANT
I-131	12.56 + 3	1.40 + 4	1.49 + 6	1.06 + 7	2.67 + 2[b]	1.47 + 3[c]
I-132	---------	---------	1.43 + 4	1.21 + 5	1.61 + 3[b]	8.85 + 3[c]
I-133	5.65 + 2	4.00 + 3	2.69 + 5	2.54 + 6	4.30 + 2[b]	2.36 + 3[c]
I-134	---------	---------	3.73 + 3	3.18 + 4	1.87 + 3[b]	1.03 + 4[c]
I-135	3.21 + 2	1.98 + 3	5.60 + 4	4.97 + 5	1.19 + 3[b]	6.54 + 3[c]
Te-132	2.02 + 1	1.26 + 2	2.37 + 1	1.99 + 2	3.60 + 4[a]	2.43 + 5[a]
Xe-133	2.60 + 1[b]	1.60 + 2[c]	---------	---------	---------	---------
Xe-135	1.93 + 2[b]	1.19 + 3[c]	---------	---------	---------	---------
Kr-88	6.38 + 2[b]	3.94 + 3[c]	---------	---------	1.53 + 3[b]	8.41 + 3[c]
Cs-134	9.10 + 4	5.32 + 4	---------	---------	1.22 + 4[a]	5.69 + 4[a]
Cs-137	5.35 + 4	3.78 + 4	---------	---------	9.40 + 3[a]	5.09 + 4[a]
Ru-106	---------	---------	---------	---------	1.17 + 6[a]	3.94 + 5[a]
Ce-144	---------	---------	---------	---------	9.72 + 5[a]	7.03 + 6[a]

[a] From NRC Regulatory Guide 1.109 unless footnoted by (b).

[b] From D.C. Kocher, dose-rate conversion factors for internal exposure to photon and electron radiation from radionuclides occurring in routine releases from nuclear fuel cycle facilities, in Health Physics Volume 38, Number 4, Page 543, 4/80. The values from D.C. Kocher were divided by the breathing rate (BR) to get the DCF in rem/Ci. The BR = 2.32 x 10^{-4} m^3/Sec.

[c] The DCFs are based on the size and density of the organ in question, on the breathing rate, and on specific isotopic retention factors for that organ. Because retention factor data was not available for infants, the infant DCFs were calculated assuming a ratio of infant to adult DCFs for other isotopes, for the noble gas whole body, and noble gas and iodine lung DCFs. This method is not considered to accurately calculate DCFs.

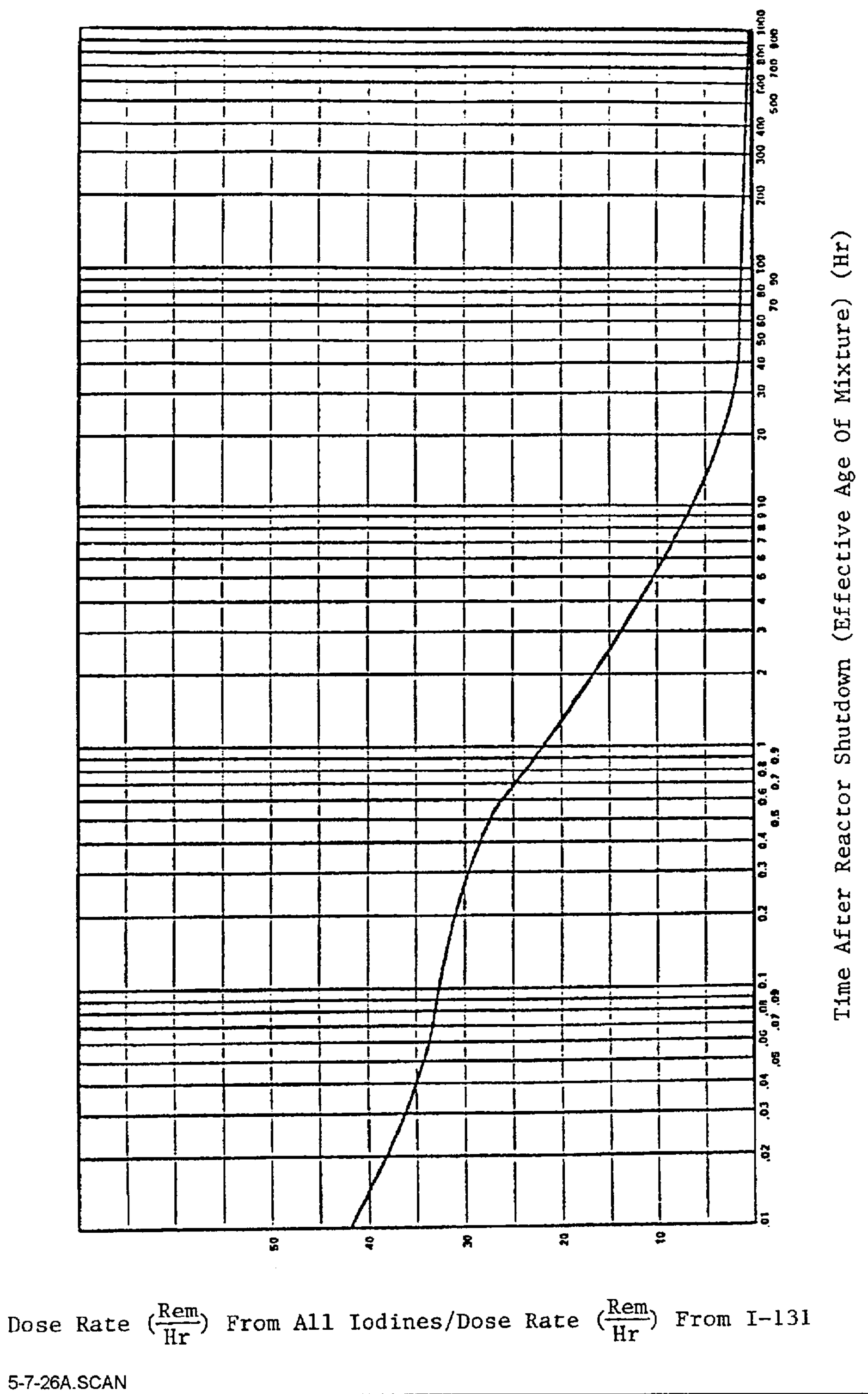
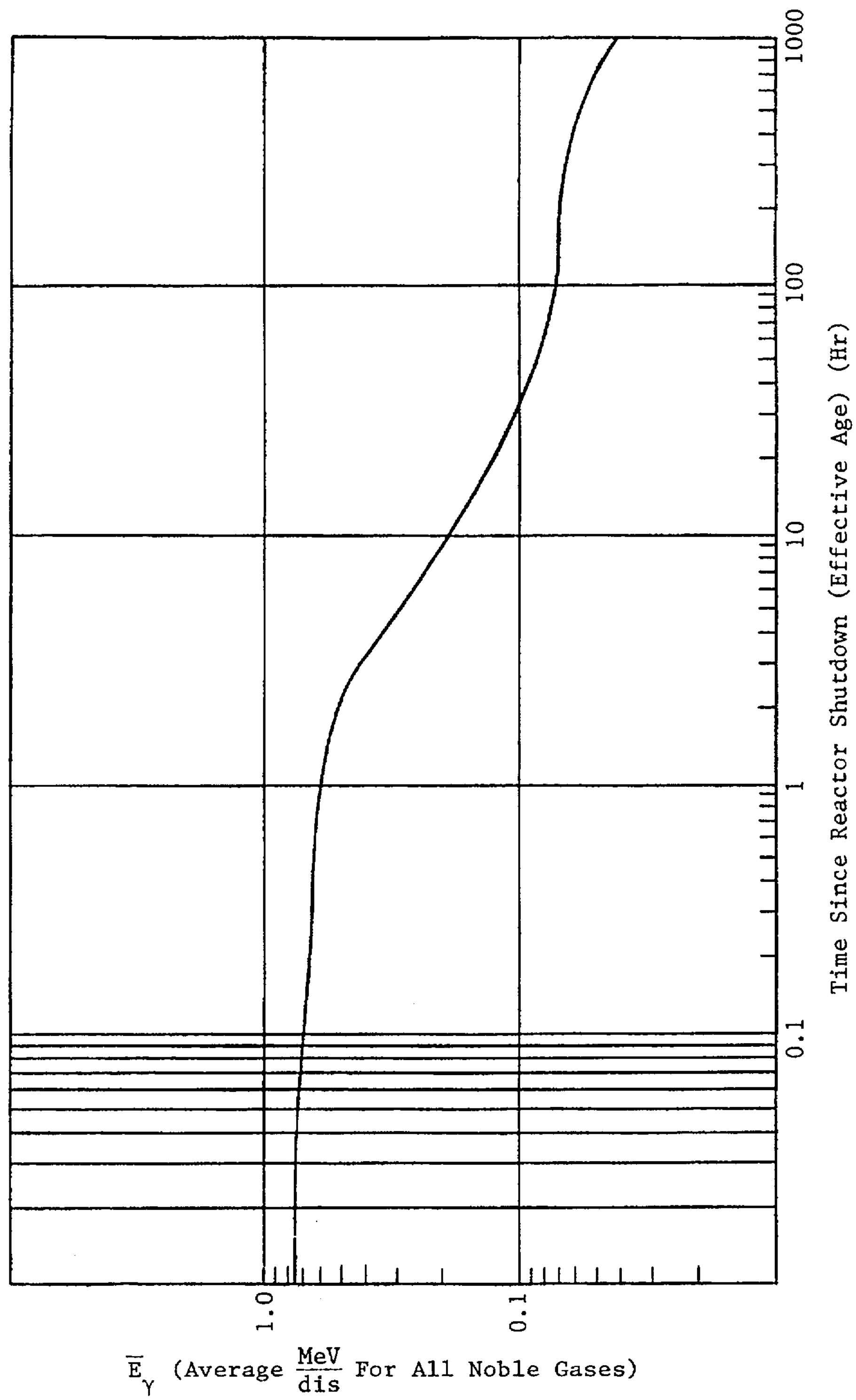

Time After Reactor Shutdown (Effective Age Of Mixture) (Hr)
Dose Rate (Rem/Hr) From All Iodines/Dose Rate (Rem/Hr) From I-131
50
40
30
20
10
5-7-26A.SCAN

Figure 1



5-7-26B.SCAN

Figure 2

1. DISCUSSION

   1.1 Formulations are developed for computing actual or potential doses associated with human intake of key isotopes via the terrestrial food chain, inhalation dose rates, and external dose rates from ground deposition. Protective actions to limit doses associated with each pathway are discussed.

2. REFERENCES

   2.1 NPPD Emergency Plan for CNS.

   2.2 NUREG 0654, Revision 1.

   2.3 NRC Regulatory Guide 1.109.

   2.4 Dose Rate Conversion Factors, D.C. Kocher, Health Physics Volume 38, Number 4, Page 543.

   2.5 ICRP 59, Working Breathing Rate.

   2.6 CNS Environmental Sampling Program.