50-331

TRANSMITTAL/ACKNOWLEDGEMENT MEMORANDUM

NOTIFICATION NO: 127
DATE: October 10, 2001

TO: NRC-NRR/Document Control Desk, Washington DC

SUBJECT: Emergency Plan Implementing Procedures (--- Series) Manual No: 91 *

Revisions to your controlled copy of the manual, as checked above, are attached. As indicated below, please remove and discard the superseded material and insert the revised material, or perform the changes as directed herein.

		REMOVE		INSERT	
MANUAL CONTENTS		REV	DATE	REV	DATE
EPIP Index		122	9/12/01	123	10/10/01
EPIP 2.5	15770	13	9/30/98	14	10/15/01
EPIP 2.6	16064	7	9/12/01	8	10/15/01
EPIP 2.7	15750	5	2/19/96	6	10/15/01
EPIP 3.1	15948	10	1/1/94	11	10/15/01
EPIP 3.2	15952	11	3/3/98	12	10/15/01
EPIP 3.3	13597	16	11/19/99	17	10/15/01
EPIP 4.2	15971	5	5/3/93	6	10/15/01
EPIP 4.3	16062	9	6/16/99	10	10/15/01
EPIP 4.5	16099	5	9/5/97	6	10/15/01
EPIP 5.2	16103	8	9/30/98	9	10/15/01

Verify the procedures listed in this distribution, or associated attachments or checklists, are not currently being performed. If any of these items are currently being performed, the verification signature below acknowledges that a controlled transition from the old revision to the new revision shall be made in accordance with Section 3.4 of ACP 101.01, "Procedure Use and Adherence."

_____ **(Verification)** _____ **(Date)**

(Can be N/A'd if revisions are being inserted into a reference manual)

Please acknowledge that the above action has been taken by signing below and returning this memorandum to:

Duane Arnold Energy Center
Procedure Department
3277 DAEC Road
Palo, IA 52324

I have inserted the above revisions in the Manual.

_____ Signed _____ Date

A045

NG-013X Rev 10

EFFECTIVE DATE: 10/10/2001

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EMERGENCY PLAN IMPLEMENTING PROCEDURE	EPIP 2.5
CONTROL ROOM EMERGENCY RESPONSE OPERATION	Rev. 14 Page 1 of 16

Effective Date: 10/15/2001

TECHNICAL REVIEW

Prepared by: _____ Date: 9-20-2001

Reviewed by: _____ Date: 9-20-2001
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: Kevin Williams for Date: 9/20/01
Manager, Emergency Planning

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1.0 PURPOSE

(1) This procedure provides guidance associated with implementing emergency preparedness requirements in the Control Room upon determining that the plant is in an unexpected operational condition.

2.0 DEFINITIONS

None

3.0 INSTRUCTIONS

3.1 EVENT CLASSIFICATION

(1) Upon determining that the plant is in an unexpected operational condition, the Operations Shift Manager/Operations Shift Supervisor (OSM/OSS) shall evaluate plant conditions using guidance contained in EPIP 1.1, "Determination of the Emergency Action Level," and, as warranted, classify the event in one of the four emergency categories.

(a) Contact should be made with the Operations Manager for clarification, as may be warranted.

(b) Additionally, Technical Support staff personnel may be contacted for advice regarding event classification and/or reporting requirements.

(2) If classified as an emergency, the OSM/OSS shall initiate notification.

(a) The OSM/OSS shall function additionally as the Emergency Coordinator and Site Radiation Protection Coordinator until relieved of such function by appropriately qualified personnel.

(3) Form CR-01 , 'OSM/OSS Checklist' should be used to ensure that all required actions are complete

(4) Form CR-04, 'Control Room to TSC Command and Control Transfer Checklist' should be used to ensure that event status is effectively transferred to the TSC.

3.2 NOTIFICATION

(1) Notification of DAEC, Corporate and offsite agency personnel, including the NRC, shall be accomplished, as specified in EPIP 1.2, "Notification."

(2) As part of the initial notification message to offsite authorities, the OSM/OSS is required to recommend protective actions for the health and safety of the public, if so warranted.

(3) An evaluation of projected offsite doses and development of associated protective action recommendations should be accomplished using EPIP 3.3, "Dose Assessment & Protective Action Recommendations."

(4) If no radiological release is occurring, Protective Action Recommendations (PAR'S), based upon plant conditions, should be made for events classified as SITE AREA or GENERAL EMERGENCY.

(5) At Emergency Classification declarations of Alert or greater, the on-shift Chemist will run MIDAS. Projected offsite doses shall be communicated to the OSM/OSS until the TSC is activated.

3.3 PLANT EVACUATION AND RESPONSE CENTER STAFFING

(1) For all events classified as an ALERT or greater, plant assembly and site evacuation (as appropriate) shall be conducted as prescribed in EPIP 1.3, "Plant Assembly and Site Evacuation."

(2) Upon annunciation of the Evacuation Alarm, all Operations Department personnel on-site should report to the Control Room, whether or not assigned on-shift duties.

(3) Should the Control Room require evacuation, personnel will report to the Remote Shutdown Panel.

(4) The Shift Technical Advisor (STA) should report to the Control Room, if not already present, to assist in the evaluation of plant conditions and to provide assistance, as requested by the OSM/OSS.

(5) Additional emergency personnel designated to report to the Control Room for communications and status reporting functions are guided by the following Checklists:

(a) CR to TSC transfer of Command & Control; refer to Form CR-04, Control Room to TSC Command and Control Transfer Checklist"."

(b) CR-TSC Communicator; refer to Form TSC-10, "TSC Communicator Checklist."

(c) TSC NRC ENS Communicator; refer to Form TSC-12, "NRC ENS Communicator Checklist."

(d) Back Panel Communicator; refer to Form CR-02, "Back Panel Communicator Checklist."

(6) The OSM/OSS may direct that additional Operations Department personnel be contacted for operating, monitoring, and communications functions.

(7) The NRC Resident Inspector is expected to report to the Control Room to independently evaluate plant status and response actions underway and to ensure that NRC Emergency centers in Rockville, MD, and at Region III in Lisle, IL, are kept fully informed of the situation.

(8) The OSM/OSS shall ensure that an accountability check is made for all emergency response personnel assigned to the Control Room and all operations personnel on-shift, this information shall be forwarded to Security.

3.4 COMMUNICATIONS AND STATUS MONITORING

(1) ERO Personnel assigned to the Control Room should inform the OSM/OSS of their assigned position upon arrival in the Control Room.

(2) Following initial activation, the OSM/OSS should ensure that the required communications and data recording/transmission functions are being executed satisfactorily, reassigning personnel, and/or appointing others, if necessary.

(3) Status information being reported, its frequency and report format may be modified at the discretion of the OSM/OSS, TSC Operations Supervisor and/or the Technical and Engineering Supervisor.

(a) Information to be reported should be based on the type of event, plant conditions deemed to be pertinent and the event phase.

(b) The report form on the VAX can be modified, adding or deleting information entries as is appropriate.

(c) The CR-TSC Communicator should use the Electronic Status Board to document information such as:

1. Summary of crew briefings
2. Summary of plant status
3. Main Steam Radiation Monitor readings
4. Summary of events taking place in the Control Room

(4) The dedicated telephone circuit between the Control Room and the TSC should be used by the CR-TSC Communicator under the direction of the OSM/OSS and the TSC Operations Supervisor for the following purposes:

(a) Provide amplifying information regarding plant status and clarify information indicated on the Plant Status Report.

(b) Provide immediate updates to the TSC regarding changing conditions and new information.

(c) Identify problems that are encountered and discuss actions which can be taken for their resolution.

(d) Discuss operational evolutions and repair activities which are planned and report status during execution.

(e) Serve as a means for the OSM/OSS to talk directly to the TSC Operations Supervisor and Emergency Coordinator.

(5) The ENS circuit shall be used to initially notify the NRC of emergency conditions.

(a) The NRC shall be notified as soon as possible after notification of the appropriate State and local agencies and no later than one hour after declaration of the Emergency Classification is made, as prescribed in 10 CFR 50.72.

(b) If an event is classified as an ALERT or greater, at the request of the NRC, the ENS circuit shall remain open and shall be staffed. Upon activation of the TSC, an ENS Communicator will be assigned to enable continuous communications with the NRC.

(c) Normally, the NRC Operations Center in Rockville, MD, will establish a communications link via the ENS to NRC Region III Offices in Lisle, IL, so that the DAEC, Region III and Headquarters are able to communicate simultaneously.

(d) The DAEC EDS link to the NRC ERDS should be initiated as soon as possible following the declaration of an ALERT or higher emergency classification, not to exceed one hour from the time of the declaration.

3.5 RADIOLOGICAL AND METEROLOGICAL INFORMATION

(1) Radiological and meteorological information shall be provided to the Rad Support Staff person in the TSC through a direct-ring (Black) telephone located on Panel 1C22 by the Back Panel Communicator.

(a) When the Plant Process Computer is operational, radiological and meteorological information is available to the TSC via SPDS and the VAX, the exception is the Main Steamline Radiation Monitors. The Back Panel Communicator shall provide this information to the CR-TSC Communicator and to the Rad Support Staff in the TSC on a periodic basis.

(2) Status information to be provided as input into dose projection calculations (if necessary) includes meteorological information, effluent monitor readings and process system flows.

(3) Effluent monitor information and process flows should be obtained from the Kaman System console located in the Control Room.

(4) Instructions for operation of the KAMAN System console are included in OI-879.

(5) Information may also be obtained from the console located in the Radiochemistry Laboratory.

(6) Meteorological information to be provided includes wind speed (in miles per hour), wind direction (the direction from which the wind is blowing, in degrees) and ΔT (the difference in temperature between sensors located at 156 and 33 feet) and degrees F.

(7) Delta T (ΔT) can be either negative or positive and should be determined by reading point 2 on the outside air temperature recorder on Panel 1C22 or by subtracting the indicated temperature at the 33 ft. level from the indicated temperature at the 156 ft. level, pts. 3 and 1 on the outside air temperature recorder on Panel 1C22.

(8) As an alternate, wind speed and wind direction can be obtained by selecting SPMET1. ΔT can be obtained by selecting SPMET2 on the SPDS terminal.

(9) Meteorological information and weather forecasts may also be obtained from the NWS Forecasting Station using the telephone number provided in the Emergency Telephone Book.

(10) The Back Panel Communicator should obtain an initial set of readings identified on Form CR-03, "Dose Projection and ARM Data Sheet," upon arriving at the Control Room and report them to the Rad Support Staff person in the TSC.

(11) The radiological and meteorological parameters should be monitored and reported at a frequency specified by the TSC.

(12) Additionally, when changes are detected and/or trends become apparent, the Site Radiation Protection Coordinator and TSC Operations Supervisor should be advised.

3.6 TRENDING

(1) Trending of important plant parameters will be accomplished as directed by the OSM/OSS in conjunction with the TSC Operations Supervisor.

(2) Parameters to be considered for trending include, but should not be limited to:

(a) Nuclear instrumentation; e.g., if shutdown has not been achieved.

(b) Reactor vessel water level and pressure.

(c) Containment pressure and temperature.

(d) Torus water level and temperature.

(e) ARM and Containment High Range Radiation Monitor levels.

(f) Radiological effluent concentrations.

(3) Recorders installed in the Control Room should be used to the maximum extent possible. To enable more accurate trending, the recorder may be placed on high speed.

(4) Additional plant parameters will be trended, as appropriate, based upon the event and plant condition as identified by the OSM/OSS or TSC Operations Supervisor.

3.7 EMERGENCY RESPONSE ACTIVITIES

(1) The OSM/OSS shall ensure that the TSC is kept informed of plant status and problems which are discovered.

(2) The OSM/OSS should review problems and corrective action options with the TSC and provide input regarding options to be pursued, actions to be taken, and so forth.

(3) The OSM/OSS shall also ensure that NRC personnel in the Control Room are kept apprised of plant status, problems, corrective action options being pursued and response actions underway.

(4) Control Room response actions and strategies to terminate the transient and mitigate the consequences of the event, should be reviewed with the TSC Operations Supervisor.

(5) In responding to off-normal conditions and restoring the plant to an acceptable operating mode, procedural requirements should be followed to the extent that plant conditions are consistent with the procedural basis.

(6) In those cases where adherence to procedural requirements cannot be maintained, the TSC Operations Supervisor should be informed.

(7) The normal administration practice governing temporary changes to procedures should be implemented unless such practices have been waived by the Emergency Response and Recovery Director.

(8) If time does not permit, response actions should be initiated to terminate the transient and mitigate the consequences of an accident, irrespective of procedural requirements.

(9) In such cases, actions taken should be logged in the Control Room Log.

(10) Adherence to Technical Specification requirements should be maintained. As specified in 10 CFR 50.54(x), deviations from Technical Specification requirements are permissible, during an emergency, to protect the health and safety of the public.

(11) As noted in EPIP 1.2, "Notification," the NRC shall be notified, in accordance with 10 CFR 50.72, of emergency circumstances requiring such protective action before such action is taken, time permitting.

(12) The TSC Operations Supervisor, with the assistance of the OSM/OSS, should recommend reclassification of the event to the Emergency Coordinator based upon plant status and projected conditions indicated by parameter trends, system operating configurations and system/equipment limitations which are being approached.

3.8 TSC/OSC NOT OPERATIONAL

(1) If the TSC and OSC are not operational and no abnormal radiological conditions are present:

(a) Operators are briefed utilizing Attachment 2, "In-Plant Operator Briefing Form" on associated precautions and pertinent operational information prior to being dispatched to plant locations where local response actions are required.

(b) Health Physics Technicians are informed of the operator actions and are requested to provide additional assistance at that time as is necessary.

(c) Personnel closely monitor in-plant and effluent radiation levels for trends and changes.

(d) All operators dispatched should exit through Access Control.

(2) If suspected abnormal radiological conditions exist, dispatch of Operations personnel will be at the discretion of the OSM/OSS provided:

(a) Operators should be briefed on associated precautions and pertinent operational information utilizing Attachment 2, "In-Plant Operator Briefing Form", to include:

(b) Expected radiological conditions

(c) Associated precautions

(d) Stay times

(e) Access routes

(f) Increased exposure limits

(g) Estimates of total exposure

(h) Personnel dispatched should don protective clothing, dosimetry, respiratory equipment as necessary, and obtain a high range survey instrument.

(i) Health Physics is informed of the operator actions and provide assistance as necessary.

(j) Personnel closely monitor in-plant and effluent radiation levels (trends/changes).

(k) All personnel dispatched should exit through Access Control.

3.9 TSC/OSC OPERATIONAL

(1) If no abnormal radiological conditions are present, operators may be dispatched directly into the plant providing:

(a) The OSC Supervisor and TSC Operations Supervisor are advised in advance, or the plant operators check in with the OSC Supervisor prior to plant entry.

(2) Operators that are dispatched into the plant should enter the plant via Access Control unless otherwise authorized by the Emergency Coordinator.

(3) If suspected abnormal radiological conditions exist the Emergency Coordinator must approve the dispatch of all personnel into the plant.

(4) Plant Operators must check in with the OSC Supervisor prior to engaging In-plant Operators to perform tasks. The OSC Supervisor shall ensure that Operators are briefed on expected radiological conditions, associated precautions, increased exposure limits, stay times and access routes, and adequate protective clothing, dosimetry, and respiratory protection equipment is donned before each entry.

(5) Personnel dispatched into the plant shall establish communications with the Control Room and the OSC by methods described by the OSC Supervisor.

(6) The OSM/OSS should consult with the TSC to ensure that Control Room personnel are aware of the dispatch of any personnel on site, such as rescue and repair activities, on-site monitoring, etc.

(7) As plant status changes, and/or problems are discovered, the OSM/OSS shall ensure that the TSC is advised.

(8) If conditions may potentially affect personnel already dispatched, the OSM/OSS should advise the TSC of the potential problems and that they are recalling any Operators currently in the plant.

(9) During such time when personnel have been dispatched into the plant, OSM/OSS shall verify that the Back Panel Communicator closely monitors the appropriate in-plant and effluent radiation monitor levels and apprises both him and the Site Radiation Protection Coordinator of any changes or trends.

(10) Where response actions may extend over a protracted period of time or when additional Operations personnel are required to adequately conduct response and recovery activities, the TSC Operations Supervisor shall make provisions for continuous coverage by realigning personnel shift assignments and shift schedules.

(11) In restoring the plant to a safe, stable configuration during an event where core degradation has occurred or where significant quantities of radioactive material have been released or are available for release (transport) from the Reactor Coolant System, consideration should be given to minimizing the spread of radioactive contamination to other areas of the plant and containing the radiological hazard to as few systems and as small an area as possible.

(a) The OSM/OSS should consult with the TSC and verify that TSC staff personnel, under the direction of the Technical and Engineering Supervisor, evaluate options available to aid in this effort.

(12) No action should be taken to operate a system in a manner which could jeopardize the health and safety of the public.

(13) The OSM/OSS shall evaluate plant status, key parameters and the ability to maintain the plant in a stable, safe condition and advise the TSC of their readiness to deactivate emergency response personnel in the Control Room. Deactivation and restoration of the plant to an operating condition following a significant event shall be accomplished in accordance with a recovery plan, developed as specified in EPIP 5.2, "Recovery and Reentry."

4.0 RECORDS

(1) All logs forms and records generated must be forwarded to the EP Department and retained in accordance with QA Record Retention requirements. Authorization for disposal shall be obtained from the NRC.

5.0 REFERENCES

(1) DAEC Emergency Plan

(2) NUREG 0654, Rev. 1

(3) 10CFR50.54

(4) NRC Region III Emergency Response Plan and Implementing Procedures

(5) NRC Administrative Letter 94-04: Change of the NRC Operations Center Commercial Telephone and Facsimile numbers.

6.0 ATTACHMENTS

(1) Attachment 1 - Control Room Forms

(2) Attachment 2 - In-Plant Operator Briefing Form

ATTACHMENT 1

CONTROL ROOM FORMS

Control Room Forms	Form No.
OSM/OSS Checklist	CR-01
Back Panel Communicator Checklist	CR-02
Dose Projection & ARM Data Sheet	CR-03
Control Room to TSC Command and Control Transfer Checklist	CR-04

ATTACHMENT 2

In-Plant Operator Briefing Form

Dispatch of In-Plant Operators During Emergency Responses
With the TSC/OSC NOT Operational

No Abnormal Radiological Conditions Present:

- ☐ Operators may be dispatched to plant locations were local response actions is required.
- ☐ Emergency Coordinator informed during his Control Room briefing utilizing Form CR-04, 'Control Room to TSC Command and Control Transfer Checklist'.
- ☐ Operators briefed on associated precautions and pertinent operational information.
- ☐ Health Physics Technician informed of the operator actions and ask for any assistance as necessary.
- ☐ Personnel closely monitor in-plant and effluent radiation levels (trends/changes).
- ☐ All Operators dispatched should exit through Access Control.

IF Suspected Abnormal Radiological Conditions Exist:

Dispatch of Operations Personnel is at the discretion of the OSM/OSS provided:

- ☐ Emergency Coordinator informed during his Control Room briefing utilizing Form CR-04, 'Control Room to TSC Command and Control Transfer Checklist'.
- ☐ Operators briefed on associated event precautions listed below:

1. Expected Radiological Conditions: _____
2. Stay Times: _____
3. Access Routes: _____
4. Associated Precautions: _____
5. Increased Exposure Limits: _____
6. Estimate of Total Exposure: _____

- ☐ Personnel dispatched should don protective clothing, dosimetry, respiratory equipment as necessary, and obtain a high range survey instrument.
- ☐ Health Physics Technician informed of the operator actions and instruct him to provide assistance as necessary.
- ☐ Personnel closely monitor in-plant and effluent radiation levels (trends/changes).
- ☐ All personnel dispatched should exit through Access Control.

EMERGENCY PLAN IMPLEMENTING PROCEDURES	EPIP 2.6
ACTIVATION AND OPERATION OF THE DAEC OFFSITE RADIOLOGICAL AND ANALYTICAL LABORATORY	Rev. 8 Page 1 of 17

Effective Date: 10/15/2001

TECHNICAL REVIEW

Prepared by: Russell H. Titus Date: 10/01/01

Reviewed by: Richard C. Thum Date: 10/03/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: Kim Williams for Date: 10/4/01
Manager, Emergency Planning

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ATTACHMENT 1, ENTRANCE/EXIT INSTRUCTIONS FOR ORAL . 17

1.0 PURPOSE

(1) This procedure provides instructions for activation and operation of the Offsite Radiological and Analytical Laboratory (ORAL) located at 1017 12th Avenue S.W. in Cedar Rapids. The ORAL is intended to be utilized to radiologically analyze air filters and iodine cartridges, and environmental type samples (e.g. water, and soil) in the event of an emergency at DAEC.

2.0 DEFINITIONS

None

3.0 INSTRUCTIONS

3.1 RESPONSIBILITIES

3.1.1 SITE RADIATION PROTECTION COORDINATOR

(1) Determine the potential need for processing samples at the ORAL.

(2) Recommend activation of the ORAL.

3.1.2 EMERGENCY COORDINATOR

(1) Authorize activation of the ORAL.

3.1.3 ORAL/ODEF SUPERVISOR

(1) Verify that actions required to physically place the ORAL in operation are accomplished.

(2) Coordinate and supervise support activities provided by personnel at the ORAL.

3.1.4 RADIOLOGICAL ASSESSMENT COORDINATOR

(1) The Radiological Assessment Coordinator will assume responsibility for the ORAL after the EOF is declared operational.

3.2 ACTIVATION

3.2.1 NOTIFICATION OF ORAL PERSONNEL

(1) The Site Radiation Protection Coordinator upon determining the potential need for processing samples at the ORAL should take the following actions:

(a) Recommend activation of the ORAL to the Emergency Coordinator.

> **NOTE**
>
> The ORAL shall be activated for a SITE or GENERAL EMERGENCY, but may be activated for events of lower classification, at the discretion of the Emergency Coordinator.

(b) Subsequent to receiving authorization from the Emergency Coordinator, contact the HP Supervisor and advise him/her of the impending activation of the ORAL and to notify the ORAL/ODEF Supervisor and OSC Supervisor.

(c) Request the HP Supervisor to contact the ORAL/ODEF Supervisor to staff the ORAL.

3.2.2 ACCESS TO ORAL

(1) The ORAL is located on the second floor of the IE Systems Protection Warehouse located at 1017 12th Avenue S.W. (Reference EPIP Form ODEF-03))

(2) Entry to the Offsite Radiological and Analytical Laboratory should only be made from the exterior entryway on the 12th Avenue side of the building (see Attachment 1, "Entrance/Exit Instructions for ORAL").

> **NOTE**
>
> The keys for the ORAL/ODEF are maintained at the Security Control Point (SCP), Chemistry Department, and in the Access Control office.

(3) All personnel delivering samples to the ORAL should ring the doorbell to obtain access. The samples should be delivered to the Sample Receipt and Preparation Laboratory.

> **NOTE**
>
> All samples shall be received by an HP or Chemistry Technician only.

(4) Personnel should not take any samples directly into the Counting Room.

3.2.3 SETUP OF THE ORAL

(1) The ORAL Facility Supervisor will make necessary arrangements to have all laboratory counting equipment made operational as soon as possible.

(2) Existing commercial telephone communications between the ORAL and the DAEC and EOF will be verified.

NOTE

The use of portable radio communication equipment (e.g., walkie-talkies) will not be permitted within the ORAL since such radiowave frequencies will interfere with the proper operation of the Radiation Detection systems.

(3) The doorbell should be tested for operability. If it is not working, ensure the Offsite Teams are aware of this by contacting the EOF or OSC and having them inform the Offsite Teams.

(4) The Offsite Decontamination Facility (ODEF) Health Physics Technicians will verify the operability of all portable radiation survey meters in use at the ORAL.

(5) The ODEF Health Physics Technician will prepare a "Contaminated Area" within the Sample Receipt and Preparation Laboratory such that there is access from the hallway leading into the facility to the Counting Room, refer to Attachment 3 for area set up location.

3.2.4 NOTIFICATION OF ORAL OPERABILITY

(1) The ORAL/ODEF Facility Supervisor should notify the HP Supervisor at the DAEC and the Radiological Assessment Coordinator at the EOF when the ORAL is staffed and the laboratory and counting room equipment is operational. Denote this on the Electronic Status Board.

3.3 ORAL OPERATING PROCEDURES

3.3.1 RECEIPT OF SAMPLES

NOTE

The sample runner should at all times avoid handling samples and should maintain good ALARA practices through the use of shielding including distance from the samples and limiting the amount of time in the sample area.

(1) In accordance with EPIP 3.2, "Field Radiological Monitoring," personnel collecting samples are responsible for assuring that each sample is packaged in a plastic bag and sealed to prevent potential spread of radioactive contamination.

(2) Also, in accordance with EPIP 3.2, personnel collecting samples are responsible for properly identifying each sample; to include the following information:

(a) Sample description

(b) Sample collection location

(c) Date and time of sampling

(d) Beta/Gamma radiation level at contact with sample container.

(3) All samples shall be received by an HP or Chemistry Technician only.

(4) In the case of milk samples, if spoilage could become a problem, add approximately 40 grams of sodium bisulfate to each gallon of milk.

3.3.2 SAMPLE PREPARATION

(1) The following actions should be taken by the ORAL Chemistry Technician:

(a) All sample identification information should be recorded on the appropriate form, in accordance with the requirements of PASAP 8.20 ("Offsite Lab and Decontamination Facility (ORAL/ODEF)").

(b) All sample preparation or aliquoting for counting should be completed in the chemical fume hood.

(c) Each sample prepared for counting should be repackaged in a "clean" plastic bag. Care must be taken to mark the sample's DATA ID number on the new plastic bag.

(2) As necessary, the chemical preparation of a sample will be completed using standard chemistry procedures as described in the DAEC Plant Chemistry Procedures.

(3) All samples prepared for counting should temporarily be stored in the shielded storage cabinet located in the Sample Receipt and Preparation Laboratory. Samples prepared for counting should not be stored in the Counting Room.

3.4 SAMPLE ANALYSIS

(1) The ORAL Chemistry Technician should complete sample analysis as described in the following instructions:

(a) PASAP 8.10, "Alpha/Beta Analysis of Samples Using the Tennelec LB 1000 at the ORAL".

(b) PASAP 8.13, "Gamma Isotopic at the ORAL"

(2) If it is desirable to save a sample for any reason, such samples should be marked "SAVE," and should be placed inside the shielded storage cabinet located in the Sample Receipt and Preparation Laboratory.

(3) After a sample has been counted and all results have been determined to be satisfactory, the sample should be marked for "DISPOSAL," and then the sample should immediately be returned to the Sample Receipt and Preparation Laboratory for disposal. Samples should not be stored or kept in the Counting Room. Disposal of any sample should not be completed unless authorized by the ORAL/ODEF Facility Supervisor.

(4) After a solid sample (e.g., air filter, swipe, iodine cartridge, etc.) has been counted and satisfactory results have been obtained, the solid sample may be placed in the approved waste container located in the Sample Receipt and Preparation Laboratory for disposal.

(5) All liquid samples may be disposed of by pouring the liquid into the chemical fume hood drain which is connected directly to a high integrity polyethylene storage bottle. Under no circumstances should any liquids be put into the solid waste container.

(a) An HP must periodically survey waste container to ensure dose is maintained ALARA.

3.5 DOCUMENTATION OF RESULTS:

(1) All counting data and sample analysis results should be recorded on the appropriate form, in accordance with the requirements of PASAP 8.20 ("Offsite Lab and Decontamination Facility (ORAL/ODEF)"). In addition, the printout for each sample analysis should be kept on file in the ORAL.

(2) All sample results will be verbally communicated to the Radiological Assessment Coordinator at the EOF, or as necessary, to the Site Radiation Protection Coordinator or HP Supervisor at the DAEC, as soon as possible.

3.6 LIQUID WASTE TRANSFER

(1) Liquid radioactive waste will be generated as liquid samples or from the preparation of samples for counting in the ORAL. Such radioactive liquid waste should be discarded only in the chemical fume hood drain. This drain is connected directly to a 10 gallon high-integrity polethylene storage bottle located directly underneath the fume hood.

(2) Radioactive liquid wastes should not be disposed of in the sink or toilet located in the restroom outside of the ORAL.

(3) As necessitated by the volume of emergency operations involving liquid samples, the ORAL Chemistry Technicians will monitor and record the liquid waste levels in both ten (10) gallon storage tanks; i.e.:

(a) The 10 gallon bottle for the laboratory sink,

(b) The 10 gallon bottle for the chemical fume hood.

(4) As the smaller 10 gallon storage bottles become full, the radioactive liquid may either be:

(a) Poured down the shower drain, or

(b) Properly packaged as required by DAEC Radwaste for transport to DAEC for ultimate processing and disposal.

3.7 LIQUID WASTE STORAGE AND DISCHARGE

(1) As the 500 gallon storage tank becomes full, sampling and analysis of the contents will be completed in accordance with PASAP 8.11, "Radioactive Waste Control and Disposal from the DAEC Lab and the Decontamination Facility."

NOTE

Radioactive liquid wastes should not be discharged into the Cedar Rapids sanitary sewage system unless written authorization has been granted by the Site Radiation Protection Coordinator.

3.8 SOLID WASTE PACKAGING AND DISPOSAL

(1) Solid radioactive waste will be packaged and disposed of as detailed in PASAP 8.11, "Radioactive Waste Control and Disposal from the DAEC Offsite Lab and the Decontamination Facility."

(2) Unless otherwise specified by DAEC Radwaste, all solid radioactive waste will be packaged in approved DOT specification containers (e.g., 55-gallon steel drum).

(3) A radiation survey will be completed, and the contact and 3 foot from container radiation levels should be recorded on a label and affixed to the container, as required.

(4) A loose contamination swipe of the container should be completed, and counted for both alpha and beta/gamma radiation. All swipe results should be recorded on the appropriate form, in accordance with the requirements of PASAP 8.20 (Offsite Lab and Decontamination Facility (ORAL/ODEF)").

(5) The waste container may then be moved out of the Sample Receipt and Preparation Laboratory via the warehouse freight elevator and temporarily stored in the designated area in the basement of the facility.

(6) The storage area will be designated as a temporary "Radioactive Materials Storage Area" and properly posted, as required in 10CFR Part 20.

NOTE

This temporary storage area should be established in close proximity to the Offsite Decontamination Facility 500 gallon storage tank.

(7) DAEC Radwaste will be requested to have the waste containers properly labeled, and then picked up for transport back to DAEC for ultimate disposal.

3.9 RADIOLOGICAL MONITORING OF THE ORAL

(1) Radiological surveys for both radiation levels and for loose contamination (i.e., both alpha and beta/gamma radiation) should be conducted as necessary during the operation of the ORAL. Air sampling should be performed as necessary to ensure habitability of the facility.

(2) During the emergency operation of the ORAL, such radiological surveys should be completed at least once a day.

(3) All radiological survey results should be recorded, and kept on file in the Offsite Radiological and Analytical Laboratory.

3.10 DEACTIVATION OF THE ORAL

(1) Deactivation Responsibility

(a) The ORAL/ODEF Supervisor will deactivate the Offsite Radiological and Analytical Laboratory upon authorization of either the Site Radiation Protection Coordinator at the DAEC or the Radiological Assessment Coordinator in the EOF.

(b) Prior to returning counting room equipment to normal status, a "background" count should be taken to monitor for any potential detector contamination.

(c) The ORAL Chemistry Technicians will then proceed to return the counting room equipment to its normal status. (See PASAP 8.12, "Routine Maintenance of the DAEC Offsite Radiological and Analytical Laboratory", and EP-009A).

(2) Resupply of the Offsite Radiological and Analytical Laboratory

(a) The ORAL/ODEF Supervisor will be responsible for assuring the completion of the resupply of the Offsite Radiological and Analytical Laboratory, as necessary.

i) Chemical and laboratory supplies must be reinventoried and restocked, as necessary.

ii) P-10 Counting Gas for the Tennelec LB 1000 Detector System must be inventoried. At least one extra full tank should be available.

iii) Liquid Nitrogen (LN:l2.) for the HPGe Detector System must be inventoried and resupplied as necessary.

iv) Miscellaneous supplies and forms must be reinventoried and restocked, as necessary.

(3) Summary Report of Offsite Radiological and Analytical Laboratory Activities

(a) The ORAL/ODEF Supervisor will be responsible for preparing a summary report of ORAL Activities conducted during the emergency activation period.

(b) This summary report should include all sample results as processed in the ORAL, including sample log forms and all reporting forms.

4.0 RECORDS

All records generated by this procedure shall be maintained iaw DAEC QA Record Retention requirements.

5.0 REFERENCES

(1) Duane Arnold Energy Center Emergency Plan

(2) PASAP 8.12, "Routine Maintenance of the DAEC Off-site Radiological and Analytical Laboratory"

(3) PASAP 8.10, "Alpha/Beta Analysis of Samples Using The Tennelec LB 1000 at the ORAL"

(4) PASAP 8.11, "Radioactive Waste Control and Disposal from the DAEC Offsite Lab and the Decontamination Facility"

(5) PASAP 8.13 "Gamma Isotopic at the ORAL"

(6) PASAP 8.20, "Offsite Lab and Decontamination Facility (ORAL/ODEF)"

(7) RWH 3403.4 - "Waste Segregation and Handling"

(8) PCP 6.12 - "Gross Water Activity"

(9) PCP 6.11 - "Gross Gamma Activity"

(10) PCP 6.2 - "Sample Preparation for the Counting Room"

(11) PCP 6.1 - "General Considerations for Counting Radioactive Samples and Recording Results"

(12) PCP 2.8 - "Collection and Analysis of Particulate and Iodine Filters From the Gaseous Effluent Monitors"

(13) PCP 7.5 - "Tennelec Low Background Counter Model LB 1000"

(14) HPP 3103.02 - "Radiation and Contamination Survey Performance and Documentation"

(15) Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA 520/1-75-001A Dated January 1990)

(16) Operating License

6.0 ATTACHMENTS

Attachment 1, "ENTRANCE/EXIT INSTRUCTIONS FOR ORAL"

ATTACHMENT 1
ENTRANCE/EXIT INSTRUCTIONS FOR ORAL

Entrance Instructions:

Deactivate door locking mechanism by holding your Alliant Tower security badge to the card reader outside door of facility. If access has been granted to your badge it will click and allow you to open door.

After entering the door, immediately to your right, will be another card reader. Present your badge to this card reader. The system will click and the yellow light will disappear and the green light will flash. This allows you to proceed upstairs and unlock the doors. An alarm will sound if you attempt to unlock the doors without having presented your badge to disarm the system. If entering the building with a group, only the first person in the group needs to swipe. Unlike DAEC security systems, it is not necessary for each person to swipe their card.

If you should lose your badge between the outside card reader and the inside card reader, entering CMD/ENT-21-8517-CMD/ENT will also disarm the system and allow you to proceeds.

Exit Instructions:

Upon exiting the building, ensure lab and holding area doors have been shut. The system will not arm if these two doors are not secure.

Press CMD/ENT twice on the keypad. Reactivate door locking mechanism by holding your Alliant Tower security badge to the card reader inside door of facility. You will get the message to EXIT NOW. It is not necessary for each individual to swipe out - only the last person.

If alarm does not set (message EXIT NOW) you will get a message. Pressing CMD/ENT - 31-8517 - CMD/ENT will tell you what zones within the building faulted.

If you have any questions or concerns about arming or disarming the system, please call Tower Security at 398-3506 for assistance.

IN THE EVENT OF A READ EMERGENCY, OR DURING DRILL PLAY, UPON ENTERING THE FACILITY PLEASE CALL THE GUARD DESK AT THE TOWER, 398-3506 AND REPORT YOUR ACTIVITIES. THEY CAN THEN DISARM THE SYSTEM, ALLOWING INDIVIDUALS WITHOUT ACCESS TO THE BUILDING TO ENTER WITHOUT SWIPING AT THE OUTSIDE DOOR.

EMERGENCY PLAN IMPLEMENTING PROCEDURE	EPIP 2.7
ACTIVATION AND OPERATION OF THE OFFSITE DECONTAMINATION FACILITY (ODEF)	Rev. 6 Page 1 of 10

Effective Date: 10/15/2001

TECHNICAL REVIEW

Prepared by: _____ Date: 9-12-2001

Reviewed by: _____ Date: 9/20/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: Kevin Williams for _____ Date: 9/21/01
Manager, Emergency Planning

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1.0 PURPOSE

(1) This procedure provides instructions for the activation and operation of the Offsite Decontamination Facility (ODEF) located at 1017 12th Avenue S.W. in Cedar Rapids. The ODEF is intended to be utilized to decontaminate personnel in the event the decontamination facilities at DAEC are not available.

2.0 DEFINITIONS

None.

3.0 INSTRUCTIONS

3.1 ACTIVATION

(1) At an ALERT or greater, the Site Radiation Protection Coordinator (SRPC), upon determining the potential need for processing personnel for decontamination at the ODEF, should contact the OSC Supervisor and recommend activation of the ODEF.

(2) After receiving authorization from the SRPC, the OSC Supervisor should contact the ORAL/ODEF Supervisor and advise him of the impending activation of the ODEF.

(3) The ORAL/ODEF Supervisor will make all necessary arrangements to have the ODEF opened and prepared to process personnel as soon as possible.

(4) Existing commercial telephone communications, and Electronic Status Board, links between the ODEF, EOF, and the TSC will be checked/activated.

(5) ODEF Health Physics Technician will:

(a) Ensure that the basement exhaust fan is turned on and running.

i) Proceed to the exhaust fan control box (indicated on Form ODEF-01).

ii) Open control box, locate red knob. Gently pull knob out and rotate to the ON position. The exhaust fan is now in manual operation.

iii) To restart exhaust fan to the automatic timer controlled mode, gently push the red knob and rotate to the 'off' position. The exhaust fan will now automatically start and stop at the preset time settings.

NOTE

If the automatic timer control panel is disabled, then turn exhaust fan on or off through the use of the electrical switch next to the control panel.

(b) Ensure that the water heater is on. This is accomplished by going to the main electrical panel indicated in Form ODEF-02 and verifying that switch #18 is in the ON position. After placing this switch in ON position, it will take about 2 hours before the water reaches a comfortable temperature for use.

(c) In main electrical panel verify switch #12 is in the ON position. This switch energizes the circuit to the holding tank pump and receptable for air sampling in the basement.

(d) Set up basement radiologically controlled areas by positioning Rad Tape, Rad Rope, Step Off Pad, and Rad Postings in accordance with Form ODEF-01.

(e) Setup or verify the ORAL sample receipt preparation lab and ODEF decon areas are setup iaw ODEF-02 and ODEF-03.

(f) Verify the operability of all portable radiation survey equipment.

(g) Set-out soap, towels, and clean clothing in preparation for processing contaminated personnel.

(h) Inform ODEF Supervisor when the ODEF is ready to process contaminated personnel.

(6) The ORAL/ODEF Supervisor should notify the OSC and ORAA Supervisors that the ODEF is staffed, and that the ODEF is operational and ready to process contaminated personnel via commercial phone and Electronic Status Board entry.

3.2 PERSONNEL ACCESS TO ODEF

(1) The ODEF is located on the second floor of the Alliant Energy Systems Protection Warehouse located at 1017 12th Avenue S.W. (see Form ODEF-03, "Travel Routes to the ORAL and ODEF).

(2) ODEF personnel should be alerted to the arrival of evacuated personnel through the use of the doorbell located at the ODEF entrance.

(3) Entry to the ODEF should only be made from the exterior entryway on the 12th Avenue side of the building (see Form ODEF-04).

(4) All potentially contaminated personnel will be directed to the Waiting Area in the basement of the ODEF (see Form ODEF-04).

3.3 PROCESSING CONTAMINATED PERSONNEL

(1) The ODEF Health Physics Technician will conduct a radiological survey of all personnel not in possession of Form HP-27 from either DAEC or the ORAA to determine the extent of contamination and to prioritize the decontamination efforts. Form HP-27 shall be completed for each contaminated individual.

(2) Upon completion of initial surveys, contaminated individuals will be escorted from the Waiting Area to the Undress Area for decontamination.

3.4 PERSONNEL DECONTAMINATION

(1) All personnel decontamination will be conducted in accordance with standard DAEC procedures unless the ORAL/ODEF Supervisor is directed otherwise by the OSC Supervisor.

(2) Contaminated individuals will be monitored by the ODEF Health Physics Technician in the waiting area of the basement or at the Undressing Area and informed of any skin areas to receive special decontamination efforts.

(3) The contaminated individual will remove all personal clothing and place it in a plastic bag. This bag should be sealed and marked with the individual's "NAME". An ODEF Health Physics Technician will survey each personal clothing item, and separate, package and label all contaminated items, as appropriate and document all information on the required forms.

(4) The contaminated individual will then enter the shower stall and using soap and water, should wash his/her entire body with special emphasis on the skin areas identified as needing decontamination.

(5) Upon exiting the shower stall and after drying, the individual will again be monitored by the ODEF Health Physics Technician for any residual skin contamination.

(6) If residual contamination still remains, and as directed by the ODEF Health Physics Technician, the individual will reenter the shower stall, or decon sink, and complete further decontamination of the affected skin areas.

(7) After receiving approval from the ODEF Health Physics Technician that the decontamination process has been satisfactorily completed, the individual may then enter the dressing area.

(8) The individual may then redress in either temporary clothing provided by the ODEF HP or in his/her personal clothing (but only if the personal clothing has been surveyed and "cleared" by the ODEF Health Physics Technician).

(9) Any follow-up bioassay or whole-body counting of the individual will be determined by the ORAL/ODEF Supervisor, and will be completed in accordance with established procedures.

(10) Following completion of decontamination, the individual will await further instruction from the ORAL/ODEF Supervisor prior to exiting the ODEF.

3.5 LIQUID WASTE DISPOSAL

(1) All liquid waste generated at the ODEF (i.e., the water from the shower stalls and sink) will drain directly into a 500 gallon high-integrity polyethylene storage tank.

(2) As necessitated by the volume of emergency operations at the ODEF, the ODEF Health Physics Technician should monitor and record the liquid waste level of the 500 gallon storage tank.

(3) As the 500 gallon storage tank becomes full, sampling and analysis of the contents will be completed. The procedures detailed in the PASAP's should be followed.

NOTE

Radioactive liquid wastes should not be discharged into the Cedar Rapids Sanitary Sewage System unless written authorization has been granted by the Site Radiation Protection Coordinator.

3.6 RADIOLOGICAL MONITORING OF THE ODEF

(1) Radiological surveys for both radiation levels and for smearable contamination (i.e., both alpha and beta/gamma radiation) should be conducted as necessary during the operation of the ODEF. Air sampling should be performed as necessary to ensure habitability of the facility.

(2) During emergency operations at the ODEF, radiological surveys should be completed at least once each day.

(3) All radiological survey results should be recorded using appropriate site survey forms, and kept on file in the ODEF.

3.7 DEACTIVATION OF THE ODEF

(1) The ORAL/ODEF Supervisor will deactivate the ODEF only upon the approval of the Site Radiation Protection Coordinator.

(2) The ODEF Health Physics Technician will then proceed to decontaminate the facility as necessary and complete radiological surveys of the ODEF.

(3) The ORAL/ODEF Supervisor will verify that the entire facility has been properly cleaned up and preparation made for restocking.

(4) Soap, towels, and clean clothing must be inventoried and restocked, by the ODEF Health Physics Technicians, as necessary.

(5) The ORAL/ODEF Supervisor will be responsible for preparing a summary report of ODEF activities conducted during the emergency activation of the ODEF.

4.0 RECORDS

(1) All reports and documentation of skin contamination levels for each individual processed in the ODEF should be completed using DAEC HP Procedures.

(2) Copies of all records should be sent to the Site Radiation Protection Coordinator.

5.0 REFERENCES

(1) Duane Arnold Energy Center Emergency Plan

(2) PASAP's

(3) DAEC HP Procedures

6.0 ATTACHMENTS

(1) Attachment 1, ODEF Forms

ATTACHMENT 1

ODEF Forms	Form No.
ODEF Decontamination Waiting Area	ODEF-01
Floor Plan for ORAL/ODEF	ODEF-02
Travel Route to ORAL/ODEF	ODEF-03
12th Avenue Entrance to ORAL/ODEF	ODEF-04

EMERGENCY PLAN IMPLEMENTING PROCEDURE	EPIP 3.1
IN-PLANT RADIOLOGICAL MONITORING	Rev. 11 Page 1 of 18

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TECHNICAL REVIEW

Prepared by: Don A. [illegible] Date: 9/13/2001

Reviewed by: Russell F. Titus Date: 9/20/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

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1.0 PURPOSE

(1) This procedure provides instructions for performing radiological monitoring activities during an emergency including determination of habitable areas, In-Plant radiological monitoring, and post-accident sampling (PASS). This procedure supports the implementation of requirements in 10CFR50, Appendix A, NUREG 0654 and the DAEC Plan.

(2) This procedure is applicable to the Site Radiation Protection Coordinator, Chemistry Technicians, the OSC Health Physics Supervisor, Health Physics Technicians and other In-Plant Monitoring Team personnel involved in In-Plant radiological monitoring activities.

(3) This procedure should be implemented for events classified as an ALERT or greater, and may be implemented upon activation of the Operational Support Center (OSC) for an event classified as a NOTIFICATION OF UNUSUAL EVENT if necessary.

2.0 DEFINITIONS

None

3.0 INSTRUCTIONS

3.1 RESPONSIBILITIES

3.1.1 SITE RADIATION PROTECTION COORDINATOR

(1) Ensure that DAEC personnel are dispatched to monitor the environs in and around the plant for radiological consequences associated with the event.

(2) Conduct an initial evaluation and assessment of the results of radiological monitoring activities. Upon activation of the Emergency Operations Facility (EOF), this function will be assumed by the Radiological Assessment Coordinator for all Off-Site monitoring activities.

(3) Assess the On-Site radiological consequences and directing protective measures, including evacuation of the plant.

(4) During the initial stages of the event, apprise local and State authorities, through the Emergency Coordinator, of the results of radiological monitoring activities and providing protective action recommendations based upon the projected radiological consequences to the population-at-risk. Upon activation of the EOF, this function will be assumed by the Radiological Assessment Coordinator.

3.1.2 OSC HEALTH PHYSICS SUPERVISOR

(1) Ensure that personnel dispatched from the OSC are properly outfitted with protective clothing and equipment, are briefed regarding ALARA and are apprised of existing and potential radiological hazards.

(2) Coordinate with the Site Radiation Protection Coordinator to obtain information regarding plant status, problems, response options, significant radiological releases in progress, offsite dose rates, plume location and meteorological conditions as necessary.

(3) Ensure the determination of habitability of assembly areas and ERO facilities.

(4) Coordinate the dispatch of monitoring teams, PASS team and Offsite Relocation Assembly Area (ORAA) and Offsite Radiological Analysis Laboratory/Offsite Decontamination Facility (ORAL/ODEF) personnel. Ensure the continued briefing of the ORAA in terms of plant and radiological conditions.

(5) Supervise efforts to prepare injured/contaminated personnel for transport to offsite medical facilities.

(6) Brief rescue and emergency repair team personnel regarding radiological hazards which exist or which potentially may be encountered and provide guidance regarding precautions to be taken and limits that shall not be exceeded.

3.2 DETERMINATION OF ASSEMBLY AREA HABITABILITY

(1) The assembly areas of concern at the DAEC include the following:

(a) Control Room

(b) TSC

(c) OSC, which includes the OSC Break Room, Security Building, the Health Physics Access Control Area, and interconnecting passageways.

(d) Hot Lab

(e) Warehouse

(f) Badging Center

(g) Training Center

(h) Plant Support Center (PSC)

(2) The OSC HP Supervisor should determine the habitability of the PSC, Badging Center and Training Center through the use of an On-Site Radiological monitoring team or, if unavailable, use additional H.P. personnel to perform this function.

(3) Initial determinations of habitability for the Control Room, TSC and Hot Lab should be accomplished by ensuring that the radiation levels being detected by the permanently installed radiation monitoring (Area Radiation Monitoring) system are normal.

(a) As discussed in EPIP 2.5, "Control Room Emergency Response Operation", the Back Panel Communicator shall record the indicated radiation levels monitored, by the Area Radiation Monitoring (ARM) System which includes detectors located in the Control Room and Hot Lab, and forward this information to the Site Radiation Protection Coordinator. (When the Plant Process Computer is operational, this data

is available to the TSC and EOF. The Back-Panel Communicator need only to forward the Main Steamline Rad Monitor data to the Site Radiation Protection Coordinator as these do not have computer points associated with them.)

NOTE

Attachment 1, "ARM Locations", provides a listing of the installed Area Radiation Monitors throughout the plant, including their locations and ranges.

(b) As specified in EPIP 2.2, "Activation and Operation of the TSC", the three TSC radiation monitors (two monitoring the ventilation intake duct work and one in the TSC general area) shall be monitored upon initially activating the TSC, by the Radiation Support Staff. This information should be forwarded to the Site Radiation Protection Coordinator.

(4) If radiation levels being monitored in the above areas are greater than normal, the Site Radiation Protection Coordinator should be advised and protective measures instituted.

NOTE

If the monitors are alarming, the Site Radiation Protection Coordinator may recommend evacuation of such areas to the Emergency Coordinator.

If radiation levels are higher than normal, priority should be given to radiation survey and sampling activities in those areas to determine their acceptability for continued access.

(5) The OSC HP Supervisor shall be responsible to initiate radiation survey and airborne sampling of the OSC, TSC, PSC, Warehouse, Badging Center, Training Center, Control Room, or other areas, based upon the priority assigned by the Site Radiation Protection Coordinator. The following activities will be conducted by Health Physics Technicians assigned by the Emergency Assignment Tag Board.

(a) Area radiation surveys shall be conducted and documented as prescribed in HP Procedures.

(b) Airborne radioactivity surveys shall be conducted and documented as prescribed in HP Procedures.

(6) The results of such survey and sampling activities shall be reviewed by the OSC HP Supervisor, and their degree of conformance to normal DAEC Administrative Guidelines determined. The OSC Supervisor and Site Radiation Protection Coordinator (SRPC) shall be informed of any abnormal conditions.

NOTE

Normal personnel external and internal exposure limits in effect are prescribed in ACP 1411.18 "Personnel Dosimetry".

Standard area contamination limits to be observed are prescribed in ACP 1411.22 "Personnel Access and Egress in Radiological Areas".

(7) Survey and sampling activities prescribed above should be conducted in the Control Room, TSC, and Hot Lab if increasing trends are detected by the installed radiation monitors or as directed by the Site Radiation Protection Coordinator.

(8) If an assembly area is determined to be uninhabitable or not suitable for long term habitability, the following should occur:

(a) The Site Radiation Protection Coordinator shall recommend evacuation of selected assembly areas or of the site, and, as appropriate, relocation of essential personnel to alternate assembly areas on site. Evacuation of non-essential personnel is required for a SITE or GENERAL EMERGENCY.

(b) Non-essential personnel should be evacuated to the ORAA, as prescribed in EPIP 2.4, "Activation and Operation of the ORAA".

(c) Essential personnel shall be relocated to another assembly area determined to be safe, or occupancy times established for the affected

areas and relief shift assignments made so that essential functions can be conducted on a continuing basis.

(9) If evacuation of one or more assembly areas is required, essential personnel should be relocated to an alternate area, as follows:

Primary Area	1st Alternate	2nd Alternate
Control Room	As required to achieve a stable, safe, shutdown condition	
TSC/OSC	Control Room	Security Bldg or ORAA
Hot Lab	ORAL	N/A
Warehouse	ORAA	N/A
Badging Center	ORAA	N/A
Training Center	ORAA	N/A
PSC	ORAA	N/A
ORAA	ODEF	N/A

NOTE

When selecting "essential" personnel, consideration should be given to the minimum shift staffing requirements defined in the DAEC Plan, Table B-1. The Emergency Telephone Book may be used as a reference for obtaining shift staffing designations.

Guidance regarding TSC personnel considered to be essential is contained in EPIP 1.3, "Plant and Site Evacuation".

(10) The OSC HP Supervisor shall assure that follow-up monitoring of Assembly Areas is conducted, and shall obtain/seek the concurrence of the OSC Supervisor.

(a) Survey and sampling activities to be conducted and their frequency should be based upon the potential radiological hazards as well as the results of prior monitoring activities and the capability of installed instrumentation to detect changes in radiological conditions.

(b) In defining the type, frequency and location of monitoring activities to be conducted, consideration should be given to increases in radiation levels throughout the plant.

(11) The results of such monitoring activities shall be reviewed by the OSC HP Supervisor. The OSC Supervisor and Site Radiation Protection Coordinator shall be advised of any problems or adverse trends detected.

(a) The Site Radiation Protection Coordinator should provide guidance to the OSC Supervisor regarding further monitoring activities to be conducted and protective measures to be instituted for personnel in those areas; for example, use of protective clothing and respirators, implementation (or modification) of occupancy times, administration of KI, etc.

NOTE

Use of accepted Health Physics practices (i.e., clothing and limiting the stay time) should only be considered for Control Room and TSC personnel.

3.3 IN-PLANT RADIOLOGICAL MONITORING

(1) Radiological monitoring activities inside the plant shall be conducted to support required response actions.

(2) A Health Physics Technician should accompany each rescue, repair and reentry team upon initial entry into an area where an actual or potential radiological hazard exists.

(a) As discussed in EPIP 4.3, "Rescue and Emergency Repair Work", repair activities may be conducted during the course of several staged entries; therefore, entries subsequent to the initial entry may be conducted without the presence of a Health Physics Technician, providing the hazards are well known and the possibility of a transient occurring is non-existent.

(b) The determination as to whether or not a Health Physics Technician shall accompany a repair team or an operator into the plant and remain in their presence shall be made by the Site Radiation Protection Coordinator.

(3) The OSC HP Supervisor shall provide guidance to the Health Physics Technician on the radiological conditions to expect and monitoring activities to be conducted prior to dispatch of personnel into an actual or potential radiological hazard area.

(a) The OSC HP Supervisor shall ensure that required protective clothing is donned properly.

(b) Respiratory protection equipment, if required, will be checked and determined to be operable, and the user aware of equipment operating limitations.

(c) Dosimetry of sufficient range will be worn to adequately monitor whole body and extremity doses, where applicable.

(d) Equipment and supplies anticipated to be required for the assignment are available and checked to ensure operability.

(e) Briefings will be conducted, to the extent required, to ensure that personnel are aware of the jobs to be performed.

(4) Upon being dispatched, the Health Physics Technician should, in addition to monitoring dose rates and total exposures:

(a) Provide guidance to team members regarding precautions to be taken to minimize their total exposure.

(b) Advise the OSC HP Supervisor of unexpected radiological conditions encountered.

(5) The OSC HP Supervisor or designee should, as time permits, monitor the activities of in-plant personnel utilizing the network of cameras available on-site.

(6) Upon egress from the plant, the Health Physics Technician should provide guidance, as required, in discarding protective clothing and in the performance of personnel monitoring and decontamination, if required, prior to passing through the Health Physics Access Control Area.

3.4 POST-ACCIDENT SAMPLING

(1) The OSC Supervisor and OSC HP Supervisor shall be advised by the Site Radiation Protection Coordinator of post-accident sampling and analysis activities to be conducted.

(2) If a particulate filter and charcoal cartridge sample from the KAMAN Effluent Monitoring System is to be obtained for analyses,

(a) The Site Radiation Protection Coordinator should determine which cartridge(s) are to be obtained and the radiation level of the cartridge, as monitored by the KAMAN System.

(b) The OSC HP Supervisor should be advised of the projected radiation levels and review with the Site Radiation Protection Coordinator appropriate radiological protective measures to be taken.

> NOTE
>
> Calculations have been completed which verify that the samples listed in Attachment 2 can be retrieved without exceeding exposure levels of 5 rem Deep Dose Equivalent to the whole body. Proper protective measures for personnel involved in sampling activities should be taken.

(3) Based upon the expected dose rates, an estimate should be made of the total exposure to be received while obtaining and analyzing a sample and exposure limit increases authorized, if required, as specified in EPIP 4.3, "Rescue and Emergency Repair Work".

(4) The OSC HP Supervisor shall designate the Chemistry Technician(s) accompanied by a Health Physics Technician to obtain the samples. The OSC HP Supervisor will conduct a briefing consisting of, at a minimum, the expected radiological conditions and associated precautions, increased exposure limits, stay times, access routes and that adequate protective clothing, dosimetry and respiratory protection equipment is donned before each entry.

> **NOTE**
>
> Prior to dispatching the PASS Sampling Team personnel into the Power Block Structure, the OSM/OSS should be advised and Emergency Coordinator authorization received.

(a) Sample retrieval from the Off-Gas Stack should be accomplished in accordance with PASAP's.

(b) Sample retrieval from the Reactor Building Stacks and Turbine Building Vent should be accomplished in accordance with PASAP's.

(c) Grab samples from the Reactor Building should be obtained as prescribed in PASAP's.

(5) Post-accident sampling conducted at the Post-Accident Sample System station should be conducted by Chemistry Technicians in accordance with PASAP's.

(6) Personnel dispatched to remote locations to obtain samples should maintain communications with the OSC, advising the OSC HP Supervisor of any unusual phenomena observed.

(7) Analyses of samples and documentation of results should be conducted using the PASAP's.

4.0 RECORDS

(1) All records generated as a result of this procedure shall be forwarded to the Site Radiation Protection Coordinator for retention and is considered a QA Record (exception is for records generated during drills/exercises).

5.0 REFERENCES

(1) DAEC Emergency Plan

(2) NUREG 0654, Rev. 1, Planning Standard H, I, J, K

(3) EPIP 1.3, "Plant and Site Evacuation"

(4) EPIP 2.5, "Control Room Emergency Response Organization"

(5) EPIP 2.2, "Activation and Operation of the TSC"

(6) HP Procedures

(7) ACP 1411.22 "Personnel Access and Egress in Radiological Areas"

(8) ACP 1411.18 "Personnel Dosimetry"

(9) EPIP 4.3, "Rescue and Emergency Repair Work"

(10) EPIP 2.4, "Activation and Operation of the ORAA"

(11) EPIP 5.2, "Recovery and Reentry"

(12) PASAP's

6.0 ATTACHMENTS

ATTACHMENT 1: ARM Locations

ATTACHMENT 2 Post-Accident Sample Capabilities

ATTACHMENT 1
ARM LOCATIONS

	Reactor Building Units Number	Location	Elevation	Range (mR/hr)	Description
1.	RT 9168	North CDR Module Area	757'6"	10^{-1} - 10^{3}	Outside airlock to Access Control
2.	RT 9170	CRD Repair Room	757'6"	10^{-1} - 10^{3}	Northwest wall, behind door
3.	RT 9167	Rx BLDG Railroad Airlock	757'6"	10^{-1} - 10^{3}	West wall, near inner Rx.B1 Truck Lock Door
4.	RT 9169	South CRD Module Area	757'6"	10^{-1} - 10^{3}	South wall, inside Drive Room
5.	RT 9176	TIP Drive Room	757'6"	10^{0} - 10^{4}	North wall, inside Drive Room
6.	RT 9177	Outside Cleanup Phase Seperator TK Room	786'0"	10^{0} - 10^{4}	Outside of CU Phase Seperator TK Room
7.	RT 9173	Spent Resin TK Room	786'0"	10^{-1} - 10^{3}	East wall of CU Discharge Mixer Pump Room
8.	RT 9157	Cleanup Heat Exchangers Room	786'0"	10^{0} - 10^{6}	Inside door to RWCU Heat Exchanger Room
9.	RT 9156	Cleanup Recirculation Pump Room	876'0"	10^{0} - 10^{6}	Inside door to RWCU Pump Room
10.	RT 9155	Jungle Room	812'0"	10^{0} - 10^{6}	East wall of Jungle Room, Right of Door
11.	RT 9171	Exhaust Fan Room	812'0"	10^{-1} - 10^{3}	Inside 2nd Airlock door to Rx Bldg. Exhaust Fan Room
12.	RT 9175	Condensate Phase Seperator Pump Room	833'6"	10^{-1} - 10^{3}	Inside door, along west wall of Cond. Phase Sep. Room
13.	RT 9163	Refuel Floor-North End	855'0"	10^{-2} - 10^{2}	West stairway wall, Refuel
14.	RT 9164	Refuel Floor - North End	855'0"	10^{-2} - 10^{2}	North stairway wall, Refuel
15.	RT 9153	New Fuel Storage Area	855'0"	10^{-1} - 10^{3}	North end of Storage Pit at Instrument panel
16.	RT 9178	Spent Fuel Storage Pool	855'0"	10^{0} - 10^{4}	NE Rail around Fuel Pool
17.	RT 9180	1T-80, 73 TK Room	737'0"	10^{0} - 10^{4}	SE Corner of Tank Room North wall inside second door
18.	RT 9166	SW Corner Room	716'9"	10^{-1} - 10^{3}	SW Corner Room, along south wall near corner
	Turbine Biulding Units				
19.	RT 9159	Reactor Feedwater Pump Area	734'0"	10^{-1} - 10^{3}	North Condenser Bay wall
20.	RT 9160	Turbine Lube Oil Area	734'0"	10^{-1} - 10^{3}	East corridor wall
21.	RT 9158	Condensate Pump Area	735'0"	10^{-1} - 10^{3}	Mounted on girder near Condensate Pumps
22.	RT 9174	Sump Area	734'0"	10^{-1} - 10^{3}	Acid & Caustic Tank, SE Corner of Turbine Bldg.
23.	RT 9179	Turbine Front Standard	780'0"	10^{0} - 10^{4}	Along east shield wall at offset

ATTACHMENT 1
ARM Locations (continued)

	Radwaste Building Units				
24.	RT 9151	Radwaste Control room	786'0"	10-1 - 10^3	South wall, near door
25.	RT 9152	Radwaste Centrifuge Hallway	786'0"	10^{-1} - 10^3	North wall of Centrifugal Room
26.	RT 9154	Radwaste Drumming Area	757'6"	10^{-1} - 10^3	At middle of west wall
	Other Units				
27.	RT 9162	Control Room (west wall)	786'0"	10^{-2} - 10^2	Control Building
28.	RT 9172	Radiological Chemistry Laboratory (Hot Lab)	786'0"	10^{-1} - 10^3	Control Bldg., west wall
29.	RT 9161	Machine Shop	757'6"	10^{-2} - 10^2	Machine Shop Building
30.	RT 9165	Site Entry and Exit (OSC)	757'6"	10^{-2} - 10^2	Entrance to Admin. Bldg

ATTACHMENT 2
POST-ACCIDENT SAMPLE CAPABILITIES

(1) High Range Effluent Monitoring (KAMAN) System particulate and iodine filter cartridges can be drawn from:

(a) Off-Gas Stack

(b) Reactor Building Stack(s)

(c) Turbine Building Vent System

(2) Post Accident Sampling System samples can be drawn from:

(a) A pressurized Reactor Coolant System sample from the Jet Pump flow sensing instrument lines

(b) A depressurized Reactor Coolant System sample from the RHR Heat Exchanger discharge line when RHR is in the Shutdown Cooling mode of operation

(c) A Torus sample from the RHR Heat Exchanger discharge line when RHR is in the LPCI, Torus Cooling, or Test mode of operation

(d) A Drywell atmospheric sample from the Containment Atmosphere Monitoring System analyzer sample lines

(e) A Torus atmospheric sample from the Containment Atmosphere Monitoring System analyzer sample lines

(3) Reactor Building grab samples can be taken from the backup sampler located on the Turbine Building roof.

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Effective Date: 10/15/2001

TECHNICAL REVIEW

Prepared by: _____ Date: 9-18-2001

Reviewed by: _____ Date: 9/20/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: Kim Williams for _____ Date: 9/21/01
Manager, Emergency Planning

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1.0 PURPOSE

(1) This procedure provides guidance associated with the performance of both onsite and offsite field radiological monitoring activities during an emergency.

(2) This procedure is applicable to the Site Radiation Protection Coordinator (SRPC), the Operational Support Center (OSC) Supervisor, OSC Health Physics (HP) Supervisor and Field Radiological Monitoring Teams personnel.

(3) Guidance associated with direction and control of the Field Radiological Monitoring Teams, and coordination of local, State and Federal agencies is contained in Emergency Plan Implementing Procedure (EPIP) 3.3, "Dose Assessment and Protective Action."

NOTE

It is expected that the majority of the offsite radiological monitoring activities described in this procedure will be conducted under the direction of the Radiological Assessment Coordinator (RAC) in the Emergency Operations Facility (EOF).

2.0 DEFINITIONS

None

3.0 INSTRUCTIONS

3.1 RESPONSIBILITIES

(1) Site Radiation Protection Coordinator (SRPC)

(a) Ensuring that DAEC personnel are dispatched to monitor the environs in and around the plant for radiological consequences associated with the event.

(b) Conducting an initial evaluation and assessment of the results of radiological monitoring activities. Upon activation of the EOF, this function will be assumed by the Radiological Assessment Coordinator (RAC) for all offsite monitoring activities.

(c) Assessing the onsite radiological consequences and directing protective measures, including evacuation of the plant in part or in whole.

(d) During the initial stages of the event, apprising local and State authorities, through the Emergency Coordinator, of the results of radiological monitoring activities and providing protective action recommendations based upon the projected radiological consequences to the population-at-risk. Upon activation of the EOF, this function will be assumed by the RAC.

(2) OSC Health Physics (HP) Supervisor

(a) Ensuring that personnel dispatched from the OSC are properly outfitted with protective clothing and equipment, are briefed regarding ALARA (As Low As Reasonably Achievable) and are apprised of existing and potential radiological hazards.

(b) Coordinating with the SRPC in the TSC to obtain information regarding plant status, problems, response options, significant radiological releases in progress, offsite dose rates, plume location and meteorological conditions as necessary.

(c) Ensure the determination of habitability of assembly areas and ERO facilities.

(d) Coordinate the dispatch of Field Radiological Monitoring teams.

3.2 TEAM PREPARATION AND DISPATCH

(1) Personnel are assigned to the Field Radiological Monitoring Teams by the Emergency Assignment Tag Board, as specified in EPIP 2.1, "Activation and Operation of the Operational Support Center."

(a) The OSC HP Supervisor may elect to reassign personnel initially assigned to the Teams to take maximum advantage of the capabilities and experience of assigned personnel.

(b) Activities to be completed by the Field Radiological Monitoring Teams prior to being dispatched are identified on the referenced checklists.

(2) Once an ALERT has been declared, and until there is a radiological release in progress, the OSC HP Supervisor will assemble, brief and dispatch the Field Monitoring Teams to assemble gear and establish radio contact with the SRPC. The OSC HP Supervisor will inform the Emergency Coordinator via the SRPC of all teams dispatched.

> **NOTE**
>
> Once set-up activities are complete, with concurrence from the Emergency Coordinator, personnel may be reallocated as necessary.

(3) In preparation for conducting monitoring activities:

(a) The SRPC shall evaluate the location and magnitude of the plume if a release is in progress, as specified in EPIP 3.3, "Dose Assessment and Protective Action" and provide direction to the field monitoring teams. Both the computerized and manual methods of dose projection are covered in this procedure.

> **NOTE**
>
> Field radiological monitoring is required for events classified as a SITE or GENERAL EMERGENCY and should be considered as a precautionary measure during an ALERT.

(b) Additionally, the SRPC shall pass on this information to the OSC HP Supervisor and shall review the briefing information identified in Attachment 1, "Typical Radiological Monitoring Team Briefing Topics", with the OSC HP Supervisor.

(c) The OSC HP Supervisor shall ensure that the Team members are appropriately dressed, have their required dosimetry and have checked out the operation of their equipment.

> **NOTE**
>
> The Health Physics Technician from each Team shall ensure that instrumentation is within calibration and has been source checked.

(d) The OSC HP Supervisor should conduct the Team briefing, reviewing, at a minimum, items noted in Attachment 1, and dispatch the Teams to their vehicles.

(4) Upon completing their vehicle checkout, including fueling, if required, and loading their equipment in the vehicle, the Team should contact the OSC HP Supervisor and advise him of their readiness to be dispatched offsite.

> **NOTE**
>
> If an adequate number of functioning vehicles cannot be obtained, the OSC Supervisor should be advised, he in turn should advise the Security and Support Supervisor.
>
> The Emergency Coordinator may authorize the use of personal vehicles, or if time permits, may elect to have the Security and Support Supervisor coordinate with the Emergency Support Manager to secure additional vehicles.

(5) The SRPC shall be advised by the OSC HP Supervisor of the readiness of the Teams to be dispatched, and responsibility for further Team communications should be transferred to the Radio Operator in the TSC.

(6) Upon receiving authorization from the Emergency Coordinator to dispatch the Teams, the SRPC should:

(a) Advise the Security and Support Supervisor that the Field Radiological Monitoring Teams are to be dispatched.

(b) Instruct the Radio Operator to advise the teams that they are under the control of the TSC and that all further communications are to be conducted with the TSC.

(c) Instruct the Radio Operator to dispatch the Teams to specific locations, to await further instructions.

(d) The SRPC will advise the Field Radiological Monitoring Teams of any releases in progress and the magnitude of the release.

NOTE

The Security and Support Supervisor should coordinate egress of monitoring teams from DAEC with DAEC Security personnel and members of Local Law Enforcement Agencies, as appropriate.

3.3 PLUME DETECTION AND MONITORING PRECAUTIONS

(1) The presence of a radioactive plume should be detected by the Field Radiological Monitoring Team by observing increasing count rates or dose rates on survey instrumentation used with the window of the vehicle rolled down and the instrument held outside the vehicle.

(a) Upon observing an increase in count rates or dose rates, the Team should inform the TSC of levels encountered and their location. The data should be documented in accordance with instructions.

(2) To determine if the plume is on the ground, open and closed shield surveys should be made with the probe held outside the vehicle.

> **NOTE**
>
> For the E-140 (or equivalent), place hand over the window for closed window surveys.

(a) If the open shield and closed shield readings are approximately the same, the team IS NOT in the plume.

(b) An open shield reading that significantly exceeds a closed shield reading (i.e., two to three times higher indicates that the team IS in the plume.

(3) If abnormally high dose rates persist even after it is expected that the plume has been exited, perform a radiation survey of the vehicle. (Inside and outside - including personnel)

> **NOTE**
>
> Caution should be observed near the air cleaner and radiator since the area is likely a source of the high radiation levels.

(a) Dose rates within the vehicle may be high enough to preclude use of the vehicle for further monitoring activities.

(b) If such is the case, the TSC (EOF) should be contacted regarding actions to be taken.

(c) If continued use of the vehicle is desired for some period of time, it may be necessary to leave the vehicle to obtain accurate survey data.

(4) Upon encountering radiation levels of 500 mRem/hr or greater, Teams should:

(a) Proceed to an area of lower dose rate (preferably background).

(b) Document the location of the high dose rate on Attachment 2, "Radiological Sampling Points and Air Sample Station Locations"

(c) Inform the TSC (EOF) of the dose rate encountered and the location.

(d) Review instructions with the TSC (EOF) before resuming monitoring activities.

(e) Check team members personal dosimeters and record on Attachment 4, "Emergency Monitoring Log".

> **NOTE**
>
> Entries into radiation levels of 500 mRem/Hr or greater may be allowed with authorization from the SRPC (TSC) or RAC (EOF).

(5) Communications with the Teams will normally be transmitted via radio.

(a) If the radio is inoperative, the Team should proceed to a telephone and contact the SRPC to obtain a spare radio. Caution should be used in not passing through the last known plume location.

(b) The SRPC should take action as required to obtain a radio and provide it to the Team.

(c) The SRPC should advise the Radiological Assessment Coordinator, if activated, of problems and response actions being taken, as soon as possible.

> **NOTE**
>
> Intermittent radio communications may be due to the terrain. When this occurs, the Teams should proceed to a higher location and try to establish contact with the TSC(EOF).

3.4 RADIOLOGICAL MONITORING ACTIVITIES

(1) The Field Radiological Monitoring Teams shall proceed to locations, as directed.

(a) The maps of the Emergency Planning Zone, posted in the facility and the maps in the Teams' kits, may be used to plan routes.

(b) Survey instrumentation should be operating on the lowest range available to enable initial detection of elevated levels of radioactivity.

(2) Upon reaching the assigned locations, the Teams shall report to the TSC(EOF) and advise that they are standing by and ready to obtain data as requested.

(a) Initial offsite radiological monitoring will usually be accomplished under the direction of the SRPC.

(b) Upon activation of the EOF this responsibility will be assumed by the RAC.

NOTE

Instructions regarding coordination of this turnover are contained in EPIP 3.3, "Dose Assessment and Protective Action."

(3) Upon receiving direction to traverse the plume, the Teams should proceed as follows:

(a) Obtain survey information as necessary to identify plume edges and areas of highest dose rate (centerline), or as directed.

(b) Take air samples as requested at the centerline of the plume (or as directed).

(c) After each traverse of the plume, report survey information to the EOF, if activated; otherwise, report to TSC.

(d) Monitor each team member's dosimeter reading periodically.

(e) Periodically monitor the team vehicle for contamination after exiting the plume. Monitor the team vehicle after completion of plume tracking.

(4) Document all radiological data in accordance with instructions.

(5) The Field Teams may be directed to change out the particulate filters and charcoal cartridges at the environmental monitoring stations located offsite in the downwind direction prior to, following and/or during the time when a release is in progress.

(a) The location of each of the air samplers is provided in Attachment 2, "Radiological Sampling Points and Air Sample Station Locations."

NOTE

Sample stations located on-site are identified in EPIP 3.1, "Inplant Monitoring."

Instructions for obtaining air samples are provided in this procedure.

(6) Team members should be alert to local conditions or situations which may not be reflected on maps or which could not be anticipated by personnel involved in directing Team activities.

(a) Examples include locations of members of the public who appear to be remaining in evacuated areas, accidents and whether further radiological surveys should be obtained, etc.

(b) Additionally, information of this nature should be recorded by the Team.

> **NOTE**
>
> Recording of information of this nature as well as recording of as much radiological information as is possible by the Field Radiological Monitoring Teams will weigh heavily during post-accident evaluation of total man-rem exposure to the public. Consequently, offsite monitoring activities should be documented as well and as extensively as possible.

(7) Team members should periodically check their pocket dosimeters and record the readings and time on Attachment 4, "Emergency Monitoring Log," and report these readings to the TSC/EOF.

(8) Authorization for team members to exceed the DAEC administrative exposure limits or the administration of potassium iodide (KI) must be recommended by the SRPC and approved by the Emergency Coordinator, on a case-by-case basis.

(9) While conducting surveys, Health Physics Technicians should minimize the contamination of survey equipment.

3.5 AIR SAMPLING (LOW VOLUME SAMPLES)

(1) Load the air sampler with appropriate filters (Particulate and Iodine).

> **NOTE**
>
> During drills, charcoal cartridges should be used in lieu of silver zeolite cartridges.

(2) If the vehicle battery is used, raise the hood on the vehicle and leave the vehicle running.

(3) Connect the air sampler to the battery, ensuring the red lead goes to the positive (+) terminal.

(4) Turn the air sampler "ON".

(a) Take precautions to prevent contamination of the sampler.

(b) The sampler should be positioned approximately waist high.

(5) Obtain a 1, 5 or 10 cubic foot air sample, as instructed.

NOTE

Normally, a 10 cubic foot air sample will be obtained in those areas where dose rates are low, ie; <5 mr/hr. A 1 cubic foot sample will be taken if dose rates are high, ie; > 200 mr/hr.

(6) Periodically perform a radiation survey on the radiator of the vehicle.

(7) Record information regarding the sample on Attachment 5, "Air Sample Identification." Include the count rate and airborne activity based on field assessment, as appropriate.

NOTE

The filter paper and silver zeolite cartridge should be stored separately.

(8) Remove the sample from the sampler, taking precautions to prevent sample contamination.

(a) Place the sample in a plastic bag, attach the Air Sample Identification label and seal the bag.

(b) Position the sample in the vehicle to minimize exposure to the occupants of the vehicle.

(9) Monitor the filter cartridge with a survey instrument, determine the airborne activity concentration, record the results, and report same to the TSC (or EOF) as follows:

(a) Record the count rate or dose rate, as appropriate, using either an E-140 (or equivalent) or an open window RO-2 (or equivalent).

(b) Using Attachment 6, "Conversion of Air Sample Results into Radioiodine Concentrations," convert the survey instrument reading to airborne activity concentration based upon the sample volume drawn.

(10) Deliver samples as described in this procedure.

3.6 RADIOLOGICAL SAMPLING

(1) As directed by either the SRPC or RAC, team members should initiate selected environmental sampling activities including the following:

(a) Surface Water Sampling in accordance with Attachment 12, "Radiological Sampling Procedure (RSP) for Surface Water."

(b) Milk Sampling in accordance with Attachment 11, "Radiological Sampling Procedure (RSP) for Milk".

(c) Vegetation Sampling in accordance with Attachment 9, "Radiological Sampling Procedure (RSP) for Pasture Grass and Forage" and Attachment 14, "Radiological Sampling Procedure (RSP) for Vegetables, Fruit and Grains".

(d) Soil Sampling in accordance with Attachment 10, "Radiological Sampling Procedure (RSP) for Soil".

(e) Snow Sampling in accordance with Attachment 13, "Radiological Sampling Procedure (RSP) for Snow".

(2) Deliver samples as described in this procedure.

3.7 TRANSPORTATION OF SAMPLES TO THE OFFSITE RADIOLOGICAL AND ANALYTICAL LABORATORY

(1) As directed by the SRPC (RAC), offsite environmental sample media should be transported to the Offsite Radiological and Analytical Laboratory (ORAL) by one of the following means:

(a) Samples may be taken directly to the ORAL by the Monitoring Teams, if they are close to that facility (refer to EPIP APPENDIX 1 form ODEF-3, "Travel Routes to the ORAL/ODEF").

(2) If samples are to be delivered to the offsite laboratory, the RAC should contact the ORAA Supervisor (if activated) or the SRPC and request that he dispatch a "Sample Runner."

(a) Prior to dispatching the Sample Runner, the ORAA Supervisor or the SRPC should ensure that the Sample Runner has been properly briefed regarding:

i) Sample pickup point.

NOTE

The sample pickup point designated for environmental sample media transfer should be selected such that it will minimize the amount of time the Monitoring Team(s) will have to suspend plume monitoring activities.

ii) Route(s) recommended for travel to the sample pickup point to avoid the plume.

iii) Travel route to the ORAL. (See EPIP APPENDIX 1 form ODEF-3, "Travel Routes to the ORAL/ODEF").

iv) The Sample Runner should have appropriate dosimetry and a TLD as determined by the HP Technicians.

v) The RAC, or SRPC, should advise the Security and Support Supervisor in the TSC of the planned transport of samples to the ORAL.

vi) Once the Sample Runner and Monitoring Team(s) have reached the sample pickup point, samples should be transferred to the Sample Runner's vehicle by the Monitoring Team Leader. Samples should be located in the vehicle such that the exposure to the Sample Runner will be minimized. The outside of the bags should be wiped down to minimize spread of contamination.

NOTE

The Sample Runner should at all times avoid handling samples. Samples are to be handled by an HP or Chemistry Technician only.

vii) The Sample Runner should proceed to the ORAL to deliver samples.

(3) Once at the ORAL, samples should be handled by the ORAL Chemistry Technicians.

3.8 ON-SITE FIELD RADIOLOGICAL MONITORING

(1) Personnel shall be assigned to the On-Site Field Monitoring Team by the appropriately numbered tags on the Emergency Assignment Tag Board, as specified in EPIP 2.1, "Activation and Operation of the OSC".

(a) The OSC HP Supervisor may elect to reassign personnel initially assigned to the Teams to take maximum advantage of the capabilities and experience of personnel available to perform radiological monitoring functions.

(b) Activities to be completed by personnel assigned to the On-Site Team prior to being dispatched are identified on the checklists.

NOTE

Attachment 18 "Onsite Map", should be used when reporting location of survey data to the TSC/OSC.

(2) In making preparations for conducting monitoring activities:

(a) The SRPC shall evaluate location and magnitude of the projected on-site dose rates, as specified in EPIP 3.3, "Dose Assessment and Protective Action", relay this information to the OSC HP Supervisor and identify the sequence of monitoring activities to be conducted.

(b) The OSC HP Supervisor shall brief the Team with this information, as well as the precautions to be taken, and ensure that the team members are appropriately dressed, have the required dosimetry, and have checked out the operation of their equipment.

(3) The Onsite Team may be directed to change out the particulate filters and charcoal cartridges at the environmental monitoring stations located onsite prior to, following and/or during the time when a release is in progress.

(a) The particulate filters and charcoal cartridges located at both stations on site should be changed.

NOTE

When changing out charcoal cartridges, they should be replaced with Silver Zeolite cartridges.

(b) Directions to each air sampler are provided in Attachment 16, "On-Site Environmental Air Sample Station Locations".

(4) The Onsite team may be directed to perform habitability checks of the Badging Center, PSC, and Training Center prior to evacuating these areas as necessary.

(5) The OSC HP Supervisor shall advise the OSC Supervisor and SRPC when the Onsite Team is ready to be dispatched.

(6) The SRPC shall assume control of the Onsite Team, and dispatch them after ensuring that the Security Shift Supervisor has been advised.

(7) The following surveys will normally be conducted and documented in accordance with the accompanying procedure:

(a) Radiation survey in accordance with HP Procedures.

(b) Radiation contamination surveys in accordance with HP Procedures.

(c) Airborne radioactivity surveys in accordance with HP Procedures.

NOTE

Instructions for obtaining a low volume air sample and estimating the activity concentration using a portable survey instrument are provided in this procedure.

(8) Onsite Monitoring personnel should maintain communications with the TSC via radio.

(9) Upon completion of the survey and as directed Team members shall return to the OSC, observing all control point requirements, and report to the OSC HP Supervisor for further instructions and debriefing.

3.9 AIR SAMPLING (LOW VOLUME SAMPLES)

(1) Load the air sampler with appropriate filters.

NOTE

Use of Silver Zeolite cartridges is recommended when obtaining low volume air samples to detect radioiodines.

(2) Perform a radiation survey on the radiator of the vehicle.

(3) Raise the hood on the vehicle and leave the vehicle running.

(4) Connect the air sampler to the battery, ensuring the red lead goes to the positive terminal.

(5) Turn the air sampler "ON".

(a) Take precautions to prevent contamination of the sampler.

(b) The sampler should be held approximately waist high.

(6) Obtain a 1, 5 or 10 cubic foot air sample, as instructed.

NOTE

Normally, a 10 cubic foot air sample will be obtained in those areas where dose rates are low, i.e., <5 mr/hr. A 1 cubic foot sample will be taken if dose rates are high, i.e., >200 mr/hr.

(7) Record information regarding the sample on Attachment 5, "Air Sample Identification". Include the count rate and airborne activity based on field assessment, as appropriate.

(8) Remove the sample from the sampler, taking precautions to prevent sample cross-contamination.

(a) Place the sample in a plastic bag, attach the Air Sample Identification label and seal the bag.

(b) Position the sample in the vehicle to minimize exposure to monitoring team members.

> **NOTE**
>
> The filter paper and Silver Zeolite cartridge should be stored separately.

(9) Evaluate the filter cartridge (Silver Zeolite) with a portable survey instrument, determine the airborne activity concentration, record the results, and report same to the TSC (or EOF), as follows:

> **NOTE**
>
> Sample evaluation must be conducted in a low background area; therefore, the Team may be required to travel to another location in order to evaluate the sample.

(a) Record the count rate or dose rate, as appropriate, using either an E-140 (or equivalent) or an open window RO-2 (or equivalent).

(b) Using Attachment 6, "Conversion of Air Sample Results into Radiological Concentrations", convert the survey instrument reading to airborne activity concentration based upon the sample volume drawn.

(c) Report results as iodine concentration in μCi/cc.

3.10 DOCUMENTATION AND ROUTING OF ONSITE MONITORING ACTIVITIES

(1) Documentation of radiological monitoring activities results should be provided to clerical personnel in the TSC where three copies of each document shall be made.

> **NOTE**
>
> As conditions warrant, the SRPC and the OSC HP Supervisor may need this documentation immediately; therefore, they should be allowed to review the documentation before it is forwarded to the Records Clerk.

(2) The original should be retained by the Document Records Clerk in the TSC.

(3) The SRPC and the OSC HP Supervisor should be provided one copy each of all documentation.

(4) The other copy should be distributed, as follows:

(a) Habitability surveys - Health Physics Access Control Point

(b) In-Plant surveys - Health Physics Access Control Point

(c) On-Site monitoring activities - Health Physics Access Control Point

3.11 DOCUMENTATION OF RADIOLOGICAL MONITORING DATA

(1) Radiological monitoring data gathered at the offsite areas shall be recorded on Attachment 4, "Emergency Monitoring Log" (or equivalent).

(2) Entries shall include the following information, as applicable.

(a) Date

(b) Page number

(c) Team Leader and Team Member names

(d) Exposure limit

(e) Wind conditions

(f) Personal dosimetry readings

(g) Survey instrument information

(h) Air sample data

a. Time

b. Location

c. Volume (ft^3)

d. Activity (μCi/cc) (Refer to Attachment 6, "Conversion of Air Sample Results into Radioiodine Concentrations").

(i) Location of survey (See Step 3.12, "Determining Sample Point and Plume Locations")

(j) Date and time of survey

(k) Radiation levels in mR/hr or R/hr (open and closed window readings)

(l) Pertinent observations by Monitoring Team members, including physical hazards

(m) Initials of the individual rewording the data.

(3) The Emergency Monitoring Logs and any other pertinent notes should be provided to the OSC HP Supervisor upon returning to the plant and subsequently provided to the Document Records Clerk in the TSC.

3.12 DETERMINING SAMPLE POINT AND PLUME LOCATIONS

(1) By use of available maps:

(a) Use the maps provided to determine your location as close as possible. Be sure to capture and document information such as landmarks and demarcations in order to be able to return to the same location if necessary. This is the 'normal' method of determining sample point and plume location.

(2) By use of the Garmin 45XL GPS Unit:

> **Note**
>
> The Garmin 45XL GPS Unit is needed when providing exact location information for use when performing back-calculations for Dose Projections (MIDAS). The location information needed for MIDAS is distance from the Offgas Stack and the direction from YOUR location TO the Offgas Stack.
>
> The Garmin 45XL GPS Unit is also needed when providing information in coordination with government agencies in support of an emergency at DAEC. The common standard is to document location information using latitude and longitude.

(a) To determine where you are in relation to the Offgas Stack:

1. Turn on and initialize GPS unit (reference instructions provided with unit).

2. Press 'GOTO' and select 'Stack'

3. Press 'PAGE' until you get to the screen that has Bearing (BRG) and Distance (DST) on it. Inform the TSC(EOF) of the Bearing and Distance from your position to the Offgas Stack.

(b) To determine where you are in Latitude and Longitude:

1. Turn on and initialize GPS unit (reference instructions provided with unit).

2. Press 'PAGE' until you get to the screen that has 'TRACK' and 'SPEED' on it. The coordinates under 'POSITION' are latitude and longitude (in that order). Inform the TSC(EOF) of your latitude and longitude.

4.0 RECORDS

(1) All records generated by this procedure shall be retained iaw QA Record Retention requirements.

5.0 REFERENCES

(1) DAEC Emergency Plan

(2) NUREG 0654 FEMA-REP-1 Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980

(3) NUREG-CR-5212, "Emergency Environmental Sampling and Analysis for Radioactive Material Facilities"

(4) EPIP 3.3, "Dose Assessment and Protective Action"

(5) EPIP 2.1, "Activation and Operation of the Operational Support Center"

(6) EPIP 3.1, "Inplant Monitoring"

(7) Offsite Dose Assessment Manual for Gaseous and Liquid Effluents

(8) HP Procedures

6.0 ATTACHMENTS

Attachment 1, "Typical Radiological Monitoring Team Briefing Topics"

Attachment 2, "Radiological Sampling Points and Air Sample Station Locations (Outside 0.5 Miles from DAEC)"

Attachment 3, "Environmental Air Sampler Station Locations"

Attachment 4, "Emergency Monitoring Log"

Attachment 5, "Air Sample Identification"

Attachment 6, "Conversion of Air Sample Results into Radioiodine Concentrations"

Attachment 7, "Selected Radiological Sampling Points"

Attachment 8, DELETED

Attachment 9, "Radiological Sampling Procedure for Pasture Grass and Forage"

Attachment 10, "Radiological Sampling Procedure for Soil"

Attachment 11, "Radiological Sampling Procedure for Milk"

Attachment 12, "Radiological Sampling Procedure for Surface Water"

Attachment 13, "Radiological Sampling Procedure for Snow"

Attachment 14, "Radiological Sampling Procedure for Vegetables, Fruits and Grains"

Attachment 15, "Radiological Sampling Procedure for Emergency Sampling"

Attachment 16, "On-Site Environmental Air Sample Station Locations"

Attachment 17, "ODAM Environmental Sample Station Locations"

Attachment 18, "Onsite Map"

Attachment 19, "Emergency Environmental Sample Collection Record, typical"

Attachment 20, "Emergency Environmental Sample Log, typical"

ATTACHMENT 1

TYPICAL RADIOLOGICAL MONITORING TEAM BRIEFING TOPICS

1. Meteorological Information, including:

   Wind Speed

   Wind Direction

2. Radiological Information - if a release is in progress:

   Release Point

   Release rate

   Maximum projected dose rate and location

   Plume boundaries

   Affected sectors/area

3. Location to which Teams will initially be dispatched, routes to be used to avoid radiological hazard areas if such exists, and tasks to be accomplished.

4. To the extent capable of being projected, the duration of time until either a release begins or is stopped.

5. Documentation requirements (maintenance of logs and charts).

6. Protective measures to be employed.

   a. Consider the need for dose extensions.

   b. Authorize use of KI.

   c. Protective clothing/respiratory protection equipment usage.

7. Reporting requirements, including, for example:

   Radiation survey readings

   Airborne sample estimates

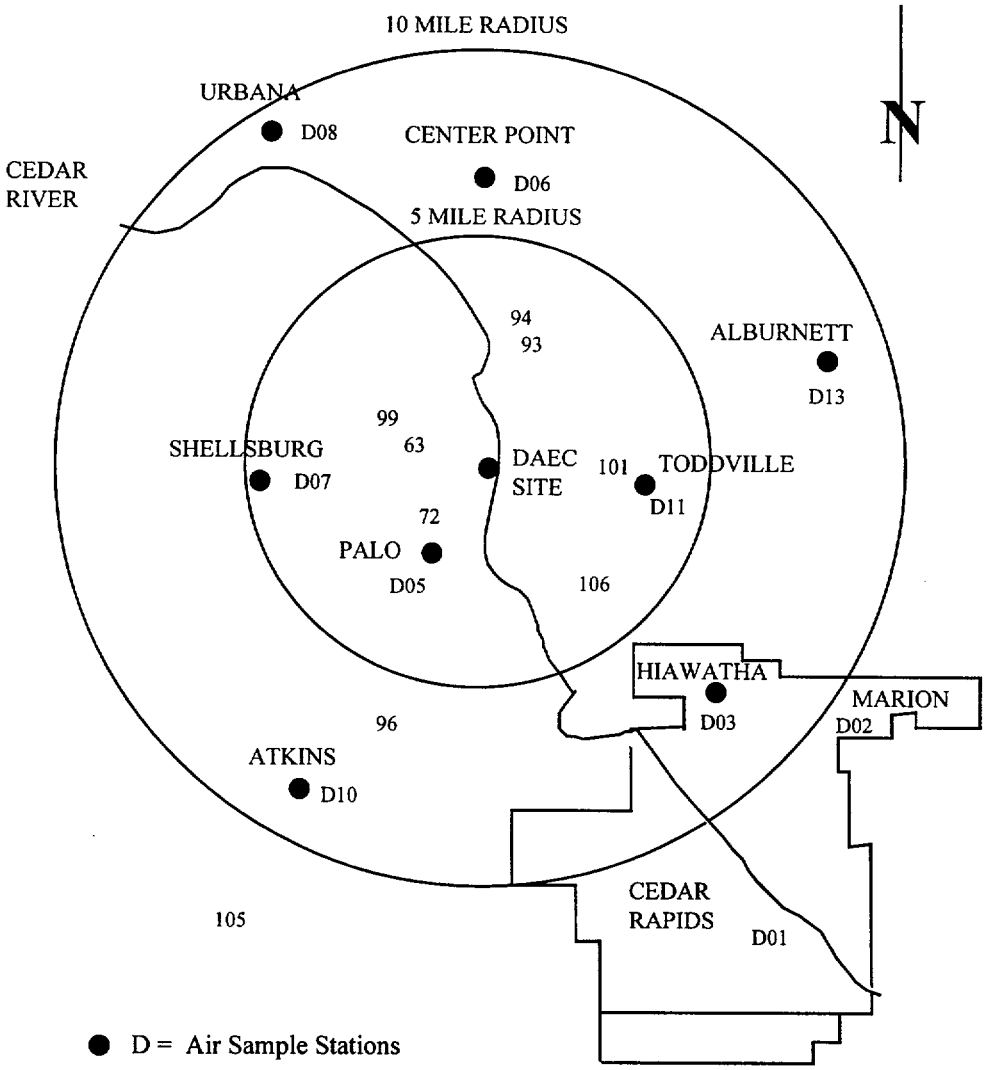
   Unusual or unexpected problems or situations which may impact the ability to perform monitoring functions

   Observations of actions taken by local, State or Federal assistance groups or the public

8. Precautions to be observed upon entering the plume and as appropriate, in high radiation fields.

ATTACHMENT 2

RADIOLOGICAL SAMPLING POINTS AND AIR SAMPLE STATION LOCATIONS
(outside 0.5 miles from DAEC)



Numbers indicate radiological sampling points

ATTACHMENT 3

ENVIRONMENTAL AIR SAMPLER STATION LOCATION

Air Stations and TLD Locations

D01 Prairie Creek Power Station - located on south side of substation fence midway down main drive - 3300 C St SW, Cedar Rapids

D02 Marion, Iowa - located on substation fence south side of emergency generator station - corner of 12 St. and 2nd Ave.

D03 Hiawatha, Iowa - located inside concrete substation on east wall at intersection of 6th Ave. and Willman Blvd.

D05 Palo, Iowa - located on substation east wall just north of Tri County Dairy at intersection of 1st St. and Drake Dr.

D06 Center Point - located on south substation fence in 700 block of Grubb Ave. (county road = E-16)

D07 Shellsburg - located on a pole across the street from Shellsburg Grain in the block of Commercial St.

D08 Urbana - located on a pole at first cemetery east of Urbana on county road #E-2W (Urbana - Center Point road)

D10 Atkins - located on a pole directly under city water tower at city garage

D11 Toddville - located on a pole at intersection of Front Rd. and 5th St.

D13 Alburnett - located on a pole at railroad crossing of North St. (E-28) NE side of town

D15 Site North - located in a white weather box on main road 1/4 mile north of Training Center

D16 Site South - located in a white weather box located at base of Met Tower

ATTACHMENT 4
EMERGENCY MONITORING LOG

Date _____ TEAM - _____ Page ___ of ___

TEAM LEADER (TL)	
TEAM MEMBER (TM)	
EXPOS. LIMITS	
EXTENDED TO	
WIND SPEED / TIME	
DIRECTION/TIME	

PERSONAL DOSIMETRY READINGS					
TIME	TL	TM	TIME	TL	TM

SURVEY INSTR. INFORMATION		
TYPE	SERIAL NO.	CAL. DUE

			AIR SAMPLE DATA				
INST. USED	SAMPLE LOCATION	START TIME	STOP TIME	FLOW (CFM)	VOL (FT^3)	NET CPM (IODINE)	IODINE 131 (µCi/cc)

			RADIOLOGICAL DATA				
LOCATION	TIME	OPEN/CLOSED	REMARKS	LOCATION	TIME	OPEN/CLOSED	REMARKS
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	

PERFORMED BY : _____ DATE: _____
HP TECHNICIAN

ATTACHMENT 5

AIR SAMPLE IDENTIFICATION

AIR SAMPLE

SAMPLE LOCATION _____

DATE/TIME ON _____/_____

DATE/TIME OFF _____/_____

SAMPLE FLOW RATE _____CFM

SAMPLE COLLECTED BY _____

ATTACHMENT 6

NOTE: This chart is only applicable for 6 hours after the Reactor scram.

Conversion of Air Sample Results Into Radioiodine Concentrations

E-140 or RO-2

COUNT RATE (cpm)	1ft^3	5ft^3	10ft^3	COUNT RATE (cpm)	1ft^3	5ft^3	10ft^3	COUNT RATE (cpm)	1ft^3	5ft^3	10ft^3
100	3.18E-8	6.36E-9	3.18E-9	5700	1.81E-6	3.63E-7	1.81E-7	23K	7.32E-6	1.46E-6	7.32E-7
200	6.36E-8	1.27E-8	6.36E-9	5800	1.85E-6	3.69E-7	1.85E-7	24K	7.64E-6	1.53E-6	7.64E-7
300	9.54E-8	1.91E-8	9.54E-9	5900	1.88E-6	3.75E-7	1.88E-7	25K	7.95E-6	1.59E-6	7.95E-7
400	1.27E-7	2.54E-8	1.27E-8	6000	1.91E-6	3.82E-7	1.91E-7	26K	8.27E-6	1.65E-6	8.27E-7
500	1.59E-7	3.18E-8	1.59E-8	6100	1.94E-6	3.88E-7	1.94E-7	27K	8.59E-6	1.72E-6	8.59E-7
600	1.90E-7	3.82E-8	1.90E-8	6200	1.97E-6	3.94E-7	1.97E-7	28K	8.91E-6	1.78E-6	8.91E-7
700	2.22E-7	4.45E-8	2.23E-8	6300	2.00E-6	4.00E-7	2.00E-7	29K	9.23E-6	1.85E-6	9.23E-7
800	2.54E-7	5.09E-8	2.55E-8	6400	2.04E-6	4.07E-7	2.04E-7	30K	9.54E-6	1.91E-6	9.54E-7
900	2.86E-7	5.72E-8	2.86E-8	6500	2.07E-6	4.14E-7	2.07E-7	31K	9.86E-6	1.97E-6	9.86E-7
1000	3.18E-7	6.36E-8	3.18E-8	6600	2.10E-6	4.20E-7	2.10E-7	32K	1.01E-5	2.04E-6	1.02E-6
1100	3.49E-7	6.99E-8	3.50E-8	6700	2.13E-6	4.26E-7	2.13E-7	33K	1.05E-5	2.10E-6	1.05E-6
1200	3.81E-7	7.64E-8	3.82E-8	6800	2.16E-6	4.33E-7	2.16E-7	34K	1.08E-5	2.16E-6	1.08E-6
1300	4.13E-7	8.27E-8	4.14E-8	6900	2.20E-6	4.39E-7	2.20E-7	35K	1.11E-5	2.23E-6	1.11E-6
1400	4.45E-7	8.91E-8	4.45E-8	7000	2.23E-6	4.45E-7	2.23E-7	36K	1.15E-5	2.29E-6	1.15E-6
1500	4.77E-7	9.54E-8	4.77E-8	7100	2.26E-6	4.52E-7	2.26E-7	37K	1.18E-5	2.35E-6	1.18E-6
1600	5.09E-7	1.02E-7	5.09E-8	7200	2.29E-6	4.58E-7	2.29E-7	38K	1.21E-5	2.41E-6	1.21E-6
1700	5.40E-7	1.08E-7	5.41E-8	7300	2.32E-6	4.64E-7	2.32E-7	39K	1.24E-5	2.48E-6	1.24E-6
1800	5.73E-7	1.15E-7	5.73E-8	7400	2.35E-6	4.71E-7	2.35E-7	40K	1.27E-5	2.54E-6	1.27E-6
1900	6.04E-7	1.21E-7	6.04E-8	7500	2.39E-6	4.77E-7	2.39E-7	41K	1.30E-5	2.61E-6	1.30E-6
2000	6.36E-7	1.27E-7	6.36E-8	7600	2.41E-6	4.84E-7	2.42E-7	42K	1.34E-5	2.67E-6	1.34E-6
2100	6.68E-7	1.34E-7	6.68E-8	7700	2.45E-6	4.90E-7	2.45E-7	43K	1.38E-5	2.74E-6	1.37E-6
2200	6.99E-7	1.39E-7	6.99E-8	7800	2.48E-6	4.96E-7	2.48E-7	44K	1.40E-5	2.80E-6	1.40E-6
2300	7.31E-7	1.46E-7	7.32E-8	7900	2.51E-6	5.03E-7	2.51E-7	45K	1.43E-5	2.86E-6	1.43E-6
2400	7.63E-7	1.52E-7	7.64E-8	8000	2.55E-6	5.09E-7	2.55E-7	46K	1.46E-5	2.93E-6	1.46E-6
2500	7.95E-7	1.59E-7	7.95E-8	8100	2.58E-6	5.15E-7	2.58E-7	47K	1.50E-5	2.99E-6	1.50E-6
2600	8.27E-7	1.65E-7	8.27E-8	8200	2.61E-6	5.22E-7	2.61E-7	48K	1.53E-5	3.05E-6	1.53E-6
2700	8.58E-7	1.72E-7	8.59E-8	8300	2.64E-6	5.28E-7	2.64E-7	49K	1.56E-5	3.12E-6	1.56E-6
2800	8.90E-7	1.78E-7	8.91E-8	8400	2.67E-6	5.34E-7	2.67E-7	50K	1.59E-5	3.18E-6	1.59E-6
2900	9.22E-7	1.85E-7	9.23E-8	8500	2.70E-6	5.40E-7	2.70E-7	51K	1.62E-5	3.25E-6	1.62E-6
3000	9.54E-7	1.91E-7	9.54E-8	8600	2.74E-6	5.47E-7	2.74E-7	52K	1.65E-5	3.31E-6	1.65E-6
3100	9.86E-7	1.97E-7	9.86E-8	8700	2.77E-6	5.54E-7	2.77E-7	53K	1.69E-5	3.37E-6	1.69E-6
3200	1.01E-6	2.04E-7	1.02E-7	8800	2.80E-6	5.60E-7	2.80E-7	54K	1.72E-5	3.43E-6	1.72E-6
3300	1.04E-6	2.10E-7	1.05E-7	8900	2.83E-6	5.66E-7	2.83E-7	55K	1.75E-5	3.49E-6	1.75E-6
3400	1.08E-6	2.16E-7	1.08E-7	9000	2.86E-6	5.73E-7	2.86E-7	56K	1.78E-5	3.56E-6	1.78E-6
3500	1.11E-6	2.23E-7	1.11E-7	9100	2.89E-6	5.79E-7	2.90E-7	57K	1.81E-5	3.63E-6	1.81E-6
3600	1.14E-6	2.29E-7	1.15E-7	9200	2.92E-6	5.85E-7	2.93E-7	58K	1.85E-5	3.69E-6	1.85E-6
3700	1.17E-6	2.35E-7	1.18E-7	9300	2.96E-6	5.92E-7	2.96E-7	59K	1.88E-5	3.75E-6	1.88E-6
3800	1.20E-6	2.24E-7	1.21E-7	9400	2.99E-6	5.98E-7	2.99E-7	60K	1.91E-5	3.82E-6	1.91E-6
3900	1.24E-6	2.48E-7	1.24E-7	9500	3.02E-6	6.04E-7	3.02E-7	61K	1.94E-5	3.88E-6	1.94E-6
4000	1.27E-6	2.54E-7	1.27E-7	9600	3.05E-6	6.11E-7	3.05E-7	62K	1.97E-5	3.94E-6	1.97E-6
4100	1.30E-6	2.61E-7	1.30E-7	9700	3.08E-6	6.17E-7	3.09E-7	63K	2.00E-5	4.01E-6	2.00E-6
4200	1.33E-6	2.67E-7	1.34E-7	9800	3.12E-6	6.24E-7	3.12E-7	64K	2.04E-5	4.07E-6	2.04E-6
4300	1.36E-6	2.74E-7	1.37E-7	9900	3.15E-6	6.30E-7	3.15E-7	65K	2.07E-5	4.14E-6	2.07E-6
4400	1.40E-6	2.79E-7	1.40E-7	10K	3.18E-6	6.36E-7	3.18E-7	66K	2.10E-5	4.20E-6	2.10E-6
4500	1.43E-6	2.86E-7	1.43E-7	11K	3.50E-6	6.99E-7	3.50E-7	67K	2.13E-5	4.25E-6	2.13E-6
4600	1.46E-6	2.93E-7	1.46E-7	12K	3.82E-6	7.64E-7	3.82E-7	68K	2.16E-5	4.33E-6	2.16E-6
4700	1.50E-6	2.99E-7	1.49E-7	13K	4.14E-6	8.27E-7	4.14E-7	69K	2.20E-5	4.39E-6	2.20E-6
4800	1.52E-6	3.05E-7	1.53E-7	14K	4.45E-6	8.91E-7	4.45E-7	70K	2.23E-5	4.45E-6	2.23E-6
4900	1.56E-6	3.12E-7	1.56E-7	15K	4.77E-6	9.54E-7	4.77E-7	8mR/hr	2.55E-5	5.10E-6	2.55E-6
5000	1.59E-6	3.18E-7	1.59E-7	16K	5.09E-6	1.02E-6	5.09E-7	10mR/hr	3.18E-5	6.36E-6	3.18E-6
5100	1.62E-6	3.25E-7	1.62E-7	17K	5.41E-6	1.08E-6	5.41E-7	12mR/hr	3.82E-5	7.64E-6	3.82E-6
5200	1.65E-6	3.31E-7	1.65E-7	18K	5.73E-6	1.15E-6	5.73E-7	15mR/hr	4.77E-5	9.54E-6	4.77E-6
5300	1.69E-6	3.37E-7	1.69E-7	19K	6.04E-6	1.21E-6	6.04E-7	20mR/hr	6.36E-5	1.27E-5	6.36E-6
5400	1.72E-6	3.44E-7	1.72E-7	20K	6.36E-6	1.27E-6	6.36E-7	25mR/hr	7.95E-5	1.59E-5	7.95E-6
5500	1.75E-6	3.50E-7	1.75E-7	21K	6.68E-6	1.34E-6	6.68E-7	30mR/hr	9.54E-5	1.91E-5	9.54E-6
5600	1.78E-6	3.56E-7	1.78E-7	22K	6.99E-6	1.40E-6	6.99E-7	50mR/hr	1.59E-4	3.18E-5	1.59E-5

ATTACHMENT 7
SELECTED RADIOLOGICAL SAMPLING POINTS

A-6	Quail Ridge Road & Williams Lake Road
A-14	North Center Point Road (Iowa 150) & Lewis Access Road
A-29	Hannen Road & Fairchild Road
A-38	Mills Road & Rolling Acres Road
B-1	Quail Ridge Road & Nelson Drive
B-12	Deal Road & McNeil Road
B-17	Central City Road (E16) & Alice Road (W45)
B-26	Paris Road (D66) & W Otter Road
C-3	Hagerman Road & Standlea Road
C-9	Lafayette Road (E28) & Alice Road (W45)
C-16	Old Center Road & C Avenue Extension
C-25	Lyman Road & Reamer Road
D-5	Hoff Lane & Otter Road (E6W)
D-12	East Otter Road & Fishel Road
D-29	Arabian Road & North Marion Road (10th Street)
D-32	Indian Bridge Road & Lillie Road
E-4	Toddville Road & Otter Road (E6W)
E-13	Midway Road & St. Peter's Road
E-19	White Road & Alburnett Road (W58)
E-23	County Home Road (E34) & Winslow Road
F-6	Hunt Road & Loggerhead Road
F-13	Knoll Drive & Council Street
F-27	Marion Blvd. & Blairs Ferry Road (Marion)
F-33	Indian Creek Road & Winslow Road

ATTACHMENT 7 (continued)

SELECTED RADIOLOGICAL SAMPLING POINTS

G-3	Rolling Road & Feather Ridge Road
G-12	Michael Drive & Milburn Road
G-28	I-380 NE & Collins Road NE (CR)
G-41	I-380 NE & 8th Street (CR)
H-3	Blairs Ferry Road & Horseshoe Lake Road
H-12	42nd Street & Seminole Valley Road
H-22	16th Ave SW (US 218/30) & West Post Road SW (CR)
H-23	Highway 94 (F Ave NW) & Ellis Blvd
J-4	Chain Bridge Rd & Covington Rd (Iowa 94) (Linn Dr)
J-9	Clinton Road & Gibney Road
J-19	Rodgers Road & Covington Road (Iowa 94)
J-27	16th Ave SW (US 218/30) & Morgan Bridge Road
K-6	Yates Road & Hollenbeck Road
K-15	Clinton Road & Young Road
K-25	32nd Avenue & 71st Street (Benton County)
K-31	US 218/30 & Linn-Benton Road
L-5	Jct Shellsburg Rd (E36) & Linn-Benton Rd (Benton Co)
L-9	68th Street & 33rd Avenue (Benton Co)
L-20	31st Avenue & 71st Street (Benton Co)
L-21	29th Avenue & 69th Street (Benton Co)
M-6	Linn-Benton Road & McVay Road (Benton Co)
M-10	32nd Avenue & 66th Street (Benton Co)
M-22	29th Avenue & 68th Street (Benton Co)

ATTACHMENT 7 (continued)

SELECTED RADIOLOGICAL SAMPLING POINTS

N-2	64th Street & 33rd Avenue (Benton Co)
N-8	64th Street & 31st Avenue (Benton Co)
N-20	62nd Street & 28th Avenue (Benton Co)
N-24	65th Street & 27th Avenue (Benton Co)
P-5	62nd Street & 33rd Avenue (Benton Co)
P-9	31st Avenue & 62nd Street (Benton Co)
P-14	60th Street Drive & 59th Street Trail (Benton Co)
P-21	60th Street & 28th Avenue Drive (Benton Co)
Q-5	33rd Avenue Drive East of 33rd Avenue, on curve (Benton Co)
Q-7	33rd Avenue Drive & 59th Street Trail (Benton Co)
Q-23	32nd Avenue & 56th Street Trail (Benton County)
Q-27	58th Street & 28th Avenue Drive (Benton Co)
R-3	Lewis Access Road (E24) & Lewis Bottom Rd (E36)
R-9	Urbana Rd (E2W) & Cedar Ridge Road (E16)
R-20	East Urbana Road & Blue Creek Road
R-24	55th Street & 32nd Avenue (Benton County)

ATTACHMENT 8

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ATTACHMENT 9

RADIOLOGICAL SAMPLING PROCEDURE FOR PASTURE GRASS AND FORAGE

1.0 Instructions

1.1 Sample Locations

a. In general, samples should be taken in the plume exposure pathway or downwind sectors It is important that sampling be done where survey meters indicate activity above background.

b. If practical, samples should be taken in the same manner and at the same sites as the routine environmental samples.

c. The ODAM Environmental Sampling Station locations are:

Location:

16 On-site South, 0.5 miles S

57 Bull Farm, 1 mile WSW - 4325 Power Plant Rd, Palo

58 Frantz Farm, 1 mile WSW-SW - 4318 Power Plant Rd, Palo

63 Andrews Farm, 1.5 miles WNW - 0.5 miles North of intersection of Power Plant Rd and Lewis Bottoms Rd.

72 VanNote Farm, 2 miles SW - 2926 Palo Marsh Rd, Palo

93 Yarborough Farm, 2.8 miles NNE - 4074 Quail Ridge Rd, Toddville

94 Hines Farm, 2.7 miles N - 3885 Williams Lake Rd, Toddville

105 Shulte Farm, 21.3 miles SSW - Take State Route 151 to the Norway turnoff. Turn onto this road and go to 3rd gravel road, turn left. Follow this road to the first road, turn right and travel to the first farm on the right side of the road.

106 Stallman Farm, 4.5 miles SE - 8401 Milburn Rd, C.R.

ATTACHMENT 9
RADIOLOGICAL SAMPLING PROCEDURE FOR PASTURE GRASS AND FORAGE
(Continued)

1.2 Contamination Control Precautions

a. All samples should be double bagged and sealed in clean sample bags or containers to prevent cross contamination as well as loss of sample.

b. Tools such as shovels, augers or grass clippers should be surveyed after each sample is collected. Decon as necessary.

c. If practical, vehicles used to transport samples should have specific areas for storing clean items, potentially contaminated items, and environmental samples.

d. Container materials should be chosen to minimize transfer or loss of activity due to absorption or other chemical reactions.

1.3 Sample Collection

Collect 1 kg. (2.2 pound) pasture grass or forage sample from an area 1 meter square (10.8 square feet). Clip grass as close to the surface as possible without getting roots and soil in the sample. If grass is very long, then just gather the top 4 inches.

1.4 Sample Identification

a. Double bag sample collected and tape the bag(s) closed

b. Fill out EPIP 3.2 Attachment 19, "Emergency Environmental Sample Collection Record, typical'. Place this form into a plastic protector baggie and attach this baggie to the external bag of the sample collected. The record shall have information as follows:
   - Sample #
   - Collection date and time
   - Location
   - Sample type
   - Contact dose rate
   - Sample collector

c. Fill out EPIP 3.2 Attachment 20, "Emergency Environmental Sample Log, typical", with the same information as above with the inclusion of weather conditions.

d. When transferring the samples, ensure proper completion of the 'chain of custody' record portion of EPIP 3.2 Attachment 19, "Emergency Enviromental Sample Collection Record, typical". The white original copy stays with the sample and the relinquisher retains a bottom copy for record of transfer.

NOTE

The person recieving the sample must display a picture ID in order to receive custody of the sample.

ATTACHMENT 10

RADIOLOGICAL SAMPLING PROCEDURE FOR SOIL

1.0 Instructions

1.1 Sample Locations

a. In general, samples should be taken in the plume exposure pathway or downwind sectors. It is important that sampling be done where survey meters indicate elevated background readings.

b. If practical, samples should also be taken in the same manner and at the same sites as the routine environmental samples.

c. The Environmental Monitoring and Air Sampling Station locations are:

Location: D15 0.5 miles NW of stack (on site)(305 degrees)
D16 0.5 miles S of stack (on site)(190 degrees)

1.2 Contamination Control Precautions

a. All samples should be double bagged and sealed in clean sample bags or containers to prevent cross contamination as well as loss of sample.

b. Tools such as shovels, augers or grass clippers should be surveyed after each sample is collected. Decon as necessary.

c. If practical, vehicles used to transport samples should have specific areas for storing clean items, potentially contaminated items, and environmental samples.

d. Container materials should be chosen to minimize transfer or loss of activity due to absorption or other chemical reactions.

ATTACHMENT 10
RADIOLOGICAL SAMPLING PROCEDURE FOR SOIL
(Continued)

1.3 Sample Collection

a. Soil samples should normally be taken in the upper 2 inches of undisturbed topsoil (exceptions - after heavy rain or when characterizing a liquid release into soil). Samples should be collected in areas free of vegetation, rocks and roots. If vegetation is present, it must be sampled with the soil to measure total deposition.

b. Utilizing a spade or auger, dig three (3) 12" x 12" x 1" holes. These holes should be in a straight line about 1 foot apart. Take at least a 1 kg. (2.2 pound) sample. The auger is useful if a deeper soil profile is needed.

1.4 Sample Identification

a. Double bag sample collected and tape the bag(s) closed

b. Fill out EPIP 3.2 Attachment 19, "Emergency Environmental Sample Collection Record, typical'. Place this form into a plastic protector baggie and attach this baggie to the external bag of the sample collected. The record shall have information as follows:

- Sample #
- Collection date and time
- Location
- Sample type
- Contact dose rate
- Sample collector

c. Fill out EPIP 3.2 Attachment 20, "Emergency Environmental Sample Log, typical", with the same information as above with the inclusion of weather conditions.

d. When transferring the samples, ensure proper completion of the 'chain of custody' record portion of EPIP 3.2 Attachment 19, "Emergency Enviromental Sample Collection Record, typical". The white original copy stays with the sample and the relinquisher retains a bottom copy for record of transfer.

NOTE

The person recieving the sample must display a picture ID in order to receive custody of the sample.

ATTACHMENT 11

RADIOLOGICAL SAMPLING PROCEDURE FOR MILK

1.0 Instructions

1.1 Sample Locations

a. In general, samples should be taken in the plume exposure pathway or downwind sectors as well as at major milk shed locations.

b. If practical, samples should also be taken in the same manner and at the same sites as the routine environmental samples.

c. The ODAM Environmental Sampling Station locations are:

Location:

93 Yarborough Farm, 2.8 miles NNE - 4074 Quail Ridge Rd, Toddville

94 Hines Farm, 2.7 miles N - 3885 Williams Lake Rd, Toddville

96 Keiper Farm, 8 miles SSW - From Power Plant Rd, Palo Marsh Rd intersection, go south to 4-way stop. Turn right on Blairs Ferry Rd. Go straight at stop sign on Hollenbeck Rd. Take Hollenbeck Rd until it T's with Ellis Rd. Extended (approx. 6 miles). Keiper farm is located on south side of the T

101 Flecksing Farm, 4.0 miles E -3306 Wubbens Rd, Toddville

106 Stallman Farm, 4.5 miles SE - 8401 Milburn Rd, C.R.

1.2 Contamination Control Precautions

a. All samples should be double bagged and sealed in clean cubitainers and bagged to prevent cross contamination as well as loss of sample.

b. If practical, vehicles used to transport samples should have specific areas for storing clean items, potentially contaminated items and environmental samples.

c. Container materials should be chosen to minimize transfer or loss of activity due to absorption or other chemical reactions.

ATTACHMENT 11

RADIOLOGICAL SAMPLING PROCEDURE FOR MILK
(Continued)

1.3 Sample Collection

a. Collect 1 gallon samples from the upwind and downwind sites in premarked cubitainers. (The upwind samples will be used as background samples.)

b. If spoilage could be a problem, add approximately 40 grams (30-50) of sodium bisulfite to each gallon of milk. (NOTE: The vendor lab may require a different stabilizer.)

1.4 Sample Identification

a. Double bag sample collected and tape the bag(s) closed

b. Fill out EPIP 3.2 Attachment 19, "Emergency Environmental Sample Collection Record, typical'. Place this form into a plastic protector baggie and attach this baggie to the external bag of the sample collected. The record shall have information as follows:

- Sample #
- Collection date and time
- Location
- Sample type
- Contact dose rate
- Sample collector

c. Fill out EPIP 3.2 Attachment 20, "Emergency Environmental Sample Log, typical", with the same information as above with the inclusion of weather conditions.

d. When transferring the samples, ensure proper completion of the 'chain of custody' record portion of EPIP 3.2 Attachment 19, "Emergency Enviromental Sample Collection Record, typical". The white original copy stays with the sample and the relinquisher retains a bottom copy for record of transfer.

NOTE

The person recieving the sample must display a picture ID in order to receive custody of the sample.

ATTACHMENT 12

RADIOLOGICAL SAMPLING PROCEDURE FOR SURFACE WATER

1.0 Instructions

1.1 Sample Locations

a. In general, samples should be taken in the plume exposure pathway or downwind sectors, as well as at distant control or upstream locations. Farm ponds should be sampled as well as human water sources. It is important that sampling be done where survey meters indicate activity above background.

b. If practical, samples should be taken in the same manner and at the same sites as the routine environmental samples.

c. The ODAM Environmental Sampling Station locations are:
Location:

49	Lewis Access, upstream of DAEC
50	Plant Intake
51	Plant Discharge
99	Pleasant Creek Lake, 2.5 miles NNW - intersection of McClintock Rd and Lewis Bottoms Rd
107	DAEC Sewage Plant Effluent

1.2 Contamination Control Precautions

a. All samples should be double bagged and sealed in clean cubitainers and bagged to prevent cross contamination as well as loss of sample.

b. If practical, vehicles used to transport samples should have specific areas for storing clean items, potentially contaminated items and environmental samples.

c. Container materials should be chosen to minimize transfer or loss of activity due to absorption or other chemical reactions.

ATTACHMENT 12

RADIOLOGICAL SAMPLING PROCEDURE FOR SURFACE WATER
(Continued)

1.3 Sample Collection

a. Each water sample cubitainer should be rinsed twice with the sampling water prior to collecting the one (1) gallon samples. Take care not to sample sediments from the bottom of rivers/lakes. If at all possible, arrange for a representative, composite sample to be taken.

1.4 Sample Identification

a. Double bag sample collected and tape the bag(s) closed

b. Fill out EPIP 3.2 Attachment 19, "Emergency Environmental Sample Collection Record, typical'. Place this form into a plastic protector baggie and attach this baggie to the external bag of the sample collected. The record shall have information as follows:

- Sample #
- Collection date and time
- Location
- Sample type
- Contact dose rate
- Sample collector

c. Fill out EPIP 3.2 Attachment 20, "Emergency Environmental Sample Log, typical", with the same information as above with the inclusion of weather conditions.

d. When transferring the samples, ensure proper completion of the 'chain of custody' record portion of EPIP 3.2 Attachment 19, "Emergency Enviromental Sample Collection Record, typical". The white original copy stays with the sample and the relinquisher retains a bottom copy for record of transfer.

NOTE

The person recieving the sample must display a picture ID in order to receive custody of the sample.

ATTACHMENT 13

RADIOLOGICAL SAMPLING PROCEDURE FOR SNOW

1.0 Instructions

1.1 Sample Locations

a. In general, samples should be taken in the plume exposure pathway. It is important that sampling be done where survey meters indicate activity above background.

1.2 Contamination Control Precautions

a. All samples should be bagged and sealed in clean sample bags to prevent cross contamination as well as loss of sample.

b. If practical, vehicles used to transport samples should have specific areas for storing clean items, potentially contaminated items and environmental samples.

c. Container materials should be chosen to minimize transfer or loss of activity due to absorption or other chemical reactions.

1.3 Sample Collection

a. The ideal container for collecting snow is a wide mouth 5 gallon plastic container (4 gallons of light snow melts to approximately 1 gallon of water.)

b. It is important to measure the area which is sampled, and if possible, standardize the sample area. This will allow analysis of contaminant deposition per unit area which will make data interpretation possible. The recommended area is two one meter square areas. Two inches deep for light snow, or one inch deep for heavily compacted snow. Ice may require chipping.

ATTACHMENT 13

RADIOLOGICAL SAMPLING PROCEDURE FOR SNOW
(Continued)

NOTE

Snow samples are dependent upon several weather related variables; a) Rate of snowfall at and since time of release; b) Air temperatures since snowfall of interest occurred; c) Wind speed and direction; d) Sunshine, rain or other weather conditions occurring after snowfall of interest.

c. Select the area to be sampled from the general location requested that has not been subjected to non-meteorological disturbances (plowing, snowmobiles, pedestrians, etc.).

NOTE

The following possibilities must be considered and existing weather conditions used to determine the area to be sampled.

1. **Snow that has fallen during or following the release or snow already on the ground may have drifted. Snow samples should be collected in areas that are not prone to drifting, if possible.**

2. **Melting and freezing and/or rain may mean the snow deposition is fixed in an ice layer and not affected by winds.**

NOTE

If the snow deposition is covered by new snowfall or a crust layer, sample appropriate layer(s).

ATTACHMENT 13

RADIOLOGICAL SAMPLING PROCEDURE FOR SNOW

1.4 Sample Identification

a. Double bag sample collected and tape the bag(s) closed

b. Fill out EPIP 3.2 Attachment 19, "Emergency Environmental Sample Collection Record, typical'. Place this form into a plastic protector baggie and attach this baggie to the external bag of the sample collected. The record shall have information as follows:

- Sample #
- Collection date and time
- Location
- Sample type
- Contact dose rate
- Sample collector

c. Fill out EPIP 3.2 Attachment 20, "Emergency Environmental Sample Log, typical", with the same information as above with the inclusion of weather conditions.

d. When transferring the samples, ensure proper completion of the 'chain of custody' record portion of EPIP 3.2 Attachment 19, "Emergency Enviromental Sample Collection Record, typical". The white original copy stays with the sample and the relinquisher retains a bottom copy for record of transfer.

NOTE

The person recieving the sample must display a picture ID in order to receive custody of the sample.

NOTE

Careful notes must be kept detailing exact size of area sampled, density of snow, weather and temperature during sampling, swirling snow conditions, crusting, overall depth of snow and rate of snowfall. A detailed map should be drawn/marked to identify the sample location.

ATTACHMENT 14

RADIOLOGICAL SAMPLING PROCEDURE FOR VEGETABLES, FRUIT AND GRAINS

1.0 Instructions

1.1 Sample Locations

a. In general, samples should be taken in the plume exposure pathway or downwind sectors. It is important that sampling be done where survey meters indicate activity above background.

b. Commercial processing and storage locations that concentrate food products from deposition areas should be sampled when crop timing is applicable.

c. If practical, these samples should be taken in the same manner, and at the same sites as the routine environmental samples.

d. The ODAM Environmental Sampling Station locations are:

Location:

16	On-site South, 0.5 miles S
57	Bull Farm, 1 mile WSW - 4325 Power Plant Rd, Palo
58	Frantz Farm, 1 mile WSW -SW- 4318 Power Plant Rd, Palo
63	Andrews Farm, 1.5 miles WNW - 0.5 miles North of intersection of Power Plant Rd and Lewis Bottoms Rd.
72	VanNote Farm, 2 miles SW - 2926 Palo Marsh Rd, Palo
93	Yarborough Farm, 2.8 miles NNE - 4074 Quail Ridge Rd, Toddville
94	Hines Farm, 2.7 miles N - 3885 Williams Lake Rd, Toddville
105	Shulte Farm, 21.3 miles SSW - Take State Route 151 to the Norway turnoff. Turn onto this road and go to 3rd gravel road, turn left. Follow this road to the first road, turn right and travel to the first farm on the right side of the road.
106	Stallman Farm, 4.5 miles SE - 8401 Milburn Rd, C.R.

ATTACHMENT 14

RADIOLOGICAL SAMPLING PROCEDURE FOR VEGETABLES, FRUITS AND GRAINS
(Continued)

1.2 Contamination Control Precautions

a. All samples should be double bagged and sealed in clean sample bags or containers to prevent cross contamination as well as loss of sample.

b. Tools such as clippers or shears should be cleaned and surveyed after each sample is collected. Decon as necessary.

c. If practical, vehicles used to transport samples should have specific areas for storing clean items, potentially contaminated items, and environmental samples.

d. Container materials should be chosen to minimize transfer or loss of activity due to absorption or other chemical reactions.

1.3 Sample Collection

a. Collect a 1 kg. (2.2 pound) unwashed sample.

b. When collecting leafy vegetation samples, collect only the leaf portion, leaving the stems and roots behind. The amount of soil collected with the vegetation should be minimized.

c. When collecting leaves from trees or bushes, avoid collecting limbs, pine needles, and other materials that will be difficult to ash.

1.4 Sample Identification

a. Double bag sample collected and tape the bag(s) closed

b. Fill out EPIP 3.2 Attachment 19, "Emergency Environmental Sample Collection Record, typical'. Place this form into a plastic protector baggie and attach this baggie to the external bag of the sample collected. The record shall have information as follows:

- Sample #
- Collection date and time
- Location
- Sample type
- Contact dose rate

- Sample collector

c. Fill out EPIP 3.2 Attachment 20, "Emergency Environmental Sample Log, typical", with the same information as above with the inclusion of weather conditions.

d. When transferring the samples, ensure proper completion of the 'chain of custody' record portion of EPIP 3.2 Attachment 19, "Emergency Enviromental Sample Collection Record, typical". The white original copy stays with the sample and the relinquisher retains a bottom copy for record of transfer.

NOTE

The person recieving the sample must display a picture ID in order to receive custody of the sample.

ATTACHMENT 15

EQUIPMENT/SUPPLIES FOR RADIOLOGICAL ENVIRONMENT SAMPLING

		SUPPLIES USED FOR SAMPLING						
	List of Recommended Supplies	AIR	PASTURE	SOIL	MILK	WATER	SNOW	VEGETATION
1.	Survey Meter		X	X			X	X
2.	Survey Meter & HP - 210 Probe	X	X	X	X	X	X	X
3.	Air Pumps Flow Meter & Sample Hood	X						
4.	Grass Clippers (6 inch blade)		X					X
5.	Measuring Tape (inch & cms)		X	X			X	
6.	Garden Spade			X			X	
7.	Garden Trowel			X			X	X
8.	Funnel				X	X	X	
9.	Garden Pick			X				X
10.	Garden Pruners (2" blade)							X
11.	Ziplock Plastic Bags (1 gal)		X	X				X
12.	Large Plastic Bags (5 gal)				X	X	X	
13.	Cubitainer, Plastic (1 gal)				X	X	X	
14.	Squeeze Bottle & Decon Solution (1litre)		X	X		X	X	
15.	Disposable Paper Towels		X	X		X	X	
16.	Duct Tape (2" wide)	X	X	X	X	X	X	
17.	Felt Tip Pen, Indelible	X	X	X	X	X	X	
18.	Pad of Paper		X	X			X	
19.	Log Book for Sample Documentation and Transfer	X	X	X	X	X	X	
20.	Index Cards (3 x 5")	X	X	X	X	X	X	
21.	Nylon Rope 1/4" (100 ft)					X		
22.	5 Gal. Plastic Bottle, Wide Mouth (5")						X	

ATTACHMENT 16

ON-SITE ENVIRONMENTAL AIR SAMPLE STATION LOCATIONS

SAMPLER # 16 (TLD # 16) SOUTH PLANT STATION

Follow the outer perimeter fence, past the COOLING TOWERS. Turn right off the intake road heading toward the Off Gas Stack. Head for the MET TOWER. The Air Sampler is located at the base of the MET TOWER. The TLD is located behind the Air Sampler. Water Station (rain gauge) present.

SAMPLER # 15 (TLD # 15) NORTH PLANT STATION

Proceed north on the road past the Training Center. Approximately 1/2 mile to chain link gate. The Air Sampler is located next to the road on the right hand side. The TLD is located inside the air sampler housing.

ATTACHMENT 17

ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS

Station Number	Station Location and Sample Type	
1	Location:	Cedar Rapids, 11 miles (135^0) SE
	Type:	TLD Control Airborne Particulate Control
2	Location:	Marion, 11 miles (125^0) ESE
	Type:	TLD Control Airborne Particulate and Iodine Control
3	Location:	Hiawatha, 7 miles (130^0) SE
	Type:	TLD Control Airborne Particulate
4	Not used	
5	Location:	Palo, 3 miles (200^0) SSW
	Type:	Airborne Particulate and Iodine
6	Location:	Center Point, 7 miles (0^0) N
	Type:	TLD Control Airborne Particulate
7	Location:	Shellsburg, 6 miles (255^0) W
	Type:	TLD Control Airborne Particulate and Iodine
8	Location:	Urbana, 10 miles (345^0) NW
	Type:	TLD Control Airborne Particulate and Iodine
9	Not used	
10	Location:	Atkins, 9 miles (210^0) SSW
	Type:	TLD Control Airborne Particulate

ATTACHMENT 17

ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS
(continued)

Station Number	Station Location and Sample Type	
11	Location: Type:	Toddville, 4 miles (90^0) E TLD Control Airborne Particulate and Iodine
12	Not Used	
13	Location: Type:	Alburnett, 9 miles (70^0) ENE TLD Control Airborne Particulate Control
14	Not Used	
15	Location: Type:	On-site North, 0.5 miles (305^0) NW TLD Control Airborne Particulate and Iodine
16	Location: Type:	On-site South, 0.5 miles (190^0) SSE TLD Control Airborne Particulate Vegetation
17	Not Used	
18	Location: Type: TLD	On-site, 0.5 miles NNE
19	Location: Type: TLD	On-site, 0.5 miles NE
20	Location: Type:	On-site, 0.5 miles ENE TLD
21	Location: Type:	On-site, 0.5 miles ENE TLD

ATTACHMENT 17
ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS
(continued)

Station Number	Station Location and Sample Type	
22	Location:	On-site, 0.5 miles E
	Type:	TLD
23	Location:	On-site, 0.5 miles ESE
	Type:	TLD
24	Not used	
25	Not used	
26	Not used	
27	Not used	
28	Location:	On-site, 0.5 miles WSW
	Type:	TLD
29	Location:	On-site, 0.5 miles W
	Type:	TLD
30	Location:	On-site, 0.5 miles WNW
	Type:	TLD
31	Location:	On-site, 0.5 miles NW
	Type:	TLD
32	Location:	On-site, 0.5 miles NNW
	Type:	TLD
33	Location:	3 miles N
	Type:	TLD

ATTACHMENT 17
ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS
(continued)

Station Number	Station Location and Sample Type	
34	Location:	3 miles NNE
	Type:	TLD
35	Location:	3 miles NE
	Type:	TLD
36	Location:	3 miles ENE
	Type:	TLD
37	Location:	3 miles E
	Type:	TLD
38	Location:	3 miles ESE
	Type:	TLD
39	Location:	3 miles SE
	Type:	TLD
40	Location:	3 miles SSE
	Type:	TLD
41	Location:	3 miles S
	Type:	TLD
42	Not used	
43	Location:	1 mile SSW
	Type:	TLD
44	Location:	1 mile WSW
	Type:	TLD
45	Location:	1 mile W
	Type:	TLD

ATTACHMENT 17
ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS
(continued)

Station Number	Station Location and Sample Type	
46	Location: Type:	1 mile WNW TLD
47	Location: Type:	1 mile WNW TLD
48	Location: Type:	1 mile NW TLD
49	Location: Type:	Lewis Access, upstream of DAEC 4 miles NNW Fish Control Surface Water Control
50	Location: Type:	Plant Intake Sediment Surface Water
51	Location: Type:	Plant Discharge Sediment Surface Water
52	Not used	
53	Location: Type:	Treated Municipal Water Ground Water
54	Location: Type:	Inlet to Municipal Water Treatment System Ground Water
55	Location: Type:	On-site Well Ground Water
56	Not used	

ATTACHMENT 17
ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS
(continued)

Station Number	Station Location and Sample Type	
57	Location:	Farm, 1 mile WSW
	Type:	Ground Water Vegetation
58	Location:	Farm, 1 mile WSW-SW
	Type:	Ground Water Vegetation
59	Not used	
60	Not used	
61	Location:	Cedar River about one-half mile downstream from DAEC Discharge
	Type:	Fish
62	Not used	
63	Location:	Farm, 1.5 miles WNW
	Type:	Milk Vegetation
64	Not used	
65	Not used	
66	Not used	
67	Not used	
68	Not used	
69	Not used	

ATTACHMENT 17
ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS
(continued)

Station Number	Station Location and Sample Type
70	Not used
71	Not used
72	Location: Farm, 2 miles SSW Type: Ground Water Vegetation
73	Not used
74	Not used
75	Not used
76	Not used
77	Not used
78	Not used
79	Not used
80	Not used
81	Not used
82	Location: On-site, 0.5 miles SE Type: TLD
83	Location: On-site, 0.5 miles SSE Type: TLD
84	Location: On-site, 0.5 miles S Type: TLD

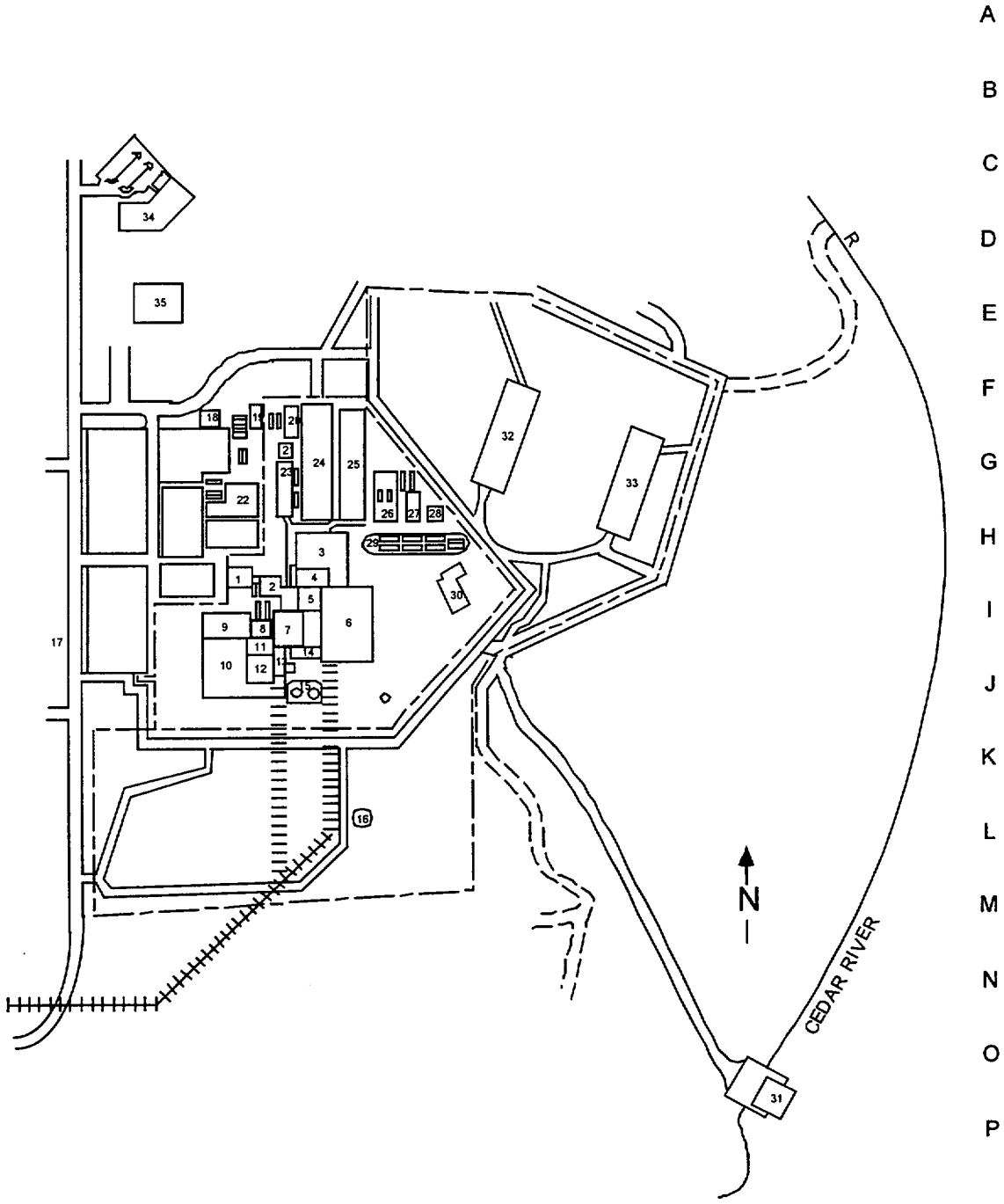
ATTACHMENT 17
ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS
(continued)

Station Number	Station Location and Sample Type	
85	Location: Type:	On-site, 0.5 miles SSW TLD
86	Location: Type:	On-site, 0.5 miles SW TLD
87	Not used	
88	Not used	
89	Not used	
90	Not used	
91	Location: Type:	On-site, 0.5 miles N TLD
92	Not used	
93	Location: Type:	Farm, 2.8 miles NNE Vegetation Milk
94	Location: Type:	Farm, 2.7 miles N Vegetation Milk
95	Not used	
96	Location: Type:	Farm, 8 miles SSW Milk
97	Not used	
98	Not used	

ATTACHMENT 17
ODAM ENVIRONMENTAL SAMPLE STATION LOCATIONS
(continued)

Station Number	Station Location and Sample Type	
99	Location:	Pleasant Creek Lake, 2.5 miles WNW
	Type:	Surface Water
100	Not used	
101	Location:	Farm, 4 miles E
	Type:	Milk
102	Not used	
103	Not used	
104	Not used	
105	Location:	Farm, 21.3 miles SSW
	Type:	Milk Control Vegetation Control
106	Location:	Farm, 4.5 miles SE
	Type:	Milk Vegetation

ATTACHMENT 18
ONSITE MAP



ATTACHMENT 19

Emergency Environmental Sample Collection Record

typical

Sample # _____

Date/Time _____

Location _____

Sample Type _____

Contact Dose Rate _____

Sample Collector _____

_____

_____

Personnel Chain of Custody Record

_____

Relinquished by (sampler)	Recieved by	Picture ID	Date	Tiem	Reason for change of custody

White copy stays with sample.

ATTACHMENT 20

Emergency Environmental Sample Log

typical

Team:_____ Team Leader:_____

Sample #	Sample Location (be specific)	Sample type	Dose rate	Date/Time	Supplemental sample information	Sample by

Effective Date: 10/15/2001

TECHNICAL REVIEW

Prepared by: _____ Date: 9-19-2001

Reviewed by: _____ Date: 9/20/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: _____ Date: 9/27/01
Manager, Emergency Planning

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1.0 PURPOSE

(1) This procedure provides instructions for directing offsite radiological monitoring activities performed by Duane Arnold Energy Center (DAEC), coordinating such activities with those accomplished by the State of Iowa, assessing the offsite radiological impacts of an event at the DAEC, and formulating Protective Action Recommendations.

2.0 DEFINITIONS

(1) **MIDAS** Meteorological Information and Dose Assessment System.

(2) **PAR** (Protective Action Recommendation) - Made to the State with regards to evacuation or sheltering of subareas within the Emergency Planning Zone (EPZ).

(3) **PAG** (Protective Action Guides) - Established by the Environmental Protection Agency (EPA) Reference 2.

3.0 INSTRUCTIONS

3.1 PROTECTIVE ACTION RECOMMENDATION DECISION MAKING

(1) At the initial Emergency Classification declaration, the on-shift chemist reports to the TSC MIDAS Computer to initiate MIDAS dose projection runs. Projected off-site doses shall be communicated to the Control Room, until the TSC is activated.

(2) Plant conditions and/or dose projections (as available) shall be reviewed to determine:

(a) If the Emergency Action Level (EAL) has changed, reclassification of the event is necessary and/or protective actions are warranted.

(b) If the EPA Protective Action Guides (PAGs) are being exceeded and if protective actions are warranted or need to be revised.

(3) Protective Action Recommendations should be determined in accordance with Attachment 1, "Protective Action Recommendation Decision Making", (forecast weather information should be considered during all Protective Action Decision Making) by:

(a) The Operations Shift Manager/Supervisor if neither the TSC nor the EOF is activated. This person is responsible for ensuring that Protective Action Recommendations are provided to offsite authorities.

(b) The Site Radiation Protection Coordinator once the TSC is activated. This person shall develop these recommendations for approval by the Emergency Coordinator. The Emergency Coordinator shall ensure that this information is provided to offsite authorities.

(c) The Radiological and EOF Manager, assisted by the Radiological Assessment Coordinator, upon activation of the EOF. These persons shall assume responsibility for development and recommendation of the Protective Actions and, upon approval by the Emergency Response and Recovery Director, provide formal communication of these recommendations to offsite agencies.

(4) If a Site Area Emergency has been declared, recommend the following protective actions as indicated in Table 1 of Attachment 1:

(a) Activate the Prompt Alert and Notification System.

(b) Place milk animals within a 2-mile radius on stored feed and covered water.

(c) If the situation is degrading such that a potential exists for declaration of a General Emergency, evaluate trends and prognosis for change to determine the need for precautionary protective measures for the general public.

(5) If a General Emergency has been declared, recommend the following protective actions as indicated in Table 1, of Attachment 1:

(a) Activate the Prompt Alert and Notification System.

(b) Place milk animals within the DAEC EPZ on stored feed and covered water.

(c) Evacuate the population within the 0-2 mile radius and to 5 miles in the downwind areas.

(6) Field readings should be used to evaluate Protective Action Recommendations. If a significant number of actual dose rates, measured in the field, are greater than those projected to be occurring at the time, consideration should be given to upgrading or expanding the current protective actions, as appropriate.

(7) Formulated Protective Action Recommendations shall be recorded on the "Emergency Action Level Notification Form" from EPIP 1.2 by the SRPC/Radiological and EOF Manager and/or the Radiological Assessment Coordinator.

(8) The Emergency Coordinator/Emergency Response and Recovery Director shall approve the Protective Action Recommendations by signing the "Emergency Action Level Notification Form", NOTE-05.

(9) The SRPC/Radiological and EOF Manager should release Protective Action Recommendations in the following manner:

(a) Short pre-briefing of impending recommendations and related plant conditions should be given to State EOC Dose Assessment personnel via the microwave phone.

(b) When the EOF is activated this briefing shall be followed by official recommendations being delivered via the "Administrative Hotline" within 15 minutes of recognizing the criteria.

(c) Fax a copy of the Emergency Action Level Notification Form to Linn County, Benton County and the State EOC. This will serve as a backup of the information received.

(d) Ensure the NRC is notified as soon as possible but within 1 hour.

(e) Protective Action Recommendations shall be displayed in the TSC/EOF.

(10) Information regarding emergency classification, plant status, offsite radiological data, Protective Action Recommendations, and response actions underway shall be provided when significant changes occur and on a periodic basis to the ERO, Linn and Benton County EOC's, the State EOC, and the NRC.

(11) Original copies of such communications should be retained for filing.

(12) If protective actions actually implemented by local and State officials differ from those recommended by DAEC, the Emergency Coordinator/Emergency Response & Recovery Director should be informed.

(13) The Protective Action Recommendations will be continuously assessed and changed, as appropriate, depending upon the changing conditions.

3.2 INITIAL AND PERIODIC BRIEFINGS

(1) Prior to assuming responsibility for offsite radiological monitoring and dose assessment activities, the Site Radiation Protection Coordinator/Radiological Assessment Coordinator should obtain the following information:

(a) Effluent release information, if a release is in progress, including the release point and release concentration from the KAMAN Effluent Monitoring System.

(b) Weather forecast information. This information can be obtained from the National Weather Service (phone number listed in the ETB).

(c) Meteorological information, including stability class (or ΔT), wind speed and wind direction from the Safety Parameter Display System (SPDS). If meteorological information cannot be obtained from SPDS via the Met Tower, then call the National Weather Service phone number and request an update of the current Met conditions.

(d) The results of dose projection calculations.

(e) Containment High Range Radiation Monitor levels.

(f) Protective Action Recommendations which have been made.

(g) On-site radiological information, post-accident sampling activities, and effluent release isotopic mixes, if available .

(h) Status of off-site monitoring activities conducted, if any, and locations of the DAEC Off-site Radiological Monitoring Teams.

(i) Plant status information and prognosis for deteriorating conditions.

(j) The status of activation of the Off-site Radiological and Analytical Laboratory (ORAL).

(k) The status of activation of the Off-site Radiological and Assembly Area (ORAA).

(2) The Site Radiation Protection Coordinator should summarize this information, advise the Emergency Coordinator of pertinent points discussed, and brief the Radiological Assessment Group.

OR

The Radiological Assessment Coordinator should summarize this information, advise the Radiological and EOF Manager of pertinent points discussed, and brief the Radiological Assessment Group.

(a) The Radio Operator/Field Team Director should ensure that the Offsite Radiological Monitoring Teams are apprised of pertinent information regarding plant potential radiological problems expected.

(b) Caution should be exercised in relaying information to teams over the radio, since the radio transmission becomes public information. Only transmit information that is necessary for the field teams to perform their duties safely and information that is made public through news releases.

(3) The Radio Operator should ensure that the Assistant Radio Operator displays meteorological and field team information on the DAEC EPZ maps/status boards. Items such as the following should be considered for display.

OR

The Field Team Director should ensure that the Radiological Data Plotters display the following information on the DAEC EPZ maps/status boards.

(a) Wind direction

(b) Wind speed

(c) Stability class

(d) Weather forecast information

(e) Plume width and centerline

(f) Team locations

(g) Survey results at selected locations and an outline of the subarea Protective Action Recommendations as necessary.

(h) Projected TEDE doses or dose rates in the plume path

(i) Projected thyroid doses or dose rates in the plume path

(4) Additionally, the Radiological Data Plotter in the EOF should display selected radiological information obtained by the State monitoring teams, as reported by the State Field Team Captain in the EOF.

3.3 OFFSITE RADIOLOGICAL MONITORING TEAMS

(1) Offsite Radiological Monitoring Teams should be initially briefed and dispatched in accordance with EPIP 3.2, "Field Radiological Monitoring."

(2) In preparation for directing the Offsite Radiological Monitoring Teams, the Radio Operator should:

(a) Conduct a radio check with the Teams and verify their locations.

(b) Advise the Teams of the latest radiological and plant status information, as necessary to perform their duties safely.

(c) Inform the Site Radiation Protection Coordinator of readiness to assume control of the Offsite Radiological Monitoring Teams.

(3) Direction and control of the Offsite Radiological Monitoring Teams should be done in accordance with the directions given in EPIP 3.2.

(4) In preparation for assuming control of the Offsite Radiological Monitoring Teams, the Field Team Director should:

(a) Contact the TSC Radio Operator and inform them of the intent to establish contact with Teams.

(b) Conduct radio check with the Teams and verify their locations.

(c) Advise the Teams of the latest radiological and plant status information, as necessary to perform their duties safely.

(d) Inform the Radiological Assessment Coordinator of readiness to assume control of the Field Radiological Monitoring Teams.

(5) When the EOF has been activated, the Radiological Assessment Coordinator should contact the Site Radiation Protection Coordinator and advise that the EOF is ready to assume control of the Offsite Radiological Monitoring Teams.

(a) The Site Radiation Protection Coordinator should inform the Emergency Coordinator that control of the field radiological monitoring teams and dose assessment has been transferred to the EOF.

(b) The Radiological Assessment Coordinator should then advise the Radiological and EOF Manager that the Radiological Assessment Group is ready to assume responsibility for offsite monitoring and dose assessment activities.

(c) The Field Team Director (in the EOF) should follow up with each Team and the TSC Radio Operator and advise them that all further communications should be conducted with the EOF.

(d) Transfer of responsibility should be recorded in both the TSC and EOF Logs.

3.4 DOSE PROJECTION ACTIVITIES

(1) Until the TSC is activated, the Operations Shift Manager/Supervisor, as the Emergency Coordinator, is responsible for assuring dose projections by the on-duty shift chemist are performed.

(a) The results of these projections will normally be summarized for the Site Radiation Protection Coordinator as part of the initial briefing.

(2) Until the EOF is activated, the Site Radiation Protection Coordinator and/or the Operations Shift Manager/Supervisor are responsible for performing dose projections.

(a) The results of these projections will normally be summarized for the Radiological Assessment Coordinator as part of the initial briefing.

(3) Dose projection calculations will be performed by the MIDAS Operator using one of the following methodologies:

(a) MIDAS computer, MIDAS Instruction Manual User's Guide.

(b) MIDAS Backup on the Personal Computer.

(c) MIDAS Laptop Personal Computer.

(4) Dose projections will normally be performed in accordance with the MIDAS instructions in the MIDAS User's Guide. If MIDAS is unavailable, the options below will be reviewed by the Site Radiation Protection Coordinator/Radiological Assessment Coordinator to determine the appropriate back-up methodology.

(a) If real-time data collection in MIDAS is not functional, the TSC MIDAS Operator should coordinate directly with the Back Panel Communicator to determine updated radiological and meteorological parameters applicable to actual or potential release rates.

(b) If there is a loss of MIDAS in the TSC consider using the following:

(i) MIDAS Backup on the Personal Computer

(ii) Use of MIDAS Laptop Computer

(c) If real-time data collection in MIDAS is not functional, the EOF MIDAS Operator should coordinate directly with the Site Radiation Protection Coordinator to determine updated radiological and meteorological parameters applicable to actual or potential release rates.

(d) If there is a loss of MIDAS in the EOF consider the following:

(i) Transfer of dose assessment back to the TSC

(ii) Use the MIDAS Backup on the Personal Computer

(iii) Use of MIDAS Laptop Computer

(5) Following review of the latest dose projection, the Site Radiation Protection Coordinator should brief the Radio Operator on the magnitude of the projected doses and the need to adjust offsite radiological monitoring activities.

OR

Following review of the latest dose projection, the Radiological Assessment Coordinator should brief the Field Team Director on the magnitude of the projected doses and the need to adjust field radiological monitoring activities.

(6) If Field Team readings are significantly higher than those projected by MIDAS, consider the possibility of an unmonitored release.

3.5 COORDINATION OF DOSE ASSESSMENT WITH THE STATE OF IOWA

(1) Upon activation of the EOF, the Radiological Data Communicator shall verify that the "Rad Data Line" is established and operable or contact the State EOC and request that it be established.

(2) Once established, the Radiological Data Communicator shall maintain communications with the State EOC and the Benton and Linn County EOC's.

(3) Radiological release, dose projections, and meteorological data from the electronic MIDAS print out shall be provided to the State in order for the State to conduct dose assessment and projection activities.

(4) The Radiological Data Communicator shall request the State's dose projection results as they become available, and provide this information to the Radiological Assessment Coordinator.

3.6 DATA RECORDING AND TREND ANALYSIS FROM THE TSC

(1) The Site Radiation Protection Coordinator should initiate and ensure conduct of trend analysis.

(a) Parameters of interest include KAMAN System Effluent Monitor readouts, analyses conducted of effluent stream particulate filters and iodine cartridges, meteorological data, ARM levels and Containment High Range Radiation Monitor levels.

(b) ARM and Containment High Range Radiation Monitor levels are of dual importance due to their direct impact on response activities within the plant and their significance with respect to determining the quantity of radioactive material potentially available for release offsite.

(2) An estimate of fuel failure can be determined by direction found in the PASAP's.

(3) An estimate of the potential release rate can be determined by using the PASAP's.

(4) The Site Radiation Protection Coordinator should evaluate the trending plot periodically to determine if any significant trends are apparent.

(5) The Emergency Coordinator and the Radiological Assessment Team should be periodically advised of the current radiological status, significant trends, and potential implications.

(a) The SRPC should ensure to periodically inform representatives of the, State and Federal Government of the current radiological status, significant trends, and potential implications (prior to operation of the EOF).

3.7 DATA RECORDING AND TREND ANALYSIS FROM THE EOF

(1) The Radiological Assessment Coordinator or his designee should trend the following information:

(a) Projected TEDE and Thyroid dose rates at the following locations:

(i) Site Boundary

(ii) Two Miles

(iii) Five Miles

(iv) Ten Miles

(v) Greater than ten miles

(vi) Location(s) of peak Whole Body and Thyroid dose rates if other than at one of the above locations.

(b) Containment High Range Radiation Monitors levels for both the Drywell and Torus

(2) An estimate of fuel failure can be determined by using the PASAP's.

(3) An estimate of the potential release rate can be determined using the PASAP's.

(4) The Radiological and EOF Manager and the Radiological Assessment Group should be periodically advised of the current radiological status, significant trends, and potential implications.

(a) The Radiological and EOF Manager should periodically inform the EOF staff and representatives of local, State and Federal governments of the current radiological status, significant trends, and potential implications.

(b) The Field Team Director should ensure that the Offsite Radiological Monitoring Teams are provided updated information periodically.

(5) The trending of offsite doses can be utilized as an estimation of integrated dose(s) to the general public throughout the course of the event.

3.8 RE-ENTRY AND FOLLOW-UP ACTIVITIES

(1) Once releases have been terminated, the Radiological and EOF Manager, Radiological Assessment Coordinator and Site Radiation Protection Coordinator should coordinate with local, State and Federal officials to identify the activities required prior to re-entry of the general public into areas that have been evacuated.

(2) As directed by the Emergency Response and Recovery Director, the Radiological and EOF Manager should establish an environmental monitoring program as part of the Recovery Plan to more adequately quantify the impact of this release on the environment.

(a) As a minimum, this program should include sampling and analysis of milk, surface water, vegetation, and soil in the affected area surrounding DAEC.

(b) This program should be structured such that it complements the routine DAEC environmental sampling program and should be conducted in accordance with the Radiological Sampling Procedures (Attachments in EPIP 3.2).

(c) This program should be coordinated with the State's environmental program.

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4.0 RECORDS

(1) All logs forms and other pertinent information shall be maintained iaw QA Record Retention Requirements (exception is for material generated during drills and exercises.)

5.0 REFERENCES

(1) DAEC Emergency Plan

(2) Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA-400-R-92-001)

(3) DAEC Radiological Engineering Calculation 93-022-H; dated December 17, 1993

(4) EPIP 3.2 "Field Radiological Monitoring"

(5) EPIP 1.2 "Notification"

(6) Response Technical Manual (RTM) 1996 Section G.

6.0 ATTACHMENTS

(1) Attachment 1 - Protective Action Recommendation Decision Making

(2) Attachment 2 - DAEC Emergency Planning Zone

(3) Attachment 3 -Evacuation Time Estimates

(4) Attachment 4 -Wind Direction and Affected Subareas.

ATTACHMENT 1

PROTECTIVE ACTION RECOMMENDATION DECISION MAKING

1.0 Introduction

This attachment is comprised of two tables intended to assist in the recommendation of appropriate protective actions to the State of Iowa. The Protective Action Recommendations for emergency classification levels and radiological releases impacting the areas outside of the site boundary, are in Table 1. The Protective Action Recommendations for Severe Core Damage or loss of control of plant functions are contained in Table 2. All protective actions listed are appropriate for the conditions indicated but do not restrict the decision-maker(s) should it be desirable to recommend other protective actions based on the situation at the time of the emergency.

2.0 Procedure

2.1 When an emergency class has been declared, or dose projections are available for radiological releases, go to Table 1. Table 1 allows for the assessment of appropriate protective actions based on downwind dose projections resulting from airborne radiological releases.

2.1.1 Protective Action Recommendations shall be recorded in your log, the Status Board and NOTE-05 of EPIP Appendix 1.

2.1.2 To determine the subareas affected and the maximum evacuation time (if needed), refer to Attachment 3, "Evacuation Time Estimates".

2.1.3 Continue to work through the table as new classifications are determined or dose projection information becomes available.

2.2 If the incident is classified as a General Emergency, with core damage as specified in Table 2, recommend the minimum protective action as given in Table 2. Table 2 allows for the assessment of a core melt sequence and provides appropriate protective actions based on the conditions adopted from Section G of the RTM-96.

2.2.1 Enter the table at the top decision block which asks, "Actual or projected severe damage or loss of control of facility".

2.2.2 To determine the sectors affected and the maximum evacuation time (if needed), refer to Attachment 3, "Evacuation Time Estimates."

2.3.3 Continue to work through the table as new information becomes available.

ATTACHMENT 1 (cont.)
PROTECTIVE ACTION DECISION MAKING
TABLE 1

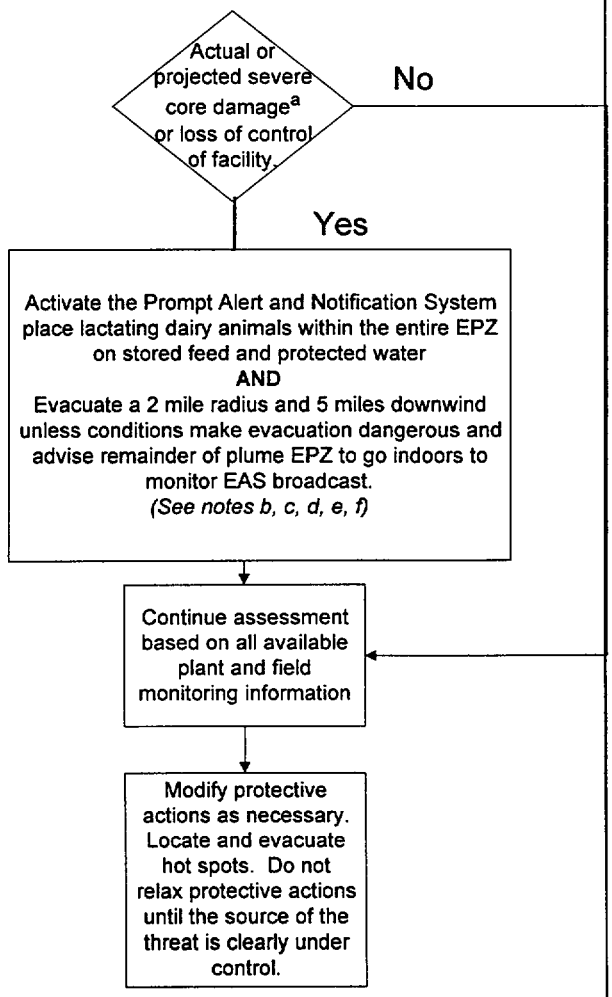
Protective Action Recommendations

Unusual Event	Alert	Site Area Emergency
☐ [A] None	☐ [B] None	☐ [C] Activate the Prompt Alert and Notification System **AND** Place dairy animals within the entire EPZ on stored feed and covered water.

General Emergency		
Default Recommendations for GENERAL EMERGENCY, core damage or dose projections ≥ 1 REM TEDE or ≥5 REM CDE @ 0-2 miles from site boundary.	*Default Recommendations for GENERAL EMERGENCY with dose projections ≥ 1 REM TEDE or ≥5 REM CDE @ 2-5 miles from site boundary.*	*Default Recommendations for GENERAL EMERGENCY with dose projections ≥ 1 REM TEDE or ≥5 REM CDE @ 5-10 miles from site boundary.*
☐ [D] Activate the Prompt Alert and Notification System, Place dairy animals within the entire EPZ on stored feed and covered water. **AND** Evacuate within a 2 mile radius and to 5 miles in the downwind subareas.	☐ [E] Activate the Prompt Alert and Notification System, Place dairy animals within the entire EPZ on stored feed and covered water. **AND** Evacuate within a 2 mile radius and to 5 miles in the downwind subareas, and shelter downwind subareas from 5 miles to EPZ edge.	☐ [F] Activate the Prompt Alert and Notification System, Place dairy animals in the entire EPZ on stored feed and covered water. **AND** Evacuate within a 2 mile radius, evacuate from 2 miles to EPZ edge in downwind subareas, and shelter as appropriate beyond EPZ edge.

ATTACHMENT 1 (cont.)
PROTECTIVE ACTION DECISION MAKING
TABLE 2 (Page 1 of 2)

Protective actions in the event of severe core damage or loss of control of facility.



NOTES

[a] severe core damage is indicated by:

(1) Fuel damage assessment (PASAP 7.2) determines at least 5% fuel clad damage
(2) Valid drywell rad monitor reading above 7E + 2R/hr
(3) Valid torus rad monitor reading above 3E + 1R/hr
(4) Coolant activity above 300µCi/gm DOSE EQUIVALENT I-131
(5) RPV Level remains below -25 inches

[b] Distances are approximate - actual distances will be determined by the size of the preplanned sub-areas, which are based on geopolitical boundaries.
[c] If there are very dangerous travel conditions, initially shelter rather than evacuate the population until conditions improve.
[d] Transit-dependent persons should be advised to remain indoors until transportation resources arrive, if possible.
[e] Shelter may be the appropriate action for controlled releases of radioactive material from the containment if there is assurance that the release is short term (puff release) and the area near the plant cannot be evacuated before the plume arrives.
[f] Consider EPA PAGs (Table G-1) in modifying initial protective actions.
(Located on page 2 of 2)

Source: U.S.N.R.C. RTM-96/NUREG/BR-0150

ATTACHMENT 1 (cont.)
PROTECTIVE ACTION DECISION MAKING

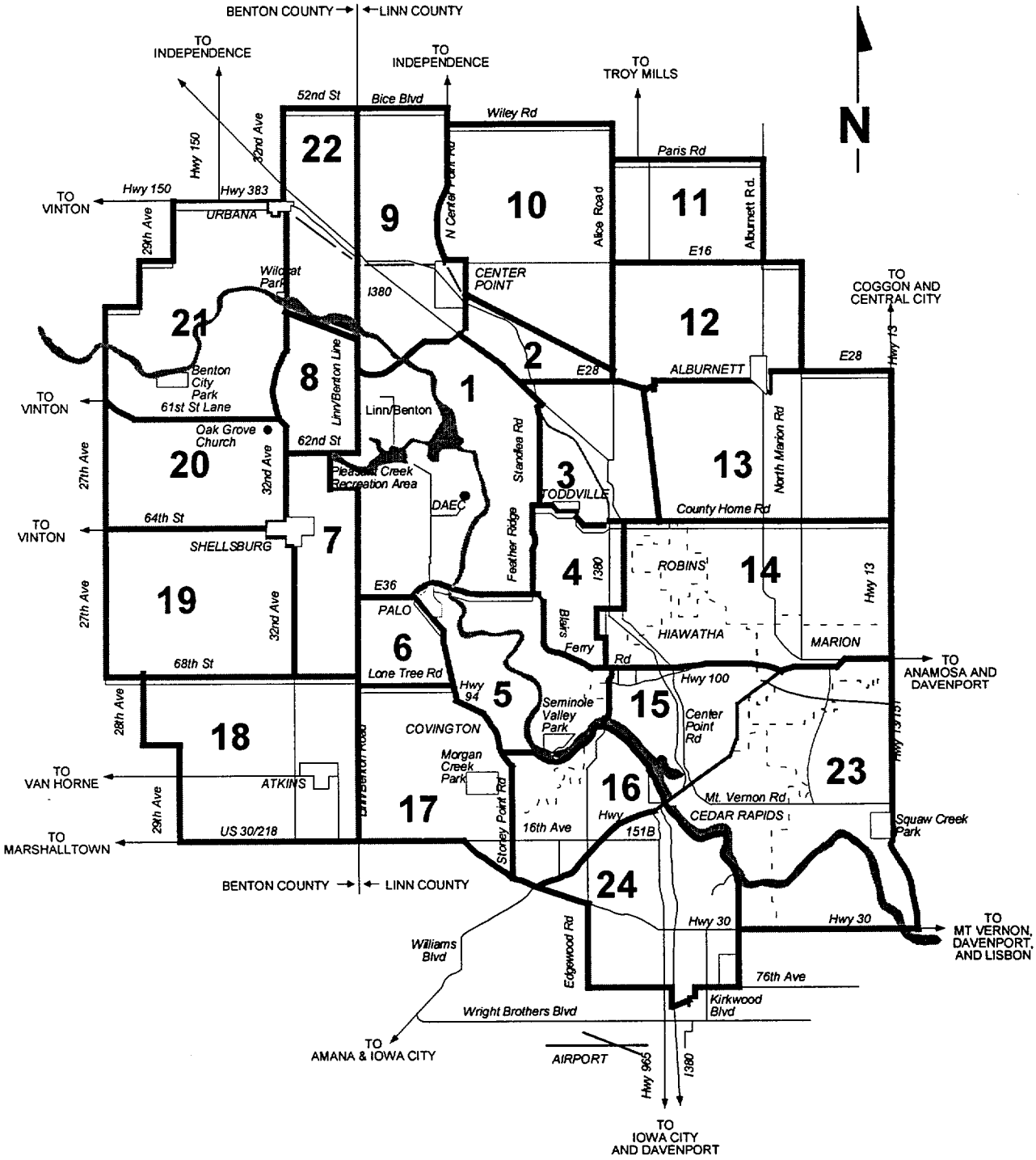
Table G-1. Early phase Protective Action Guides (PAGs)

Protective action	PAG (projected dose)	Comments
Evacuation (or sheltering)[a]	1-5 rem[b]	Evacuation (or for some situations, sheltering)[a] should normally be initiated at 1 rem.
Administration of stable iodine	25 rem thyroid	Requires approval of State medical officials.

[a] Sheltering may be the preferred protective action when it will provide protection equal to or greater than evacuation, based on consideration of factors such as source term characteristics, and temporal or other site-specific conditions. For further guidance, see EPA 400-92-001, Sect. 2.3.1.
[b] The sum of the effective dose equivalent (EDE) resulting from exposure to external sources and the committed effective dose equivalent (CEDE) incurred from all significant inhalation pathways during the early phase. Committed dose equivalents to the thyroid and to the skin may be 5 and 50 times larger, respectively.
[c] Committed dose equivalent (CDE) to the thyroid from radioiodine.

Source: Adapted from EPA 400-R-92-001, p. 2-6

ATTACHMENT 2
DAEC EMERGENCY PLANNING ZONE'



ATTACHMENT 3
EVACUATION TIME ESTIMATES

1. Select the appropriate table for the event scenario (Summer or Winter, Midweek or Weekend, Midday or Evening)

2. Select the section of the table corresponding to the extent of the evacuation recommendation (Within 2, 5, or 10 miles, or to the EPZ boundary).

3. Select the wind range for the expected wind direction, and read across for the evacuation time estimate under the expected weather condition for both the general population and special population (special population consists of those at hospitals, nursing homes, and other residential care facilities).

4. Following the tables are evacuation time estimates for two recreational events occurring annually within the DAEC EPZ: the All-Iowa Fair and the Cedar Rapids Freedom Festival.

5. Times in the tables are given in hours and minutes (i.e., 03:35 = 3 hours, 35 minutes).

NOTES:

- For Summer or Winter Weekend Evening times, use the Summer or Winter Midweek Evening times, respectively.

- Summer defined as Memorial Day through Labor Day. Winter defined as Labor Day to Memorial Day.

ATTACHMENT 3 (Cont.)

EVACUATION TIME ESTIMATES FOR SUMMER WEEKEND MIDDAY AND SUMMER MIDWEEK EVENING SCENARIOS

WIND DIRECTION IN DEGREES FROM	AFFECTED SUBAREAS	GENERALPOPULATION		SPECIAL POPULATION	
		NORMAL	RAIN	NORMAL	RAIN
WITHIN 2 MILES					
Any Direction	1	03:35	03:35	03:35	03:35
WITHIN 5 MILES					
348.76 - 11.25 (N)	1,4,5,6	03:40	03:40	03:40	03:40
11.26 - 33.75 (NNE)	1,5,6,7	03:40	03:40	03:40	03:40
33.76 - 56.25 (NE)	1,5,6,7	03:40	03:40	03:40	03:40
56.26 - 78.75 (ENE)	1,5,6,7	03:40	03:40	03:40	03:40
78.76 - 101.25 (E)	1,7,8	03:45	03:45	03:45	03:45
101.26 - 123.75 (ESE)	1,7,8	03:45	03:45	03:45	03:45
123.76 - 146.25 (SE)	1,7,8	03:45	03:45	03:45	03:45
146.26 - 168.75 (SSE)	1,2,8	03:45	03:45	03:45	03:45
168.76 - 191.25 (S)	1,2,3,8	03:45	03:45	03:45	03:45
191.26 - 213.75 (SSW)	1,2,3	03:35	03:35	03:35	03:35
213.76 - 236.25 (SW)	1,2,3	03:35	03:35	03:35	03:35
236.26 - 258.75 (WSW)	1,2,3,4	03:35	03:35	03:35	03:35
258.76 - 281.25 (W)	1,3,4	03:35	03:35	03:35	03:35
281.26 - 303.75 (WNW)	1,3,4,5	03:40	03:40	03:40	03:40
303.76 - 326.25 (NW)	1,3,4,5	03:40	03:40	03:40	03:40
326.26 - 348.75 (NNW)	1,4,5,6	03:40	03:40	03:40	03:40
Any Direction	1-8	03:45	03:45	03:45	03:45

ATTACHMENT 3 (Cont.)

EVACUATION TIME ESTIMATES FOR SUMMER WEEKEND MIDDAY AND SUMMER MIDWEEK EVENING SCENARIOS

WIND DIRECTION IN DEGREES FROM				AFFECTED SUBAREAS	GENERAL POPULATION		SPECIAL POPULATION	
					NORMAL	RAIN	NORMAL	RAIN
WITHIN 10 MILES								
348.76	-	11.25	(N)	1,4,5,6,15-18	05:40	07:35	12:00	15:05
11.26	-	33.75	(NNE)	1,5,6,7,16-19	05:35	06:35	12:00	15:05
33.76	-	56.25	(NE)	1,5,6,7,17-20	03:35	06:25	03:35	06:25
56.26	-	78.75	(ENE)	1,5,6,7,18-21	03:45	04:00	03:45	04:00
78.76	-	101.25	(E)	1,7,8,18-21	03:45	04:00	03:45	04:00
101.26	-	123.75	(ESE)	1,7,8,19-22	03:45	04:00	03:45	04:00
123.76	-	146.25	(SE)	1,7,8,9,20-22	03:45	04:00	03:45	04:00
146.26	-	168.75	(SSE)	1,2,8,9,10,21,22	03:45	04:00	03:45	04:00
168.76	-	191.25	(S)	1,2,3,8-12,21,22	03:45	04:00	03:45	04:00
191.26	-	213.75	(SSW)	1,2,3,9-13,22	03:45	04:00	03:45	04:00
213.76	-	236.25	(SW)	1,2,3,10 -13	03:40	03:40	03:40	03:40
236.26	-	258.75	(WSW)	1,2,3,4,10-14	05:35	06:45	12:00	15:05
258.76	-	281.25	(W)	1,3,4,12-15	05:40	07:35	12:00	15:05
281.26	-	303.75	(WNW)	1,3,4,5,12-16	05:40	07:35	12:00	15:05
303.76	-	326.25	(NW)	1,3,4,5,13-17	05:40	07:35	12:00	15:05
326.26	-	348.75	(NNW)	1,4,5,6,14-18	05:40	07:35	12:00	15:05
Any Direction				1-22	05:40	07:35	12:00	15:05
TO EPZ BOUNDARY								
348.76	-	11.25	(N)	1,4-6,15-18,23,24	09:10	11:25	12:00	15:05
11.26	-	33.75	(NNE)	1,5-7,16-19,24	05:30	06:15	12:00	15:05
258.76	-	281.25	(W)	1,3,4,12-15,23	08:40	10:40	12:00	15:05
281.26	-	303.75	(WNW)	1,3-5,12-16,23,24	09:05	11:35	12:00	15:05
303.76	-	326.25	(NW)	1,3-5,13-17,23,24	09:05	11:35	12:00	15:05
326.26	-	348.75	(NNW)	1,4-6,14-18,23,24	09:10	11:35	12:00	15:05
Any Direction				1-24	09:10	11:35	12:00	15:05

ATTACHMENT 3 (Cont.)

EVACUATION TIME ESTIMATES FOR SUMMER MIDWEEK MIDDAY SCENARIOUS

WIND DIRECTION IN DEGREES FROM	AFFECTED SUBAREAS	GENERAL POPULATION		SPECIAL POPULATION	
		NORMAL	RAIN	NORMAL	RAIN
WITHIN 2 MILES					
Any Direction	1	03:05	03:05	03:05	03:05
WITHIN 5 MILES					
348.76 - 11.25 (N)	1,4,5,6	03:10	03:10	03:10	03:10
11.26 - 33.75 (NNE)	1,5,6,7	03:10	03:10	03:10	03:10
33.76 - 56.25 (NE)	1,5,6,7	03:10	03:10	03:10	03:10
56.26 - 78.75 (ENE)	1,5,6,7	03:10	03:10	03:10	03:10
78.76 - 101.25 (E)	1,7,8	03:15	03:30	03:15	03:30
101.26 - 123.75 (ESE)	1,7,8	03:15	03:30	03:15	03:30
123.76 - 146.25 (SE)	1,7,8	03:15	03:30	03:15	03:30
146.26 - 168.75 (SSE)	1,2,8	03:15	03:30	03:15	03:30
168.76 - 191.25 (S)	1,2,3,8	03:15	03:30	03:15	03:30
191.26 - 213.75 (SSW)	1,2,3	03:05	03:05	03:05	03:05
213.76 - 236.25 (SW)	1,2,3	03:05	03:05	03:05	03:05
236.26 - 258.75 (WSW)	1,2,3,4	03:05	03:05	03:05	03:05
258.76 - 281.25 (W)	1,3,4	03:05	03:05	03:05	03:05
281.26 - 303.75 (WNW)	1,3,4,5	03:10	03:10	03:10	03:10
303.76 - 326.25 (NW)	1,3,4,5	03:10	03:10	03:10	03:10
326.26 - 348.75 (NNW)	1,4,5,6	03:10	03:10	03:10	03:10
Any Direction	1-8	03:15	03:30	03:15	03:30

ATTACHMENT 3 (Cont.)

EVACUATION TIME ESTIMATES FOR SUMMER MIDWEEK MIDDAY SCENARIOUS

WIND DIRECTION IN DEGREES FROM				AFFECTED SUBAREAS	GENERAL POPULATION		SPECIAL POPULATION	
					NORMAL	RAIN	NORMAL	RAIN
WITHIN 10 MILES								
348.76	-	11.25	(N)	1,4,5,6,15-18	06:05	07:40	12:00	15:05
11.26	-	33.75	(NNE)	1,5,6,7,16-19	05:45	06:50	12:00	15:05
33.76	-	56.25	(NE)	1,5,6,7,17-20	05:45	06:40	05:45	06:40
56.26	-	78.75	(ENE)	1,5,6,7,18-21	03:15	03:30	03:15	03:30
78.76	-	101.25	(E)	1,7,8,18-21	03:15	03:30	03:15	03:30
101.26	-	123.75	(ESE)	1,7,8,19-22	03:15	03:30	03:15	03:30
123.76	-	146.25	(SE)	1,7,8,9,20-22	03:15	03:30	03:15	03:30
146.26	-	168.75	(SSE)	1,2,8,9,10,21,22	03:15	03:30	03:15	03:30
168.76	-	191.25	(S)	1,2,3,8-12,21,22	03:15	03:30	03:15	03:30
191.26	-	213.75	(SSW)	1,2,3,9-13,22	03:15	03:30	03:15	03:30
213.76	-	236.25	(SW)	1,2,3,10-13	03:10	03:10	03:15	03:30
236.26	-	258.75	(WSW)	1,2,3,4,10-14	05:50	07:05	03:10	03:10
258.76	-	281.25	(W)	1,3,4,12-15	06:05	07:40	12:00	15:05
281.26	-	303.75	(WNW)	1,3,4,5,12-16	06:05	07:40	12:00	15:05
303.76	-	326.25	(NW)	1,3,4,5,13-17	06:05	07:40	12:00	15:05
326.26	-	348.75	(NNW)	1,4,5,6,14-18	06:05	07:40	12:00	15:05
Any Direction				1-22	06:05	07:40	12:00	15:05
TO EPZ BOUNDARY								
348.76	-	11.25	(N)	1,4-6,15-18,23,24	09:40	12:05	12:00	15:05
11.26	-	33.75	(NNE)	1,5-7,16-19,24	05:40	06:40	12:00	15:05
258.76	-	281.25	(W)	1,3,4,12-15,23	09:05	11:05	12:00	15:05
281.26	-	303.75	(WNW)	1,3-5,12-16,23,24	09:40	12:05	12:00	15:05
303.76	-	326.25	(NW)	1,3-5,13-17,23,24	09:40	12:05	12:00	15:05
326.26	-	348.75	(NNW)	1,4-6,14-18,23,24	09:40	12:05	12:00	15:05
Any Direction				1-24	09:45	12:05	12:00	15:05

ATTACHMENT 3 (Cont.)

EVACUATION TIME ESTIMATES FOR WINTER MIDWEEK, MIDDAY SCENARIOS

WIND DIRECTION IN DEGREES FROM	AFFECTED SUBAREAS	GENERAL POPULATION			SPECIAL POPULATION		
		NORMAL	RAIN	SNOW	NORMAL	RAIN	SNOW
WITHIN 2 MILES							
Any Direction	1	03:00	03:00	05:05	03:00	03:00	05:05
WITHIN 5 MILES							
348.76 - 11.25 (N)	1,4,5,6	03:10	03:10	05:10	03:40	03:40	06:05
11.26 - 33.75 (NNE)	1,5,6,7	03:10	03:10	05:10	03:40	03:40	06:05
33.76 - 56.25 (NE)	1,5,6,7	03:10	03:10	05:10	03:40	03:40	06:05
56.26 - 78.75 (ENE)	1,5,6,7	03:10	03:10	05:10	03:40	03:40	06:05
78.76 - 101.25 (E)	1,7,8	03:15	03:30	05:30	02:20	02:20	03:10
101.26 - 123.75 (ESE)	1,7,8	03:15	03:30	05:30	02:20	02:20	03:10
123.76 - 146.25 (SE)	1,7,8	03:15	03:30	05:30	02:20	02:20	03:10
146.26 - 168.75 (SSE)	1,2,8	03:15	03:30	05:30	03:40	03:40	05:05
168.76 - 191.25 (S)	1,2,3,8	03:15	03:30	05:30	03:50	03:50	05:15
191.26 - 213.75 (SSW)	1,2,3	03:05	03:05	05:10	03:50	03:50	05:15
213.76 - 236.25 (SW)	1,2,3	03:05	03:05	05:10	03:50	03:50	05:15
236.26 - 258.75 (WSW)	1,2,3,4	03:05	03:05	05:10	03:50	03:50	05:15
258.76 - 281.25 (W)	1,3,4	03:05	03:05	05:10	03:50	03:50	05:15
281.26 - 303.75 (WNW)	1,3,4,5	03:10	03:10	05:10	03:50	03:50	05:15
303.76 - 326.25 (NW)	1,3,4,5	03:10	03:10	05:10	03:50	03:50	05:15
326.26 - 348.75 (NNW)	1,4,5,6	03:10	03:10	05:10	03:40	03:40	05:00
Any Direction	1-8	03:15	03:30	05:30	03:50	03:50	05:15

ATTACHMENT 3 (Cont.)

EVACUATION TIME ESTIMATES FOR WINTER MIDWEEK, MIDDAY SCENARIOS

WIND DIRECTION IN DEGREES FROM				AFFECTED SUBAREAS	GENERAL POPULATION			SPECIAL POPULATION		
					NORMAL	RAIN	SNOW	NORMAL	RAIN	SNOW
WITHIN 10 MILES										
348.76	-	11.25	(N)	1,4,5,6,15-18	06:05	07:35	08:10	12:00	15:05	15:05
11.26	-	33.75	(NNE)	1,5,6,7,16-19	05:45	06:45	07:15	12:00	15:05	15:05
33.76	-	56.25	(NE)	1,5,6,7,17-20	05:45	06:45	07:15	03:40	06:05	06:05
56.26	-	78.75	(ENE)	1,5,6,7,18-21	03:15	03:30	05:30	03:40	06:05	06:05
78.76	-	101.25	(E)	1,7,8,18-21	03:15	03:30	05:30	02:20	03:10	03:10
101.26	-	123.75	(ESE)	1,7,8,19-22	03:15	03:30	05:30	02:20	03:10	03:10
123.76	-	146.25	(SE)	1,7,8,9,20-22	03:15	03:30	05:30	02:20	03:10	03:10
146.26	-	168.75	(SSE)	1,2,8,9,10,21,22	03:15	03:30	05:30	03:40	05:05	05:05
168.76	-	191.25	(S)	1,2,3,8-12,21,22	03:15	03:30	05:30	03:40	05:05	05:[illegible]
191.26	-	213.75	(SSW)	1,2,3,9-13,22	03:15	03:30	05:30	03:40	05:05	05:05
213.76	-	236.25	(SW)	1,2,3,10-13	03:10	03:15	05:10	03:40	05:05	05:05
236.26	-	258.75	(WSW)	1,2,3,4,10-14	05:40	06:50	07:20	12:00	15:05	15:05
258.76	-	281.25	(W)	1,3,4,12-15	06:05	07:35	08:10	12:00	15:05	15:05
281.26	-	303.75	(WNW)	1,3,4,5,12-16	06:05	07:35	08:10	12:00	15:05	15:05
303.76	-	326.25	(NW)	1,3,4,5,13-17	06:05	07:35	08:10	12:00	15:05	15:05
326.26	-	348.75	(NNW)	1,4,5,6,14-18	06:05	07:35	08:10	12:00	15:05	15:05
Any Direction				1-22	06:05	07:35	08:10	12:00	15:05	15:05
TO EPZ BOUNDARY										
348.76	-	11.25	(N)	1,4-6,15-18,23,24	09:05	12:05	12:10	12:00	15:05	15:05
11.26	-	33.75	(NNE)	1,5-7,16-19,24	05:40	06:30	07:10	12:00	15:05	15:05
258.76	-	281.25	(W)	1,3,4,12-15,23	09:00	11:00	11:35	12:00	15:05	15:05
281.26	-	303.75	(WNW)	1,3-5,12-16,23,24	09:10	11:40	12:35	12:00	15:05	15:05
303.76	-	326.25	(NW)	1,3-5,13-17,23,24	09:10	11:40	12:35	12:00	15:05	15:05
326.26	-	348.75	(NNW)	1,4-6,14-18,23,24	09:10	12:05	12:10	12:00	15:05	15:05
Any Direction				1-24	09:10	12:05	12:35	12:00	15:05	15:05

ATTACHMENT 3 (Cont.)

EVACUATION TIME ESTIMATES FOR WINTER, WEEKEND, MIDDAY AND WINTER, MIDWEEK, EVENING SCENARIOS

WIND DIRECTION IN DEGREES FROM	AFFECTED SUBAREAS	GENERAL POPULATION			SPECIAL POPULATION		
		NORMAL	RAIN	SNOW	NORMAL	RAIN	SNOW
WITHIN 2 MILES							
Any Direction	1	03:35	03:35	05:00	03:35	03:35	05:00
WITHIN 5 MILES							
348.76 - 11.25 (N)	1,4,5,6	03:40	03:40	05:10	03:40	03:40	05:10
11.26 - 33.75 (NNE)	1,5,6,7	03:40	03:40	05:10	03:40	03:40	05:10
33.76 - 56.25 (NE)	1,5,6,7	03:40	03:40	05:10	03:40	03:40	05:10
56.26 - 78.75 (ENE)	1,5,6,7	03:40	03:40	05:10	03:40	03:40	05:10
78.76 - 101.25 (E)	1,7,8	03:40	03:55	05:10	03:40	03:55	05:10
101.26 - 123.75 (ESE)	1,7,8	03:40	03:55	05:10	03:40	03:55	05:10
123.76 - 146.25 (SE)	1,7,8	03:40	03:55	05:10	03:40	03:55	05:10
146.26 - 168.75 (SSE)	1,2,8	03:40	03:55	05:10	03:40	03:55	05:10
168.76 - 191.25 (S)	1,2,3,8	03:40	03:55	05:10	03:40	03:55	05:10
191.26 - 213.75 (SSW)	1,2,3	03:35	03:35	05:05	03:35	03:35	05:05
213.76 - 236.25 (SW)	1,2,3	03:35	03:35	05:05	03:35	03:35	05:05
236.26 - 258.75 (WSW)	1,2,3,4	03:35	03:35	05:05	03:35	03:35	05:05
258.76 - 281.25 (W)	1,3,4	03:35	03:35	05:05	03:35	03:35	05:05
281.26 - 303.75 (WNW)	1,3,4,5	03:40	03:40	05:05	03:40	03:40	05:05
303.76 - 326.25 (NW)	1,3,4,5	03:40	03:40	05:05	03:40	03:40	05:05
326.26 - 348.75 (NNW)	1,4,5,6	03:40	03:40	05:05	03:40	03:40	05:05
Any Direction	1-8	03:40	03:55	05:10	03:40	03:55	05:10

ATTACHMENT 3 (Cont.)

EVACUATION TIME ESTIMATES FOR WINTER, WEEKEND, MIDDAY AND WINTER, MIDWEEK, EVENING SCENARIOS

WIND DIRECTION IN DEGREES FROM				AFFECTED SUBAREAS	GENERAL POPULATION			SPECIAL POPULATION		
					NORMAL	RAIN	SNOW	NORMAL	RAIN	SNOW
WITHIN 10 MILES										
348.76	-	11.25	(N)	1,4,5,6,15-18	05:40	07:20	08:10	12:00	15:05	15:05
11.26	-	33.75	(NNE)	1,5,6,7,16-19	05:10	05:55	07:00	05:10	05:55	07:00
33.76	-	56.25	(NE)	1,5,6,7,17-20	05:30	06:25	07:00	05:30	06:25	07:00
56.26	-	78.75	(ENE)	1,5,6,7,18-21	04:00	04:05	05:10	04:00	04:05	05:10
78.76	-	101.25	(E)	1,7,8,18-21	04:00	04:05	05:10	04:00	04:05	05:10
101.26	-	123.75	(ESE)	1,7,8,19-22	04:00	04:05	05:10	04:00	04:05	05:10
123.76	-	146.25	(SE)	1,7,8,9,20-22	04:00	04:05	05:10	04:00	04:05	05:10
146.26	-	168.75	(SSE)	1,2,8,9,10,21,22	04:00	04:05	05:10	04:00	04:05	05:10
168.76	-	191.25	(S)	1,2,3,8-12,21,22	04:00	04:05	05:10	04:00	04:05	05:10
191.26	-	213.75	(SSW)	1,2,3,9-13,22	03:40	03:40	05:10	03:40	03:40	05:10
213.76	-	236.25	(SW)	1,2,3,10-13	03:40	03:40	05:10	03:40	03:40	05:10
236.26	-	258.75	(WSW)	1,2,3,4,10-14	05:20	06:35	06:55	12:00	15:05	15:05
258.76	-	281.25	(W)	1,3,4,12-15	05:40	07:20	08:15	12:00	15:05	15:05
281.26	-	303.75	(WNW)	1,3,4,5,12-16	05:40	07:20	08:15	12:00	15:05	15:05
303.76	-	326.25	(NW)	1,3,4,5,13-17	05:40	07:20	08:15	12:00	15:05	15:05
326.26	-	348.75	(NNW)	1,4,5,6,14-18	05:40	07:20	08:15	12:00	15:05	15:05
Any Direction				1-22	05:40	07:20	08:15	12:00	15:05	15:05
TO EPZ BOUNDARY										
348.76	-	11.25	(N)	1,4-6,15-18,23,24	08:30	10:45	11:10	12:00	15:05	15:05
11.26	-	33.75	(NNE)	1,5-7,16-19,24	05:30	06:25	06:55	12:00	15:05	15:05
258.76	-	281.25	(W)	1,3,4,12-15,23	08:35	10:35	11:05	12:00	15:05	15:05
281.26	-	303.75	(WNW)	1,3-5,12-16,23,24	08:35	10:45	11:10	12:00	15:05	15:05
303.76	-	326.25	(NW)	1,3-5,13-17,23,24	08:35	10:45	11:10	12:00	15:05	15:05
326.26	-	348.75	(NNW)	1,4-6,14-18,23,24	08:35	10:45	11:10	12:00	15:05	15:05
Any Direction				1-24	08:45	10:50	11:25	12:00	15:05	15:05

ATTACHMENT 3 (Cont.)
EVACUATION TIME ESTIMATES

The evacuation time estimates for the All-Iowa Fair and the Cedar Rapids Freedom Festival consider an evacuation of the general population within the entire DAEC Emergency Planning Zone (Subareas 1-24) while each of these events is in progress.

All-Iowa Fair: 9:10

Cedar Rapids Freedom Festival: 10:15

ATTACHMENT 4

WIND DIRECTION and AFFECTED SUBAREAS

Wind Direction		0-2	2-5	5-10	10-EPZ
N	(348.75-11.25)	1	4,5,6	15,16,17,18	23,24
NNE	(11.25-33.75)	1	5,6,7	16,17,18,19	24
NE	(33.75-56.25)	1	5,6,7	17,18,19,20	
ENE	(56.25-78.75)	1	5,6,7	18,19,20,21	
E	(78.75-101.25)	1	7,8	18,19,20,21	
ESE	(101.25-123.75)	1	7,8	19,20,21,22	
SE	(123.75-146.25)	1	7,8	9,20,21,22	
SSE	(146.25-168.75)	1	2,8	9,10,21,22	
S	(168.75-191.25)	1	2,3,8	9,10,11,12,21,22	
SSW	(191.25-213.75)	1	2,3	9,10,11,12,13,22	
SW	(213.75-236.25)	1	2,3	10,11,12,13	
WSW	(236.25-258.75)	1	2,3,4	10,11,12,13,14	
W	(258.75-281.25)	1	3,4	12,13,14,15	23
WNW	(281.25-303.75)	1	3,4,5	12,13,14,15,16	23,24
NW	(303.75-326.25)	1	3,4,5	13,14,15,16,17	23,24
NNW	(326.25-348.75)	1	4,5,6	14,15,16,17,18	23,24

Effective Date: 10/15/2001

TECHNICAL REVIEW

Prepared by: Don A. [illegible] Date: 9-20-2001

Reviewed by: Russell J. Titus Date: 9/20/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: Kevin Williams for Date: 10/5/01
Manager, Emergency Planning

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1.0 PURPOSE

(1) This procedure provides overall guidance for the treatment of injured and/or contaminated individuals during an emergency.

(2) This procedure is applicable to key Emergency Response Organization supervisory personnel, rescue team personnel, individuals who may administer first aid treatment and Health Physics Technicians involved in personnel decontamination efforts.

2.0 DEFINITIONS

(1) None

3.0 INSTRUCTIONS

3.1 RESPONSIBILITIES

(1) Security Shift Supervisor

(a) Ensure that offsite medical authorities are advised of the need for medical assistance.

(b) Verify that personnel designated to provide first aid treatment are knowledgeable in the techniques that are expected to be needed.

(c) Provide direction, as necessary, in the application of first aid techniques.

(2) OSC Supervisor

(a) Supervise the performance of personnel monitoring and decontamination activities.

(b) Supervise the preparations for and dispatch of injured and/or contaminated personnel to offsite medical facilities for treatment.

(c) Apprise the Site Radiation Protection Coordinator (SRPC) of problems experienced in decontamination of personnel and/or treatment of injuries and progress being made.

(3) Site Radiation Protection Coordinator (SRPC)

(a) Verify that the primary Medical Consultant (or the secondary Medical Consultant, as necessary) is advised of contaminated personnel to be transported to Mercy Medical Center (or University of Iowa Hospitals) for further decontamination and/or treatment of contaminated injuries.

(b) Verify that the Emergency Room physician at Mercy Medical Center (or University of Iowa Hospitals) is advised in advance that personnel with injuries and/or who require decontamination are being transported from the site.

(c) Provide overall guidance to the OSC Supervisor, as required, for personnel decontamination and treatment of injuries when contamination is present.

(d) Advise the Emergency Coordinator of the problems in decontamination of personnel and/or treatment of injuries where assistance is/may be required from offsite medical authorities.

(4) Emergency Coordinator

(a) Advise the Emergency Response and Recovery Director of the actions being taken in response to any personnel injuries and/or personnel decontamination which require offsite medical assistance.

(b) Ensure that the NRC Operations Center is notified within one hour of any fatality or serious injury on-site.

3.2 RECOVERY OF INJURED PERSONNEL

(1) During rescue operations conducted in accordance with EPIP 4.3, "Rescue and Emergency Repair Work", when individual(s) reported to be missing are found and require medical or ambulatory assistance,

(a) The extent of injuries should be determined and the OSC Supervisor advised.

> **NOTE**
>
> During plant emergencies the Emergency Coordinator shall be advised of all injuries.
>
> If offsite medical assistance is required, contact shall be made by the CAS Operator, and/or the TSC.

(b) If injuries are evident, treatment priorities shall be based upon the radiological and medical condition of the injured party, as specified in EPIP 4.3.

(c) Application of first aid, including preparations to prevent further injury prior to relocating severely injured personnel, will normally take precedence over radiological considerations.

(d) Unless instructed otherwise, the injured party should be returned by the rescue team to the Health Physics Access Control area.

> **NOTE**
>
> First aid treatment will normally be provided at the First Aid Room; however, for severely injured victims, first aid may have to be provided at other locations in the plant while awaiting medical support assistance.

(2) If during subsequent re-entries into the plant to conduct repair, damage control and corrective action activities a personnel injury requiring medical or ambulatory assistance occurs, the OSC Supervisor shall be advised by another member of the repair team via the paging system or plant telephones.

(a) A determination should be made of the nature and extent of injuries as quickly as possible and the OSC Supervisor advised of the injury status, and the location of the injured party.

(b) A determination as to whether or not the repair effort should be continued or aborted shall be made by the OSC Supervisor based upon discussions and judgment of the Repair Team Leader.

(c) The victim should be administered first aid and returned to the Health Physics Access Control Area by personnel on the scene, if available and knowledgeable in first aid techniques, or by qualified first aid personnel dispatched from the OSC.

(3) If first aid personnel need to be dispatched, the OSC HP Supervisor shall determine whether or not a Health Physics Technician should accompany them by considering:

(a) The similarity of the ingress route to the location of the injured party to the route used by the repair team and radiation levels monitored during that entry.

(b) The availability of the Health Physics Technician assigned to the repair team to attend to rescue activities, should it be determined that the repair effort is not to be aborted.

(4) Subsequent dispatch of rescue personnel and conduct of rescue activities shall be performed, as described in EPIP 4.3, "Rescue and Emergency Repair Work".

(5) The OSC Supervisor should inform the Site Radiation Protection Coordinator of the state of injured personnel and personnel decontamination efforts.

(a) The Emergency Coordinator should ensure that required NRC notifications, if any, are made and so apprise the Emergency Response and Recovery Director.

(b) In addition, the Emergency Coordinator should apprise the Emergency Response and Recovery Director of pertinent details concerning the

injured or contaminated individuals and actions which have been initiated or planned.

3.3 PERSONNEL SURVEYING AND DECONTAMINATION

(1) If there is no injury but the individual is contaminated above acceptable levels for uncontrolled areas, decontamination will be conducted as per HP Procedures.

(2) If contamination is within acceptable levels for uncontrolled areas, the injured victim should be taken to the First Aid Room for treatment and subsequent transfer, if necessary.

(3) An individual who is contaminated and who also has minor injuries consisting of cuts or breaks in the skin shall receive immediate first aid, covering those areas with bandages to aid in avoiding internal contamination.

(a) Decontamination shall follow first aid treatment but only to the extent necessary to reduce the spread of contamination during transfer to Mercy Medical Center/University of Iowa Hospitals.

(b) Personnel contamination records shall be prepared in accordance with the requirements defined in HP Procedures.

NOTE

In general, injuries shall take precedence over contamination considerations during any emergency.

(4) Health Physics personnel should provide guidance and monitor the effectiveness of decontamination efforts which normally are to be accomplished at decontamination facilities provided at the Health Physics Access Control Area.

NOTE

Where open wounds are present coincident with contamination, decontamination of areas adjacent to the wound must be accomplished so as not to disturb the wound area.

Decontamination of open wounds will normally be accomplished under the direction of medical support personnel.

(5) An individual who is contaminated and so seriously injured that decontamination cannot be performed, shall be given immediate first aid.

(a) The victim may be wrapped in a blanket to limit the spread of contamination and await transfer to Mercy Medical Center or University of Iowa Hospitals.

(b) If the contamination is of such a level to create an added hazard to the victim, first aid personnel with assistance from Health Physics personnel may remove the individual's clothing, if possible.

3.4 OFFSITE MEDICAL ASSISTANCE

(1) Offsite medical support may be provided by one or more of the following organizations:

(a) Palo Fire Department

(b) Linn County Sheriff's Rescue

(c) Benton/Linn Ambulance Service

(d) Area Ambulance Service

(e) Mercy Medical Center, Cedar Rapids

(f) University of Iowa Hospital, Iowa City

(2) Transportation of patients who are contaminated or who may potentially be so should be arranged through Benton/Linn Ambulance or Area Ambulance.

(3) If Area Ambulance plans on dispatching a helicopter:

(a) Advise the dispatcher if an offsite release is in progress and, if so, the direction of the plume.

(b) If the event occurs during darkness, ensure that flares are lit at the helipad and the helipad is illuminated with search lights.

(4) Notification of such support organizations should be accomplished from CAS and the Emergency Coordinator so advised.

(a) The Emergency Coordinator shall notify the Emergency Response and Recovery Director, if not previously accomplished, that assistance from offsite medical facilities has been requested, provide a brief update regarding the status of the patient, and actions that have been accomplished.

(b) If the injury is compounded by potential or actual radiological problems, the Site Radiation Protection Coordinator shall verify that follow-up contact is made with Mercy Medical Center (or University of Iowa Hospitals) provide specific information regarding the extent of the radiological problem.

NOTE

A review should be made of the victim's medical file, if available, and medical support personnel advised of any pertinent information which may be recorded.

(5) The Site Radiation Protection Coordinator shall also verify that DAEC's primary Medical Consultant (or secondary Medical Consultant, as necessary) is apprised of personnel injury cases which involve potential or actual personnel contamination. Contact information is available in the ETB.

3.5 TRANSPORTATION OF INJURED PERSONNEL TO MEDICAL TREATMENT LOCATION

(1) The injured contaminated party shall be loaded onto the transport vehicle.

(2) Dosimetry devices, protective clothing and other equipment, as appropriate, shall be provided for ambulance personnel.

(3) The OSC Supervisor should select at least one Health Physics Technician; two, if possible, to accompany contaminated victims transported from the site to the local medical facility and to provide guidance and assistance to medical support personnel to limit the spread of contamination.

> **NOTE**
>
> If two Health Physics Technicians are available, consideration should be given to dispatching one ahead of the contaminated victim, to aid medical support personnel in establishing contamination control measures.
>
> When a helicopter is used to transport a contaminated injured individual to the hospital the on-board flight personnel will determine whether a Health Physics Technician will accompany the patient via helicopter. This decision will be based on the patient's medical condition and the number of people the helicopter can safely transport.
>
> The OSC Supervisor should make provisions for transporting the Health Physics Technician(s) back from offsite medical facilities to the DAEC.

(4) The OSC Supervisor should advise the Site Radiation Protection Coordinator of the departure of injured or contaminated personnel from the site. This

information relayed, in turn, to the Emergency Coordinator and Emergency Response and Recovery Director.

3.6 MEDICAL TREATMENT

(1) Upon being advised of a severe injury which involves a contaminated patient, the DAEC Medical Consultant should make himself available to the Emergency Room Staff for:

(a) Advising medical personnel regarding measures to be taken to handle contaminated victims.

(b) Coordinating all hospital activities and consulting with experts on radiation injuries and effects, as required.

(c) Directing and controlling the administration of radio-protective drugs.

(2) Medical treatment for the injury and decontamination of open wounds should be accomplished by medical support personnel.

3.7 FOLLOW-UP MONITORING AND ANALYSIS ACTIVITIES

(1) The Site Radiation Protection Coordinator, in coordination with the Medical Consultant, should determine if further evaluations, including more detailed bioassays and medical examinations, are warranted and arrange for their conduct.

4.0 RECORDS

(1) All records generated as a result of this procedure shall be retained IAW QA Record Retention Requirements, exception is for records generated during drills and exercises.

5.0 REFERENCES

(1) DAEC Emergency Plan

(2) NUREG 0654 Rev. 1

(3) HP Procedures

EMERGENCY PLAN IMPLEMENTING PROCEDURE	EPIP 4.3
RESCUE AND EMERGENCY REPAIR WORK	Rev. 10 Page 1 of 29

Effective Date: 10-15-2001

TECHNICAL REVIEW

Prepared by: _____ Date: 10/4/2001

Reviewed by: _____ Date: 10/8/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: _____ for Date: 10/8/01
Manager, Emergency Planning

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1.0 PURPOSE

(1) This procedure provides guidance for rescue and emergency repair team preparation and activities.

(2) This procedure is applicable to key Emergency Response Organization personnel located in the Control Room, TSC and OSC and to personnel involved in rescue and emergency repair team activities.

2.0 DEFINITIONS

(1) None

3.0 INSTRUCTIONS

3.1 RESPONSIBILITIES

(1) Security Staff

(a) Conducting an accountability check for all personnel within the protected area.

(b) Directing notification of the Emergency Response Organization, as required.

(c) Limiting access into the facility to only those personnel who are required for emergency response efforts.

(d) Establishing measures that will enable continuous accountability for all personnel within the protected area once the initial accountability check has been completed.

(e) Ensuring that no unauthorized personnel gain access to the site.

(f) Assigning personnel for first aid duties, as required.

(2) Security and Support Supervisor

(a) Assuring that an accountability check for all personnel within the protected area is conducted in a timely fashion and that requisite security posts are filled.

(b) Ensuring that the Emergency Response Organization notification process as described in the Emergency Plan Implementing Procedures has been initiated and is successfully complete.

(c) Determining existing and potential administrative support needs and providing direction to the Administrative Supervisor, as required.

(3) TSC Operations Supervisor

(a) Serve as an interface between the Operations Shift Supervisor and all other non-operating personnel and groups.

(b) Provide direction and assistance as necessary to achieve and maintain stable plant conditions.

(c) Assist the Operations Shift Supervisor in coordinating operational activities.

(d) Monitor operational activities to assure that the plant is operated and maintained in as safe a condition as possible.

(e) If no abnormal radiological conditions are present, dispatch of operations personnel from the control room to plant locations where local operational response actions may be required to initially mitigate the emergency condition is permitted providing:

1. The Emergency Coordinator is informed during his Control Room briefing soon after their dispatch of the location and tasks of any operators initially dispatched into the plant prior to the activation of the OSC.

2. After OSC activation, dispatch of any operator into the plant by the Control Room is permitted providing the TSC Operations Supervisor and the OSC Supervisor is informed. The OSC may elect to dispatch a Health Physics technician to accompany these operators. The Health

Physics technician shall keep the HP Supervisor or the Site Radiation Protection Coordinator informed of any abnormal radiation conditions that may exist.

NOTE

If additional individuals/resources (other than operations and/or HP personnel) are required to accompany the operator, such as Mechanics, Electricians, and I & C Technicians then they shall be classified as a team and shall be coordinated and controlled by the TSC/OSC.

(f) Coordinate with the OSM/OSS and the Site Rad Protection Coordinator, the dispatch of operators when radiological conditions make entry into the plant hazardous. Inform the OSC and HP Supervisor as soon as possible.

(g) Coordinate, as necessary, with the OSC Supervisor to maintain an awareness of the status of corrective actions in progress by repair teams which have been dispatched and rescue activities which may be in progress. Ensure to inform the OSM/OSS of the repair team progress and results.

(4) Emergency Coordinator

(a) Ensure the activation of the DAEC Emergency Response Organization as appropriate for the classification and circumstances of the emergency condition.

(b) Coordinate efforts to return the plant to, and maintain it in a safe, stable condition.

(c) Coordinate accident assessment and analyses efforts to determine the full scope and impact of the emergency.

(d) Ensure appropriate initial notification of IES, local, State, and Federal officials and agencies. This function will be assumed by the Corporate Emergency Response Organization upon activation of the Emergency Operations Facility.

(e) Provide initial protective action recommendations, as appropriate, to local and State authorities who are responsible for offsite protective measures. This function will be assumed by the Corporate Emergency Response Organizations upon activation of the Emergency Operations Facility.

(f) Apprise NMC, local, State, and Federal officials and agencies of updated information pertaining to the emergency condition.

(g) Classify/Reclassify the event as necessary.

(h) Approve extensions on occupational dose limits, as necessary.

(i) Prepare the DAEC Emergency Response Organization for an orderly transfer of responsibilities to the recovery organization.

(j) Authorize issuance of KI.

(k) Authorize the dispatch of Rescue and Emergency Repair Teams.

(l) Authorize the formation of an OSC Quick Response Team.

NOTE

While the administrative aspects of most of these responsibilities may be delegated by the Emergency Coordinator, the responsibilities for items (e), (g), and (h) may not be delegated except as indicated herein.

(5) Technical and Engineering Supervisor

(a) Verifying that the TSC is fully activated and staffed as described in the Emergency Plan Implementing Procedures.

(b) Evaluating plant status and providing support to the operations staff as requested.

(c) Providing overall management and direction to the technical staff assembled in the TSC.

(d) Evaluating recommendations for corrective action provided by the technical staff and operating crew and recommending to the Emergency Coordinator a course of action to be taken to combat the existing situation.

(e) Recommending changes in the Emergency Classification based upon:

1. Plant status changes, with or without radiological releases in progress.

2. Actual or potential radiological release parameters.

3. The progress of activities undertaken to mitigate the situation and their probability for success.

(f) Providing direction to the technical staff comprised of support personnel such as SPDS Operator, Reactor Engineer, and consultant/contractor representatives to analyze plant conditions and define courses of action to mitigate the emergency situation.

(g) Providing direction to the engineering staff in the Technical Support Center to aid in analysis of plant conditions and defines courses of action to mitigate the emergency situation.

(h) Coordinating engineering activities undertaken by the Corporate Emergency Response Organization with efforts being taken at the DAEC to mitigate the event and establish stable plant conditions.

(i) Providing support to the OSC Supervisor as necessary for coordinating all repair/corrective action efforts conducted at the DAEC.

(6) Site Radiation Protection Coordinator

(a) Evaluate projected exposure to Rescue and Emergency Repair Teams.

(b) Make recommendations to the Emergency Coordinator on dose extensions, as necessary.

(c) Evaluating projected exposure to Rescue and Emergency Repair Teams.

(d) Ensuring that DAEC personnel are dispatched to monitor the environs in and around the plant for radiological consequences associated with the event.

(e) Conducting an initial evaluation and assessment of the results of radiological monitoring activities. Upon activation of the Emergency Operations Facility, this

function will be assumed by the Radiological Assessment Coordinator for all offsite monitoring activities.

(f) Assessing the onsite radiological consequences and directing protective measures, including evacuation of the plant in part or in whole.

(g) During the initial stages of the event, apprising local and State authorities, through the Emergency Coordinator, of the results of radiological monitoring activities and providing protective action recommendations based upon the projected radiological consequences to the population-at-risk. Upon activation of the Emergency Operations Facility, this function will be assumed by the Radiological Assessment Coordinator.

(7) OSC Supervisor

(a) Supervising the implementation of the tasks and staffing delineated by the Emergency Assignment Tag Board.

(b) Providing general supervision and direction to personnel who report to the Operational Support Center.

(c) Coordinating evacuation from the site and all unnecessary personnel in the event that the Operational Support Center is not habitable and during events classified as a SITE AREA or GENERAL EMERGENCY, once such an evacuation has been authorized by the Emergency Coordinator.

(d) Coordinating all repair/corrective action efforts conducted at the DAEC to achieve stable plant condition and to terminate any uncontrolled or excessive radiological release.

(e) Ensuring that personnel dispatched from the Operational Support Center are properly briefed and equipped for their assignment in regards to technical contents as well as ALARA including existing and potential radiological hazards.

(8) Health Physics Supervisor

(a) Ensuring that personnel dispatched from the Operational Support Center are properly outfitted with protective clothing and equipment, are briefed regarding ALARA and are apprised of existing and potential radiological hazards.

(b) Coordinating with the Site Radiation Protective Coordinator in the TSC to obtain information regarding plant status, problems, response options, significant radiological releases in progress, offsite dose rates, plume location and meteorological conditions as necessary.

(c) Ensure that determination of habitability of assembly areas and ERO facilities.

(d) Coordinate the dispatch of monitoring teams, PASS team and ORAA and ORAL/ODEF personnel. Ensure the continued briefing of the ORAA and ORAL/ODEF in terms of plant and radiological conditions.

(e) Supervise efforts to prepare injured/contaminated personnel for transport to offsite medical facilities.

(f) Brief rescue and emergency repair team personnel regarding radiological hazards which exist or which potentially may be encountered and provide guidance regarding precautions to be taken and limits that shall not be exceed.

3.2 RADIOLOGICAL CONCERNS

(1) An evaluation of projected exposures to team members shall be made prior to dispatch.

(a) DAEC limits defined by 10 CFR 20.1201 and EPA-400-R-92-001 are prescribed in ACP 1411.17, "Exposure Limits and Upgrades," and are partially reproduced on Attachment 1, "External Exposure Limits".

(b) If exposures in excess of 5 Rem are projected for team members, the Emergency Coordinator may authorize exposures up to the limits specified on Attachment 2, "Guidance on Dose Limits for Workers Performing Emergency Services", in accordance with 10 CFR 50.47(b)(11), providing that team members are volunteers.

(2) Individuals assigned to rescue and emergency repair teams shall take reasonable precautions to maintain their exposures as low as possible, consistent with ALARA considerations and job assignment.

(a) Respiratory equipment, if required, shall be fitted and determined to be functioning properly, as prescribed in ACP 1411.20 "Radiological Respiratory Protection".

(b) Area radiation surveys shall be conducted as prescribed in HP Procedures and team members shall position themselves to minimize their own exposures due to localized hot spots.

(c) Personal dosimetry shall be checked periodically, as specified in ACP 1411.18, "Personnel Dosimetry", so as to monitor the total dose received and to ensure that the exposure limits established are not exceeded.

(3) Based upon the most probable locations where individuals determined to be missing may be located, an assessment of potential radiological exposures should be conducted.

(a) If no significantly increased radiation levels are indicated by the Area Radiation Monitors (ARMs), projected exposures can be estimated by reviewing the latest survey forms, RWPs and ARM readings coupled with estimated time to conduct rescue activities.

(b) If significant radiation levels are indicated, i.e., Hi Hi or upscale ARM indications and/or elevated Containment High Range Radiation monitor readings, an estimate of projected exposures can be made by reviewing the Shielding Study or reviewing the results of accident analyses contained in Chapter 15 of the UFSAR coupled with estimated time to conduct rescue activities.

(4) In estimating projected exposures consideration needs to be given to ingress/egress routes and expected dose rates which may be encountered enroute.

NOTE

Operations personnel should be consulted when evaluating ingress/egress routes due to their familiarity with physical layout considerations and awareness of how such routes may be impacted due to changing plant conditions.

(5) The Emergency Coordinator shall approve changes to the established DAEC dose levels, if warranted, provided they are in accordance with 10 CFR 20.1201 and/or EPA 400-R-92-001.

(a) The Site Radiation Protection Coordinator shall be notified of the increased exposure limits.

(b) The increased levels, the individuals to whom such levels apply and the name of the individual who authorized such levels shall be documented in the Site Radiation Protection Coordinator's Log.

NOTE

During an emergency, the normal process of requesting and approving increased exposure limits, prescribed in ACP 1411.17, "Exposure Limits and Upgrades", need not be followed.

(6) The exposure records of personnel assigned to the rescue team should be maintained to ensure that the projected exposure to be received during rescue activities will not result in any member of the team exceeding the limits defined by EPA-400-R-92-001.

(a) Team membership should be modified if personnel assigned are approaching such limits.

(b) Team membership shall be comprised of volunteers if projected exposures for the proposed rescue activities will cause personnel exposures to exceed limits specified in 10 CFR 20.1201 and/or EPA-400-R-92-001.

1. Documentation that individuals so assigned are volunteers and that they understand the risks and limits established for the assignment shall be recorded in the OSC Supervisor's log along with the names of the volunteers.

(c) If significant airborne iodine activity is anticipated, consideration should be given to thyroid blocking, as prescribed in EPIP 4.5, "Administration of Potassium Iodide (KI)".

1. Guidance with respect to implementation of emergency exposure limits and use of volunteers is contained in Attachment 3, "Guidelines Regarding Selection of Volunteers".

(7) For those response options which will require personnel access into radiation areas in the plant, an assessment of the potential radiological exposures should be conducted, as prescribed in this procedure.

(8) The benefit of the proposed repair/damage control activity should be evaluated considering:

(a) The magnitude and/or duration of the potential or actual radiological release if the repair/damage control activity is not performed.

(b) The associated delay or inability to establish control of the plant and/or restore stable conditions.

(c) The magnitude of the projected exposure to the public calculated in accordance with PASAP's and EPIP 3.3, "Dose Assessment and Protective Action ".

(d) Exposures received by skilled personnel during performance of the activity which may make them unavailable for further assignments.

(9) If the course of action selected will result in emergency repair team personnel exceeding 5 Rem, see guidance contained in this procedure.

(10) Monitoring shall be performed by the Health Physics Technician, as specified in this procedure.

3.3 REQUIREMENTS

(1) Once the TSC has been activated, rescue and emergency repair teams shall not be dispatched without the prior approval of the Emergency Coordinator or designated representative when radiological conditions make entry into the plant hazardous.

(2) The TSC Operations Supervisor shall be informed, in advance whenever possible, of the dispatch of personnel to locations where local operational response actions are required.

(3) Prior to dispatch of rescue and emergency repair teams, briefings shall be conducted by the OSC Supervisor and appropriate discipline supervisor which cover at a minimum:

(a) The activity to be performed.

(b) The specific area where the activity is to be performed.

> **NOTE**
>
> For rescue activities, the area designated may only be a best estimate.

(c) Routes to be used to gain access to the area.

(d) Estimated radiation levels in the specific area and radiation levels estimated to be encountered along the route.

(e) Authorized exposure limits for team members and dose rate limits which should not be exceeded.

(f) Communications requirements and methods.

(g) Specific technical and administrative requirements associated with performance of the activity.

(h) Precautions to be taken during performance of the activity.

3.4 RESCUE OPERATIONS

(1) If accountability for all personnel within the Protected Area, as prescribed in EPIP 1.3, "Plant and Site Evacuation", can not initially be established, one or all of the following actions should be taken in an effort to locate the missing individual(s) and determine if rescue operations are required.

(a) Contact emergency response facility supervisory personnel to determine if the individual(s) is/are, in fact, present.

(b) Contact the individual's direct supervisor and personnel with whom the individual was working to determine the job assignment and ascertain last-known whereabouts.

> **NOTE**
>
> The Personnel Statement Concerning Incident form provided with EPIP 2.1, "Activation and Operation of the Operational Support Center", may provide information regarding last known whereabouts.

(c) Check the security computer system for location and time of the employee's last entry or exit.

(d) Attempt contact of the individual(s) using the plant paging system.

(2) Rescue teams should be comprised of the following personnel:

(a) One (1) Health Physics Technician.

(b) Two (2) individuals, knowledgeable in first aid techniques.

(c) Additional personnel as specified by the Security and Support Supervisor to support search and rescue activities.

(3) Prior to dispatch of a rescue team, the OSC Supervisor shall ensure that a briefing is conducted.

(a) The HP Supervisor or his designee should brief team personnel regarding expected radiological hazards, limits which are applicable, considerations associated with injured personnel who may be contaminated with open wounds and/or in high radiation fields, and communications requirements.

(b) The Security Supervisor should check to ensure that first aid personnel have equipment and supplies expected to be necessary and are familiar with techniques which may be required.

(4) Communications between the rescue team and the OSC Supervisor should be conducted using the Plant Page system or telephones.

(5) The OSC Supervisor will then dispatch and coordinate direction of the rescue teams upon being authorized by the Emergency Coordinator or designated representative.

(6) While enroute, the Health Physics Technician shall:

(a) Monitor ahead of the team to detect areas of high radiation.

(b) Monitor total dose for each team member.

(7) Upon locating the missing individual(s):

(a) The extent of injuries, if any, should be determined.

(b) The OSC Supervisor shall be advised.

(8) If no injuries were sustained, the individual shall be escorted back to the OSC.

(9) If injuries are evident, treatment priorities shall be based on the radiological and the medical condition of the injured.

(a) Such determination should be made jointly between the Health Physics Technician and First Aid personnel.

(b) If both the injury and level of radiation is life threatening, the victim should first be relocated to a "safe" radiation area, then first aid treatment administered.

NOTE

As a general rule, consideration should be given to immediately relocating a victim if the radiation level is >25 R/hr.

(c) If the injury is life threatening but the level of radiation is not, immediate first aid treatment should be provided.

(d) If the injury is not life threatening, priority should be given to relocating the victim to a safe area, preferably the First Aid Room, before administering first aid.

(10) Unless directed otherwise during the briefing or during subsequent communications with the HP Supervisor, rescue teams should return with the injured to the Health Physics Access Control area.

(11) Additional medical treatment and documentation of injuries, radiological problems and the like shall be performed, as described in EPIP 4.2, "First Aid, Decontamination, and Medical Support".

3.5 EMERGENCY REPAIR

(1) Equipment malfunctions, operational trends and proposed corrective actions should be transmitted to the OSC Supervisor and Technical and Engineering Supervisor by the TSC Operations Supervisor.

(2) Corrective action options which may include emergency repair and damage control activities should be evaluated and developed by the Technical and Engineering Supervisor, OSC Supervisor, Emergency Coordinator, and TSC Operations Supervisor. priorities should be assigned to each work task. Attachment 6 "Emergency Team Data Sheet" should be utilized when forming an emergency repair team. The flow path of the Emergency Team Data Sheet is depicted as Attachment 7.

(3) If it is determined that an quick OSC Repair Team response is necessary, the Emergency Coordinator shall make a PA announcement informing the TSC/OSC of this need. An individual shall be named as the owner, typically this would be the applicable craft OSC Supervisor. The owner shall take the lead in ensuring that all the necessary paperwork is expedited and coordinating all the necessary briefings. All of the applicable personnel in the TSC and OSC shall give this OSC Quick Response Team their full attention. All applicable procedures regarding the formation, dispatch, and debriefing of OSC Repair Teams shall be adhered to.

(4) Where several courses of action can be taken, the Emergency Coordinator shall determine which option is to be pursued.

(a) Approval of the Emergency Response and Recovery Director is obtained.

(b) Deviation from such standard practices are documented as Action Requests (AR) under the direction of the Manager, Quality Assurance.

(5) Personnel initially assigned to emergency repair work by the Emergency Assignment Tag Board, defined in EPIP 2.1, "Activation and Operation of the OSC", include:

(a) One Mechanic, one Instrument and Controls Technician and two Electricians and one HP Technician (unless waived by the SRPC).

(b) Additionally, one Health Physics Technician should be assigned for emergency repair work if work must be accomplished in a radiation area.

(6) The OSC Supervisor should verify that individuals to be assigned to emergency repair work by the Emergency Assignment Tag Board are appropriately qualified to execute the desired activities.

(7) The composition of emergency repair teams should be modified based upon the considerations defined in this procedure.

(a) The OSC Supervisor shall redesignate, as necessary, the individuals to be assigned.

(b) The OSC Supervisor shall ensure that personnel so identified are available and ready for such assignment.

(8) Prior to dispatch of an emergency repair team, the OSC Supervisor shall ensure that a briefing is conducted.

(a) The HP Supervisor or his designee should brief team personnel regarding expected radiological hazards and limits which are applicable.

(b) The Technical and Engineering Supervisor or his designee should ensure that team personnel understand the repair or damage control functions to be performed, actions to take if other than expected conditions are discovered, and communications requirements.

(9) Communications between the emergency repair team and the Technical and Engineering Supervisor should be conducted using the Plant Page system or telephones.

(10) The OSC Supervisor shall dispatch the emergency repair team upon receiving authorization from the Emergency Coordinator or designated representative.

(11) Emergency repair or damage control activities shall be conducted in accordance with the instructions provided during the briefing.

(a) Problems encountered or unexpected conditions discovered should be reported to the Technical and Engineering Supervisor via the communication pathway as shown in Attachment 5.

(b) The Technical and Engineering Supervisor shall coordinate emergency repair team activities, as required, with the TSC Operations Supervisor.

(12) Upon completion of emergency repair/damage control activities or as otherwise directed, emergency repair team members shall return to the OSC.

(a) Normal radiation protection practices shall be observed at the access area unless otherwise directed by the HP Supervisor.

(b) Decontamination, if required, shall be performed in accordance with the requirements defined in EPIP 4.2, "First Aid, Decontamination, and Medical Support".

(c) Debriefing of all teams should be performed with the appropriate Craft Supervisor, HP Supervisor, and Engineering as necessary..

(d) All deviations from procedures or hardware non-conformances will be documented via Action Request (AR) initiation.

(13) Emergency repair and damage control activities conducted shall be documented in the Technical and Engineering Supervisor's and OSC Supervisor's log.

4.0 RECORDS

(1) All records generated by this procedure shall be retained IAW QA Record Retention Requirements (except records generated during drills and exercises)

5.0 REFERENCES

(1) Duane Arnold Energy Center Emergency Plan

(2) Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA 400-R-92-001 dated October 1991 with 2nd printing May 1992)

(3) 10 CFR 20.1201

(4) Updated Final Safety Analysis Report (UFSAR), Chapter 15

(5) ACP 1411.20 "Radiological Respiratory Protection"

(6) ACP 1411.17, "Exposure Limits and Upgrades"

(7) ACP 1411.18, "Personnel Dosimetry"

(8) HP Procedures

(9) EPIP 4.5, "Administration of Potassium Iodide (KI)"

(10) EPIP 4.2, "First Aid, Decontamination, and Medical Support"

(11) EPIP 3.3, "Dose Assessment and Protective Action"

(12) EPIP 2.1, "Activation and Operation of the OSC"

(13) PASAP's

6.0 ATTACHMENTS

Attachment 1 - External Exposure Limits

Attachment 2 - Guidance on Dose Limits for Workers Performing Emergency Services

Attachment 3 - Guidelines Regarding Selection of Volunteers

Attachment 4 - ARM Locations

Attachment 5 – *DELETED*

Attachment 6 - Emergency Team Data Sheet

Attachment 7 - Emergency Team Data Sheet Flow Path

ATTACHMENT 1
EXTERNAL EXPOSURE LIMITS

	Habitability Limits (1)	10 CFR 20.1201 Exposure Limits (TEDE) (2)
24 hour/day Occupancy 12 hour/day Occupancy 8 hour/day Occupancy	6 mrem/hr 12 mrem/hr 19 mrem/hr	
Per Year	0.5 rem	5 rem (3)
Airborne	3.0 E^{-9} µCi/cc	
Contamination	1000 dpm/100cm^{2}b-g 20dpm/100cm^{2}a	

NOTES:

(1) Assumes that the early phase of the emergency will not last more than one week and that the dose to individuals in the TSC/CR is to be maintained below 1000 millirem during this one week period.

(2) For further information, including standard requirements applicable to authorizing increased limits, refer to ACP 1411.17, "Occupational Dose Limits and Upgrades".

(3) For implementation of such increased exposure limits, refer to ACP 1411.17, "Occupational Dose Limits and Upgrades".

ATTACHMENT 2

Guidance on Dose Limits for Workers Performing Emergency Services*

Dose Limit[a] (rem)	Activity	Condition
5	all	
10	protecting valuable property	lower dose not practicable
25	life saving or protection of large populations	lower dose not practicable
>25	lifesaving or protection of large populations	only on a voluntary basis to persons fully aware of the risks involved

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

*EPA 400-R-92-001 - Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, Dated 1991 with 2nd printing May 1992.

ATTACHMENT 3
GUIDELINES REGARDING SELECTION OF VOLUNTEERS

- Rescue personnel should be volunteers or professional rescue personnel who volunteer by choice of employment.
- Rescue personnel should be broadly familiar with consequences of the exposure.
- Women capable of reproduction should not take part in these actions. Volunteers above the age of 45 should be selected.
- TEDE should be optimized by the use of the best available respiratory protection (positive pressure self-contained breathing apparatus) and contamination should be controlled by the use of protective clothing.
- Exposure under these conditions shall be limited to once in a lifetime.
- Persons receiving exposures as indicated should avoid procreation for a few months.
- Medical follow-up should be considered depending on the magnitude of the exposure.

NOTES

1. Exposure limits in excess of those permitted in 10 CFR 20.1201 should be authorized only as a last resort.
2. Dose limits can not be specified but must be commensurate with the significance of the objective and held to as low as is reasonably achievable.
3. It is compatible with the risk concept to accept exposures leading to doses in excess of those permitted for routine occupational duties, when involved in a major accident for the following activities:

    a) Measures to circumvent substantial exposures to population groups.

    b) Recovery of victims/saving of a life.

ATTACHMENT 4
ARM LOCATIONS *

Number	Location	Elev.	Range (mR/hr)	Description
Reactor Building Units				
1. RT 9168	North CRD Module Area	757'6"	10^{-9} - 10^{3}	Outside airlock to Access Control
2. RT 9170	CRD Repair Room	757'6"	10^{-1} - 10^{3}	Northwest wall, behind door
3. RT 9167	South Equipment Railroad Access	757'6"	10^{-1} - 10^{3}	West wall, near inner RX.B1 Truck Lock Door
4. RT 9169	South CRD Module Area	757'6"	10^{-1} - 10^{3}	South wall, near airlock
5. RT 9176	TIP Cubicle	757'6"	10^{0} - 10^{4}	North wall, inside cage area
6. RT 9177	Cleanup Phase Separators Work Area	786'0"	10^{0} - 10^{4}	East wall of CU Phase Separator Room
7. RT 9173	Cleanup System Resin Handling Area	786'0"	10^{-1} - 10^{3}	East wall of CU Discharge Mixer Pump Room
8. RT 9157	Cleanup Heat Exchangers	786'0"	10^{2} - 10^{6}	Inside airlock to RWCU Heat Exchanger Room
9. RT 9156	Cleanup Recirculation Pump Area	876'0"	10^{2} - 10^{6}	Inside Door to RWCU Pump Room
10. RT 9155	Cleanup Demineralizer Work Area	812'0"	10^{2} - 10^{6}	East Wall of Filter Demin. Room
11. RT 9171	Ventilation Equipment Area	812'0"	10^{-1} - 10^{3}	Inside 2nd airlock door to Rx. Building Exhaust Fan Room
12. RT 9175	Condensate Phase Separator Pumps	833'6"	10^{-1} - 10^{3}	Inside door, along west wall of Cond. Phase Sep. Room
13. RT 9163	Refuel Floor - North End	855'0"	10^{-2} - 10^{2}	West stairway wall, Refuel
14. RT 9164	Refuel Floor - South End	855'0"	10^{-2} - 10^{2}	North stairway wall, Refuel
15. RT 9153	New Fuel Storage Area	855'0"	10^{-1} - 10^{3}	North end of Storage Pit at Instrument panel

*With remote readout (Control Room)

ATTACHMENT 4 (continued)
ARM LOCATIONS*

Number	Location	Elev.	Range (mR/hr)	Description
Reactor Building Units				
16. RT 9178	Spent Fuel Storage Pool	855'0"	10^0 - 10^4	N.E. rail around Fuel Pool
17. RT 9180	Waste Collecting Tank Area	737'0"	10^0 - 10^4	S.E. Corner Room, North wall inside second door
18. RT 9166	Radwaste Pump Room	716'9"	10^{-1} - 10^3	S.W. Corner Room, along south wall near corner
Turbine Building Units				
19. RT 9159	Reactor Feedwater Pump Area	734'0"	10^{-1} - 10^3	North Condenser Bay wall
20. RT 9160	Turbine Lube Oil Area	734'0"	10^{-1} - 10^3	East corridor wall
21. RT 9158	Condensate Pump Area	734'0"	10^{-1} - 10^3	Mounted on girder near Condensate Pumps
22. RT 9174	Sump Area	734'0"	10^{-1} - 10^3	Acid & Caustic Tank, S.E. Corner of Turbine Bldg.
23. RT 9179	Turbine Front Standard	780'0"	10^0 - 10^4	Along east shield wall at offset
Radwaste Building Units				
24. RT 9151	Radwaste Control Room	786'0"	10^{-1} - 10^3	South wall, near door
25. RT 9152	Sample Tank and Pump Floor	786'0"	10^{-1} - 10^3	North wall of Centrifuge Room
26. RT 9154	Radwaste Drumming Area	757'6"	10^{-1} - 10^3	At middle of west wall
Other Units				
27. RT 9162	Control Room (west wall)	786'0"	10^{-2} - 10^2	Control Building
28. RT 9172	Radiological Chemistry Laboratory	786'0"	10^{-1} - 10^3	Control Bldg., west wall of hot lab
29. RT 9161	Machine Shop	757'6"	10^{-2} - 10^2	Machine Shop Building
30. RT 9165	Site Entry and Exit	757'6"	10^{-2} - 10^2	Entrance to Admin. Bldg.

*With remote readout (Control Room)

ATTACHMENT 5

Deleted

ATTACHMENT 6
REPAIR TEAM DATA SHEET
(pg. 1 of 2)

TEAM IDENTIFICATION NUMBER : _____

Team Composition: _____MM _____EM _____IC _____HP _____OPS _____OTHER

Names: _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

DESTINATION

Proceed to: _____ VIA: _____

WORK PLANNING

_____

HP/ALARA PLANNING

☐ Wear respirator ☐ Wear SCBA ☐ Wear plastics

☐ Dose Extended to: _____ Authorized By : _____

☐ Take dosimetry: type - _____

☐ Take other equipment/protective clothing - _____

☐ Take Potassium Iodide (KI) Authorized By Emergency Coordinator ☐ YES ☐ NO

☐ Get keys from - _____

CRITERIA TO ABORT MISSION (Check one or more)

☐ Dose rate: _____ mR/hr ☐ Dose: _____mR ☐ Time: _____ mins.hrs. ☐ N/A

DEPARTURE/RETURN TIMES

Team left OSC: _____ Team returned to OSC: _____

ATTACHMENT 6
(pg 2 of 2)

Work Performed:

As Found :

_____
_____
_____
_____
_____

Action Taken :

_____
_____
_____
_____

Radiation Conditions :

_____
_____
_____

Non-Tech Spec Material Used, *(initiate AR)* :

_____
_____
_____

Problems Encountered, *(initiate AR if necessary)* :

_____
_____
_____

Debriefed By :

OSC Supervisor: _____ Time/Date: _____

Craft Supervisor: _____ Time/Date: _____

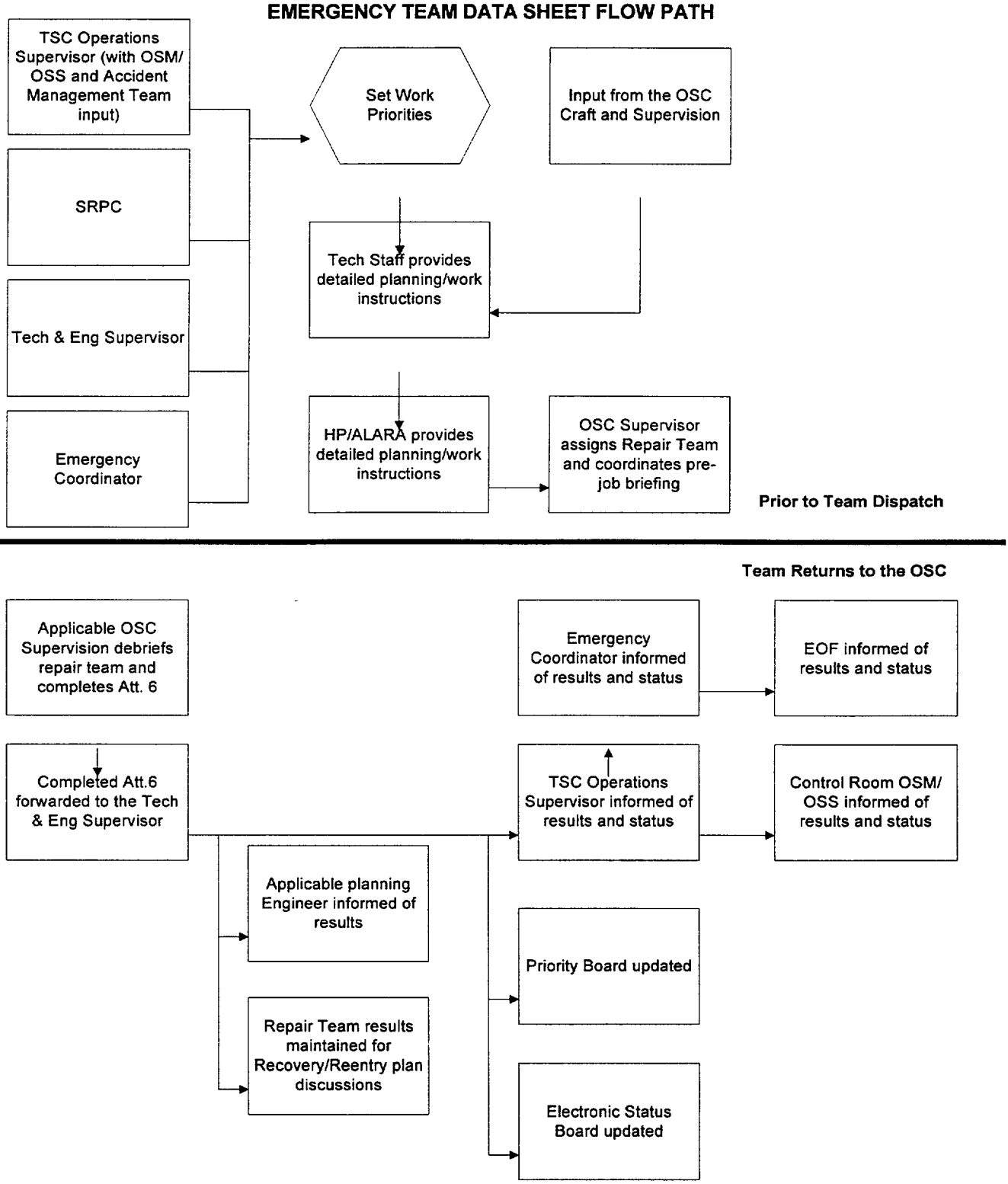
HP Supervisor: _____ Time/Date: _____

Reviewed By :

Maintenance Engineer: _____ Time/Date: _____

Tech & Eng. Supervisor: _____ Time/Date: _____

ATTACHMENT 7
EMERGENCY TEAM DATA SHEET FLOW PATH



EMERGENCY PLAN IMPLEMENTING PROCEDURE	EPIP 4.5
ADMINISTRATION OF POTASSIUM IODIDE (KI)	Rev. 6 Page 1 of 6

Effective Date: 10/15/2001

TECHNICAL REVIEW

Prepared by: Don A. Johnson Date: 10-4-2001

Reviewed by: [signature] Date: 10/8/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: [signature] Date: 10/8/2001
Manager, Emergency Planning

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1.0 PURPOSE

(1) This procedure provides guidance for recommending and supervising the administration of potassium iodide (KI) to emergency workers who have been, or are expected to be exposed to airborne radioiodine.

2.0 DEFINITIONS

(1) None

3.0 INSTRUCTIONS

3.1 ADMINISTRATION OF POTASSIUM IODIDE

(1) In the event of fuel failure combined with a plant related Emergency Declaration of a Site Area Emergency or General Emergency, the Site Radiation Protection Coordinator (SRPC) should identify the population(s) of emergency workers at risk of exposure to airborne radioiodine.

NOTE

Fuel failure can be identified in a variety of ways, including but not limited to:

- High drywell ARM readings
- High Torus ARM readings
- KAMAN sample analysis
- Field airborne readings

(2) In determining the population(s) at risk, the SRPC should consider the following:

(a) Has an exposure occurred?

(b) Is the individual or group expected to be exposed to airborne radioiodine because of entry into the power block?

(c) Is the individual or group expected to be exposed to airborne radioiodine because of entry into the power block?

(d) Is there an indication of airborne radioiodine in the TSC, OSC, Control Room, or Assembly Areas?

(3) The SRPC should obtain approval from the Emergency Coordinator (EC) to initiate a dose regimen of one tablet of KI each day for the at-risk population(s).

(4) The SRPC shall notify the Medical Consultant(s) if the KI dose regimen needs to extend beyond 10 days and if the projected or confirmed thyroid doses exceed 25 REM (CEDE).

(5) Each individual to be provided KI shall be issued one tablet. Use Attachment 1 to document the administration of KI. Ensure that each recipient reads the pharmaceutical information provided with the KI tablets. An individual who refuses to take the KI should not be allowed to enter an environment where KI is necessary. Disposition of this individual shall be at the discretion of the EC and SRPC.

(a) A supply of KI is stored in the TSC. The Offsite Field Monitoring Teams and ORAA are provided with a supply of KI tablets

(b) KI has an approved shelf-life with the expiration date listed on each bottle. However, the expiration date may be extended. Documentation of extensions are available in the TSC.

(c) To ensure that the KI supply is valid, these dates will be inspected during the inventory of the TSC and emergency lockers and the KI replaced as necessary.

(6) The dose regimen of KI should be discontinued when airborne conditions post-fuel break have been remediated.

(7) The dose regimen of KI should not be continued for a period of time in excess of 10 days unless directed otherwise by the Medial Consultant.

4.0 RECORDS

(1) All records generated by this procedure shall be maintained IAW QA Record Retention requirements, exception is for records generated during drills and exercises.

5.0 REFERENCES

(1) DAEC Emergency Plan

(2) Medical Consultant's letter dated 2/15/93 to Iowa Electric

(3) NG 93-1628 memorandum dated 4/16/93

6.0 ATTACHMENTS

ATTACHMENT 1, "KI ISSUANCE LOG"

ATTACHMENT 1

KI ISSUANCE LOG

NAME	SSN	DATE/TIME OF ISSUANCE	ISSUED BY

Effective Date: 10/15/2001

TECHNICAL REVIEW

Prepared by: _____ Date: 10-4-2001

Reviewed by: _____ Date: 10/8/01
Independent Reviewer

PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by: _____ for Date: 10/8/2001
Manager, Emergency Planning

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1.0 PURPOSE

(1) This procedure provides guidance for the planning and performance of recovery and reentry operations. The basis for this procedure is documented in NUREG-0654 (Reference 1), 10 CFR 50 (Reference 2), and the DAEC Emergency Plan (Reference 4).

2.0 DEFINITIONS

(1) **Recovery:** that point following an emergency condition when the plant is in a stable state, necessary plant operating equipment is functioning properly and there is no potential for uncontrolled radiological releases.

3.0 INSTRUCTIONS

3.1 OVERVIEW

(1) The Emergency Response and Recovery Director (ER&RD) (or Assistant ER&RD) will determine when the response phase has ceased and the recovery/re-entry phase has begun and coordinate the assembly of personnel and resources to manage the recovery organization.

(a) The ER&RD will assign personnel to develop the recovery phase plan.

(2) The ER&RD or Assistant ER&RD will direct the notification of State, local and federal authorities and the Emergency Response Organization (ERO) of the initiation of the recovery phase. {IC001}

(3) The Radiological and EOF Manager will coordinate with State and county officials to provide assistance in environmental sampling and decontamination activities and provide information to the State to support the development of estimates of total population exposure, as requested.

(4) The Radiological Assessment Coordinator (RAC) will direct DAEC monitoring and sampling personnel assisting the State and counties.

(5) The Support Services Coordinator will coordinate with other DAEC organizations to obtain necessary resources.

(6) The Emergency Coordinator will coordinate and manage recovery activities at DAEC.

(a) Ensure that within 30 days after the Director of the Office of Nuclear Reactor Regulation is notified, that the reactor is and can be maintained in a safe and stable condition, a cleanup plan is developed for submittal for the Director's approval.

(b) The Emergency Coordinator shall notify the Site Emergency Response Organization of the transition from emergency status to recovery status. He shall assign an ERO member to produce a "Deactivation Report" as described on Form TSC-36.

(7) The Site Radiation Protection Coordinator will establish and manage radiological controls for re-entry and recovery activities.

(a) Develop plans and procedures to process and control liquid, gaseous and solid waste in conjunction with recovery operation.

(b) Coordinate development of the cleanup plan to be submitted to the Office of Nuclear Reactor Regulation.

3.2 INITIATION OF THE RECOVERY PHASE

(1) Following the initial response phase to an emergency at the DAEC, the emergency classification level may be downgraded or canceled, as appropriate. Reclassification of the emergency is not a prerequisite to entering the recovery phase.

(a) Any changes to the declared emergency classification level are communicated to offsite authorities and the ERO in accordance with Reference 5.

(2) The "Prerequisites to Recovery" found on EOF-33, "Recovery Issues" provide requirements and considerations to be addressed prior to initiating recovery activities. {IC001} (Reference 7)

(3) The ER&RD will notify offsite authorities and the ERO that the recovery phase of the response is being initiated. {IC001} This can be accomplished through:

1. Communications methods established during the initial response phase;
2. By pager message;
3. Through the conference call;
4. A combination of the above methods.

(a) This notification will include any changes in the response organization's structure.

3.3 CONFERENCE CALL

(1) A conference call involving members of the ERO will be held between the EOF and the TSC and the JPIC.

(a) This call is coordinated and directed by the ER&RD.

(b) The NRC should be incorporated into the recovery process.

(c) The purpose of the conference call is to collectively review the status of the emergency, and to verify an accurate understanding of its status. (TSC-37 from Appendix 1 of the EPIP Manual can be used to determine if the plant is in a de-escalating condition).

(d) This call will also serve to assign responsibilities for recovery activities. These responsibilities should be noted on Form TSC-35.

(e) Guidance in EOF-34, "EOF Activities" and TSC-38, "TSC/Control Room/OSC Activities" may be used during these discussions. {IC001}

(2) Participants in the conference call may include, but are not limited to the following:

(a) From the EOF:

1. ER&RD
2. Radiological and EOF Manager
3. Radiological Assessment Coordinator

4. STA/OPS Liaison
5. Assistant ER&RD

(b) From the JPIC

1. JPIC Manager
2. DAEC Spokesperson

(c) From the TSC:

1. Emergency Coordinator
2. Site Radiological Protection Coordinator
3. Technical and Engineering Supervisor
4. OSC Supervisor
5. TSC Operations Supervisor

(3) Following the conference call, participants in the call will return to their facilities to discuss details of recovery and reentry activities with their organizations.

(4) EOF-35, "Recovery Phase Plan Outline" may be used as a guide in developing a Recovery Plan.

3.4 CLEANUP PLAN

(1) A cleanup Plan shall be developed and submitted to the Director of the Office of Nuclear Reactor Regulation within 30 days of notifying the Director of stable state operation.

(2) The plan shall identify all cleanup operations that will be required to decontaminate the reactor sufficiently to allow resumption of operations consistent with the Commission's occupational exposure limits in 10 CFR Part 20.

(3) The plan may also include:

(a) Processing of any contaminated water generated.

(b) Decontamination of surfaces inside the turbine and reactor buildings to levels consistent with limits in 10 CFR Part 20.

(c) Decontamination and/or disposal of equipment.

(d) Decontamination or removal and disposal of internal parts and damaged fuel from the reactor vessel.

3.5 ESTIMATES OF TOTAL POPULATION EXPOSURE

(1) When requested, the Radiological and EOF Manager will provide information to the State to support the development of exposure estimates for the total population. Estimates can be based on information from field monitoring activities, dose projection data, and population estimates documented in the Evacuation Time Estimate.

3.6 RADIOLOGICAL PREREQUISITES FOR RE-ENTRY

(1) Prior to a planned entry into any area of the plant which has been subjected to physical or radiological damage, the following conditions shall be met:

(a) Establish objectives for re-entry team.

(b) Based on the extent, severity and location of the emergency and other plant data available, an optimum point of entry into the affected area shall be determined.

(c) The Emergency Coordinator shall grant authorization for entry.

(d) Exposure limits shall comply with the appropriate Health Physics Procedures.

(e) An entry team shall consist of a minimum of two persons with one being a Health Physics Technician.

NOTE

In order to minimize personnel exposure, the total number of team members and stay times shall be limited. Activities of Health Physics personnel shall be limited to radiological monitoring functions.

(f) Entry team personnel shall be briefed as described in form EOF-36.

3.7 RE-ENTRY

NOTE

Prior to entry, precautions shall be taken to ensure the safety of the entry team(s), including radiological and environmental assessment, surveys, atmosphere ambient temperature readings and gaseous or particulate surveys, if possible.

(1) The entry team shall enter the affected area cautiously and shall perform the following tasks:

(a) Complete radiation and contamination surveys.

(b) Obtain visual data, or photographs, if possible.

(c) Verify the operability of permanently installed communications within the entry area, time permitting.

(2) Upon completion of initial observations and data collection, the entry team shall exit the affected area.

(3) Decontamination activities shall be in compliance with Health Physics Procedure.

3.8 ANALYSIS OF THE RE-ENTRY DATA

(1) Personnel shall be debriefed as described in Form EOF-37.

(2) Determine if the objectives of the re-entry were accomplished.

(3) The operability of equipment as indicated in the Control Room shall be compared with the data taken during re-entry as follows:

(a) Cross-check instrument readings of the radiation monitors against the survey readings.

(b) Compare the operable equipment with the non-operable equipment as recognized by the re-entry team.

(4) Evaluate initial observations to develop a plan for subsequent entries to determine:

> **NOTE**
>
> Repairs should initially be made only on equipment that is essential to the safe and efficient operation of the plant.

(a) If equipment and/or systems require additional inspection or repair.

(b) If equipment is operable.

(c) If additional personnel are required.

(d) If additional decontamination is required.

4.0 RECORDS

(1) All records generated by this procedure shall be maintained iaw QA Record Retention requirements, exception is for records generated during drills and exercises.

5.0 REFERENCES

(1) NUREG-0654, Rev. 1, Planning Standard M

(2) 10 CFR 50.54(w)

(3) EPA PAG Manual, EPA 400-R-92-001, Chapters 4, 7

(4) DAEC Emergency Plan

(5) EPIP 1.2, "Notification"

(6) QA Audit I-90-22, Obs. B

(7) {IC001} CC M 91009

(8) NRC IR 90018

6.0 ATTACHMENTS

(1) EOF/TSC FORMS

ATTACHMENT 1

EOF/TSC FORMS	Form No.
RECOVERY ISSUES	EOF-33
EOF ACTIVITIES	EOF-34
RECOVERY PHASE PLAN OUTLINE GUIDELINE	EOF-35
RE-ENTRY BRIEFING GUIDE	EOF-36
RE-ENTRY DEBRIEFING GUIDE	EOF-37
ASSIGNMENT FORM	TSC-35
DEACTIVATION REPORT	TSC-36
PLANT OPERATIONS STATUS	TSC-37
TSC/CONTROL ROOM/OSC ACTIVITIES	TSC-38