

DETROIT EDISON - FERMI 2
AUTOMATED RECORD MANAGEMENT
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06/18/03

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| TPEPT | EP-542 | 6 | | 1 | ST | 06/18/03 | | AFC |
| TPEPT | EP-545 | 18 | | 1 | ST | 06/18/03 | | AFC |

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=====
Detroit Edison EF2, C/O Info Mgmt 140 NOC, 6400 North Dixie Highway,
Newport MI 48166. (734) 586-4338 OR (734) 586-4061 for questions or concerns.

Ref: cb3596

A045

PROTECTIVE ACTION RECOMMENDATIONS

Revision Summary

- 1) Deleted reference to ERIS and replaced it with the Integrated Plant Computer System (IPCS) in Enclosure B.
- 2) Updated Enclosures D and E with current population analysis data.

Implementation Plan

- 1) This procedure goes into effect upon issuance.

Attachments - None

CM

Enclosures

| | | |
|---|--------|--|
| A | 090402 | PAR Flowchart |
| B | 032803 | Downwind Affected Sector to Area Conversion Table |
| C | 012798 | Protective Action Areas |
| D | 032803 | EF 2 10-Mile EPZ Evacuation Time Estimates Summary |
| E | 032803 | EF 2 10-Mile EPZ Population Analysis |
| F | 050602 | Representative Shielding Factors From a Gamma Cloud Source |
| G | 050602 | Inhalation Shielding Factors for a Wood House, Snug Doors, Closed Windows (Thyroid) |

| Information and Procedures | | | | |
|----------------------------|--------------------------|-----------------------------|------------------------|-------------------|
| DSN EP-545 | Revision 18 | DCR # 03-0186 | DTC TPEPT | File # 1703.10 |
| IP Code I | Date Approved 6-17-03 | Released By P. Scott /s/ | Date Issued 6-18-03 | Recipient 935 |

CONTROLLED

1.0 PURPOSE

To provide guidelines for formulating and recommending appropriate protective actions for the general public in the event of a General Emergency.

2.0 USE REFERENCES

2.1 EP-290, Emergency Notifications

3.0 ENTRY CONDITIONS

3.1 A Site Area Emergency or General Emergency is declared.

4.0 GENERAL INFORMATION

4.1 Protective actions (evacuation and/or sheltering) are required for the affected areas of the general public at the General Emergency declaration and are recommended to local and/or state authorities as appropriate.

4.2 Protective Action Recommendation (PAR) formulation involves an assessment of risk to the general public. Appropriate recommendations are determined using Enclosure A, PAR Flowchart, which considers risk assessment based on two primary indicators.

4.2.1 Dose Projections

1. Dose projections are classified as "Actual" or "Potential".
 - a. **Actual** doses are based on radioactivity actually being released from the plant. They are calculated using either effluent radiation monitor readings (normal), grab sample results, or actual field measurements.
 - b. **Potential** doses are based on radioactivity in primary containment available for release. They are calculated using Containment High Range Radiation Monitors (CHRRMs) or containment atmosphere grab sample results.

2. PAR decision making may be based on an estimate of radiation exposure an individual might receive over a projected period in comparison to a Protective Action Guideline (PAG).

- a. A PAG is a level of exposure that an individual might receive that warrants a specific protective action to be implemented.
- b. PAG values are expressed in units of dose and represent the risk of health effects to the exposed population.
- c. PAG values are as follows:

| | |
|---------------|-------|
| TEDE | 1 rem |
| Adult Thyroid | 5 rem |

- d. A projected dose greater than a PAG value is used to initiate PAR decision-making and normally requires an evacuation.
3. The risk associated with a projected dose that exceeds a PAG value is generally higher than the risk associated from an evacuation.
 - a. The risks associated with an evacuation during inclement weather or other competing disasters may be greater than that associated with a PAG value. This will require state decision-makers to assess those risks and take appropriate protective actions.
 4. When projected doses exceed a PAG value at a distance greater than 10 miles, manual dose calculations may be used to determine the affected areas and distances.

4.2.2 Plant Status

1. PAR decision-making also includes an assessment of plant conditions, specifically core damage estimates.
2. A General Emergency declaration represents a significant risk to the general public and indicates a severe core damage accident is in progress or projected (>20% gap release).

3. Severe core damage accidents reflect an amount of radioactivity that may be available and present an unacceptable risk to the general health of the public. These accidents would require evacuation of those close to the plant and sheltering of further out areas should later evacuations be needed.
4. The risks due to the potential radiation exposure from a severe core damage accident are reduced by the implementation of protective actions.
5. PAR decision-making based on plant status represents the desired proactive approach to the protection of the public. It focuses the decision-maker on the likelihood of radiation exposure thereby offering the greatest reduction of risk.
6. Careful evaluation of plant conditions is needed to properly determine if a fuel melt accident is in progress or projected. This evaluation may include, but is not limited to:
 - a. Status of injection capabilities
 - b. How long fuel has been uncovered (reactor water level)
 - c. CHRRMs
 - d. Core damage estimates such as EP-547, "Rapid Estimate of Core/Fuel Damage Based on Containment High Range Radiation Monitor," or dose assessment program
7. Fuel melt sequences represent the greatest risk to the health of the general public. Activity produced from these sequences, if released, can produce severe early health effects and necessitates immediate protection of the public.
8. Analysis of potential primary containment failure during a severe accident may prove to be extremely difficult or impossible to predict due to plant conditions are outside of plant design. Therefore, status of primary containment is not considered for the initial PAR development.

4.2.3 PARs must be continually evaluated to assure the public's health and safety as conditions change or more information becomes available.

1. If dose calculations become available after an initial PAR has been made the impact on PAR effectiveness must be determined.

2. Meteorological data and the Offsite Radiological Emergency Team (RET) survey(s) provide useful information for PAR development. Each provides information on plume position.
 3. Current offsite hazards may also exist that might impact protective actions. The presence of physical or environmental hazards (e.g., tornadoes, ice storms, road hazards, etc.) should be communicated to offsite authorities for their consideration.
 4. The current status of emergency response efforts can provide insight to future PARs. Successful (or failed) efforts can provide decision makers with data to help determine likelihood of further core damage.
- 4.3 Other considerations may be involved when evaluating the effectiveness of a PAR and are normally evaluated by state decision-makers.
- 4.3.1 Certain members of the general public may be at a greater risk from an evacuation or evacuation efforts may take much longer. These members may include, but are not limited to, schools, hospitals, nursing homes, parks, golf courses, etc.
 - 4.3.2 Evacuations are most effective if completed before plume arrival.
 1. Enclosures D and E identify evacuation time estimates and total population which may be useful to evaluate evacuation effectiveness.
 - 4.3.3 Dose received before PAR implementation is not used for PAR effectiveness evaluations.
 - 4.3.4 In cases where evacuations are not prudent, sheltering may be appropriate.
 1. Enclosure F, Representative Shielding Factors From a Gamma Cloud Source, and Enclosure G, Inhalation Shielding Factors for a Wood House, Snug Doors, Closed Windows (Thyroid), may be used to evaluate sheltering effectiveness by multiplying projected Total Effective Dose Equivalent (TEDE) and adult thyroid dose respectively by the Enclosure's shielding factors.
- 4.4 Protective actions for the early phase of a General Emergency are prescribed for the 10-Mile Emergency Planning Zone (EPZ) surrounding the site.
- 4.4.1 For planning purposes, the EPZ is divided into concentric rings of 2, 5, and 10 miles.

- 4.4.2 The EPZ is also divided into sixteen 22.5° sectors.
- 4.4.3 The EPZ is further divided into five Protective Action Areas (PAAs) as shown in Enclosure C, Protective Action Areas.
- 4.4.4 When making PARs, the minimum area considered is the PAAs located in the 2-mile radius, and the projected plume's centerline sector, and two adjacent sectors out to five miles.
 - 1. When developing PARs for "Security Event Resulting in Loss of Physical Control of the Plant" (HG1), the minimum area considered is the PAA located in the 2-mile radius (Area 1).
 - 2. If the projected dose exceeds a PAG value >10 miles away, adhoc protective actions would be developed in conjunction with offsite authorities.
- 4.4.5 Once a PAR has been determined and communicated, less stringent recommendations are normally not considered or used.
- 4.4.6 Other information such as better understood accident sequence, presence of significant particulate fission products or radioiodine, or the presence of an unmonitored or unfiltered release path may lead to more stringent Adhoc protective actions.
- 4.5 Responsibility for PARs
 - 4.5.1 Detroit Edison decision-makers only recommend protective actions. State decision-makers make the final decision on what protective action(s) to implement.
 - 4.5.2 If the Technical Support Center (TSC) and Emergency Operations Facility (EOF) are not functional:
 - 1. The Shift Technical Advisor evaluates available information and advises the Emergency Director in matters related to protective action recommendations.
 - 2. The Emergency Director is responsible for making the final recommendation(s) to local and/or state authorities as appropriate.

4.5.3 If the TSC is functional and the EOF is not functional:

- 1. The Radiation Protection Advisor and/or Technical Engineer, as appropriate, evaluate available information and advise the Emergency Director in matters related to protective action recommendations.**
- 2. The Emergency Director is responsible for making a final recommendation to local and/or state authorities as appropriate.**

4.5.4 If the EOF is functional:

- 1. The Radiation Protection Coordinator evaluates available information and advises the Emergency Officer in matters related to protective action recommendations. The Nuclear Operations Advisor should assist as appropriate.**
- 2. The Emergency Officer is responsible for making a final recommendation to local and/or state authorities as appropriate.**

4.5.5 PARs are made to the State Emergency Operations Center (SEOC) if the SEOC is functional.

- 1. Recommendations will be discussed with the State Emergency Director before issuance, when time permits.**
- 2. The State Emergency Director will consider recommendations and issue a Protective Action Order, when appropriate, acting with the delegated authority of the Governor.**

4.5.6 PARs are made directly to Wayne and Monroe Counties when the SEOC is not functional.

- 1. Recommendations will be discussed with county officials before issuance, when time permits.**
- 2. When deemed appropriate, recommendations will be passed on to the public by county officials.**

5.0 IMMEDIATE ACTIONS

5.1 When a Site Area Emergency is declared:

NOTE: Do not make any PAR until a General Emergency has been declared.

5.1.1 Initiate formulation of PARs using Enclosures A and B when possible before declaration of a General Emergency.

5.2 When a General Emergency is declared:

NOTE: A PAR shall be made to appropriate offsite authorities concurrent with the initial notification of General Emergency declaration and documented using a Nuclear Plant Event Notification Form.

5.2.1 Formulate PARs using Section 6.0.

6.0 PROCEDURE

6.1 Initial PAR

6.1.1 Determine centerline sector using available resources.

6.1.2 Determine appropriate PAR using Enclosures A and B.

NOTE: Notifications of initial PARs must be completed within 15 minutes of the General Emergency declaration.

6.1.3 Immediately communicate the PAR to offsite authorities in accordance with EP-290, "Emergency Notifications."

6.1.4 GO TO step 6.2.

6.2 PAR Effectiveness

6.2.1 Evaluate the effectiveness of the existing PAR using the questions listed in Enclosure A, "Evaluation Considerations for PAR Effectiveness" block as a guide.

6.2.2 Modify the existing PAR using Enclosures A and B as necessary.

NOTE: Notifications of any change to PARs must be completed within 15 minutes upon indication(s) of conditions requiring a PAR change.

- 6.2.3 Immediately communicate the new PAR to offsite authorities in accordance with EP-290, "Emergency Notifications."

7.0 FOLLOW-UP ACTIONS

- 7.1 Continue to evaluate PAR effectiveness (step 6.2.1) as conditions require.
- 7.2 Keep offsite authorities informed of current dose projection results, plant status, response efforts, and other information which may potentially affect PARs in accordance with EP-290, "Emergency Notifications."

8.0 RECORDS

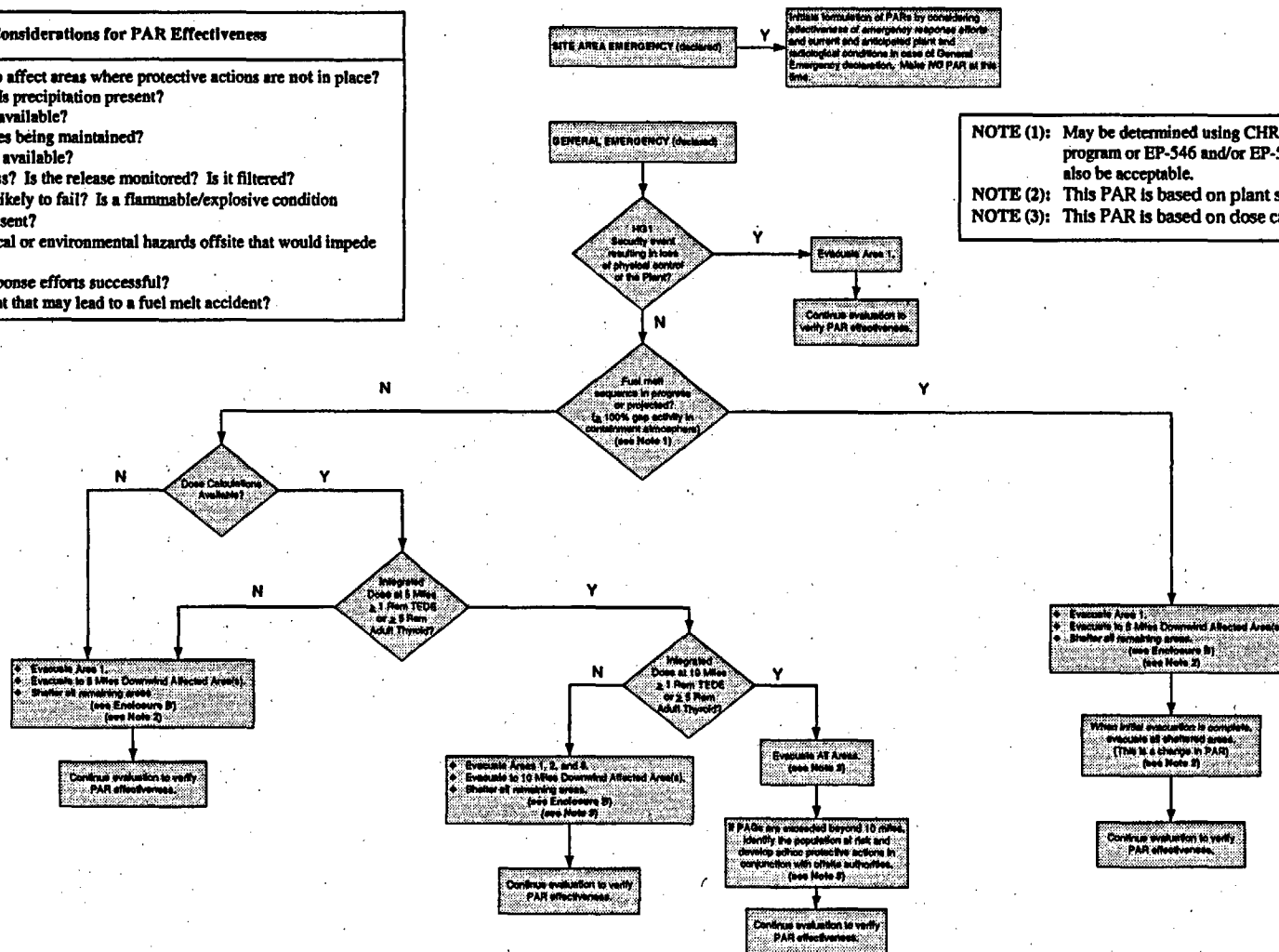
- 8.1 There are no required records generated through this procedure.

END OF TEXT

PAR FLOWCHART

Evaluation Considerations for PAR Effectiveness

1. Are wind shifts expected to affect areas where protective actions are not in place?
2. Is a lake breeze in effect? Is precipitation present?
3. Is offsite RET survey data available?
4. Are core cooling capabilities being maintained?
5. Are core damage estimates available?
6. Is there a release in progress? Is the release monitored? Is it filtered?
7. Has containment failed or likely to fail? Is a flammable/explosive condition ($H_2 \geq 6\%$ and $O_2 \geq 5\%$) present?
8. Are there significant physical or environmental hazards offsite that would impede an evacuation?
9. Are current emergency response efforts successful?
10. Are plant conditions present that may lead to a fuel melt accident?



DOWNWIND AFFECTED SECTOR TO AREA CONVERSION TABLE

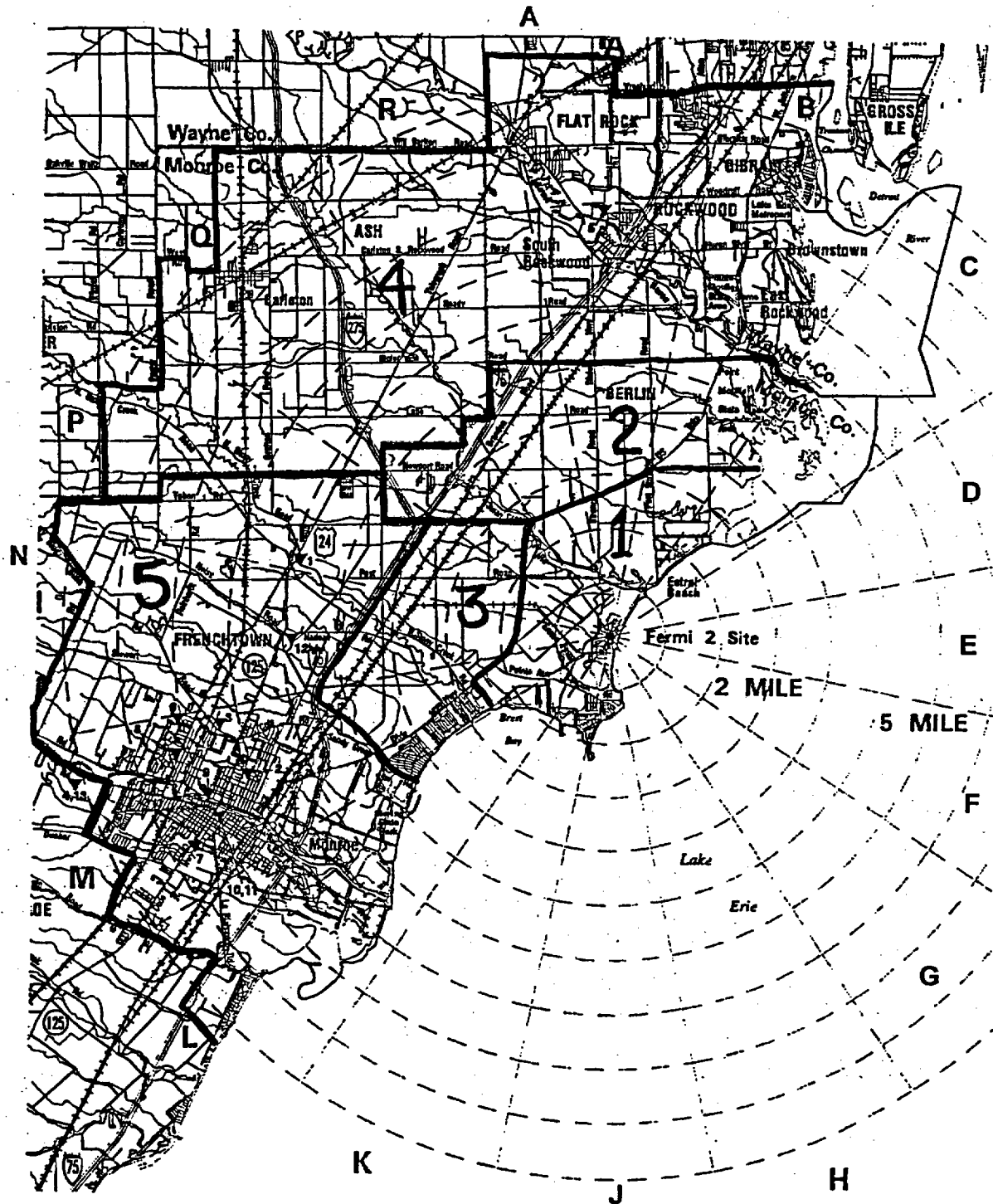
NOTE: The Centerline Sector can be identified on:

- the Integrated Plant Computer System (IPCS) "Straight Line" plume plot display
- dose reports indicating "Affected Sector"
- field team data

| When evacuating to 5 miles "Downwind Affected Area(s)" | The "Downwind Affected Area(s)" are: |
|--|--------------------------------------|
| If Downwind Centerline Sector is E, F, G, H, or J | Area 1 |
| If Downwind Centerline Sector is A, B, C, or D | Areas 1 and 2 |
| If Downwind Centerline Sector is K, L, or M | Areas 1 and 3 |
| If Downwind Centerline Sector is N, P, Q, or R | Areas 1, 2, and 3 |

| When evacuating to 10 miles "Downwind Affected Area(s)" | The "Downwind Affected Area(s)" are: |
|---|--------------------------------------|
| If Downwind Centerline Sector is R, A, B, C, or D | Areas 1, 2, 3, and 4 |
| If Downwind Centerline Sector is E, F, G, H, or J | Areas 1, 2, and 3 |
| If Downwind Centerline Sector is K, L, or M | Areas 1, 2, 3, and 5 |
| If Downwind Centerline Sector is N, P, or Q | Areas 1, 2, 3, 4, and 5 |

PROTECTIVE ACTION AREAS



EF2 10-MILE EPZ EVACUATION TIME ESTIMATES SUMMARY*

| Area | Description | Summer Day Normal | Summer Day Adverse ^b | Summer Night Normal | Summer Night Adverse ^b | Winter Day Normal | Winter Day Adverse ^b | Winter Night Normal | Winter Night Adverse ^b |
|-------------------------------|---|-------------------------|---------------------------------------|---------------------------|---|-------------------------|---------------------------------------|---------------------------|---|
| 1 | All Sectors to 2 miles | 2:40 | 3:10 | 1:15 | 1:15 | 2:40 | 3:10 | 1:15 | 1:15 |
| 1 & 2 | All Sectors to 2 miles Northwest sectors to 5 miles | 2:40 | 3:15 | 1:15 | 1:20 | 2:45 | 3:05 | 1:15 | 1:20 |
| 1 & 3 | All Sectors to 2 miles Southwest sectors to 5 miles | 4:45 | 5:05 | 1:55 | 2:05 | 4:00 | 4:50 | 1:35 | 1:25 |
| 1, 2, & 3 | All sectors to 5 miles | 4:45 | 5:05 | 1:55 | 2:05 | 4:00 | 4:50 | 1:35 | 1:25 |
| 1, 2, 3, & 4 | All Sectors to 5 miles Northwest sectors to 10 miles | 4:45 | 5:05 | 2:25 | 2:30 | 4:15 | 5:05 | 2:20 | 2:20 |
| 1, 2, 3, & 5 ^{a.} | All Sectors to 5 miles Southwest sectors to 10 miles | 4:55 | 5:40 | 4:55 | 5:10 | 5:40 | 5:50 | 4:30 | 4:55 |
| 1, 2, 3, 4, & 5 ^{a.} | All sectors to 10 miles | 5:12 | 5:53 | 5:03 | 5:21 | 5:51 | 6:06 | 4:40 | 5:09 |

* These are comparative times based on data drawn from the Evacuation Time Estimates Analyses for the Fermi 2 Nuclear Power Plant Emergency Planning Zone, March, 2003, prepared by Advent Engineering Services. Times are given in hours : minutes.

- a. When evaluating an evacuation PAR for distances greater than 5 miles, and including Area 5, consideration should be given to the special needs of Mercy Memorial Hospital and Mercy Memorial Nursing Center. These facilities are located approximately 7 miles from the site and require approximately 6 hours - 6 minutes to complete an evaluation.
- b. "Adverse" weather conditions are those which may impair visibility and/or traction, such as light snow, ice, rain, or fog.

EF2 10-MILE EPZ POPULATION ANALYSIS*

| Area | Description | Summer Day | Summer Night | Winter Day | Winter Night |
|-----------------|---|------------|--------------|------------|--------------|
| 1 | All Sectors to 2 miles | 4271 | 3656 | 5156 | 3646 |
| 1 & 2 | All Sectors to 2 miles Northwest sectors to 5 miles | 6726 | 5876 | 7953 | 5866 |
| 1 & 3 | All Sectors to 2 miles Southwest sectors to 5 miles | 8810 | 7933 | 11431 | 7881 |
| 1, 2, & 3 | All sectors to 5 miles | 11265 | 10153 | 14227 | 10101 |
| 1, 2, 3, & 4 | All sectors to 5 miles Northwest sectors to 10 miles | 52603 | 48664 | 64554 | 45381 |
| 1, 2, 3, & 5 | All sectors to 5 miles Southwest sectors to 10 miles | 74526 | 65673 | 83703 | 63013 |
| 1, 2, 3, 4, & 5 | All sectors to 10 miles | 115864 | 104184 | 134030 | 98293 |

* EPZ population data extracted from the Evacuation Time Estimates Analyses for the Fermi 2 Nuclear Power Plant Emergency Planning Zone, March, 2003, prepared by Advent Engineering Services. Additional population data provided by local planning agencies using U.S. Census data.

REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE^(a)

| Structure or Location | Representative Shielding Factor (b) | Representative Range |
|--|--|-----------------------------|
| Outside | 1.0 | -- |
| Vehicles | 1.0 | -- |
| Wood frame house ^(c) (no basement) | 0.9 | 0.9 |
| Basement of wood house | 0.6 | 0.1 to 0.7 ^(d) |
| Masonry house (no basement) | 0.6 | 0.4 to 0.7 ^(d) |
| Basement of masonry house | 0.4 | 0.1 to 0.5 ^(d) |
| Large office or industrial building | 0.2 | 0.1 to 0.3 ^(d,e) |

(a) Taken from SAND 77-1725 (Unlimited Release).

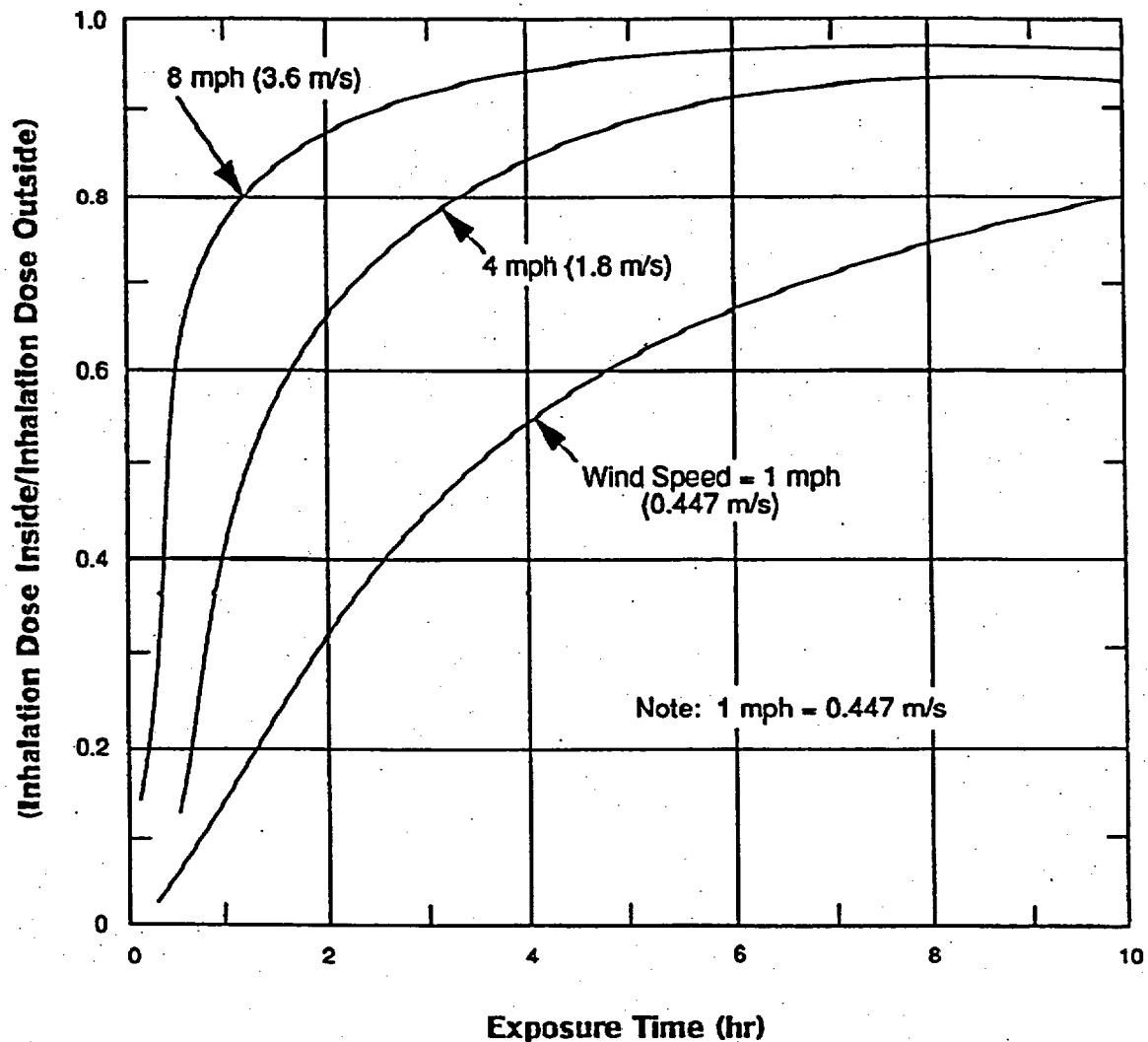
(b) The ratio of the dose received inside the structure to the dose that would be received outside the structure.

(c) A wood-frame house with brick or stone veneer is approximately equivalent to a masonry house for shielding purposes.

(d) This range is mainly due to different wall materials and different geometries.

(e) The shielding factor depends on where the personnel are located within the building (e.g., the basement or an inside room).

**INHALATION SHIELDING FACTORS FOR A WOOD HOUSE,
SNUG DOORS, CLOSED WINDOWS (THYROID)**



The above curve assumes the house remains closed up for the duration. Actually, the dose inside the house can be further reduced by opening the doors and windows after the cloud has passed and purging the house with fresh air.

"Reactor Safety Study," Appendix VI, Wash-1400, October 1975

END

SITE AREA EMERGENCY

Revision Summary

- 1) Deleted reference to ERIS and replaced it with Integrated Plant Computer System (IPCS) in Attachments 1 and 2.

Implementation Plan

- 1) This revision goes into effect upon issuance.

Attachments

CM

- 1 032803 Site Area Emergency - Checklist for Immediate Actions
- 2 032803 Site Area Emergency - Checklist for Follow-Up Actions

Enclosures - None

| <i>Information and Procedures</i> | | | | |
|-----------------------------------|--------------------------|-----------------------------|------------------------|-------------------|
| DSN EP-104 | Revision 15 | DCR # 03-0180 | DTC TPEPT | File # 1703.10 |
| IP Code I | Date Approved 6-17-03 | Released By P. Scott /s/ | Date Issued 6-18-03 | Recipient 935 |

CONTROLLED

1.0 PURPOSE

Prescribes actions to be taken when an emergency condition has been classified as a Site Area Emergency.

2.0 USE REFERENCES

- 2.1 EP-101, Classification of Emergencies
- 2.2 EP-204-01, Damage Control and Rescue Teams
- 2.3 EP-220, Personnel Monitoring and Radiological Emergency Teams
- 2.4 EP-290, Emergency Notifications
- 2.5 EP-402, Responsibilities of the Recovery Organization
- 2.6 EP-530, Assembly and Accountability and Onsite Protective Actions
- 2.7 EP-542, Computer-Based Offsite Dose Assessment – Airborne Release
- 2.8 20.000.22, Plant Fires
- 2.9 MLS05, Notifications/General Regulatory Reporting Requirements
- 2.10 Off-Site Dose Calculation Manual

3.0 ENTRY CONDITIONS

An emergency condition has been classified as a SITE AREA EMERGENCY in accordance with EP-101.

4.0 GENERAL INFORMATION

- 4.1 **Definition of Site Area Emergency:** Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to exceed Environmental Protection Agency (EPA) Protective Action Guideline exposure levels except at or near the site boundary.

4.2 The purpose of the Site Area Emergency declaration is to:

- 4.2.1 Ensure that response centers are manned**
- 4.2.2 Ensure that monitoring teams are dispatched**
- 4.2.3 Ensure that personnel required for evacuation of near-site areas are at duty stations if the situation becomes more serious**
- 4.2.4 Provide consultation with offsite authorities**
- 4.2.5 Provide updates for the public through offsite authorities**

NOTE: If assembly and accountability was ordered for a lower emergency classification, it may be omitted at the Site Area Emergency at the discretion of the Emergency Director.

- 4.3 The Technical Support Center (TSC), Operational Support Center (OSC), Emergency Operations Facility (EOF) and Joint Public Information Center (JPIC) emergency response facilities are activated with the declaration of a Site Area Emergency. The Fermi 2 Emergency Call Out System must be activated and assembly of all personnel within the Protected Area ordered to achieve staffing of the facilities. Control Room personnel must perform these duties as soon as possible after declaration of a Site Area Emergency.**
- 4.4 Emergency notification of government agencies is detailed in EP-290. State and local governments must be notified within 15 minutes of declaration of the emergency. The Nuclear Regulatory Commission (NRC) must be notified immediately following the offsite authorities but not to exceed 1 hour. Notify Canada immediately after the NRC.**
- 4.5 The Shift Manager shall continue to act as Emergency Director until relieved of this responsibility by the Plant Manager/alternate or until the emergency situation is terminated.**
 - 4.5.1 When the Plant Manager/alternate relieves the Shift Manager and the TSC is functional, the functions of the Emergency Director shall be shifted to the TSC, including offsite notifications, dose assessment, and protective action recommendations.**
 - 4.5.2 The Shift Manager shall remain in the plant to supervise plant operations.**
 - 4.5.3 Notifications to the NRC shall be made from the Control Room throughout the emergency, unless otherwise ordered by the Emergency Director.**

- 4.6 Once the EOF is declared functional, the Emergency Officer relieves the Emergency Director of the following responsibilities:

NOTE: Notifications to the NRC shall be made from the Control Room throughout the emergency, unless otherwise ordered by the Emergency Director.

- 4.6.1 Notification of and communications with government agencies
 - 4.6.2 Offsite radiological surveys and environmental sampling
 - 4.6.3 Dose assessment/projections, meteorology
 - 4.6.4 Protective Action Recommendations
- 4.7 When a Site Area Emergency is declared and the EOF is declared functional, the Emergency Officer shall assume overall responsibility for the emergency response. The Emergency Director reports directly to the Emergency Officer. The Emergency Officer is directly responsible for technical review of information and updates provided to the JPIC for dissemination to the press and the public.

5.0 IMMEDIATE ACTIONS

- 5.1 Complete Site Area Emergency - Checklist for Immediate Actions (Attachment 1).

5.1.1 Attachment 1 must be signed by the Emergency Director or the Emergency Officer.

6.0 PROCEDURE - None

7.0 FOLLOW-UP ACTIONS

- 7.1 Complete Site Area Emergency - Checklist for Follow-Up Actions (Attachment 2).

7.1.1 Attachment 2 must be signed by the Emergency Director or the Emergency Officer.

- 7.2 Continue to monitor the progress of Emergency Teams in controlling the emergency.

- 7.3 Ensure that additional personnel support and equipment are made available as necessary.

- 7.4 Periodically make follow-up status reports to on-shift personnel. Ensure all operations personnel and emergency response personnel are kept informed of:
 - 7.4.1 Personnel hazards
 - 7.4.2 Plant lineups
 - 7.4.3 Corrective actions
 - 7.4.4 Steps taken to control or mitigate the emergency
 - 7.4.5 Status of any offsite protective actions ordered by the state
- 7.5 Periodically make follow-up reports to the State of Michigan, Monroe County, Wayne County, Nuclear Information, and NRC using EP-290
- 7.6 Establish a long-term relief rotation to ensure personnel are not required to remain at their assigned positions for an excessive period of time (normally not greater than 12 hours).
- 7.7 The Emergency Director may de-escalate to an appropriate, lower emergency classification if:
 - 7.7.1 The emergency condition(s) no longer meets the requirements for a Site Area Emergency; and
 - 7.7.2 The actual and potential offsite and onsite radiological hazard does not exceed the Offsite Dose Calculation Manual (ODCM) gaseous effluent limits for dose and dose rate or has been eliminated; and
 - 7.7.3 The Emergency Officer concurs (if the EOF is functional).
- 7.8 If the emergency situation is de-escalated, enter EP-103, Alert or EP-102, Unusual Event, as applicable.
- 7.9 The emergency situation may be terminated if:
 - 7.9.1 Release of radioactive materials has ceased or is within ODCM limits, and
 - 7.9.2 No further potential exists for uncontrolled releases of radioactive materials to the environment, and
 - 7.9.3 The reactor and associated systems are in a stable, safe condition, and
 - 7.9.4 Termination of the emergency will not adversely impact offsite protective actions that are in progress.

7.10 If the emergency classification is terminated or de-escalated:

- 7.10.1 A summary of the termination or de-escalation shall be provided to the State of Michigan in accordance with EP-290.**
- 7.10.2 A summary of the termination or de-escalation shall be provided to the NRC.**
- 7.10.3 Carry out the actions described in EP-402, Responsibilities of the Recovery Organization, as applicable.**

7.11 Completed forms shall be forwarded to the Supervisor, RERP for disposition.

8.0 RECORDS

8.1 The following are required records and shall be retained or dispositioned in accordance with established requirements:

- 8.1.1 All completed Site Area Emergency - Checklist for Immediate Actions (Attachment 1)**
- 8.1.2 All completed Site Area Emergency - Checklist for Follow-Up Actions (Attachment 2)**

END OF TEXT

SITE AREA EMERGENCY - CHECKLIST FOR IMMEDIATE ACTIONS

Complete NA

1. ☐ On-shift personnel notified.
2. ☐ Fermi 2 Emergency Call Out System activated in accordance with EP-290.
3. ☐ ☐ Assembly and accountability ordered within the Protected Area in accordance with EP-530.
4. ☐ TSC, OSC, EOF, and JPIC activated.
5. ☐ Immediate notifications to offsite authorities in accordance with EP-290.
6. ☐ NRC Operations Center notified immediately following offsite authorities, not to exceed 1 hour, in accordance with EP-290.
7. ☐ ☐ Radiological Emergency and Personnel Monitoring Teams activated (EP-220).
8. ☐ ☐ Fire Brigade activated (20.000.22).
9. ☐ ☐ Damage Control and Rescue Teams activated (EP-204-01).
10. ☐ ☐ Offsite emergency support requested (EP-290).
11. ☐ Province of Ontario notified in accordance with EP-290.
12. ☐ Nuclear Information notified in accordance with EP-290.
13. ☐ ☐ Radiological sampling ordered (EP-220/ODCM).
14. ☐ ☐ Offsite dose assessment initiated (EP-542/ODCM).
15. ☐ ☐ Onsite protective actions ordered (EP-530).
16. ☐ "Site Area Emergency" entered into Integrated Plant Computer System (IPCS).
17. ☐ Emergency Response Data System (ERDS) activated.

Emergency Director/Emergency Officer signature _____

Forward completed form to Supervisor, RERP, 164 NOC

SITE AREA EMERGENCY - CHECKLIST FOR FOLLOW-UP ACTIONS

Complete NA

1. ☐ ☐ Additional Control Room personnel placed on standby.
2. ☐ ☐ Follow-up actions of Abnormal and Emergency Operating Procedures completed.
3. ☐ TSC, OSC, EOF, and JPIC functional.
4. ☐ ☐ Assess plant conditions and reclassify if necessary in accordance with EP-101.
5. ☐ ☐ Follow-up reports completed in accordance with EP-290.
6. ☐ ☐ On-shift personnel informed of changing conditions.
7. ☐ ☐ All reporting requirements met in accordance with MLS05.
8. ☐ ☐ Long term organization established.
9. ☐ INPO and Nuclear Insurers notified (EP-290).
10. ☐ Emergency terminated or deescalated.
11. ☐ Emergency termination or deescalation notification and summary to offsite authorities in accordance with EP-290.
12. ☐ Emergency termination or deescalation notification and summary to NRC Operations Center in accordance with EP-290.
13. ☐ ☐ Recovery initiated (EP-402).
14. ☐ Update the Integrated Plant Computer System (IPCS) emergency classification entry.

Comments: _____

Emergency Director/Emergency Officer signature _____

Forward completed form to Supervisor, RERP, 164 NOC

ALERT

Revision Summary

- 1) Deleted reference to ERIS and replaced it with Integrated Plant Computer System (IPCS) in Attachments 1 and 2.

Implementation Plan

- 1) This revision goes into effect upon issuance.

Attachments

CM

- 1 032803 Alert - Checklist for Immediate Actions
- 2 032803 Alert - Checklist for Follow-Up Actions

Enclosures - None

| <i>Information and Procedures</i> | | | | |
|-----------------------------------|--------------------------|-----------------------------|------------------------|-------------------|
| DSN EP-103 | Revision 15 | DCR # 03-0179 | DTC TPEPT | File # 1703.10 |
| IP Code I | Date Approved 6-17-03 | Released By P. Scott /s/ | Date Issued 6-18-03 | Recipient 935 |

CONTROLLED

1.0 PURPOSE

Prescribes actions to be taken when an emergency has been classified as an Alert.

2.0 USE REFERENCES

- 2.1 EP-101, Classification of Emergencies
- 2.2 EP-204-01, Damage Control and Rescue Teams
- 2.3 EP-220, Personnel Monitoring and Radiological Emergency Teams
- 2.4 EP-290, Emergency Notifications
- 2.5 EP-402, Responsibilities of the Recovery Organization
- 2.6 EP-530, Assembly and Accountability and Onsite Protective Actions
- 2.7 EP-542, Computer-Based Offsite Dose Assessment – Airborne Release
- 2.8 20.000.22, Plant Fires
- 2.9 MLS05, Notifications/General Regulatory Reporting Requirements
- 2.10 Off-Site Dose Calculation Manual

3.0 ENTRY CONDITIONS

An emergency condition has been classified as an ALERT in accordance with EP-101.

4.0 GENERAL INFORMATION

- 4.1 **Definition of Alert** - Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) Protection Action Guidelines exposure levels.

4.2 The purpose of the Alert declaration is to:

- 4.2.1** Ensure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required.
- 4.2.2** Provide offsite authorities with current status information.

4.3 The Technical Support Center (TSC) and Operational Support Center (OSC) emergency response facilities are activated with the declaration of an ALERT. The Fermi Emergency Call Out System must be activated and assembly of all personnel within the Protected Area ordered to achieve staffing of the facilities. Control Room personnel must perform these duties as soon as possible after declaration of an Alert.

4.4 Emergency notifications to government agencies are detailed in EP-290. State and local governments must be notified within 15 minutes of declaration of the emergency. The Nuclear Regulatory Commission (NRC) must be notified immediately following the offsite authorities but not to exceed 1 hour. Notify Canada immediately after the NRC.

4.5 The Shift Manager shall continue to act as Emergency Director until relieved of this responsibility by the Plant Manager/alternate, or until the emergency situation is terminated.

- 4.5.1** When the Plant Manager/alternate relieves the Shift Manager and the Technical Support Center (TSC) is functional, the functions of the Emergency Director shall be shifted to the TSC, including offsite notifications, dose assessment, and protective action recommendations.
- 4.5.2** The Shift Manager shall remain in the plant to supervise plant operations.
- 4.5.3** The Control Room shall maintain contact with the NRC.

5.0 IMMEDIATE ACTIONS

5.1 Complete Alert - Checklist for Immediate Actions (Attachment 1).

- 5.1.1** Attachment 1 must be signed by the Emergency Director.

6.0 PROCEDURE - None

7.0 FOLLOW-UP ACTIONS

7.1 Complete Alert - Checklist for Follow-Up Actions (Attachment 2).

7.1.1 Attachment 2 must be signed by the Emergency Director.

7.2 Continue to monitor the progress of Emergency Teams in controlling the emergency.

7.3 Ensure that additional personnel support and equipment are made available as necessary.

7.4 Periodically make follow-up status reports to ensure that all operations personnel and emergency response personnel are kept informed of:

7.4.1 Personnel hazards

7.4.2 Plant lineups

7.4.3 Corrective actions

7.4.4 Steps taken to control or mitigate the emergency

7.5 Periodically make follow-up reports to the State of Michigan, Monroe County, Wayne County, Nuclear Information, and NRC using EP-290.

7.6 Establish long-term relief rotation to ensure personnel are not required to remain at their assigned positions for an excessive period of time (normally not greater than 12 hours).

7.7 The Emergency Director may de-escalate the emergency classification to an Unusual Event if the emergency conditions no longer meet the requirements for an Alert Classification.

7.7.1 If de-escalation is ordered, enter EP-102, Unusual Event.

7.8 The emergency situation may be terminated if:

7.8.1 Release of radioactive materials has ceased or is within Offsite Dose Calculation Manual (ODCM) limits; and

7.8.2 No further potential exists for uncontrolled releases of radioactive materials to the environment; and

7.8.3 The reactor and associated systems are in a stable, safe condition.

7.9 If the emergency classification is terminated or de-escalated:

- 7.9.1 A summary of the termination or de-escalation shall be provided to the State of Michigan, Wayne County and Monroe County in accordance with EP-290.**
- 7.9.2 A summary of the termination or de-escalation shall be provided to the NRC.**
- 7.9.3 Carry out the actions described in EP-402, Responsibilities of the Recovery Organization, as applicable.**

7.10 Completed forms shall be forwarded to the Supervisor, RERP for disposition.

8.0 RECORDS

8.1 The following are required records and shall be retained or dispositioned in accordance with established requirements:

- 8.1.1 All completed Alert - Checklist for Immediate Actions (Attachment 1)**
- 8.1.2 All completed Alert - Checklist for Follow-Up Actions (Attachment 2)**

END OF TEXT

ALERT - CHECKLIST FOR IMMEDIATE ACTIONS

Complete NA

1. ☐ On-shift personnel notified.
2. ☐ Fermi 2 Emergency Call Out System activated in accordance with EP-290.
3. ☐ Assembly and accountability ordered within the Protected Area in accordance with EP-530.
4. ☐ TSC and OSC activated.
5. ☐ Immediate notifications to offsite authorities in accordance with EP-290.
6. ☐ NRC Operations Center notified immediately following offsite authorities, not to exceed 1 hour, in accordance with EP-290.
7. ☐ ☐ Radiological Emergency and Personnel Monitoring Teams activated (EP-220).
8. ☐ ☐ Fire Brigade activated (20.000.22).
9. ☐ ☐ Damage Control and Rescue Teams activated (EP-204-01).
10. ☐ ☐ Offsite emergency support requested (EP-290).
11. ☐ Province of Ontario notified in accordance with EP-290.
12. ☐ Nuclear Information notified in accordance with EP-290.
13. ☐ ☐ Radiological sampling ordered (EP-220/ODCM).
14. ☐ ☐ Offsite dose assessment initiated (EP-542/ODCM).
15. ☐ ☐ Onsite protective actions ordered (EP-530).
16. ☐ "Alert" entered into the Integrated Plant Computer System (IPCS).
17. ☐ Emergency Response Data System (ERDS) activated.

Emergency Director signature _____

Forward completed form to Supervisor, RERP, 164 NOC

ALERT - CHECKLIST FOR FOLLOW-UP ACTIONS

Complete NA

1. ☐ ☐ Additional Control Room personnel placed on standby.
2. ☐ ☐ Follow-up actions of Abnormal and Emergency Operating Procedures completed.
3. ☐ ☐ Assess plant conditions and reclassify if necessary in accordance with EP-101.
4. ☐ ☐ TSC and OSC functional.
5. ☐ ☐ Follow-up reports completed in accordance with EP-290.
6. ☐ ☐ On-shift personnel informed of changing conditions.
7. ☐ ☐ All reporting requirements met in accordance with MLS05.
8. ☐ ☐ Long term organization established.
9. ☐ INPO and Nuclear Insurers notified (EP-290).
10. ☐ Emergency terminated or deescalated.
11. ☐ Emergency termination or deescalation notification and summary to offsite authorities in accordance with EP-290.
12. ☐ Emergency termination or deescalation notification and summary to NRC Operations Center in accordance with EP-290.
13. ☐ ☐ Recovery initiated (EP-402).
14. ☐ Update the Integrated Plant Computer System (IPCS) emergency classification entry.

Comments: _____

Emergency Director signature _____

Forward completed form to Supervisor, RERP, 164 NOC

UNUSUAL EVENT

Revision Summary

- 1) Deleted reference to ERIS and replaced it with Integrated Plant Computer System (IPCS) in Attachments 1 and 2.

Implementation Plan

- 1) This revision goes into effect upon issuance.

Attachments

CM

- 1 032803 Unusual Event - Checklist for Immediate Actions
- 2 032803 Unusual Event - Checklist for Follow-Up Actions

Enclosures - None

| <i>Information and Procedures</i> | | | | |
|-----------------------------------|--------------------------|-----------------------------|------------------------|-------------------|
| DSN EP-102 | Revision 16 | DCR # 03-0178 | DTC TPEPT | File # 1703.10 |
| IP Code I | Date Approved 6-17-03 | Released By P. Scott /s/ | Date Issued 6-18-03 | Recipient 935 |

CONTROLLED

1.0 PURPOSE

Prescribes actions to be taken when an emergency condition has been classified as an Unusual Event.

2.0 USE REFERENCES

- 2.1 EP-101, Classification of Emergencies
- 2.2 EP-204-01, Damage Control and Rescue Teams
- 2.3 EP-220, Personnel Monitoring and Radiological Emergency Teams
- 2.4 EP-290, Emergency Notifications
- 2.5 EP-402, Responsibilities of the Recovery Organization
- 2.6 EP-530, Assembly and Accountability and Onsite Protective Actions
- 2.7 EP-542, Computer-Based Offsite Dose Assessment – Airborne Release
- 2.8 20.000.22, Plant Fires
- 2.9 MLS05, Notifications/General Regulatory Reporting Requirements
- 2.10 Off-Site Dose Calculation Manual

3.0 ENTRY CONDITIONS

An emergency condition has been classified as an UNUSUAL EVENT in accordance with EP-101.

4.0 GENERAL INFORMATION

- 4.1 **Definition of Unusual Event:** Events are in process or have occurred that indicate a potential degradation of the level of safety of the plant. No release of radioactive material requiring offsite response or monitoring is expected.

4.2 The purpose of offsite notification is to:

4.2.1 Ensure the first step in any response later found to be necessary has been carried out.

4.2.2 Bring the operating staff to a state of readiness.

4.2.3 Provide systematic handling of unusual events information and decision making.

4.3 Emergency notifications of government agencies are detailed in EP-290. State and local government agencies must be notified within 15 minutes of declaration of the emergency. The Nuclear Regulatory Commission (NRC) must be notified immediately following the offsite authorities but not to exceed 1 hour. The Province of Ontario is notified after the NRC.

4.4 Shift Manager is the Emergency Director until relieved of this responsibility by the Plant Manager/alternate or until the emergency situation is terminated. The Shift Manager shall remain in the plant to supervise plant operations.

5.0 IMMEDIATE ACTIONS

5.1 Complete Unusual Event - Checklist for Immediate Actions (Attachment 1).

5.1.1 Attachment 1 must be signed by the Emergency Director.

6.0 PROCEDURE - None

7.0 FOLLOW-UP ACTIONS

7.1 Complete Unusual Event - Checklist for Follow-Up Actions (Attachment 2).

7.1.1 Attachment 2 must be signed by the Emergency Director.

7.2 Continue to monitor the progress of Emergency Teams in controlling the emergency.

7.3 Ensure additional personnel support and equipment are made available as necessary.

- 7.4 Periodically make follow-up status reports to ensure all operations personnel and emergency response personnel are kept informed of:
 - 7.4.1 Personnel hazards
 - 7.4.2 Plant lineups
 - 7.4.3 Corrective actions
 - 7.4.4 Steps taken to control or mitigate the emergency
- 7.5 Establish a long-term relief rotation to ensure personnel are not required to remain at their assigned positions for an excessive period of time (normally not greater than 12 hours).
- 7.6 The emergency situation may be terminated if:
 - 7.6.1 Release of radioactive materials has ceased or is within Offsite Dose Calculation Manual (ODCM) limits; and
 - 7.6.2 No further potential exists for uncontrolled releases of radioactive materials to the environment; and
 - 7.6.3 The reactor and associated systems are in a stable, safe condition.
- 7.7 If the emergency situation is terminated:
 - 7.7.1 A summary of the termination shall be provided to the State of Michigan, Monroe County, and Wayne County in accordance with EP-290.
 - 7.7.2 A summary of the termination shall be provided to the NRC.
 - 7.7.3 Carry out the actions described in EP-402, Responsibilities of the Recovery Organization, as applicable.
- 7.8 Forward all completed Unusual Event - Checklist for Immediate Actions (Attachment 1) and Unusual Event - Checklist for Follow-Up Actions (Attachment 2) to Supervisor, RERP, 164 NOC.

8.0 RECORDS

8.1 The following are required records and shall be retained or dispositioned in accordance with established requirements:

8.1.1 Unusual Event - Checklist for Immediate Actions (Attachment 1)

8.1.2 Unusual Event - Checklist for Follow-Up Actions (Attachment 2)

END OF TEXT

UNUSUAL EVENT - CHECKLIST FOR IMMEDIATE ACTIONS

Complete NA

1. ☐ On-shift personnel notified.
2. ☐ ☐ Fermi 2 Emergency Call Out System activated in accordance with EP-290 (Optional - at ED discretion based on likelihood of escalation).
3. ☐ Immediate notifications to offsite authorities in accordance with EP-290.
4. ☐ NRC Operations Center notified immediately following offsite authorities, not to exceed 1 hour, in accordance with EP-290.
5. ☐ ☐ Radiological Emergency and Personnel Monitoring Teams activated (EP-220).
6. ☐ ☐ Fire Brigade activated (20.000.22).
7. ☐ ☐ Damage Control and Rescue Teams activated (EP-204-01).
8. ☐ ☐ Offsite emergency support requested (EP-290).
9. ☐ Province of Ontario notified in accordance with EP-290.
10. ☐ Nuclear Information notified in accordance with EP-290.
11. ☐ ☐ Radiological sampling ordered (EP-220/ODCM).
12. ☐ ☐ Offsite dose assessment initiated (EP-542/ODCM).
13. ☐ ☐ Onsite protective actions ordered (EP-530).
14. ☐ "Unusual Event" entered into the Integrated Plant Computer System (IPCS).

Emergency Director signature _____

Forward completed form to Supervisor, RERP, 164 NOC

UNUSUAL EVENT - CHECKLIST FOR FOLLOW-UP ACTIONS

Complete NA

1. ☐ ☐ Additional Control Room personnel placed on standby.
2. ☐ ☐ Follow-up actions of Abnormal and Emergency Operating Procedures completed.
3. ☐ ☐ Assess plant conditions and reclassify if necessary in accordance with EP-101.
4. ☐ ☐ Follow-up reports completed in accordance with EP-290.
5. ☐ ☐ On-shift personnel informed of changing conditions.
6. ☐ ☐ All reporting requirements met in accordance with MLS05.
7. ☐ ☐ Long term organization established.
8. ☐ Emergency terminated.
9. ☐ Emergency termination notification and summary to offsite authorities in accordance with EP-290.
10. ☐ Emergency termination notification and summary to NRC Operations Center in accordance with EP-290.
11. ☐ ☐ Recovery initiated (EP-402).
12. ☐ Update the Integrated Plant Computer System (IPCS) emergency classification entry.

Comments: _____

Emergency Director signature _____

Forward completed form to Supervisor, RERP, 164 NOC

TECHNICAL SUPPORT CENTER

Revision Summary

- 1) Deleted reference to ERIS and replaced it with Integrated Plant Computer System (IPCS) in step 4.4.12.1.

Implementation Plan

- 1) This procedure goes into effect upon issuance.

Attachments

- 1 010802 TSC Immediate Action Checklist

Enclosures

- A 010802 Typical TSC Floor Plan
- B 010802 TSC Organization Chart

| <i>Information and Procedures</i> | | | | |
|-----------------------------------|--------------------------|-----------------------------|------------------------|-------------------|
| DSN EP-301-01 | Revision 16 | DCR # 03-0182 | DTC TPEPT | File # 1703.10 |
| IP Code I | Date Approved 6-17-03 | Released By P. Scott /s/ | Date Issued 6-18-03 | Recipient 935 |

CONTROLLED

1.0 PURPOSE

To prescribe the methods by which the Technical Support Center (TSC) is activated and functions during an emergency.

2.0 USE REFERENCES

- 2.1 23.410.01, Office Building Annex, Computer and Document Control Rooms, and Technical Support Center HVACs
- 2.2 EP-201-03, Variances from Routine Radiological Practice and Procedures During an Emergency
- 2.3 EP-220, Personnel Monitoring and Radiological Emergency Teams
- 2.4 EP-290, Emergency Notifications
- 2.5 EP-530, Assembly and Accountability and Onsite Protective Actions
- 2.6 EP-545, Protective Action Recommendations

3.0 ENTRY CONDITIONS

- 3.1 Alert, Site Area Emergency, or General Emergency is declared.
- 3.2 Emergency Director has ordered the TSC activated.

4.0 GENERAL INFORMATION

- 4.1 The TSC is activated upon declaration of an Alert or higher emergency classification, or earlier at the discretion of the Emergency Director.
 - 4.1.1 Activation indicates that the facility staff have been ordered to the TSC for the purpose of making it functional.

4.2 The TSC is declared functional at the discretion of the Emergency Director when the following conditions are met and documented on Attachment 1.

4.2.1 The Emergency Director has been briefed on Emergency Status.

1. The Emergency Director must determine the following related to offsite notifications:
 - a. What information has been communicated to offsite authorities
 - b. Number of the last communication made from the Control Room
 - c. Which offsite agency has communications responsibility

4.2.2 TSC personnel have an understanding of radiological conditions as can best be determined from available resources.

4.2.3 TSC is determined to be radiologically habitable.

1. Determination of TSC habitability may be made based on review of radiation monitor indications, survey results, or knowledge of current conditions.

NOTE: Dose assessment does not have to be initiated – only available.

4.2.4 Radiation Protection personnel in the TSC have determined the status of dose assessment operations.

1. Dose assessment should be initiated when any of the following exist:
 - a. Declared loss or potential loss of clad
 - b. Effluent radiation monitors exceed 2 times ODCM control values
 - c. As directed

4.2.5 TSC Minimum Staffing to be declared functional, consisting of an Emergency Director, a Radiation Protection Advisor, and a Communicator, is achieved.

1. Minimum staffing positions may be activated at the discretion of the Emergency Director upon declaration of an Unusual Event.
2. Minimum staffing positions should be present in the TSC within 30 minutes of an Alert being declared.

3. **Additional staffing of 1 Technical Engineer or 1 Nuclear Safety Advisor, 1 Support Engineer, and 1 Communicator (for a total of 2) should be present within 60 minutes of TSC activation.**

4.2.6 TSC personnel are briefed on emergency status.

- 4.3 **Once declared functional, the TSC provides plant management and technical support to the Control Room, and relieves the reactor operators of peripheral duties not directly related to reactor system manipulations.**

4.3.1 The following are among the TSC responsibilities:

1. Accident assessment
2. Emergency classification
3. Radiological assessment
4. Corrective action development and implementation
5. Direction and control of onsite activities
6. Onsite protective actions
7. Site access control
8. Severe Accident Guideline implementation

4.3.2 In addition to these responsibilities, the TSC is also responsible for the following until relieved by the EOF:

1. Emergency communications and notifications
2. Offsite protective action recommendations
3. Direction and control of offsite emergency teams (utility personnel)
4. Meteorological and dose assessment

4.4 Responsibilities of key functional positions in the TSC follow.

4.4.1 The Emergency Director:

1. Classifies emergency conditions.
2. Coordinates implementation of immediate onsite corrective and protective actions to control the emergency and mitigate its effects.
3. Provides initial notifications, periodic status updates, and protective action recommendations to offsite authorities until relieved of this responsibility by the EOF.
4. Interfaces with offsite authorities as required.
5. Authorizes emergency radiation exposure limits in excess of 10 CFR 20 limits for plant or other emergency workers if conditions warrant.
6. Ensures that public information release is prompt, accurate, and made through proper channels until relieved of this responsibility by the EOF.
7. Ensures Detroit Edison personnel are called in as required to support emergency operations.
8. Obtains assistance of offsite support organizations as necessary.
9. Provides TSC personnel with periodic briefings on plant and emergency status.
10. Ensures safety of onsite personnel.
11. Oversees implementation of Severe Accident Guidelines.

4.4.2 The Technical Engineer:

1. Maintains overall perspective of plant operations and changing plant conditions.
2. Provides recommendations to the Emergency Director on plant technical matters.
3. Advises the Emergency Director in matters related to emergency classification and protective actions.
4. Serves as Severe Accident Guideline decision maker.

4.4.3 The Operations Liaison:

- 1. Assists the Technical Engineer.**
- 2. Maintains cognizance of Control Room activities as they relate to plant operations.**
- 3. Evaluates Severe Accident Guidelines.**

4.4.4 The Nuclear Safety Advisor:

- 1. Maintains overall perspective of plant conditions and the status of plant systems and ongoing repair activities.**
- 2. Advises the Emergency Director on plant engineering matters.**
- 3. Provides work assignments to support engineers.**

4.4.5 The Radiation Protection Advisor:

- 1. Maintains overall perspective of plant radiological conditions.**
- 2. Maintains cognizance of the location and status of emergency responders in the plant.**
- 3. Establishes radiation protection requirements for plant activities.**
- 4. Advises the Emergency Director on onsite protective actions and offsite protective action recommendations.**
- 5. Ensures facility habitability is monitored and maintained.**
- 6. Provides work direction for radiation protection and dose assessment personnel.**
- 7. Directs dispatch and control of onsite RETs.**
- 8. Directs dispatch and control of offsite RETs until the EOF is functional.**
- 9. Authorizes dose extensions in excess of Fermi 2 Administrative Guidelines, not to exceed 10 CFR 20 limits for emergency response personnel, as needed.**

4.4.6 The Radchem Advisor:

1. Advises the Emergency Director on radiochemistry issues.
2. Advises the Emergency Director on radwaste issues.
3. Directs inplant sampling and radiochemistry laboratory analysis activities.
4. Evaluates status of damage to reactor core.

4.4.7 The TSC Administrators:

1. Ensure that all offsite notifications and communications are complete and made in a timely manner.
2. Maintain and control documentation concerning the emergency.
3. Advise the Emergency Director on matters related to personnel or equipment.
4. Coordinate logistical support for onsite emergency personnel.
5. Coordinate replacement or additional TSC personnel or equipment as necessary.
6. Supervise TSC Communicators and Administrative Support personnel.

4.4.8 The Security Advisor:

1. Ensures that site security is maintained and appropriate contingency measures are implemented.
2. Ensures that security and traffic control measures are in effect, including traffic direction during evacuation.
3. Ensures personnel accountability procedures are implemented in the event of a radiological emergency or the need for plant/site evacuation.
4. Maintains security of the TSC.
5. Advises the Manager - Nuclear Security and Emergency Director on matters related to security.

4.4.9 TSC Communicators:

1. Establish and maintain communication with the state and counties when required.
2. Contact additional or replacement TSC staff as directed.

4.4.10 Technical Communicators:

1. Two Technical Communicator positions are staffed.
2. The TSC Technical Communicator:
 - a. Provides the communication link for technical information and emergency team dispatch with the Control Room, OSC, and EOF.
 - b. Provides information updates to and supervision of Emergency Status Engineers.
3. The NRC Technical Communicator relieves the Main Control Room of NRC notifications responsibility as directed by the Emergency Director.

4.4.11 Dose Assessors:

1. Perform offsite dose assessment calculations and report results to Radiation Protection Advisor.
2. Assess meteorological conditions and projections.

4.4.12 Support Engineers:

1. Use the Integrated Plant Computer System (IPCS) and other available information to trend key plant parameters and develop technical recommendations.
2. Advise Nuclear Safety Advisor on plant engineering matters.
3. Evaluate Severe Accident Guidelines.

4.5 TSC Equipment Storage and Maintenance

- 4.5.1 The General Supervisor, Radiation Protection Operations, ensures all radiation protection emergency protection equipment stored in the TSC is maintained in accordance with 67.000.405.
- 4.5.2 Documentation stored in the TSC is maintained by Information and Procedures.

5.0 IMMEDIATE ACTIONS

- 5.1 Upon activation, complete Attachment 1, TSC Immediate Action Checklist, to make the TSC Functional.
 - 5.1.1 Document completed steps in space provided.
 - 5.1.2 Emergency Director sign and date completed form.

6.0 PROCEDURE

NOTE: The following actions are evaluated and performed only as appropriate, and in any order, to support the function of the TSC.

- 6.1 The Emergency Director shall:
 - 6.1.1 Monitor emergency status and upgrade emergency classifications.
 - 6.1.2 Implement onsite protective actions in accordance with EP-530.
 - 6.1.3 Recommend offsite protective actions in accordance with EP-545.
 - 6.1.4 Provide periodic briefings on emergency status and priorities for the organization.
 - 6.1.5 Support the Main Control Room in implementation of required procedures.
 - 6.1.6 Relieve the Main Control Room of NRC notifications when the NRC Technical Communicator is available and knowledgeable of plant and emergency status.
 - 6.1.7 Review and approve all emergency notifications in accordance with EP-290.

- 6.1.8 Brief the State Emergency Director on the status of the emergency and associated response efforts.
 - 6.1.9 Review and approve the formation and dispatch of required emergency response teams.
 - 6.1.10 Authorize variances from routine radiological practices and procedures in accordance with EP-201-03.
 - 6.1.11 Complete each event classification checklist in accordance with EP-102, EP-103, EP-104, and EP-105.
 - 6.1.12 Implement Severe Accident Guidelines.
- 6.2 The Radiation Protection Advisor shall:
- 6.2.1 Initiate dose assessment.
 - 6.2.2 Distribute dosimetry to TSC personnel.
 - 6.2.3 Perform periodic facility habitability surveys.
 - 6.2.4 Establish a contamination control point at TSC entrance.
 - 6.2.5 Place TSC HVAC in the Emergency Makeup Mode in accordance with 23.410.01 when a radiological release is detected.
 - 6.2.6 Activate the airlock function at the entrances to the TSC when a radiological release is detected.
 - 6.2.7 Staff the Health Physics Network, when directed by the NRC, by a person who is knowledgeable of plant and radiological conditions.
 - 6.2.8 Determine Off-site Assembly area location based on current and forecast weather conditions.
 - 6.2.9 Activate the Off-site RET in accordance with EP-220.
 - 6.2.10 Establish appropriate radiological controls for on-site activities.

6.2.11 Assist the Emergency Director in developing on-site protective actions in accordance with EP-530.

6.2.12 Assist the Emergency Director in developing off-site protective action recommendations in accordance with EP-545.

6.3 The TSC Administrators shall:

6.3.1 Ensure full TSC staffing is achieved.

6.3.2 Assist with all required emergency notifications.

7.0 FOLLOW-UP ACTIONS

7.1 TSC Administrator shall ensure that a second shift for TSC personnel is placed on standby 8 hours into the emergency, or after 8 hours are worked as directed.

7.2 Second shift should be briefed and in place at their emergency assignments 12 hours into the emergency, or after 12 hours are worked.

CM

7.3 In the event that environmental conditions in the TSC hinder routine operation, the Emergency Director may direct any or all of the following actions to alleviate the condition:

7.3.1 Reduce lighting and other electrical loads to the minimum necessary to accomplish TSC functions.

7.3.2 Dismiss or reassign unnecessary personnel to an alternate location to reduce the heat load.

7.3.3 Rotate personnel on a more frequent basis to ensure that personnel fatigue does not affect TSC operation.

7.4 If airborne radioactivity levels in the TSC exceed established limits at any time during the emergency, the Emergency Director shall determine whether to transfer the TSC functions to alternate locations.

7.4.1 If the Emergency Director does decide to transfer the TSC functions, some functions may be transferred to the Control Room but most would be transferred to the EOF.

7.5 If area radiation level exceeds the established limits, TSC functions may be similarly transferred at the direction of the Emergency Director.

CM

7.6 Radiation Protection Advisor shall return TSC HVAC to Normal Mode in accordance with 23.410.01 when Emergency Makeup Mode is no longer required.

7.7 All forms and records generated in the TSC as a result of the emergency shall be retained by TSC Administrator and turned over to Supervisor, RERP at the conclusion of the event for disposition and storage.

8.0 RECORDS

8.1 Attachment 1, TSC Immediate Action Checklist, is a required record.

8.2 Required records generated from this and other procedures used concurrently with this procedure shall be dispositioned as specified in Section 7.7 and in accordance with the requirements defined in the governing procedure.

END OF TEXT

TSC IMMEDIATE ACTION CHECKLIST

A. The following items shall be completed in any order prior to declaring the TSC functional.

- _____ 1. Receive Briefing on Emergency Status.
 - ☐ a. Understand plant conditions.
 - ☐ b. Understand emergency classification.
 - ☐ c. Determine status of repair activities.
 - ☐ d. Determine location and status of any emergency teams.
 - ☐ e. Determine status of onsite and offsite protective actions.
 - ☐ f. Determine status of offsite notifications.
 - ☐ g. Determine status of emergency action checklists (agree on turnover items).
- _____ 2. Understand radiological conditions. Consult with Radiation Protection Advisor (RPA).
- _____ 3. Verify TSC habitability with RPA.
- _____ 4. Determine status of Dose Assessment operations. Consult with RPA.
- _____ 5. Verify minimum staffing.
- _____ 6. Brief TSC personnel on emergency status.

B. The following items shall be completed in any order when ready to declare the TSC functional.

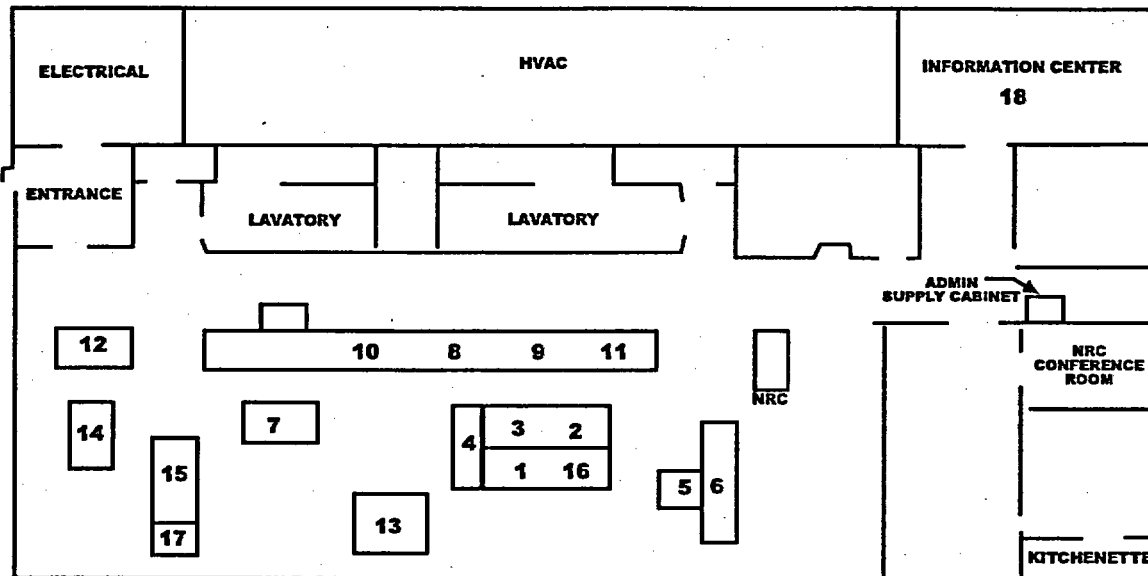
- _____ 1. Declare the TSC functional. Time: _____
- _____ 2. Relieve Control Room of Emergency Director duties.
- _____ 3. Assume communications responsibilities.

C. Announce that TSC is functional and the name of Emergency Director.

- _____ 1. Make announcement to TSC staff.
- _____ 2. Have sitewide Hi-Com announcement made.
- _____ 3. Inform Offsite Authorities.
- _____ 4. Contact the State Emergency Director.

Emergency Director/Date: _____/_____

TYPICAL TSC FLOOR PLAN

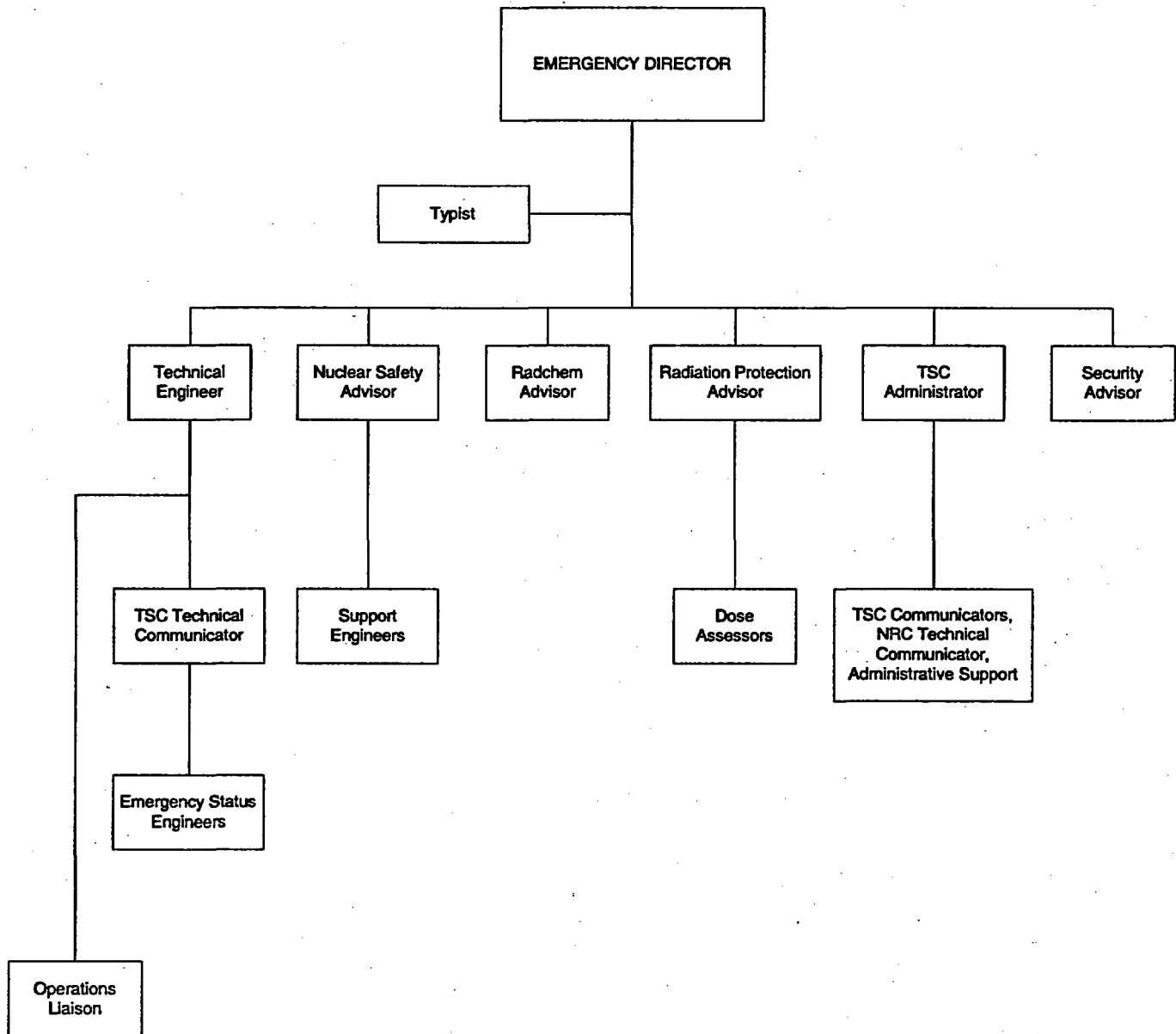


NOTE: Physical location of TSC personnel may be modified depending on equipment availability, physical or radiological conditions or other reasons as determined by the Emergency Director.

- | | | | |
|---|----------------------------|----|-------------------------------|
| 1 | EMERGENCY DIRECTOR | 10 | DOSE ASSESSOR |
| 2 | TECHNICAL ENGINEER | 11 | RADCHEM ADVISOR |
| 3 | TSC TECHNICAL COMMUNICATOR | 12 | SECURITY ADVISOR |
| 4 | TYPIST | 13 | EMERGENCY STATUS ENGINEERS |
| 5 | NUCLEAR SAFETY ADVISOR | 14 | ADMINISTRATIVE SUPPORT |
| 6 | ENGINEERING SUPPORT | 15 | TSC COMMUNICATORS |
| 7 | TSC ADMINISTRATOR | 16 | OPERATIONS LIAISON |
| 8 | RAD PROTECTION ADVISOR | 17 | NRC TECHNICAL COMMUNICATOR |
| 9 | ASSISTANT RPA (OPTIONAL) | 18 | INFORMATION CENTER SPECIALIST |

NORTH →

TSC ORGANIZATION CHART



END

COMPUTER-BASED OFFSITE DOSE ASSESSMENT - AIRBORNE RELEASE

Revision Summary

- 1) This is a total rewrite. No revision bars have been used.

Implementation Plan

- 1) This procedure goes into effect upon issuance.

Attachments - None

Enclosures

| | | |
|---|--------|---|
| A | 051303 | Dose Assessment Initiation Flowchart |
| B | 051303 | Operating Raddose-V in Automatic Mode |
| C | 051303 | Operating Raddose-V in Manual Mode |
| D | 051303 | Back Calculation Using Field Dose Rates |
| E | 051303 | Effluent Sample Analysis |
| F | 051303 | Override Monitor Readings |
| G | 051303 | Source Air Sample Analysis |

| Information and Procedures | | | | |
|----------------------------|--------------------------|-----------------------------|------------------------|-------------------|
| DSN EP-542 | Revision 6 | DCR # 03-0185 | DTC TPEPT | File # 1703.10 |
| IP Code I | Date Approved 6-17-03 | Released By P. Scott /s/ | Date Issued 6-18-03 | Recipient 935 |

CONTROLLED

1.0 PURPOSE

To prescribe the method by which dose assessment personnel use a computer-based program to calculate offsite Total Effective Dose Equivalent (TEDE) and thyroid dose and dose rates resulting from an unplanned/abnormal airborne release.

2.0 USE REFERENCES

- 2.1 EP-101, Classification of Emergencies
- 2.2 EP-546, Calculation of Estimated Containment High Range Radiation Monitor or SGTS/AXM Monitor Readings if Instruments are Inoperable or Offscale
- 2.3 EP-547, Rapid Estimate of Core/Fuel Damage Based on Containment High Range Radiation Monitor
- 2.4 23.615, Integrated Plant Computer System (IPCS)

3.0 ENTRY CONDITIONS

- 3.1 Potential exists for an abnormal/unplanned release to the environment

or

- 3.2 Actual abnormal/unplanned release has occurred or is occurring through one of the plant effluent release pathways.

4.0 GENERAL INFORMATION

- 4.1 The Raddose-V dose assessment program interfaces with the Integrated Plant Computer System (IPCS) to obtain meteorological and radiation monitor data for calculating offsite dose and dose rates. The program's Automatic Mode serves as the primary method for performing dose calculations. The Manual Mode serves as an alternate/backup for performing dose assessment.
- 4.2 Airborne fission product radioactivity released in the plant is normally transported by the plant ventilation systems (e.g., SGTS, RB HVAC, etc.) to the environment and quantified by effluent radiation monitors. Due to accident/plant conditions, Radiation Protection personnel must consider and have surveys performed for the possibility of unmonitored releases.

- 4.3 Raddose-V features a "Control" User Mode associated with operating in the Automatic Mode. The user must select "Control" to operate in the Automatic Mode. The Automatic Mode is the only mode that retrieves IPCS data (i.e., Met and SPING/AXM data) automatically, prints dose reports every 15 minutes, and writes data files to the Integrated Plant Computer System (IPCS) as well as to the local PC terminal.
- 4.4 The Dose Assessor, responsible for dose assessment, must operate in the "Control" User Mode even if IPCS data are unavailable. Raddose-V in the "Control" User Mode indicates Fermi Summary Reports as the "Record Copy" and identifies the "Control" terminal.
- 4.5 Initiating Raddose-V in the "Independent" User Mode will automatically force Raddose-V to operate in the Manual Mode. This mode is used for any miscellaneous dose calculations and indicates Fermi Summary Reports as "For Information Use Only."
- 4.6 Raddose-V can be operated in the Manual Mode even if IPCS data are available to allow the user to run back-up (peer check) calculations or choose other methods (e.g., back calculate using field data) to calculate offsite dose/dose rates. If IPCS data are unavailable, the Dose Assessor must operate in the Manual operating mode and all Raddose-V inputs are entered manually.
- 4.7 Raddose-V defaults to a four-hour projection duration. This duration is consistent with the evacuation time estimate (for our 10-mile EPZ). The user can change the default projection duration if other projected dose durations are deemed necessary.
- 4.8 Raddose-V has seven Accident Types to choose from.

NOTE: Accident Type selection is determined by identifying the location(s) of the airborne fission product activity (source term) and the release pathway.

- LOCAC/LOCACP (LOCA/fission products in containment; pathway via SGTS): LOCACP is the potential projection model
- LOCAX (LOCA/fission products outside containment; pathway via SGTS)
- FHA (Fuel Handling Accident; pathway via SGTS)
- RXBLG (fission products in the Reactor Building; pathway via RB HVAC)
- TRBLG (fission products in the Turbine Building; pathway via TB HVAC)
- RWBLG (fission products in the Radwaste Building; pathway via RW HVAC)
- PCV (fission products in containment; pathway via SGTS Torus hardened pipe)

4.9 Source Type selection involves selecting one of three default Source Types or inputting an air sample isotopic analysis. The three default Source Types are:

- Coolant (use during LOCAs or release of fission products with no fuel damage)
- Gap (fuel/clad damage event; assumes 10% noble gases, 2% iodines)
- Core (fuel/core melt event; assumes 100% noble gases, 2% iodines)

4.9.1 Raddose-V and CHRRMs readings can be used to select default Source Types. "Override Monitor Readings" can be used from the NG Basis option (under "Potential Projection") to obtain the 100% (worst case) Source Type value for CHRRMs (Refer to Enclosure F).

4.9.2 EP-547, "Rapid Estimate of Core/Fuel Damage Based on Containment High Range Radiation Monitor," (Enclosures A and B) can be used to determine a 100% "Gap" or "Core Melt" CHRRM reading to assist in Source Type selection.

4.9.3 An air sample isotopic analysis (e.g., PASS atmospheric sample) can be used as the Source Type. The user enters sample results on a nuclide entry screen. This option is only available in the Manual operating mode (Refer to Enclosure G).

4.10 If using "Back Calculation Using Field Dose Rates" as the method of dose assessment, a minimum of one calculated time step using valid met and effluent monitor readings is required to reflect a release. This option is only available in the Manual operating mode (Refer to Enclosure D).

4.11 If an effluent sample isotopic analysis is to be used as the method of dose assessment, choose "Effluent Sample Analysis" under the NG Basis options. This option is only available in the Manual operating mode (Refer to Enclosure E).

5.0 IMMEDIATE ACTIONS

NOTE: Enclosure A, Dose Assessment Initiation Flowchart, provides guidance on plant conditions requiring initiation of dose assessment.

5.1 Initiate the Automatic Mode of the Raddose-V dose assessment program in accordance with Enclosure B.

5.2 If IPCS data are not available or another method of dose assessment is preferred, initiate the Manual Mode of Raddose-V in accordance with Enclosure C.

6.0 PROCEDURE – None

7.0 FOLLOW-UP ACTIONS

- 7.1** Continue to calculate TEDE and Adult Thyroid dose and dose rates until directed to terminate dose assessment.

8.0 RECORDS

- 8.1** All documentation generated as part of performing dose assessment should be reviewed by the Radiation Protection Advisor/Radiation Protection Coordinator then forwarded to the Supervisor, RERP, for retention.

END OF TEXT

DOSE ASSESSMENT INITIATION FLOWCHART

NOTE (1): Monitors used to identify airborne fission product activity include but not limited to:

- Elevated CHRRMS or CHRRMS in alarm
- SPINGS in alarm (on any SPING unit)
- Elevated ARMs or ARMs in alarm
- Offgas/MSIV radiation monitors in alarm
- Obtain/review RET data to verify any unmonitored releases

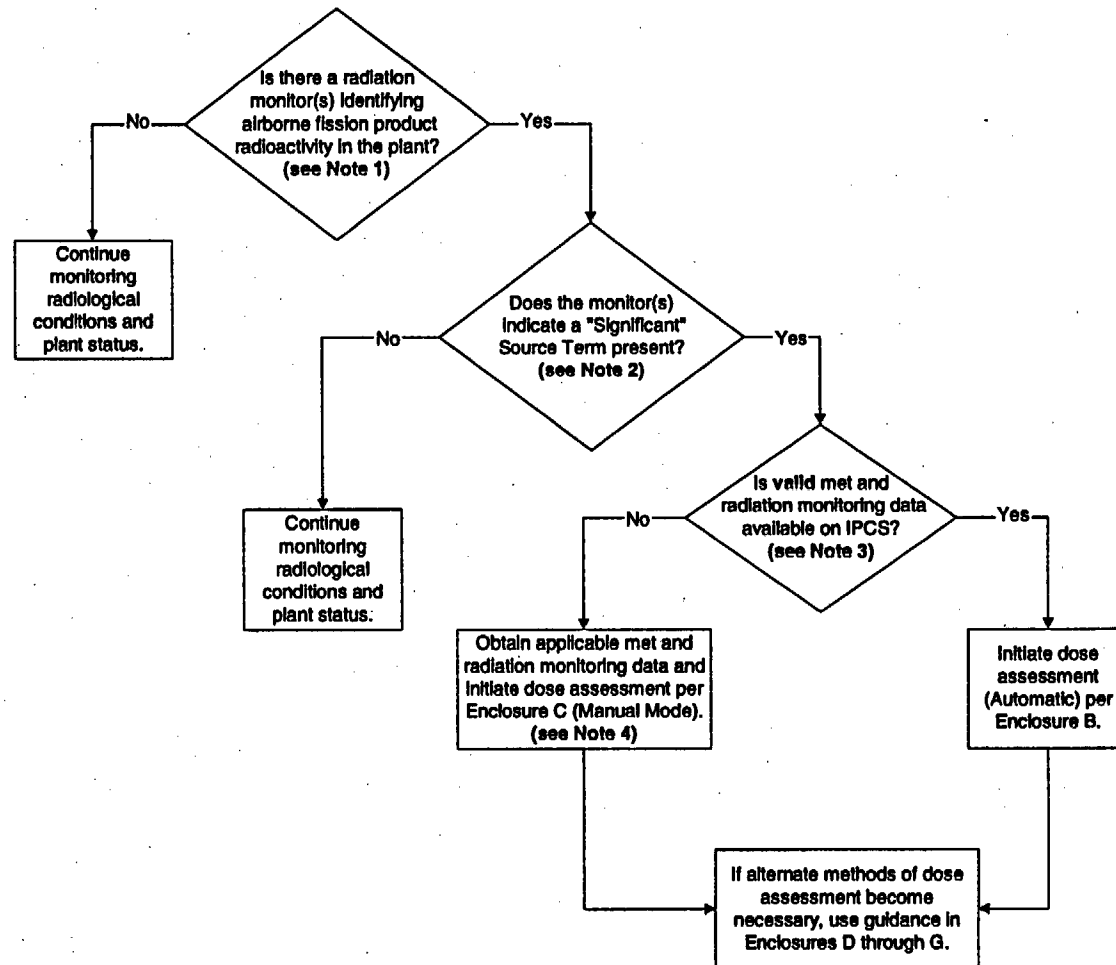
NOTE (2): "Significant" source terms may be indicated by:

- CHRRMS in alarm (>1000 R/hr) (EP-101, Tab F)
- SPING(s) on an operating HVAC system in alarm and reached/exceeded AU1 EAL SPING values (EP-101, Tab A)
- Declared "Loss (or Potential Loss) of Clad" (EP-101, Tab F)

NOTE (3): Valid refers to indications green ("good") or red (in alarm) on IPCS or have been verified by other methods (e.g., control panel displays, reports from plant personnel, or radiological survey results).

NOTE (4): Obtain CHRRMS and/or SPING/AXM data via Control Room/Relay Room instrumentation. SPING readings can also be obtained directly at the individual units. Meteorological data may be obtained by:

- Using designated PC for dialing up/accessing the meteorological building data [Refer to 23.615, Integrated Plant Computer System (IPCS)]
- Accessing the RERP Intranet Weather page to obtain either the "Fermi II Local Weather" data or "Fermi 2 NGM MOS Forecast" data



OPERATING RADDOSE-V IN AUTOMATIC MODE

1. Access an IPCS terminal that has Raddose-V.
2. From the IPCS terminal Windows desktop, click on the Raddose-V icon (i.e., radiation symbol icon).

NOTE: The user **MUST** chose "Control" User Mode to operate in the "Automatic Mode" and have a dose report print out automatically every 15 minutes.

3. From the "Initialization Options" screen, chose "Control" User Mode.
4. Select "Automatic Mode" for the Operating Mode.
5. Select "Accident" Run Mode for plant data or "Drill" to connect to the simulator computer.
6. Once selections are made, click OK.
7. Review the "Status Screen". This screen identifies your IPCS terminal, current selections, and latest "Control" Mode information.
 - a. To change User, Operating, or Run Mode(s), click "Change Selections."
 - b. To exit out of the Raddose-V program, click "Exit Raddose-V."
8. To continue initiating dose assessment, click "Proceed to Start-Up Menu."
9. *If continuing dose assessment* (i.e., taking over control or continuing a scenario already initiated), **GO TO** step 11.
10. *If initiating dose assessment*, **GO TO** step 12.
11. *To continue dose assessment*, click "Continue Previous Incident". The user receives a pop-up message warning you will be continuing with the data from the previous controller.
 - a. Click 'Yes' to continue or 'No' to return to "Start-up Menu" screen.
 - b. A "Continuation Data" screen will appear identifying previous information. After review, click OK. This will start Raddose-V running and display the "Automatic Mode Status Screen" which provides the "Summary of Operations".
 - c. **GO TO** step 13.

OPERATING RADDOSE-V IN AUTOMATIC MODE

NOTE: A pop up message will warn the user that current Controller data will be overwritten if "Begin New Incident" is chosen.

12. *To initiate dose assessment*, click "Begin New Incident" on the "Start-Up Menu" screen and click 'Yes' on the pop-up warning message.

- a. From the "Accident Scenario Definition" screen, enter:

NOTE: Release start time refers to time when airborne radioactivity was identified in the plant. It also is the scenario start time for "Operating" reactor scenarios.

- 1) Release Information (Release Start Date, Release Start Time)
- 2) Operator's Initials

NOTE: If Reactor is not shutdown, Reactor Shutdown Date/Time becomes disabled (shaded out).

- 3) Reactor Information
- 4) Verify if Eastern Standard or Daylight Savings Time is correctly indicated.
- 5) Select Automatic Data Retrieval Parameters (see General Information steps 4.8 and 4.9 for selecting Accident Types and Source Types if necessary)
 - a) Select Accident Type.
 - b) Select Source Type.
 - If an air sample result (e.g., PASS atmosphere sample) is to be used as the "Source Type", exit out of the "Automatic Mode" and use "Manual Mode" per Enclosure C.
 - c) Select proper "Div".
 - If SGTS is the release pathway, click the appropriate "Div" circle indicator. Verify correct division via IPCS or contact the Control Room. "Div" is shaded out for non-SGTS pathways.
 - d) Verify projection period reflects *four* hours.

OPERATING RADDOSE-V IN AUTOMATIC MODE

- e) Verify "Print Report" is checked (to receive automatic report every 15 minutes).
 - f) Verify all inputs on the "Accident Scenario Definition" screen then click OK.
 - g) This will start Raddose-V running and display the "Automatic Mode Status Screen" which provides the "Summary of Operations".
13. Review "Summary of Operations" section of the "Automatic Mode Status Screen" to verify Raddose-V is receiving data from IPCS.
14. Obtain and review Summary Reports (printed every 15 minutes) then forward to PAR decision-maker (e.g., Emergency Director, RPA, or RPC) for review.

NOTE: Minimizing the "Automatic Mode Status Screen" will enable the user to access/view multiple IPCS screens.

15. Continue reviewing radiation monitor readings and met data from IPCS.
16. To make changes to inputs on the "Accident Scenario Definition" screen (e.g., change "Operating" reactor to "Shutdown"):
- a. Click the "Quit Automatic Mode" button, then click 'Yes' on the pop-up box to display the "Main Menu" screen.
 - b. From the "Main Menu" screen click "Return to Start-Up Menu".
 - c. From the "Start-Up Menu" screen click "Return to Status Screen".
 - d. From the "Status Screen" click "Change Selections."
 - e. **GO TO** step 3 to re-initiate Raddose-V in "Automatic Mode."
17. If IPCS data (i.e., SPINGs/AXMs and/or met data) become unavailable, perform dose assessment in "Manual Mode" per Enclosure C.
18. If dose assessment is to be calculated with methods other than IPCS inputs (e.g., Back Calculation Using Field Data, Effluent Sample Analysis, Override Monitor Readings, etc.) perform dose assessment in "Manual Mode" per Enclosure C.
19. To terminate Raddose-V, click "Quit Automatic Mode," then click 'Yes' on the pop-up box.

OPERATING RADDLOSE-V IN AUTOMATIC MODE

20. To exit Raddose-V:
 - a. From the "Main Menu" screen, click on "Return to Start-Up Menu".
 - b. From the "Start-Up Menu", click "Return to Status Screen".
 - c. From the "Status Screen", click "Exit Raddose-V".

OPERATING RADDOSE-V IN MANUAL MODE

NOTE: The Manual Operating Mode is used to perform dose assessment whenever normal plant monitors are not available (i.e., Automatic Mode not available) or other calculational methods are preferred. For example, back calculations, source sample input, effluent sample analysis, monitor override (DBA), or direct entry, are all performed in the Manual Operating Mode.

1. Log onto Raddose-V by clicking the Raddose-V icon (radiation symbol icon).
2. From the "Initialization Options" screen, select "Control" User Mode if responsible for dose assessment. Otherwise, select "Independent" User Mode.
3. Select "Manual Mode" for the Operating Mode.
4. Select "Accident" Run Mode for plant data (or "Drill" to connect to the simulator computer).
5. Once selections are made, click OK.
6. Review the "Status Screen". This screen identifies your IPCS terminal, current selections, and latest "Control" Mode information.
 - a. To change User, Operating, or Run Mode(s), click "Change Selections."
 - b. To exit out of the Raddose-V program, click "Exit Raddose-V."
7. To continue initiating dose assessment, click "Proceed to Start-Up Menu."
8. *If continuing dose assessment* (i.e., continuing a scenario already initiated), **GO TO** step 10.
9. *If initiating dose assessment*, **GO TO** step 11.
10. *To continue dose assessment*, click "Continue Previous Incident". The user receives a pop-up message warning you will be continuing with the data from the previous controller.
 - a. Click 'Yes' to continue or 'No' to return to "Start-up Menu" screen.
 - b. A "Continuation Data" screen will appear identifying previous information. After review, click OK.
 - c. **GO TO** step 12.

OPERATING RADDOSE-V IN MANUAL MODE

NOTE: If a previous scenario has been run in Raddose-V, a pop up message will warn the user that current Controller data will be overwritten (Control Mode) or previous data will be erased (Independent Mode) if "Begin New Incident" is chosen.

11. *To initiate dose assessment*, click "Begin New Incident" on the "Start-Up Menu" screen and click 'Yes' on the pop-up warning message.

- a. From the "Accident Scenario Definition" screen, enter:

NOTE: Release start time refers to time when airborne radioactivity was identified in the plant. It is also the scenario start time for "Operating" reactor scenarios.

- 1) Release Information (Release Start Date, Release Start Time)

- 2) Operator's Initials

NOTE: If Reactor is not shutdown, Reactor Shutdown Date/Time becomes disabled (shaded out).

- 3) Reactor Information

- 4) Verify if Eastern Standard or Daylight Savings Time is correctly indicated.

NOTE: In the "Manual" and "Independent" Modes, "Automatic Data Retrieval Parameters" is disabled (shaded out) on the "Accident Scenario Definition" screen.

- b. Click OK once all data are entered and verified correct.

12. From the "Main Menu" screen, click "Enter/Edit Meteorological Data" box.

- a. If met data are not available from IPCS, a pop-up box will direct user to enter data manually. Click OK.

13. Enter wind speed (10 meter), wind direction (10 meter, Direction From) Stability Class and Precipitation.

- a. Ensure met data are "entered" into the program by depressing the "enter" keyboard button.

- b. If multiple met data steps are needed for this scenario, use the "Add New Step" button to continue inputting data.

- c. Once met data are filled in and self-checked, click OK.

OPERATING RADDOSE-V IN MANUAL MODE

14. Click the "Enter/Edit Source Term Data" box.
 - a. If source term data are not available from IPCS, a pop-up box will direct user to enter data manually. Click OK.
15. From the "Source Term Data Input" screen, verify Pathway 1 tab is selected then select the "Accident Type".
 - a. Follow the directions on the bottom of the screen to display drop down boxes.
16. Chose applicable "Accident Type" based on location of airborne activity and release pathway.
17. Chose applicable "Source Type".
 - a. If an air sample nuclide analysis is available to represent the source term, click "SRC SAMP" and enter the isotopic results (Refer to Enclosure G).

18. Chose the appropriate "NG Basis."

NOTE: If Potential Projections (LOCAC Accident Type) are the only dose assessment results applicable due to no release in progress and/or SPINGs/AXMs inoperable, the user may insert a small effluent monitor value (i.e., 1E-10) or select another "NG Basis" method.

- a. This menu provides options to manually input radiation monitor values or chose the following other methods to calculate offsite dose/dose rates:
 - Back Calculate (uses field team dose rate data) (Refer to Enclosure D)
 - Effluent Sample Analysis (e.g., isotopic analysis results from PASS or AXM samples) (Refer to Enclosure E)
 - Override Monitor Readings (this option enters the Design Base Accident/worst case values) (Refer to Enclosure F)
 - Direct Entry (if release rates are known, they can be entered directly)
- b. If running a LOCA in containment scenario, the user will be prompted to enter applicable data in the "Potential Projection" tab.

OPERATING RADDOSE-V IN MANUAL MODE

NOTE: The "Total of Pathways 1 and 2" tab reflects the sum of pathways 1 and 2 release rates.

- c. If the user is modeling two release pathways simultaneously, fill in applicable data in the "Pathway 2" tab.
19. Once all Source Term Data are entered and self-checked, click OK.
20. From the Main Menu screen, click "Perform Calculations".
 - a. The user receives a pop-up message confirming the projection calculation will use met/source term data for the corresponding step. Click OK.
- NOTE:** If multiple steps were added to the met and source term data tables, the user can click "Continue Calculations" to run each data step. Once the last step is calculated, from the "Output Menu" screen click on "Go to Report Menu" to view results.
21. From the "Output Menu" screen, click on "Go to Report Menu".
22. From the "Report Options Menu" screen, click on "View Summary Report" to review dose assessment results.
 - a. Click on the appropriate tab to review projection results. Real time results reflect dose data during the current time step only.
 - b. Multiple data screens (e.g., Inputs Summary, Grid Point, etc.) are available by clicking bottom screen tabs.
 - c. Click "Done" to exit out of "Fermi Summary Report" screen.
23. To print reports and/or maps, click on "Print Reports and Maps" box.
 - a. Check items to be printed then click OK.
24. To review plume maps and/or multiple data screens, go to the "Output Menu" screen.
25. To continue further calculations, return to the "Main Menu" screen to enter new meteorological and source term data or modify method of calculations (e.g., changing NG Basis).

OPERATING RADDOSE-V IN MANUAL MODE

26. Further options from the "Main Menu" screen include:
 - a. Perform Forecast (click here to change projection duration in hours)
 - b. Change current Shutdown Date/Time
 - c. Resume Automatic Operating Mode (disabled unless user was previously in "Automatic Mode" in this scenario run)
27. To exit Raddose-V:
 - a. Return to "Start-Up Menu" screen.
 - b. Proceed to the "Status Screen."
 - c. Click on Exit Raddose-V."

BACK CALCULATION USING FIELD DOSE RATES

The **Back Calculation Using Field Dose Rates** option can be used whenever a confirmed release is in progress and offsite field dose rates (from Offsite RETs) become available. This method may serve as a good comparison to normal dose assessment calculation using in-plant radiation monitors. This method should be used whenever an unmonitored release has been confirmed and/or in-plant monitor readings are suspect or become unreliable.

NOTE: This option requires that plume data be calculated before performing a "back" calculation. Prior to using this option, valid inputs for both met and effluent radiation monitor data are required and prior time steps must be calculated (i.e., "Perform Calculations" from the Main Menu options).

To perform dose assessment using the Back Calculate option, perform the following:

1. If valid effluent radiation monitor data are not available for initial time steps, implement EP-546, "Calculation of Estimated Containment High Range Radiation Monitor or SGTS/ASM Monitor Readings if Instruments are Inoperable or Offscale."
2. Select Back Calculate from the "NG Basis" drop down menu.
3. Enter on the Back Calculation of Release Rate pop-up screen the following:
 - a. The 3 foot gamma (closed window) dose rate
 - b. The "Emergency Survey Point Identifier" if applicable or keep as "none". If a survey point is selected, the distance and bearing will be filled in; therefore, **GO TO** step 4.
 - c. Distance (in miles) the dose rate was measured

NOTE: The "bearing" is the physical location of the measurement with 0/360 degrees being north of the plant. Example of a bearing of 270 degrees would be west of the plant in sector N.

- d. Bearing (in degrees) the dose rate was measured
4. Once all data are entered and self-checked, click OK.
5. Return to Enclosure C, step 18 to continue Manual Mode operations.

EFFLUENT SAMPLE ANALYSIS

The Effluent Sample Analysis option can be used whenever a confirmed release is in progress and an actual effluent sample is obtained and analyzed for isotopic composition.

Effluent sample analyses represent an actual mix of isotopes being released. This option also serves as a correction for limitations relating to effluent radiation monitors. Effluent samples can be obtained from normal release pathways (i.e. HVAC systems) via SPING samples. During severe accident conditions, AXM samples may be obtained and analyzed. Effluent isotopic data will then be used to calculate the release rates in-lieu of effluent radiation monitor readings. Effluent sample analysis currently entered into Raddose-V can be carried forward into future time steps. Once entered in the NG Basis, the program continues to use this data and decay correct the isotopes until another NG Basis is selected.

To perform dose assessment using the Effluent Sample Analysis option, perform the following:

1. Select Effluent Sample Analysis from the "NG Basis" drop down menu.
2. Enter Effluent concentrations (in uCi/cc).
 - a. Once concentrations are entered and self-checked, click OK.
3. Return to Enclosure C, step 18 to continue Manual Mode operations.

OVERRIDE MONITOR READINGS

The **Override Monitor Reading** option provides a method to calculate Design Base Accident (DBA) or worst case release rates. This method also calculates a 100% source term monitor reading taking time after reactor shut down into account. This option can be used to assist in Source Type selection by comparing the actual current CHRRM reading to the "Override" calculated CHRRM reading. Based on this, the LOCAC Accident Type is the only Accident Type applicable due to the only Accident Type utilizing CHRRMs.

To select a Source Type using the Override Monitor Reading option, perform the following:

1. Ensure the LOCAC Accident type is selected.
2. Select the "Coolant" Source Type or "Gap" Source Type if fuel damage has occurred.
3. Under "Potential Projection," select Override Monitor Reading from the "NG Basis" drop down menu.
4. Verify calculated Release Rates (i.e. NG, Iodine, and Particulate) are filled in (on the "Source Term Data Input" screen).
5. Once release rates are entered and self-checked, click OK.
6. Click on "Perform Calculations."
7. Click on "Go to Report Menu."
8. Click on "View Summary Report."
9. Under the "Potential Projection" report, obtain the "Override CHRRM Monitor Reading."
10. If the actual current CHRRM monitor reading is higher than the "Override Monitor" reading, advance to the next higher Source Type. For example, if the current CHRRM reading is 45,000 R/hr and the "Override Monitor" CHRRM reading is 40,000 R/hr (for a Gap Source Type), then advance to the Core Melt Source Type.
11. If the actual current CHRRM monitor reading is not higher than the "Override Monitor" reading, continue with the currently selected Source Type.
12. Continue to monitor CHRRM readings. If CHRRM readings are elevating, this may prompt a Source Type change.

SOURCE AIR SAMPLE ANALYSIS

The **Source Air Sample (SRC SAMP)** option can be used whenever airborne fission products are present in the plant and an actual effluent air sample is obtained and analyzed for isotopic composition.

These air samples represent an actual mix of isotopes being present, therefore, can be used to calculate release rates in-lieu of default Source Types (i.e. Coolant, Gap, and Core Melt). Source air samples are directly related to the building in which they are obtained. For example, the source air sample for the LOCAC Accident Type is a Primary Containment (PASS) atmosphere sample. Each Accident Type (except Fuel Handling Accident) has a corresponding source air sample based on the building it represents. The air sample analysis screen requires a Sample Time (defaults to previous time step). The user must enter the date/time the sample was taken. This enables Raddose-V to decay corrects the isotopes.

To perform dose assessment using the SRC SAMP option, perform the following:

1. Select SRC SAMP from the Source Type drop down menu.
2. Enter airborne isotopic concentrations (in uCi/cc).
3. Enter date and time when sample was obtained.

NOTE: Raddose-V generates a pop-up message box asking the user if the isotopic mix will be used in subsequent time steps. If yes, the isotopic mix is carried forward and decay corrected. If no, the user will need to select new source term data inputs on the next time step.

- a. Once concentrations and sample date and time are entered and self-checked, click OK.
4. Return to Enclosure C, step 18 to continue Manual Mode operations.

END

GENERAL EMERGENCY

Revision Summary

- 1) Deleted reference to ERIS and replaced it with Integrated Plant Computer System (IPCS) in Attachments 1 and 2.

Implementation Plan

- 1) This revision goes into effect upon issuance.

Attachments

CM

- 1 032803 General Emergency - Checklist for Immediate Actions
- 2 032803 General Emergency - Checklist for Follow-Up Actions

Enclosures - None

| <i>Information and Procedures</i> | | | | |
|-----------------------------------|--------------------------|-----------------------------|------------------------|-------------------|
| DSN EP-105 | Revision 15 | DCR # 03-0181 | DTC TPEPT | File # 1703.10 |
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CONTROLLED

1.0 PURPOSE

Prescribes actions to be taken when an emergency has been classified as a General Emergency.

2.0 USE REFERENCES

- 2.1 EP-101, Classification of Emergencies
- 2.2 EP-204-01, Damage Control and Rescue Teams
- 2.3 EP-220, Personnel Monitoring and Radiological Emergency Teams
- 2.4 EP-290, Emergency Notifications
- 2.5 EP-402, Responsibilities of the Recovery Organization
- 2.6 EP-530, Assembly and Accountability and Onsite Protective Actions
- 2.7 EP-542, Computer-Based Offsite Dose Assessment – Airborne Release
- 2.8 EP-545, Protective Action Recommendations
- 2.9 20.000.22, Plant Fires
- 2.10 MLS05, Notifications/General Regulatory Reporting Requirements
- 2.11 Off-Site Dose Calculation Manual

3.0 ENTRY CONDITIONS

An emergency has been classified as a **GENERAL EMERGENCY** in accordance with EP-101.

4.0 GENERAL INFORMATION

- 4.1 **Definition of General Emergency:** Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed Environmental Protection Agency (EPA) Protective Action Guidelines exposure levels offsite for more than the immediate site area.

4.2 The purpose of the General Emergency declaration is to:

- 4.2.1 Initiate predetermined protective actions for the public.**
- 4.2.2 Provide continuous assessment of information from licensee and offsite organization measurements.**
- 4.2.3 Initiate additional measures as indicated by actual or potential releases.**
- 4.2.4 Provide consultation with offsite authorities.**
- 4.2.5 Provide updates for the public through offsite authorities.**

NOTE: If assembly and accountability was ordered for a lower emergency classification, it may be omitted at the General Emergency at the discretion of the Emergency Director.

- 4.3 The Technical Support Center (TSC), Operational Support Center (OSC), Emergency Operations Facility (EOF) and Joint Public Information Center (JPIC) emergency response facilities are activated for a General Emergency. The Fermi 2 Emergency Call Out System must be activated and assembly of all personnel within the Protected Area ordered to achieve staffing of the facilities. Control Room personnel must perform these duties as soon as possible after declaration of a General Emergency.**
- 4.4 Emergency notification to government agencies is detailed in EP-290. State and local governments must be notified within 15 minutes of declaration of the emergency. The Nuclear Regulatory Commission (NRC) must be notified immediately following the offsite authorities but not to exceed 1 hour. Notify Canada immediately after the NRC.**
- 4.5 The Shift Manager shall continue to act as Emergency Director until relieved of this responsibility by the Plant Manager/alternate or until the emergency situation is terminated.**
 - 4.5.1 When the Plant Manager/alternate relieves the Shift Manager and the TSC is functional, the functions of the Emergency Director shall be shifted to the TSC, including notification, dose assessment, and protective action recommendations.**
 - 4.5.2 The Shift Manager shall remain in the plant to supervise plant operations.**
 - 4.5.3 Notifications to the NRC shall be made from the Control Room throughout the emergency, unless otherwise ordered by the Emergency Director.**

- 4.6 When the EOF is declared functional, the Emergency Officer shall relieve the Emergency Director of the following responsibilities:

NOTE: Notifications to the NRC shall be made from the Control Room throughout the emergency, unless otherwise ordered by the Emergency Director.

- 4.6.1 Notification of and communications with government agencies.
 - 4.6.2 Offsite radiological surveys and environmental sampling.
 - 4.6.3 Dose assessment/projection, and meteorology.
 - 4.6.4 Protective Action recommendations
- 4.7 When a Site Area or General Emergency is declared and the EOF is functional, the Emergency Officer shall assume overall responsibility for the emergency response. The Emergency Director will report directly to the Emergency Officer. The Emergency Officer shall be directly responsible for technical review of information and updates to the Joint Public Information Center (JPIC) for dissemination to the press and the public, and shall approve all protective actions recommended to the offsite authorities.

5.0 IMMEDIATE ACTIONS

- 5.1 Complete General Emergency - Checklist for Immediate Actions (Attachment 1).
- 5.1.1 Attachment 1 must be signed by the Emergency Director or the Emergency Officer.

6.0 PROCEDURE - None

7.0 FOLLOW-UP ACTIONS

- 7.1 Complete General Emergency - Checklist for Follow-Up Actions (Attachment 2).
- 7.1.1 Attachment 2 must be signed by the Emergency Director or the Emergency Officer.
- 7.2 Continue to monitor the progress of Emergency Teams in controlling the emergency.
- 7.3 Ensure that additional personnel support and equipment are made available as necessary.

- 7.4 Periodically make follow-up status reports to on-shift personnel. Ensure all operations personnel and emergency response personnel are kept informed of:
 - 7.4.1 Personnel hazards
 - 7.4.2 Plant lineups
 - 7.4.3 Corrective actions
 - 7.4.4 Steps taken to control or mitigate the emergency
 - 7.4.5 Status of any offsite protective actions ordered by the state
- 7.5 Periodically make follow-up reports to State of Michigan, Monroe County, Wayne County, Nuclear Information, and NRC using EP-290.
- 7.6 Establish a long-term relief rotation to ensure personnel are not required to remain at their assigned positions for an excessive period of time (normally not greater than 12 hours).
- 7.7 The Emergency Director may de-escalate to an appropriate, lower emergency classification if:
 - 7.7.1 The emergency condition(s) no longer meets the requirements for a General Emergency; and
 - 7.7.2 The actual and potential offsite radiological hazard does not exceed the Offsite Dose Calculation Manual (ODCM) gaseous effluent limits for dose and dose rate or has been eliminated; and
 - 7.7.3 The Emergency Director (Emergency Officer if the EOF is activated) has conferred with the State of Michigan officials and the NRC and all three parties agree on de-escalating and
 - 7.7.4 The Emergency Officer concurs (if the EOF is activated).
- 7.8 If the emergency situation is de-escalated, enter EP-104, Site Area Emergency, or EP-103, Alert, or EP-102, Unusual Event, as applicable.

7.9 The emergency situation may be terminated if:

- 7.9.1 Release of radioactive materials has ceased and or is within ODCM limits, and**
- 7.9.2 No further potential exists for uncontrolled releases of radioactive materials to the environment, and**
- 7.9.3 The reactor and associated systems are in a stable, safe condition, and**
- 7.9.4 Termination of the emergency will not adversely impact offsite protective actions that are in progress.**

7.10 If the emergency classification is terminated or de-escalated:

- 7.10.1 A summary of the termination or de-escalation shall be provided to the State of Michigan in accordance with EP-290.**
- 7.10.2 A summary of the termination or de-escalation shall be provided to the NRC**
- 7.10.3 Carry out the actions described in EP-402, Responsibilities of the Recovery Organization, as applicable.**

7.11 Completed forms shall be forwarded to the Supervisor, RERP for disposition.

8.0 RECORDS

8.1 The following are required records and shall be retained or dispositioned in accordance with established requirements:

- 8.1.1 All completed General Emergency - Checklist for Immediate Actions (Attachment 1)**
- 8.1.2 All completed General Emergency - Checklist for Follow-Up Actions (Attachment 2)**

END OF TEXT

GENERAL EMERGENCY - CHECKLIST FOR IMMEDIATE ACTIONS

Complete NA

1. ☐ On-shift personnel notified.
2. ☐ Fermi 2 Emergency Call Out System activated in accordance with EP-290.
3. ☐ ☐ Assembly and accountability ordered within the Protected Area in accordance with EP-530.
4. ☐ TSC, OSC, EOF, and JPIC activated.
5. ☐ Offsite Protective Action Recommendation formulated in accordance with EP-545.
6. ☐ Emergency Director/Emergency Officer have conferred with State Emergency Director regarding Protective Action Recommendations.
7. ☐ Immediate notifications to offsite authorities in accordance with EP-290.
8. ☐ NRC Operations Center notified immediately following offsite authorities, not to exceed 1 hour, in accordance with EP-290.
9. ☐ ☐ Radiological Emergency and Personnel Monitoring Teams activated (EP-220).
10. ☐ ☐ Fire Brigade activated (20.000.22).
11. ☐ ☐ Damage Control and Rescue Teams activated (EP-204-01).
12. ☐ ☐ Offsite emergency support requested (EP-290).
13. ☐ Province of Ontario notified in accordance with EP-290.
14. ☐ Nuclear Information notified in accordance with EP-290.
15. ☐ ☐ Radiological sampling ordered (EP-220/ODCM).
16. ☐ ☐ Offsite dose assessment initiated (EP-542/ODCM).
17. ☐ ☐ Onsite protective actions ordered (EP-530).
18. ☐ "General Emergency" entered into Integrated Plant Computer System (IPCS).
19. ☐ Emergency Response Data System (ERDS) activated.

Emergency Director/Emergency Officer signature _____

Forward completed form to Supervisor, RERP, 164 NOC

GENERAL EMERGENCY - CHECKLIST FOR FOLLOW-UP ACTIONS

Complete NA

1. ☐ ☐ Additional Control Room personnel placed on standby.
2. ☐ ☐ Follow-up actions of Abnormal and Emergency Operating Procedures completed.
3. ☐ ☐ TSC, OSC, EOF, and JPIC functional.
4. ☐ ☐ Assess plant conditions and reclassify if necessary in accordance with EP-101.
5. ☐ ☐ Follow-up reports completed in accordance with EP-290.
6. ☐ ☐ On-shift personnel informed of changing conditions.
7. ☐ ☐ All reporting requirements met in accordance with MLS05.
8. ☐ ☐ Long term organization established.
9. ☐ ☐ INPO and Nuclear Insurers notified (EP-290).
10. ☐ ☐ Emergency terminated or deescalated.
11. ☐ ☐ Emergency termination or deescalation notification and summary to offsite authorities in accordance with EP-290.
12. ☐ ☐ Emergency termination notification and summary to NRC Operations Center in accordance with EP-290.
13. ☐ ☐ Recovery initiated (EP-402).
14. ☐ ☐ Update the Integrated Plant Computer System (IPCS) emergency classification entry.

Comments: _____

Emergency Director/Emergency Officer signature _____

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