

DUKE POWER COMPANY

EMERGENCY DOSE ASSESSMENT MANUAL

June 13, 1989

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CRISIS MANAGEMENT PLAN

IMPLEMENTING PROCEDURE

EDA - 9

"Environmental Monitoring for Emergency Conditions for  
McGuire Nuclear Station"

*R E Harris*  
Approved By

*8/10/87*  
Date

Rev. 0  
August 15, 1987

DUKE POWER COMPANY  
ENVIRONMENTAL MONITORING FOR EMERGENCY CONDITIONS  
FOR  
MCGUIRE NUCLEAR STATION

1.0 PURPOSE

To provide a systematic method for identifying airborne plumes or liquid effluents, and obtaining field data indicative of the radiation exposure to the general public following a suspected uncontrolled release of radioactive material.

2.0 REFERENCES

- 2.1 Crisis Management Implementing Procedures, CMIP-7, "Radiological Assessment Group Implementing Procedure."
- 2.2 Crisis Management Plan, Section H, "Emergency Facility and Equipment," Section I, "Accident Assessment."
- 2.3 Duke Power Company Radio Operators Manual.
- 2.4 NUREG-0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."
- 2.5 FEMA REP-2, Rev. 1, "Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 - Airborne Release."

3.0 LIMITS AND PRECAUTIONS

- 3.1 Enclosure 5.1 contains protective clothing, dosimetry, and respiratory equipment criteria for field monitoring. The Offsite Monitoring Coordinator (OMC) can change these criteria depending upon conditions.
- 3.2 Open radio communications shall be maintained between the OMC and the FMT's. If the radio becomes inoperable, the FMT's shall telephone the OMC in the Crisis Management Center (CMC).
- 3.3 The radio operator should use the radio operation guidance per reference 2.3.
- 3.4 During a drill, repeat the statement, "This is a drill, this is a drill" at the beginning and end of each radio transmission.

NOTE: The radio call sign is WQC-700.

- 3.5 A helicopter team may be activated for radiological surveillance as determined by the OMC per reference 2.1.

- 3.6 The helicopter team shall be used for qualitative (plume location) and not quantitative analysis.
- 3.7 Backup sampling vans and FMT members shall be provided by the unaffected stations upon request from the OMC to the respective Station Health Physicist.
- 3.8 Environmental sampling during emergency conditions shall not replace, but rather supplement normal environmental monitoring.

#### 4.0 PROCEDURE

##### 4.1 Field Monitoring Team (FMT) Activation

- 4.1.1 Form as many survey teams and sampling van teams as possible, based upon the number of personnel available and field monitoring required.

<u>Call Sign</u>	<u>Members</u>	<u>Transportation</u>
Alpha	2	Emergency Van
Bravo	2	Land Vehicle
Charlie	2	Land Vehicle
Delta	2	Emergency Van
Echo	2	Helicopter
Gamma	2	Emergency Boat

For any backup sampling vans from other stations, the call sign shall be preceded by the station name (ex. Catawba Alpha Team).

- 4.1.2 The OMC shall coordinate with the station Field Monitoring Coordinatro (FMC) to ensure that at least one FMT member from the affected station is on each FMT in the event that backup sampling vans/FMT members are provided from other stations.

##### 4.2 Locating and Tracking the Plume

- 4.2.1 Unless otherwise directed by the OMC, the FMT's will generally be dispatched as follows:

- Alpha - performance of air sample and beta/gamma radiation surveys and mobile analyses beyond the 0.5 mile radius from the plant, utilizing an emergency van.
- Bravo - performance of beta/gamma radiation surveys on the right lateral edge of the suspected area to determine plume boundaries, utilizing a

station vehicle.

Charlie - performance of beta/gamma radiation surveys on the left lateral edge of the suspected area to determine plume boundaries, utilizing a station vehicle.

Delta - performance of air sample and beta/gamma radiation surveys and mobile analyses beyond the 0.5 mile radius from the plant, utilizing an emergency van.

Echo - performance of aerial beta/gamma radiation surveys, utilizing a helicopter.

Gamma - performance of beta/gamma radiation surveys on adjacent lake areas, utilizing an emergency boat.

4.2.1.1 The OMC may direct the FMT's to traverse the plume, if not dose prohibitive.

4.2.1.2 The OMC may direct the helicopter team to conduct aerial radiation surveys to locate "hot spots" within the plume path.

4.2.2 Utilizing preselected monitoring locations and/or the quadrants depicted on the station EPZ map, the OMC will direct FMT's to systematically survey the suspected areas and to obtain air samples as conditions warrant.

4.2.2.1 The preselected monitoring locations are shown on the Catawba Nuclear Station Emergency Planning Zone map as orange dots and labelled with orange print (ex. C2-10-7, where: C2 is the zone, 10 is the approximate distance from the station in miles, and 7 is the location number).

4.2.2.2 Each quadrant consists of a four square mile area (two miles on each side). This area is then sub-divided into four sub-quadrants of one square mile each.

4.2.2.2.1 A quadrant on the EPZ Map will be identified by, 1) the letter depicting the

column and 2) the number depicting the row (ex. H-12).

NOTE: The letter "I" has been omitted to eliminate possible confusion with the number one (1).

4.2.2.2.2 A sub-quadrant will be described as either the upper left (UL), upper right (UR), lower left (LL), or lower right (LR).

4.2.2.3 FMT's shall report the location, and radiation levels, including the highest and the approximate average radiation levels within the sub-quadrant to the OMC.

4.2.3 The radio operator shall use the Field Monitoring Survey Data Sheet (Enclosure 5.2) to log FMT movement and field data such as beta/gamma surveys, air samples, and smears.

4.2.4 The OMC shall periodically provide information on the emergency classification, wind speed, wind direction and sectors affected to the FMT's.

4.2.5 If FMT's are expected to be working in plume exposure dose rates of  $>500$  mR/hr, then the OMC shall periodically check and track FMT members radiation exposures using Enclosure 5.3.

#### 4.3 Special Sampling, as directed:

4.3.1 The OMC may request FMT members to collect additional special samples including but not limited to: smears of surrounding areas, integrated dose over a period of time with TLD's, broad-leaf vegetation, shoreline sediment, and milk. FMT's may also be requested to retrieve and replace environmental air samples and/or TLD's.

#### 4.4 FMT Turnover

4.4.1 Each FMT shall be relieved as directed by the OMC.

4.4.2 The OMC shall direct the FMT's to provide turnover to the relief FMT's.

NOTE: Relief FMT's must bring their own dosimetry.

4.5.4 FMT's shall turn in all data sheets to the OMC or designee, as directed.

5.0 ENCLOSURES

- 5.1 Recommended Criteria for Protective Clothing, Dosimetry, and Respiratory Equipment
- 5.2 Field Monitoring Survey Data Sheet
- 5.3 Field Monitoring Team Radiation Exposure Record



Recommended Criteria for Protective Clothing, Dosimetry, and Respiratory Equipment  
DUKE POWER COMPANY

MCGUIRE NUCLEAR STATION

Date \_\_\_\_\_ Time \_\_\_\_\_  
Job Description Field Monitoring Emergency Response Activities

Location: Building/Unit N/A Room/Elevation N/A Area 10 Mile EPZ

PROTECTIVE CLOTHING AND EQUIPMENT REQUIRED

Job Classification  
Refer to Comments Section

A	B	C	D
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Hood

Disposable		X	X	X
Cloth				
Wetsuit				

Coveralls

Disposable	X	X	X	X
Cloth				
Wetsuit				

Gloves

Cotton liner	X	X	X	X
Rubber		X	X	X
Surgical				
Cotton Work				
Heavy Rubber				
Leather				

Shoe Covers

Disposable		X	X	X
Cloth				
Rubber				
Heavy Rubber				

Tape Required

	X	X	X	X
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No Personal Outer Clothing

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Dosimetry

Whole-Body TLD	X	X	X	X
Extremity TLD				
Low Range Pocket Dosimeter	X	X	X	X
High Range Pocket Dosimeter	X	X	X	X
Extremity Pocket Dosimeter				
Digital Alarming Dosimeter				

Respiratory

Full-Face Particulate/Iodine			X	X
Air Line				
SCBA				
Air Supplied Suit/Hood				
Potass. Iodide Tablet				X

SPECIAL INSTRUCTIONS/PRECAUTIONS

- Notify FMC/OMC prior to start of work, or changing work locations.
- Contact FMC/OMC for expected conditions during job.
- Utilize RCZ/ \_\_\_\_\_ laundry bins/and Radioactive waste containers.
- Health Physics approval required prior to sweeping, brushing, grinding, welding, or use of compressed air and solvents.
- Provide for adequate system drainage and provide absorbent material to pick up water.
- Lay down polyethylene and/or canvas to protect work surfaces and limit contamination.
- Set up local exhaust system with HEPA filter for proper ventilation.
- Enter time in RCA/RCZ on Daily Exposure Time Record Card.
- Review area Radiological Status Sheet prior to entry.
- Low dose-rate areas are identified.
- Personnel/tool/equipment monitoring required when leaving RCA/RCZ.
- Housekeeping tour required before RWP termination.

Refer to Comments Section for Additional Instructions/Information.

Health Physics Coverage Required	Radiation Monitoring Required	ALARA Considerations												
<input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent <input type="checkbox"/> Start of Work <input type="checkbox"/> Dose Controller <input type="checkbox"/> _____ <input type="checkbox"/> _____	<table border="1"> <tr> <th>Type</th> <th>Level</th> </tr> <tr> <td><input type="checkbox"/> Alpha</td> <td>_____ X _____ Radiation Level</td> </tr> <tr> <td><input checked="" type="checkbox"/> Beta</td> <td>_____ X _____ Contamination</td> </tr> <tr> <td><input type="checkbox"/> Gamma</td> <td>_____ X _____ Airborne Particulate</td> </tr> <tr> <td><input checked="" type="checkbox"/> Beta-Gamma</td> <td>_____ X _____ Airborne Iodine</td> </tr> <tr> <td><input type="checkbox"/> Neutron</td> <td>_____ _____ Gaseous Activity</td> </tr> </table> <p><i>See survey and/or supplemental sheets for specific levels</i></p>	Type	Level	<input type="checkbox"/> Alpha	_____ X _____ Radiation Level	<input checked="" type="checkbox"/> Beta	_____ X _____ Contamination	<input type="checkbox"/> Gamma	_____ X _____ Airborne Particulate	<input checked="" type="checkbox"/> Beta-Gamma	_____ X _____ Airborne Iodine	<input type="checkbox"/> Neutron	_____ _____ Gaseous Activity	<input checked="" type="checkbox"/> Pre-Job Briefing <input checked="" type="checkbox"/> Post-Job Debriefing <input type="checkbox"/> Tool List <input type="checkbox"/> Temp. Shielding <input type="checkbox"/> _____ <input type="checkbox"/> Additional Sheet
Type	Level													
<input type="checkbox"/> Alpha	_____ X _____ Radiation Level													
<input checked="" type="checkbox"/> Beta	_____ X _____ Contamination													
<input type="checkbox"/> Gamma	_____ X _____ Airborne Particulate													
<input checked="" type="checkbox"/> Beta-Gamma	_____ X _____ Airborne Iodine													
<input type="checkbox"/> Neutron	_____ _____ Gaseous Activity													

Notice: Each radiation worker is responsible for knowing their work area dose rates and the location of low dose-rate waiting areas. Each radiation worker is responsible for following the requirements of this RWP.

	B-γ Radiation (mR/hr)	Airborne Activity (MPC/μCi/ml)	Contamination (dpm/100 cm <sup>2</sup> /ccpm*)
A	≤0.04	<0.25	<1000
		<2.3 E <sup>-9</sup>	<30
B	0.04-0.12	<0.25	1000-15,000
		<2.3E <sup>-9</sup>	<450
C	0.12	≥0.25	15,000-150,000
		>2.3E <sup>-9</sup>	<4500
		≥745	*with HP210/260 probe
		≥6.7E <sup>-6</sup>	on RM-14 or equivalent



