Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379

February 22, 2000

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - EMERGENCY PLAN IMPLEMENTING PROCEDURE (EPIP) REVISIONS

In accordance with the requirements of 10 CFR 50, Appendix E, Section V, enclosed are copies of SQN EPIP-10, Revision 13, "Medical Emergency Response"; and EPIP-15, Revision 8, "Emergency Exposure Guidelines."

If you have any questions concerning this matter, please telephone me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

Pedro Salas
Licensing and Industry Affairs Manager

Enclosure
cc: See page 2

A045

cc: Mr. R. W. Hernan, Project Manager (Enclosure)
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852-2739

NRC Resident Inspector (Enclosure will be provided by
Sequoyah Nuclear Plant SQN Document Control Unit)
2600 Igou Ferry Road
Soddy-Daisy, Tennessee 37384-3624

Regional Administrator (Enclosure)
U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303-3415

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP-10

MEDICAL EMERGENCY RESPONSE

Revision 13

QUALITY RELATED

Reference Use

PREPARED/PROOFREAD BY: J. Randy Ford

RESPONSIBLE ORGANIZATION: Emergency Preparedness

APPROVED BY John Casey

EFFECTIVE DATE: February 16, 2000

REVISION DESCRIPTION: This is a non-intent change and does not impact the effectiveness of this procedure or the REP. Removed the requirement for the MERT leader to contact the Health Station as this is performed by the Shift Manager (step 4.5.B); clarified support provided by the nurse at the de-contamination facility. Revised phone numbers on Attachment and made format and grammatical enhancements. Added Fire Ops Group Pager. Updated references. Clarified transport of non-contaminated/non-irradiated patients to non-agreement hospitals if requested. Revised organizational titles. Consolidated patient transport decisions into a separate appendix. Emphasized difference between MERT and first-aid by creating SCOPE section. Revision bars not shown due to substantial reformatting.

TABLE OF CONTENTS

1.0 PURPOSE

This procedure outlines the actions to be followed by the Medical Emergency Response Team (MERT) during medical emergencies.

2.0 SCOPE

The activation of the MERT and the medical alarm (extension 3911) is not required if the patient needs only minor treatment of cuts, scrapes, or illness and the following conditions are met:

- Medical or EMT personnel are immediately available to attend to the patient and no additional assistance needs to be summoned to assist in that treatment.
- Assistance is not required from Radcon, Operations, or Security.
- The patient is not in medical distress and
- Patient will not be transported offsite by TVA or HCEMS ambulance.

3.0 REFERENCES

3.1 EPIP-7, "Activation and Operation of the Operations Support Center"

3.2 EPIP-15, "Emergency Exposure Guidelines"

3.3 EPIP-17, "Emergency Equipment and Supplies"

3.4 SPP-3.5, "Regulatory Reporting Requirements"

4.0 INSTRUCTIONS

4.1 Initial Response

Upon discovering an ill or injured person, personnel shall:

A. Administer aid for any life threatening situation if trained.

B. Summon assistance from available personnel in the immediate area.

C. Notify the Control Room of the medical emergency by calling extension 3911.

D. Patients known or suspected of being in medical distress shall not be allowed to walk, especially when the cause of distress may be aggravated by exertion.

4.2 Control Room Response

The Control Room will obtain:

- Name of caller,
- Location (building, elevation, column),
- Type of medical emergency,
- Number of personnel involved,
- Immediate area hazards (radiological, safety), and
- Telephone number of caller.

4.3 Activation of the Medical Emergency Response Team (MERT)

Upon receipt of the emergency call (code call), the Control Room will:

A. Notify the Shift Manager and the Incident Commander of the emergency.

B. Verify Fire Operations is notified by:

1. Ringdown line to Fire Operations or
2. Operations radio (channel F-3) or
3. Call extension 7447 or 7448 or,
4. Page Fire Operations by pushing the "FPU Page" button on the emergency phone (or pager 90478 if autodial is non-functional).

C. Perform a plant-wide PA announcement that a medical emergency has been reported to alert the MERT to respond to the location.

D. Confirm/coordinate MERT response (via radio or phone) until Incident Commander assumes control.

E. If the Operations Support Center (OSC) has been activated under EPIP-7, the MERT will coordinate the emergency by radio or telephone through the OSC Fire Operations Advisor, who shall ensure a Team Tracking Number is assigned for tracking and debriefing purposes.

4.4 MERT Response

The MERT will proceed to the emergency and shall consist of:

- Incident Commander [Unit Supervisor (US)Team Leader].
- Fire Operations Personnel (EMT and MERT Leader).
- Level I and/or II Responders.
- RADCON technician(s).
- Site Security Officer(s).
- Health Services - as requested

4.5 Responsibilities of the Shift Manager

Shift Manager shall:

A. Establish and maintain communications with the Incident Commander.

B. Ensure the Health Services Station (if staffed) has been notified to standby and monitor the radio.

C. Notify Site Security to escort the ambulance onsite as required or establish access control at the helicopter landing zone.

D. If an ambulance is requested by Health Services and the MERT is not activated, alert the Incident Commander and MERT leader to coordinate support activities.

E. Notify industrial safety as time permits.

F. If transporting to an agreement hospital, the Shift Manager shall complete Attachment 1 and provide the information to the receiving hospital. Attachment 1 will be forwarded to the SQN Emergency Preparedness Manager for retention for two years.

G. Consider dispatching an Environmental Monitoring to assist in analyzing the samples taken by the plant RADCON group at the hospital. The van should be dispatched prior to ambulance departure from the site to ensure timely arrival at the hospital.

H. The Shift Manager is responsible for any further notifications in accordance SQN SPP-3.5 and applicable site procedures.

I. The Shift Manager should verify that the patient's emergency contact has been notified in accordance with applicable site procedures.

4.6 Responsibilities of the Incident Commander

Incident Commander/Unit Supervisor (US) will:

A. Provide direction on the scene until relieved by the MERT Leader.

B. Coordinate and direct plant personnel in support of medical response activities provided by the MERT, (i.e., Radiological Control or Security, as conditions warrant).

C. Determine from RADCON if patient was irradiated in excess of 5 Rem or is contaminated.

D. With the MERT Leader, determine the number of patients, appropriate hospital, and mode of transport for each and notify the Shift Manager.

E. Notify the Shift Manager of any TVA or Offsite emergency vehicle use.

F. Determine from the MERT Leader if the Health Services Nurse is needed and if needed, notify the Shift Manager to have Health Services respond.

4.7 Responsibilities of the Fire Operations MERT Leader

MERT Leader will:

A. Direct the on-scene medical response and rescue activities and determine mode of patient off site transport.

B. Lead the MERT in and out by best route.

C. Direct Site Security to secure the Triage area if needed.

D. With the Incident Commander, determine the number of patients, appropriate hospital, and mode of transport for each (See Appendix B).

E. Ensure that necessary medical treatment will take precedence over decontamination efforts.

F. Determine from RADCON if each patient was irradiated >5 Rem or is contaminated.

G. Request the HCEMS Paramedic or Supervisor become a member of the Command Post Organization upon arrival to ensure that patients are handled as quickly as possible and in the appropriate order based on their injuries.

H. Keep Shift Manager advised (through the Incident Commander) of the situation and request additional aid as needed.

I. When Lifeforce is called, contact Lifeforce on the TnEMS Frequency 155.205 Mhz (TnEMS Mutual Aid frequency).

J. Establish and assume responsibility for the Helicopter Landing Zone.

K. Request that the HCEMS medical attendant inform the Shift Manager if the ambulance is diverted to a different hospital after leaving site.

L. Request that the HCEMS medical attendant in the transporting vehicle follow-up with the receiving hospital and provide Estimated Time of Arrival (ETA), medical conditions, radiological conditions, and any pertinent patient information via radio or cellular phone immediately upon site departure.

M. If communication difficulties arise, the onsite Operations Fire Foreman or Shift Manager shall perform the follow-up notification by telephone. As a minimum, an updated ETA and confirmation of medical and radiological conditions shall be conveyed.

4.8 Responsibilities of the Fire Ops. EMT

The EMT will:

A. Assist in delivery of necessary medical and rescue equipment to the scene.

B. Provide emergency medical care as trained.

C. If needed, perform patient rescue and extrication from hazardous areas and assist in relocation to the Triage area (e.g.: elevation 706' breezeway outside the Work Coordination Center).

D. Provide ambulance transport and care as required.

4.9 Responsibilities of Health Services

Health Services (Nurse) will:

A. Remain at the Health Services Station while monitoring the patient's status via radio communications.

B. Prepare to assist with patient care in the event the patient is brought to the site Health Services Station.

C. Respond to the accident scene or triage area when requested (e.g., triage or multiple casualty incidents) by the Incident Commander through the SM. Security will arrange escort per 4.11.E.

D. As requested, coordinate radiological assessment and decontamination efforts with RADCON while onsite as the medical status permits. (See Appendix A.)

E. Perform follow-up notifications and provide the hospital with a medical history.

F. As required and as available, the plant nurse will provide any relevant medical information requested by the patient's attending physician.

4.10 Responsibilities of Radiological Control (RADCON)

Radiological Control (RADCON) will:

A. Advise the MERT of radiological conditions and protective actions including ALARA considerations and exposure control.

B. Provide contamination control and monitoring assistance during patient handling, transport, and decontamination. (Appendix A)

C. Determine if each patient was irradiated > 5 Rem or is contaminated. Personnel exceeding 5 Rem will be considered as "irradiated" under Section 2.0 of Appendix A.

D. If personnel contamination with injury has occurred, necessary medical treatment will take precedence over decontamination efforts.

E. Provide area and equipment contamination control during emergency and recovery phase activities.

F. Provide support to plant/ambulance/hospital personnel as necessary. Support may include activities deemed necessary by the MERT Leader or Incident Commander, such as establishing control zones to limit the spread of contamination from chemicals or radioactive materials.

G. If contamination or irradiation is suspected or confirmed, RADCON personnel (as available) will accompany the patient and provide radiological services as required. (See Appendix A)

H. As medical conditions allow, if internal contamination is suspected, RADCON shall initiate an isotopic analysis on a sample of the contamination involved and provide data to the receiving hospital as requested.

I. RADCON will provide the receiving hospital with radiological information upon arrival. As required, further information such as patient exposures by processed TLDs and isotopic analyses through gamma-ID results may be conveyed to the hospital's Radiation Safety Officer by telephone at first opportunity.

J. At the first opportunity and as information becomes available, RADCON will notify TVA Health Services anytime TVA personnel receive radiation doses in excess of the TVA occupational dose limits.

4.11 Responsibilities of Site Security

Site Security will:

A. Facilitate emergency personnel and equipment movement through security areas.

B. Provide crowd control at the accident scene, triage area, and ambulance and provide assistance as requested.

C. Provide access control to the Helicopter Landing Zone limiting access to those directly involved in patient care and transport.

D. Escort offsite ambulances to the accident scene or point of patient transfer, as required.

E. Escort Health Services personnel from the health station to the accident scene as required.

F. Badge out at the vehicle gate the ambulance crew and personnel being transported in a TVA ambulance as non-emergency traffic.

4.12 Supplies

A. As needed, Corporate Emergency Preparedness shall restock and inventory the Radiological Emergency Supply Cabinets located at the agreement hospitals in accordance with EPIP-17.

B. Specialized replacement items can be obtained in coordination with the SQN Emergency Preparedness Manager as required.

5.0 RECORDS

5.1 QA Records

None.

5.2 Non-QA Records

The Hospital and Personnel Notification Report in this Instruction is a Non-QA document and will be retained by the SQN Emergency Preparedness Manager for two years.

Appendix A
Page 1 of 3

1.0 GENERAL PATIENT CARE GUIDELINES

1.1 First aid and emergency medical care should be provided onsite to preserve life and to minimize injury and suffering.

1.2 The medical emergency response team will take appropriate medical action as directed by the EMT trained in emergency medical care until the patient is transferred to a higher medical authority.

1.3 The Medical Director at the Emergency Room should be consulted when in the EMTs judgment further professional attention is needed.

1.4 If no work related trauma, life-threatening conditions, contamination, or excessive exposure are involved or suspected and the patient is informed and capable, then the patient may have the choice of hospital when offsite medical attention is necessary.

1.5 The care of persons known or suspected to be associated with radiation exposure or contamination will be coordinated with RADCON. The essential aims of the medical-RADCON team are:

- Minimize the injury and further radiation exposure to the victim.
- Protect attending personnel from excessive and unnecessary radiation exposure.
- Control spread of radioactive contamination.
- Assess and document the patient's radiological exposure.
- Immediate lifesaving and disability limiting procedures will take precedence over noncritical decontamination and dosimetry assessment procedures.

1.6 As medical conditions allow, inform the patient of his/her radiological status.

2.0 IRRADIATED-NONCONTAMINATED

2.1 Remove the victim from further exposure providing only essential first aid in the process, then direct attention to medical care of other physical injuries.

2.2 Medical care of the radiation exposure is governed by the medical status of the patient and the findings of RADCON. In most cases the treatment of illness or physical injury takes precedence over treatment for radiation exposure.

2.3 Individuals who have received an acute whole body dose of less than 5 rem usually require no medical examination or treatment for the radiation exposure.

Appendix A

Page 2 of 3

2.4 Individuals who have received an acute whole body dose greater than 5 Rem should have hematological studies performed to detect chromosomal aberrations or other changes in blood constituents, under the direction of a TVA physician representative.

2.5 Any personnel known or suspected of receiving radiation exposure in excess of the TVA occupational dose limits should be reported by RADCON personnel to TVA medical and the area medical chief as soon as possible. RADCON should document the amount and type of radiation and assist MEDICAL SERVICES in follow-up by supplying them with this information.

3.0 CONTAMINATED PATIENTS

3.1 The patient should be given initial emergency care by the MERT. All decontamination that the medical status of the patient will allow should be accomplished. The appropriate sequence of care must be determined on an individual basis by the medical-RADCON team. The injured person will be transported and treated in one of two ways:

A. If the person is severely injured, they may be transported directly to an agreement hospital. Every reasonable effort should be made to reduce the radioactive contamination level to less than 500 mRem per hour at one foot. Spread of contamination may be minimized by removing the patient's excess clothing and wrapping him in a sheet, as his injuries permit.

B. If cases of less severe injuries, the patient will be sent to the personnel decontamination facility to remove as much contamination as possible before being treated in the emergency treatment area or transferred to an agreement hospital.

3.2 The RADCON group will collect, identify, label, and analyze all biological specimens as required and deemed necessary. The RADCON Group will obtain the injured person's personal dosimetry and replace with equivalent dosimetry if appropriate.

3.3 The RADCON group will control contamination as necessary during transportation to the receiving hospital.

3.4 At the hospital, a RADCON representative will furnish radiological services as necessary to attending physicians and hospital personnel as requested.

Appendix A

Page 3 of 3

4.0 GENERAL RADCON ASSISTANCE GUIDELINES

4.1 RADCON personnel will assist emergency room personnel in instituting contamination control procedures at the time of the radiation emergency admission.

4.2 Upon arrival at the hospital the lead RADCON person from the plant should report the radiological status to the hospital medical team leader.

4.3 If requested by the hospital, provide this assistance:

- Establish a checkpoint and monitoring station for entry and exit from the contamination control area.
- Survey patients and advise physician in charge of external radiation levels to personnel and of patient contamination.
- Survey personnel, equipment and facilities and designate those that must be restricted for decontamination.
- Supervise decontamination of personnel and facilities and release areas that are not contaminated.
- Direct handling of radioactive waste.
- Request the medical staff collect samples of nasal swabs, clothing, gauze, and materials used in cleansing for analysis. Place in plastic bags and label.

4.4 Survey the ambulance and its contents. Supervise decontamination if required. If the ambulance cannot be surveyed immediately it should be locked to prevent spread of contamination.

4.5 If deemed necessary, an Environmental Monitoring Van will be dispatched to assist in analyzing the samples taken by the plant RADCON group. The van should be dispatched prior to ambulance departure to ensure timely arrival at the hospital.

4.6 Collect contaminated material from hospital and return to site for disposal. Transport of this material will be in accordance with TVA Radiological Material Shipping Manual.

APPENDIX B
DETERMINATION OF BEST METHOD OF PATIENT TRANSPORT
Page 1 of 1

A. If the patient is suspected or known to have been irradiated (< 5 Rem) or contaminated with radioactive material, utilize an agreement hospital and ambulance, listed on Attachment 1.

B. All Sequoyah employees with service related traumatic injuries should be transported to an agreement facility, listed on Attachment 1.

C. If in shock or the condition is life threatening, he or she should be transported to the nearest facility, Memorial North Park Hospital if by ambulance or to Erlanger if by Lifeforce.

D. The selection of the Lifeforce helicopter or the transporting ambulance (SQN versus offsite ambulance) shall be primarily based upon the medical needs of the victim. Since the Fire Operations MERT Leader is responsible for the management of fire/EMT personnel onsite, he/she shall have the final responsibility for selection of the transportation vehicle. Considerations in making the selection include:

- The capabilities of the ambulance service shall be considered according to the medical needs of the patient (Advanced Life Support versus Basic Life Support services). The recommendations of the EMT or nurse should be considered in the decision process.
- The reduction in onsite response capabilities if the TVA ambulance is utilized.
- **Offsite ambulances shall be used as the primary means of transport unless** the medical emergency is life threatening ("load and go"), and the estimated arrival time for an offsite ambulance is unacceptable (adverse impact on patient's condition). To avoid these delays, requests for local ambulance or Lifeforce helicopter support shall be made as soon as the need for transport is identified.

  Examples of "Load and go" or life-threatening conditions:
  - severe airway obstructions not alleviated by manual means,
  - respiratory emergencies (tension pneumothorax),
  - uncontrolled severe bleeding,
  - head injury with unilateral blown or dilated pupils,
  - open chest or abdominal wounds,
  - severe burns,
  - deteriorating level of consciousness or unconsciousness from any cause,
  - cardiac arrest, and
  - severe medical problems including heart attack, stroke, heatstroke, poisoning, abnormal childbirth, and signs or symptoms of shock.

APPENDIX C

Page 1 of 1

TVA has an agreement with the Radiation Emergency Assistance Center/Training Site (REAC/TS) Cytogenetics Laboratory for support services including a white blood cell lymphocyte culture for dose assessment of TEDE exposures to ionizing radiation.

Upon the order of a physician, and in coordination with a health physicist, REAC/TS shall be contacted to request and coordinate the shipment and return of a blood sample kit. This kit contains all necessary collection, shipping, and instruction materials. The kit is provided by REAC/TS to promote optimal test results by use of controlled sample handling materials.

KEY INFORMATION ON CYTOGENTIC BLOOD STUDIES:

WHEN:

Upon the order of a responsible physician, with verification that known or suspected ionizing radiation exposure **(acute TEDE)** exceeds **5 REM.**

FREQUENCY:

Once, unless directed otherwise by REAC/TS or physician.

TO REQUEST KIT:

Attending physician should contact:

REAC/TS, (865) 576-3131 - day time phone number

(865) 576-1005 - after hours.

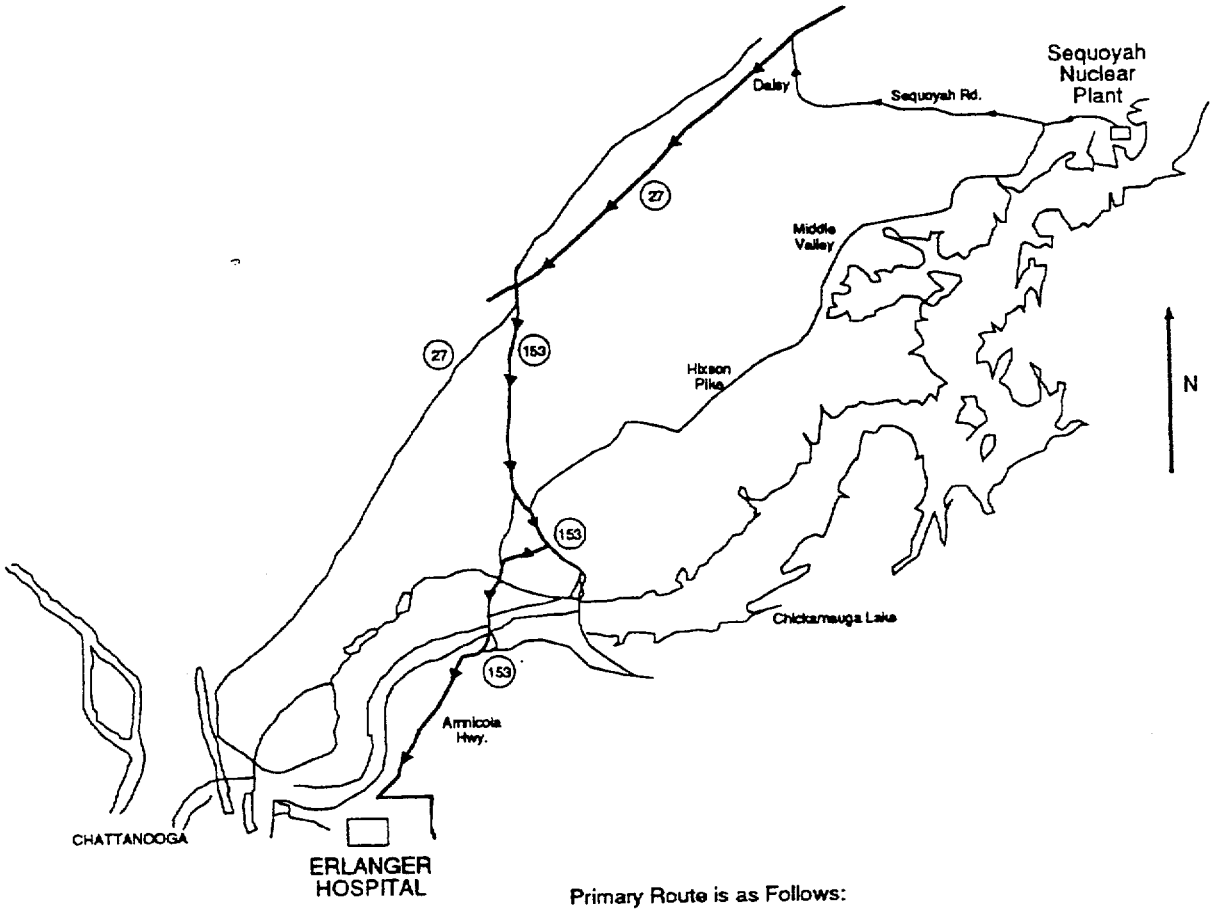
REPORT RESULTS TO:

Attending Physician

Refer to REND,
Section K, Medical Support, 1. TVA Health Services

APPENDIX D
Page 1 of 4

SQN TO CHATTANOOGA



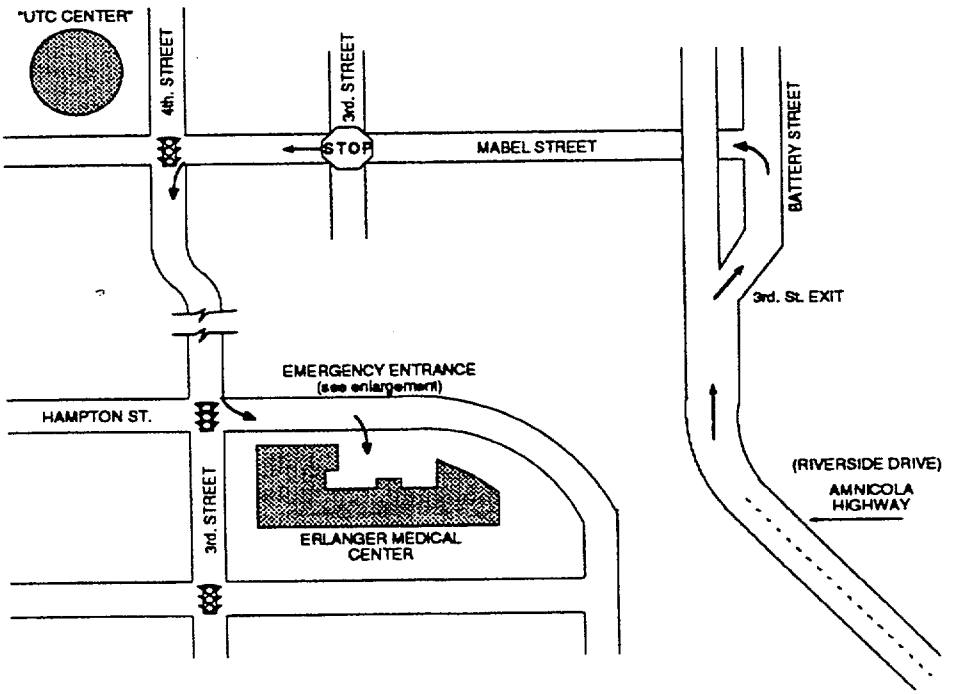
Primary Route is as Follows:

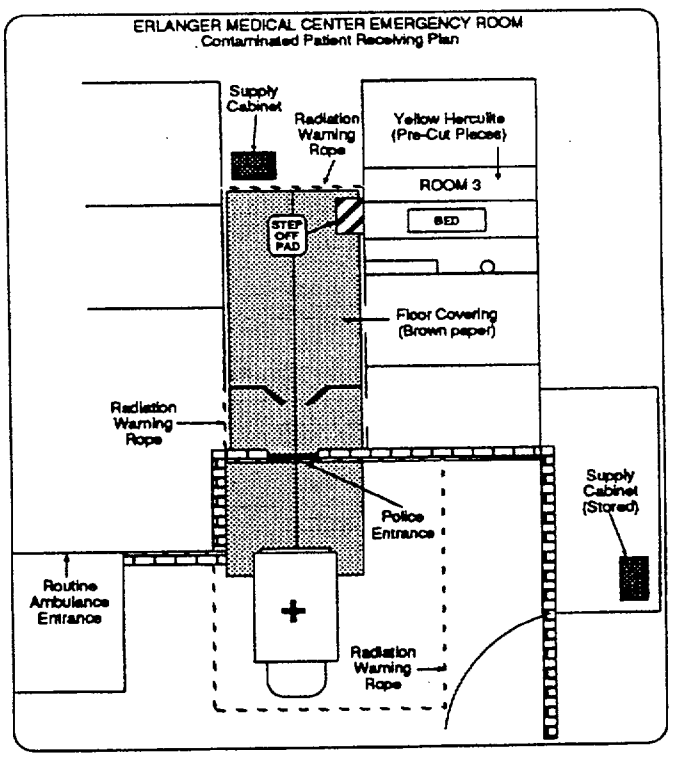
Leave Sequoyah Nuclear Plant via Sequoyah Road to Highway 27 (6.3 miles) Highway 27 to Highway 153 (6.6 miles) Highway 153 to C. B. Robinson Connector Road (4.2 miles) C. B. Robinson Connector Road to Amnicola Highway (2.5 miles) Amnicola Highway to Riverside Drive (2.6 miles) (See Locality Map Erlanger Medical Center Area for the following) Riverside Drive to 3rd Street Exit (1.5 miles) 3rd Street Exit to 4th Street via Mabel Street (0.1 miles) 4th Street to Erlanger Hospital via Lansing Street 50 3rd Street (0.6 miles).

APPENDIX D

Page 2 of 4

ERLANGER MEDICAL CENTER AREA





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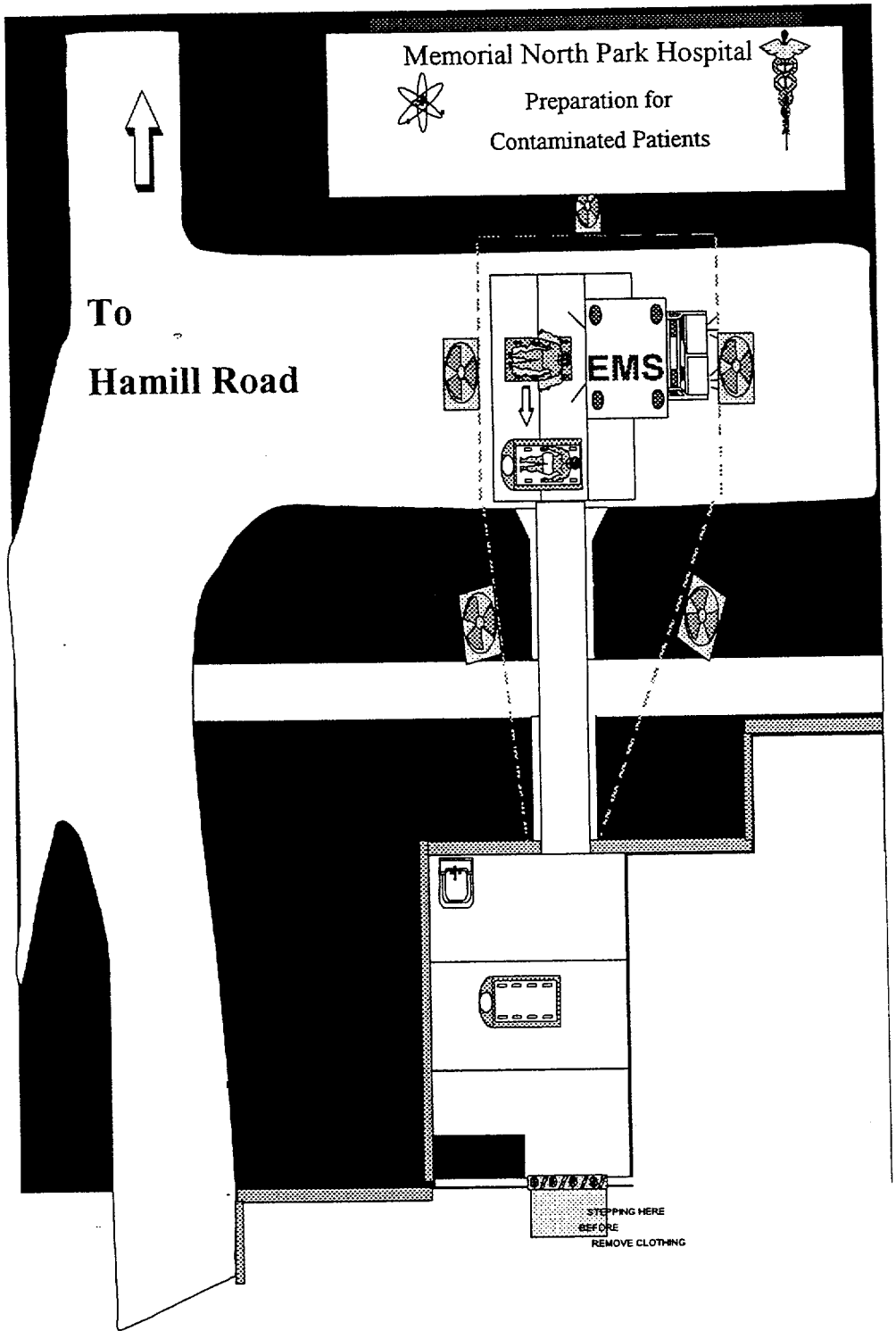

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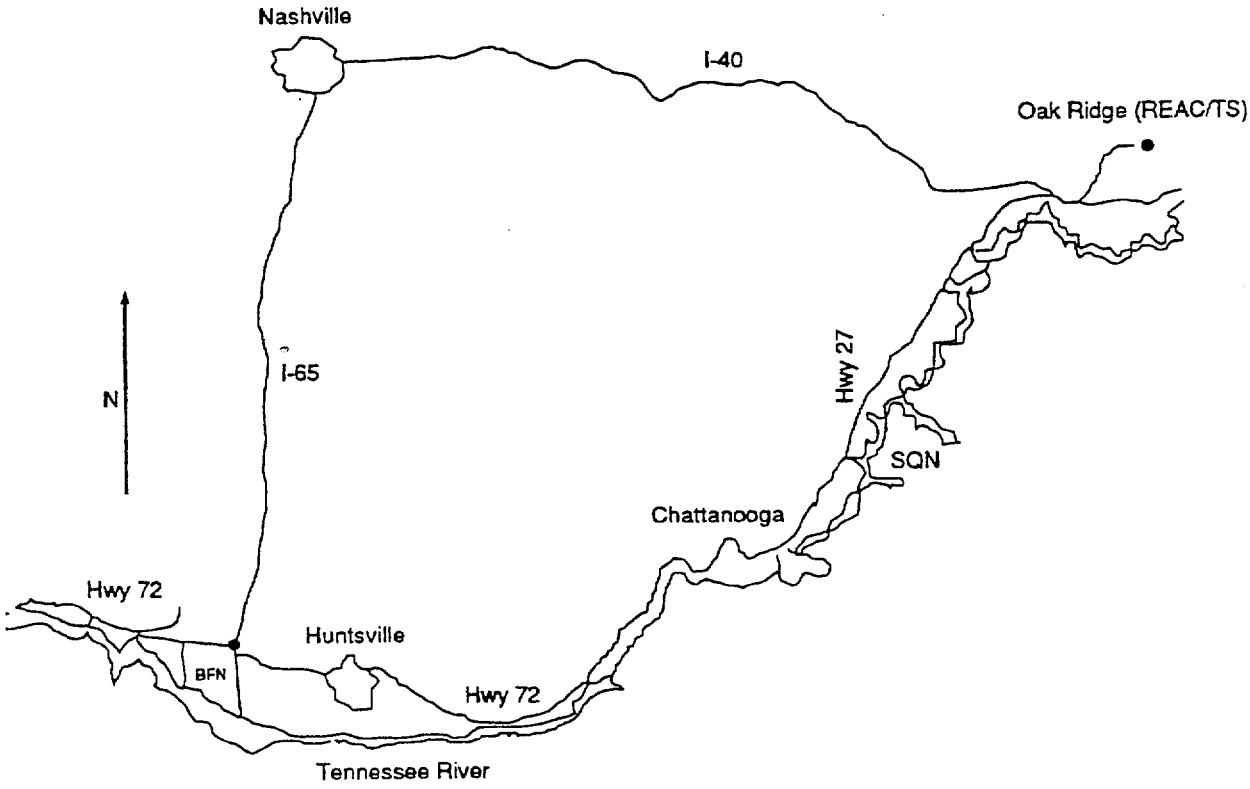

Sequoyah Nuclear Plant to REAC/TS
Via Hwy 27: Travel distance 110 Mi.
Travel time 1.5 Hrs at 70 mph

SOURCE NOTES

REQUIREMENTS STATEMENT	SOURCE DOCUMENT	IMPLEMENTING STATEMENT
	NP Radiological Emergency Plan (NP-REP)	

Attachment 1
Page 1 of 2

HOSPITAL AND PERSONNEL NOTIFICATION REPORT

The Shift Manager shall complete this form for individuals being transported to an agreement hospital (Memorial Northpark or Erlanger). He shall notify the destination hospital **as soon as** the need for off site transportation is determined.

Shift Manager _____

Date _____/_____/____ **Time** _____ **Hospital**_____

Person Contacted _____ **Title**_____

MESSAGE TO THE HOSPITAL

Sequoyah Nuclear Plant will be sending _____ **(number) injured person(s) to your hospital Emergency Department by** _____ **Ambulance** _____ **Lifeforce.**

The victim(s) is:

_____ Confirmed, **NOT** a radiation accident victim - no radiological hazards exist (NOT contaminated and NOT irradiated).

_____ Radiological conditions are **unknown** at this time. (survey incomplete due to injuries or location)

_____ **Contaminated** with radioactive material
____ Externally at _____ CPM or _____ mrad.
____ Internally

_____ **Irradiated** in excess of 5 rem - Expected Exposure of _____ Rem.

Medical condition and ETA should be provided by the EMT upon departure from the site.

____ **Confirmation call- back from the Hospital received.**

____ **SQN Plant Management notified.**

____ **SQN Industrial Safety notified.**

____ **Employee Manager's Notified.**

____ **SSP 3.5 Notifications Complete.**

ROUTE COMPLETED FORM TO EP MANAGER FOR RETENTION

Attachment 1
Page 2 of 2

HOSPITAL AND PERSONNEL NOTIFICATION LIST

A. SEQUOYAH EMERGENCY NUMBERS

Fire/Medical Emergency	- 3911
Fire Operation Unit	- 7448 or 7447
Health Station (DS/N)	- 8026 or 8027
Nuclear Security	- 6144 or 6184
Shift Manager	- 6211 or 7211
Radiological Control	- 6300 or 6160
Industrial Safety	- 6647

B. SEQUOYAH NURSING STAFF (Home Telephone Numbers)

Andy Miller, RN, ONP (Supervisor)	842-7005	Hixson, TN
Carolyn O'Brien, RN	842-5470	Hixson, TN
Melanie Cooper Theisen, RN	886-1949	Signal Mtn, TN

C. SQN AMBULANCE

7447 or Cellular Telephone 667-6274

D. LOCAL AGREEMENT AMBULANCE SERVICE

Hamilton County Ambulance
(423) 622-7777
Alternate: 911

Erlanger Lifeforce
(423) 778-5433
Alternate: 1-800-523-6723

MEDCOM - #633 (from Cell Phone)

NOTE: Inform Lifeforce that communications will be via the TnEMS Mutual Aid Frequency 155.205MHz.

E. AGREEMENT HOSPITALS

Memorial North Park Hospital
2051 Hamill Road
Chattanooga, TN 37343
(423) 870-6164 (24 hours) or
(423) 870-6100

Erlanger Medical Center
975 East Third Street
Chattanooga, TN 37403
(423) 778-7296 (24 hours)
(423) 778-7664

F. REAC/TS, OAK RIDGE, TENNESSEE

Commercial (0800-1630)	(865) 576-3131
24 hour Emergency - DOE EOCC	(865) 756-1005

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP-15

EMERGENCY EXPOSURE GUIDELINES

Revision 8

QUALITY RELATED

PREPARED/PROOFREAD BY: J. Randy Ford

RESPONSIBLE ORGANIZATION: Emergency Preparedness

APPROVED BY: John H. Casey, Jr.

EFFECTIVE DATE: 02/16/00

REVISION DESCRIPTION: This general revision is generated to incorporate changes due to the recent revision of **10CFR20, Standards for Protection Against Radiation**. Compliance with 10CFR20 requirements ensures that the site Emergency Plan Implementing Procedures fully satisfy the TVAN **Radiological Emergency Plan** (TVAN-REP) and Technical Specifications. This revision is a non-intent revision. Due to the extent of the changes, change bars are not included.

1.0 PURPOSE

This procedure provides guidance for authorizations of personnel dose limits under emergency conditions, consistent with **EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents** (Reference 2.A). These limits apply only to emergency exposure authorizations and not to spontaneous reactions by individuals attempting to mitigate an emergency situation.

2.0 REFERENCES

A. EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents

B. TVAN Radiological Emergency Plan (TVAN-REP)

C. SPP-5.1, Radiological Controls

D. EPIP-10, Medical Emergency Response

E. EPIP-14, Radiological Control Response

3.0 RESPONSIBILITIES

3.1 Radiological Control (RADCON)

RADCON is responsible for completing **Appendix A, Authorization to Exceed Occupational Dose Limits**, in accordance with **Section 4.1.I**, and will perform radiological surveys or other assessments to estimate the radiation doses.

3.2 Site Emergency Director (SED)

The SED shall provide written authorization (Appendix A) for all emergency radiation doses that may exceed the limits of **10CFR20, Standards for Protection Against Radiation**.

4.0 REQUIREMENTS

4.1 Guidance for Emergency Dose Limits

NOTE For the purposes of this procedure the assumption of 1 rad = 1 rem is assumed for all levels of exposure.

A. The total effective dose equivalent (TEDE) of personnel during emergency operations shall be maintained As Low As Reasonably Achievable (ALARA).

B. The utilization of respiratory equipment may be required to ensure TEDE is maintained ALARA. Respiratory equipment assigned protection factors (APF) are provided in **Appendix C, Assigned Protection Factor Guideline for Respiratory Protection**.

4.0 REQUIREMENTS (Continued)

C. Protective clothing should be used to minimize personnel contamination.

D. Receipt of emergency dose limits shall be on a voluntary basis.

E. Other factors being equal, older volunteers should be selected first.

F. Other factors being equal, selection of female volunteers capable of reproduction should be avoided.

G. During declared emergencies TVA Administrative Dose Levels (ADLs) shall be amended as shown in Appendix D, Emergency Exposure Reference Guide, however, efforts shall be taken to hold doses to the lowest practicable level that the emergency permits. An individual's remaining allowable dose (RAD) is determined by subtracting the year-to-date dose from the applicable 10CFR20 exposure limit. Emergency responders that require additional dose in excess of 10CFR20 limits may obtain consent through the completion of **Appendix A**.

H. Exposure under emergency conditions shall be limited to once in a lifetime. Personnel who have received previous accident or emergency exposures in excess of **25 rem** TEDE shall not participate in further emergency exposure assignments.

NOTE If emergency conditions dictate, the SED may provide a verbal approval of an Appendix A. A hard copy Appendix A will be filled out as soon as possible thereafter. Written completion of Appendix A should not delay emergency efforts, especially in cases of lifesaving activities when the victim(s) may be in an area of high radiation exposure.

I. RADCON shall prepare **Appendix A**. Upon completion, the form shall be hand carried or faxed to the Technical Support Center (TSC) (Fax 843-6461) for the SED approval signature. The SED should consult with the most senior RADCON person available on a timely basis prior to signing Appendix A. The appropriately signed form shall then be hand carried or faxed back to the Operational Support Center RADCON Supervisor (Pax 843-6439) as documentation of approval.

4.0 REQUIREMENTS (Continued)

J. Personnel receiving emergency exposures shall be informed of the risks involved, including the numerical levels of dose at which acute effects of radiation will be incurred, and numerical estimates of the risk of delayed effects. **Appendix B, EPA Emergency Exposure Risk Information**, provides EPA tables which may be useful for this briefing

K. Personnel shall not enter any area where dose rates are unknown or unmeasurable with instruments and dosimetry immediately available.

L. If the projected dose to the thyroid from inhalation of radioiodines is expected to exceed **10 rem** during a radiological emergency, potassium iodide (KI) should be issued to the affected personnel as a protective measure, in accordance with **EPIP-14** (Reference 2.E). The SED shall be informed prior to issuance.

M. Until isotopic assessments of airborne radioactivity are available, an administrative correction factor of **2** should be used to estimate TEDE exposures in airborne activity areas:

Estimated TEDE = (Dosimeter reading) × (2)

The above value corresponds to the ratio of external (measured) dose rate to estimated TEDE dose, in accordance with default values in the TVA dose assessment model. When accident-specific nuclide assessments are available, more definitive dose assessments should be performed to adjust the correction factors.

4.2 Lifesaving or Protection of Large Populations

A. **Appendix D, Emergency Exposure Reference Guide**, may be used as a reference for exposure limits

B. Situations may occur in which a dose in excess of **25 rem** would be required for lifesaving operations. It is not possible to prejudge the risk that one person should be allowed to take to save the life of another. However, persons undertaking an emergency mission in which the dose would exceed 25 rem dose equivalent to the whole body should do so only on a **voluntary** basis and with full awareness of the risks involved.

4.0 REQUIREMENTS (Continued)

C. Exposure Guidelines for Saving a Life

1. A limit of **25 rem** TEDE (Total Effective Dose Equivalent) when a lower dose is not practical.
2. A limit of **75 rem** LDE (Lens Dose Equivalent) or 3 times the TEDE limit.
3. A limit for any other organ (including skin and extremities) of **250 rad** or 10 times the TEDE limit.

D. Exposure Limits for Protection of Valuable Property

1. A limit of **10 rem** TEDE when a lower dose is not practical.
2. A limit of **30 rem** LDE or 3 times the TEDE limit.
3. A limit for any other organ (including skin and extremities) of **100 rad** or 10 times the TEDE limit.

4.3 Post-Exposure Activities

A. Personnel receiving emergency doses should be restricted from further occupational exposure pending the outcome of exposure evaluations, and if necessary, medical surveillance.

B. RADCON shall conduct post exposure dose assessments for exposed individuals, with particular attention to determining the adequacy of administrative dosimeter correction factors for TEDE doses resulting from internal and external exposures.

C. Any exposures above **5 rem** TEDE shall be reported to a TVA physician. It is the responsibility of the physician to determine appropriate medical evaluations and required care. Cross reference guidance is in **EPIP-10**, (Reference 2.C).

D. Any emergency exposures shall be reported to the site RADCON Manager as soon as possible.

5.0 APPENDICES/ATTACHMENTS

Appendix A Authorization to Exceed Occupational Dose Limits

Appendix B EPA Emergency Exposure Risk Information

Appendix C Assigned Protection Factor Guidelines for Respirators

Appendix D Emergency Exposure Reference Guide

SOURCE NOTES

Requirements Statement	Source Document	Implementing Statement
All	TVAN Radiological Emergency Plan (TVAN REP)	All

APPENDIX A

AUTHORIZATION TO EXCEED OCCUPATIONAL DOSE LIMITS

The persons listed below are authorized to exceed occupational dose limits during the evaluation or mitigation of an emergency situation.

The persons listed below acknowledge (by signature) that they have volunteered for this assignment, have been briefed on the emergency situation, and are aware of the possible consequences of the estimated radiation dose(s).

Hand carry or Fax to the TSC (843-6461) for SED signature

	NAME	SSN	SIGNATURE	DOSE LIMIT (REM)
1.				
2.				
3.				
4.				
5.				
5.				
6.				
7.				
8.				
9.				
10.				

RADCON Survey # _____ (If Applicable)

Remarks: Emergency Location(s) _____

Estimated Dose(s) _____

Authorized by: _____

Site Emergency Director * **Date / Time**

* **Consult with the most senior RADCON person prior to authorization**

After SED signs, hand carry or Fax to the OSC RADCON Supervisor (843-6439)

- Route to Emergency Preparedness Manager -

APPENDIX B

EPA EMERGENCY EXPOSURE RISK INFORMATION

* Health Effects Associated With Absorbed Whole Body Doses Received Within a Few Hours (1)

Whole Body Absorbed Dose (rad)	Early Fatalities (2) (percent)	Whole Body Absorbed Dose (rad)	Prodomal Effects (3) (percent)
140	5	50	2
200	15	100	15
300	50	150	50
400	85	200	85
460	95	250	98

* Approximate Cancer Risk to Average Individuals From 25 rem Effective Dose Equivalent Delivered Promptly

Age at Exposure (Years)	Risk of Premature Death (Deaths per 1,000 persons exposed)	Average Years of Life Lost if Premature Death Occurs (Years)
20 to 30	9.1	24
30 to 40	7.2	19
40 to 50	5.3	15
50 to 60	3.5	11

* These tables are taken from **EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents**, Environmental Protection Agency, October 15, 1991

NOTES

1 Risks will be lower for protracted exposure periods.

2 Supportive medical treatment may increase the dose at which these frequencies occur by approximately 50%.

3 Forewarning symptoms of more serious health effects associated with large doses of radiation.

APPENDIX C
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ASSIGNED PROTECTION FACTOR GUIDELINES FOR RESPIRATORS[A]

Description[B]		Modes[C]	Assigned Protection Factor[D] Parts.	Parts./Gases/Vapors[E]
Air purifying full face respirators[F, K]		NP	100[J]	-----
Powered air purifying (tight fitting full facepiece) respirators or hood[F, K]		PP	100	-----
Airline respirators[K, L]	Full-face	CF	-----	1,000[G]
	Full-face	PD	-----	1,000[G]
	Hood	CF	-----	1,000[G]
	Suit	CF	-----	(H)
SCBA (full-face)		PD	-----	10,000[I]
Any combination of air purifying and airline respirator[F, K, L]				APF for type and mode of operation as listed above

NOTES

A For use in the selection of respiratory protection devices to be used only where the contaminants have been identified and the concentrations (or possible concentrations) are known.

B Only for clean shaven faces and where nothing interferes with the seal of tightfitting facepieces against the skin (hoods and suits are excepted).

C
- CF Continuous flow
- PD Pressure demand (i.e., always positive pressure)
- NP Negative pressure (i.e., negative phase during inhalation)
- PP Positive pressure

D Assigned Protection Factor (APF) means the expected workplace level of respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained users. Operationally, the inhaled concentration can be estimated by dividing the ambient airborne concentration by the APF.

APPENDIX C
(Page 2 of 2)

ASSIGNED PROTECTION FACTOR GUIDELINES FOR RESPIRATORS[A]

NOTES (Continued)

E The APFs for gases and vapors are not applicable to radioactive contaminants that present an absorption or submersion hazard. For tritium oxide vapor, approximately one-third of the intake occurs by absorption through the skin so that an overall assigned protection factor of 3 is appropriate when atmosphere-supplying respirators are used to protect against tritium oxide. Air purifying respirators are not suitable for protection against tritium oxide. Exposure to radioactive noble gases is not considered a significant respiratory hazard, and protective actions for these contaminants should be based on external (submersion) dose considerations.

F Canisters and cartridges shall not be used beyond service life limitations.

G An APF of 1,000 may be used for hoods when airflow is maintained at the manufacturer's recommended minimum airflow rate of > 6 CFM but < 15 CFM as measured by an in-line calibrated pressure gauge.

An APF of 1,000 may be used for continuous flow or pressure demand full face air line respirators when the minimum airflow rate is ≥ 4 CFM as measured by an installed calibrated pressure or flow gauge.

H Equipment that has not been tested or certified by NIOSH, or for which there is no schedule for testing or certification, the licensee shall submit an application to the NRC for authorized use of this equipment except as provided in **10CFR20** (Reference 3.A).

I This type of respirator provides the largest degree of protection and is designated for emergency situation usage.

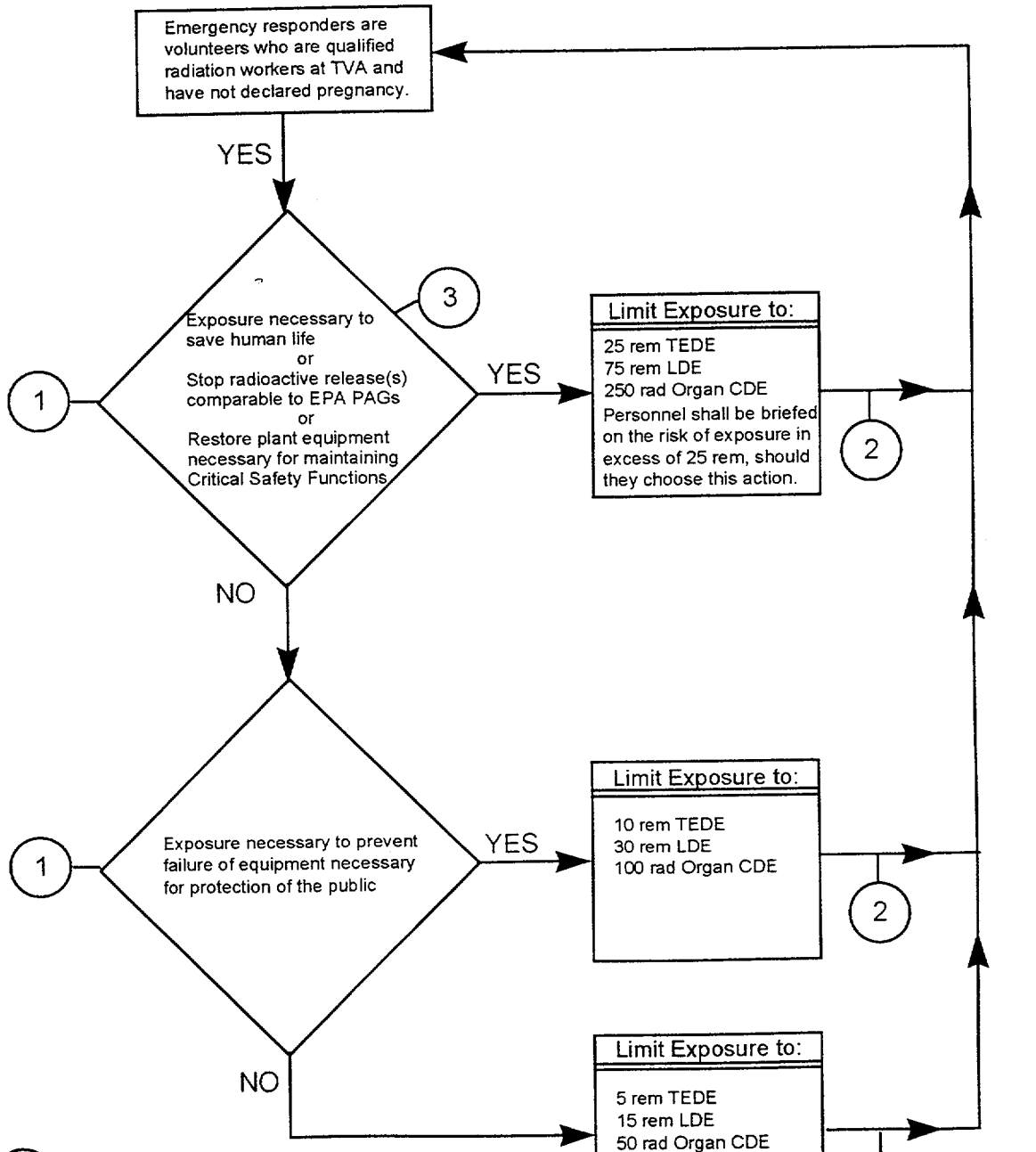
J When equipped with high efficiency particulate filters rated by the manufacturer as being 99.97% efficient to 0.3 micron particles. After initial use (and each subsequent use) the filter is tested for efficiency and flow restriction. No allowance is made for the use of sorbents incorporated with these filters against radioactive gases and vapors.

K These devices may not be used in IDLH atmospheres.

L These devices shall not be used with, or charged with, compressed Oxygen.

APPENDIX D

EMERGENCY EXPOSURE REFERENCE GUIDE



1. If conditions are not known, then answer is NO.
2. Continue accessing and modify exposure actions as necessary
3. **EPA PAGs** are: 1 rem TEDE or 5 rem Thyroid CDE

UPON DETERMINATION OF EXPOSURE LIMIT REFER TO INSTRUCTIONS PRIOR TO AUTHORIZING EXPOSURE