

Mississippi Radiological Emergency Preparedness 2018



Emergency Worker Handbook

Mississippi Radiological Emergency Preparedness



The Emergency Worker Handbook includes information about responding to a radiological emergency at Grand Gulf Nuclear Power Plant:

Please read through this handbook. If you have any questions or concerns, please discuss them with your radiological officer or supervisor.



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Radiological Emergency Preparedness Program

Federal regulations require nuclear power plants have a federally tested and approved emergency response plan. State and county governments have the same responsibility as outlined in the Constitution of Mississippi and Title 33, Chapter 15, Mississippi Code of 1972, as amended. The purpose of the Radiological Emergency Preparedness (REP) program is to protect public health and safety.

Nuclear Power Plants and Exposure

Nuclear power plants are built to contain radioactive material but they do release some radioactivity into the environment. These releases are monitored and controlled by strict Environmental Protection Agency (EPA) guidelines. The Nuclear Regulatory Commission (NRC) is responsible for the regulatory application of these guidelines. Releases therefore, are kept well below amounts that would affect public health or the environment.

No deaths or serious injuries have been recorded during 50 years of nuclear power plant production in the United States due to exposure to radiation. This includes the country's only commercial nuclear accident at Three Mile Island.

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Emergency Planning Zone

The Emergency Planning Zone (EPZ) is a ten-mile area around a nuclear power plant that may be most at risk of radiation exposure in the event of a release of radioactive material.

This EPZ is divided into sub-areas. Not all residents in the EPZ may be affected during an accident so residents may be advised to take certain actions based on their sub-area.

The power plant gives immediate notification to the state and counties in the EPZ if there is any incident that could lead to protective action recommendations. The plant makes notification through the use of Emergency Classification Levels (see next section). In addition, the utility recommends protective actions to the state and affected counties.

Responders will be notified by their agencies about when and where to respond.

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Emergency Classification Levels

There are four emergency classification levels (ECL).
Each level calls for a certain response.

Notification of Unusual Event (NUE)

A low level event which poses no threat to public safety but which warrants an increased awareness on the part of plant and off-site agency personnel.

Alert

Also a low level condition which poses no threat to public safety, but precautionary mobilization of certain response functions is appropriate in case conditions degrade.

Site Area Emergency

At this level, conditions have degraded to a point warranting the full activation of response functions. Precautionary protective actions for high risk portions of the general public might be recommended.

General Emergency

Conditions have degraded to a point threatening public safety and some form of protective actions will be initiated.



Radiation Principles

Radiation is energy emitted from unstable atoms. Atoms are the building blocks of all matter. Unstable atoms try to become stable by giving off energy. This energy is radiation. Radiation is emitted from the air, our food and water, and from the earth itself.

In a nuclear power plant, atoms in the uranium fuel split into fragments. These fragments are not stable. Unstable atoms lose their excess energy by emitting three types of radiation: alpha and beta particles, and gamma rays.

- Alpha particles are the least penetrating and can be stopped by sheets of paper.
- Beta particles are more penetrating and can be stopped with a few layers of plastic or by the outside layers of skin.
- Gamma rays have a high penetrating power but can be slowed by dense shielding material such as lead or concrete.

Radiation and Us

We are exposed to radiation in our every day lives. Exposure to radiation can damage cells in the human body. It is possible for cells to repair themselves depending on the amount of radiation exposure and the physical condition of the person exposed.

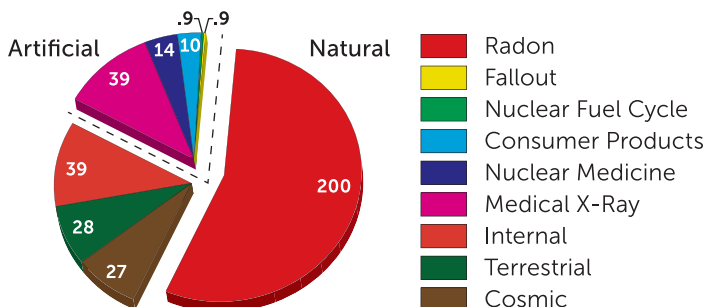
We measure the biological effects of radiation on the body using the measurements of “Rem” or “milliRem” (a milliRem or mRem equals one one-thousandth of a Rem).

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The chart below shows the source of radiation and exposure on an annual basis.

Average Yearly U.S. Radiation Exposure in mRem/year



The effects of large amounts of radiation are well understood; however, effects of small amounts of radiation are not clear. Federal guidelines suggest that there is risk with any exposure to radiation, even from one of the sources listed on the chart.

The main concern is the cumulative risk of radiation exposure over a period of several years. Therefore, exposures to small amounts of radiation are considered less risky than large amounts of radiation.

Exposure exceeding 150,000 to 600,000 mRem can produce symptoms of radiation sickness. An exposure of 600,000 mRem, left untreated, could be fatal. The limits used in the REP program are designed to limit your exposure. Adhering to these limits will reduce the risk of developing any observable symptoms and reduce the risk of cancer in the future.

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Dosimeter

A dosimeter measures the amount of radiation exposure to your body. You will be issued dosimetry if you are asked to perform a specific function where you might be exposed to radiation or come in contact with radioactive material. Different types of dosimeters are used to gather radiation exposure information.

Thermoluminescent Dosimeters (TLD)

A TLD records the amount of radiation from an individual exposure. It should be worn on the front of the body between the waist and shoulders. The TLD provides a permanent record of exposure after processing in a laboratory. The serial number will be recorded on the Emergency Worker Dosimeter Log.

While a TLD provides an accurate record of exposure, it cannot be read in the field by the responder. In order to allow workers to monitor their exposure while working, a second type of dosimeter, a Direct Reading Dosimeter (DRD), will be issued to each emergency worker or group of workers.



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Direct Reading Dosimeter (DRD)

A DRD is designed to work alongside the TLD. It gauges any exposure an emergency worker receives and can be read directly in the field. Individuals can take the appropriate action based on the reading shown.

How to Read Your DRD

Note the scale:

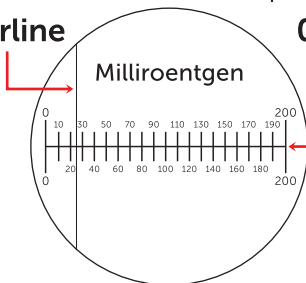
- On a High Range DRD (CDV 730), the scale is listed in Rem with a range of 0-20 R.
- On a Low Range DRD (CDV-138), the scale is listed in mR with a range of 0-200 mR.
- Point it toward an ambient light source.
- Note the position of the hairline (see example below) to establish a “baseline” for future readings.
- Read and record your DRD reading every 30 minutes on the “Emergency Worker Exposure Log”.

Contact your supervisor or radiological officer if you drop the dosimeter and the reading changes or if you lose your TLD or DRD.

Instructions on the use of DRDs and TLDs can be found on the next pages. These instructions should be reviewed and followed when you are on an assignment.

- All DRD's shall be zeroed prior to use.

Hairline



**0 to 200 mR
DRD scale**



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1. Self Powered Dosimeter Charger (CDV-750 M6)

- a. The CDV-750 M6 dosimeter charger (figure 1) can be used to zero all DRDs. The charger is self powered, requiring no batteries. The voltage necessary to charge a dosimeter is generated by squeezing the generator lever. A discharge button allows the operator to set a dosimeter exactly on zero. The clamp trigger pulls on the clamp to allow a dosimeter to be positioned on the charger or be removed from the charger. The charger controls the movement of the hairline fiber inside the dosimeter. When the fiber is on zero, the dosimeter is said to be “zeroed”.
- b. Charging The Dosimeter

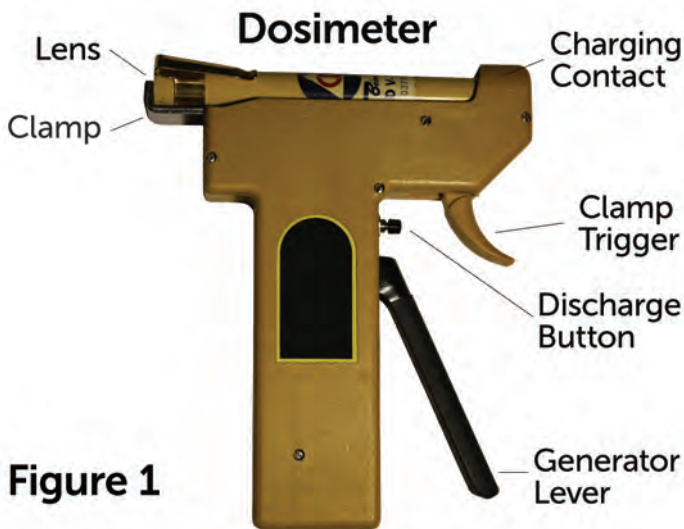


Figure 1

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1. Hold the charger upright as shown in figure 1. Lift the clamp and pull it back to its maximum length. Place the dosimeter in the clamp and fit the dosimeter recess (opposite end from the lens) over the charging contact. This allows for electrical contact between the dosimeter and the charger.
2. Squeeze the clamp trigger. Push the clamp forward until the end is against the eyepiece of the dosimeter.
3. Release the trigger. Check that the position of the dosimeter provides a good view through the lens.
4. With the dosimeter locked in place and lens facing you, point toward a suitable light source, such as a light fixture, window, candle, etc., as shown in figure 2.
5. Look through the lens and observe the scale (figure 3). Squeeze the generator lever and release lightly a few times.

NOTE: If the dosimeter is not responding, you may need to apply more pressure with the clamp by gently pushing forward on the clamp against the end of the dosimeter. **DO NOT PUSH TOO HARD.** You can damage the dosimeter.



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6. Watch for movement of the fiber from the right of the scale towards 0. Squeeze the lever again if needed to zero the dosimeter. NOTE: If the fiber has travelled to the left of the zero but is still visible, push the discharge button and watch the fiber move to the right. If the fiber is not visible, repeat Step 5.
7. To remove the dosimeter, pull clamp trigger, lift dosimeter to just above the end of clamp and pull dosimeter straight back to disengage it from the charging contact. The length of the clamp will not change unless the clamp is manually adjusted.

c. READING THE DRD

To read the DRD direct the bottom of the barrel at a light source. Look through the eyepiece at the top and rotate the DRD so the scale is right side up with the zero on the left. Read the location of the hairline on the center scale, estimating to the nearest whole number. Record this information on your Personal Radiation Exposure Card (REP-I). You should read your DRDs at least every 30 minutes and report any exposure (hairline movement) to your supervisor.

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Electronic Dosimeter

The dosimeter can be read directly in the field and has preset exposure limits and will alarm and/or vibrate when the limits are reached.

How to operate your Electronic Dosimeter

- Press and hold On/Acknowledge button for three seconds until LCD screen turns on.
- Screen should normally read 0.00 mR/hr, but may pick up background radiation .03 to .05 mR/hr.
- Make sure battery indicator shows full.
- Pressing the ACK button allows user to silence the alarm. The alarm will resume alarming again after 60 seconds.
- You may use a check source to check the equipment. Equipment will read an "F" and 0.00 will flash if the unit is not reading properly.

Contact your supervisor or radiological officer if your dosimeter is not working correctly.

Further instructions on how to use your electronic dosimeter can be found on page 31 of this handbook.



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As Low As Reasonably Achievable (ALARA)
Emergency workers should reduce the risk of being exposed to radiation and keep any exposure at the lowest possible level. This concept is called As Low as Reasonably Achievable or ALARA.

Other techniques that can reduce your exposure:



Time

reduce the time you are exposed to radiation



Distance

increase the distance between you and the source



Shielding

place a shield between you and the source

Specific techniques should be discussed with your supervisor or radiological officer.

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Radiation Protection

Exposure Limits

Note: For the purpose of tracking exposure in the REP program:

1 Roentgen \approx 1 Rem

1,000 mR \approx 1,000 mRem

Mississippi Emergency Worker Dose Limits

Mississippi workers performing emergency services in radiological events are assigned a base dose limit of 5 rem Total Effective Dose Equivalent (TEDE) for standard response activities, with a turn-back limit of 1R as read on their dosimeters for normal work activities.

Critical situations may justify higher emergency worker dose limits to protect the people of Mississippi. A dose limit of 10 rem is allowed for the protection of key resources and critical infrastructure, with a turn-back limit of 2R as read on self-reading dosimeters. A dose limit up to 25 rem is allowed for life saving activities and the protection of large populations, with a turn-back limit of 5R. These values are summarized in the table below:

Dose Limit	Turn-Back Limit	Response Activity
5 rem	1R	Standard Response
10 rem	2R	Protection of Critical Infrastructures/Key Resources
25 rem	5R	Lifesaving or Protection of Large Populations

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For a Hostile Action Based (HAB) incident, the dose limits follow the EPA dose limit guidance for life-saving and the protection of large populations.

There are no turn-back limits for responders working outside the EPZ or outside of an area under a protective action.

Permission to exceed the dose limits from the state is only required if you are exceeding a limit in a particular response activity identified above. Local jurisdictions determine the type of response activity and use the corresponding dose limits.

The guidance to establish these limits comes from the Manual of Protective Action Guides and Protective Actions for Nuclear Incidents and uses the same limits for federal responders in a radiological emergency.

Mississippi Contamination Limits are as follows	
Return Home	Less Than 300 CPM + Background
Return to Duty	Less Than 1000 CPM + Background

Items exceeding the contamination levels identified above must be decontaminated before being released or returned to service.

If you have any questions contact your supervisor.

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Potassium Iodide (KI) for Emergency Workers

One of the radioactive materials that may be released during a radiological incident is radioactive iodine. Iodine is used in the human body by the thyroid gland. Potassium iodide is a thyroid blocking agent and is used to “saturate” the thyroid with nonradioactive iodine. This reduces the chance that radioactive iodine will build up in your thyroid.

Taking Potassium Iodide (KI)

You will be issued potassium iodide and a “Potassium Iodide (KI) Ingestion Record” if there is a possibility that you will be exposed to radioactivity in the plume.

You need to read and understand the warnings and instructions on the record before you are deployed. Make sure you know when you start and how long you should self-administer KI.

It is important to log how many times you self-administered KI. Radiation protection professionals may review this log to determine if any further monitoring of your thyroid is needed.



Radioactive Contamination

Radioactive contamination is radioactive material in an unwanted place.

Contamination levels can not be accurately detected using a DRD or TLD.

Contamination Monitoring

Radioactive contamination may be detected with hand held instruments or larger portal monitors. Monitoring for emergency workers is done at an Emergency Worker Decontamination Center.

The contamination limit for the REP program is 2x above background 300 counts per minute above background for both people and items.

Decontamination

There are a variety of ways to decontaminate people and items. They may include:

- Lukewarm soap and water – simple washing is very effective in removing surface contamination
- Disposal of items – clothing or items may be discarded in an appropriate manner if they are found to be contaminated.

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Contamination Prevention

There are a few simple steps you can take to avoid becoming contaminated:

- Do not eat, use tobacco, or drink while responding when radioactive material may be present unless instructed to do so.
- Use proper personal protective equipment (PPE).
- Follow procedures for your specific task.

Emergency Worker Decontamination Centers

Once you reach the end of your shift or if in the unlikely event that you reach your “turn back level”, you will need to report to an Emergency Worker Decontamination Center for monitoring and/or decontamination. The goal of these centers is to monitor, and if necessary decontaminate, emergency workers and vehicles. Emergency workers will also return dosimetry and all records they used during their response. Supervisors and/or Radiological Officers may direct responders to a specific center.

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Emergency Worker Decontamination Stations

Primary Stations

Claiborne County:

Hermanville-Claiborne County Fire Department
1/2 mile off Hwy 18 East, Hermanville

Pattison-Claiborne County Fire Department
1/2 block off Hwy 547 South, Pattison

Warren County:

Vicksburg Fire Department - Station No. 5
Hwy 61, Vicksburg Municipal Airport

Backup Decon Stations

Backup emergency worker decon stations are located at the reception centers of host counties while they are in operation (Warren, Adams, Hinds, and Copiah Counties).



Protective Action Areas

- **Protective Action Area 1** includes the GGNS site and is that area between the Big Black River and Bayou Pierre west of Old Grand Gulf Road.
- **Protective Action Area 2A** includes the area between the Big Black River and Bayou Pierre west of Highway 61 to Old Grand Gulf Road.
- **Protective Action Area 2B** includes the area between the Big Black River and Bayou Pierre east of Highway 61 .
- **Protective Action Area 3A** includes the area between Bayou Pierre and Little Bayou Pierre west of the Natchez Trace Parkway.
- **Protective Action Area 3B** includes the area between Bayou Pierre and Little Bayou Pierre east of the Natchez Trace Parkway.
- **Protective Action Area 4A** includes the area between Little Bayou Pierre and Widows Creek south and east of Bayou Pierre to the Natchez Trace Parkway, including the town of Port Gibson.
- **Protective Action Area 4B** includes the area between Little Bayou Pierre, south and east of the Natchez Trace Parkway and north of Gordon Station Road.
- **Protective Action Area 5A** includes the area between Bayou Pierre and Russum-Westside Road east to Widows Creek.
- **Protective Action Area 5B** includes the area south of the Russum-Westside Road from the Ferry Road east to Gordon Station Road.
- **Protective Action Area 6** includes all of Alcorn State University.
- **Protective Action Area 7** includes the area north of the Big Black River and east of the Mississippi River.



GGNS Emergency Information Radio Stations

24-hour Broadcasting

WIDS-AM at AM 620 in Jackson

WMPN-FM at FM 91.3 in Jackson

WJMI-FM at FM 99.7 in Jackson

WMS I-FM at FM 102.9 in Jackson

WQNZ-FM at FM95.1 in Natchez

WAKK-FM at FM 105.7 in McComb

NOTE: EAS primary stations in the Central and Southwest Mississippi Operational Areas will rebroadcast EAS alerts as civil emergency messages regarding a Grand Gulf Nuclear Station emergency. Participating EAS stations may rebroadcast these messages at their discretion.



Traffic Management Concepts

- A. To provide the efficient control of evacuee/emergency worker traffic in the event of a radiological emergency at the Grand Gulf Nuclear Station (GGNS).
- B. There are two traffic management concepts which could be used, both together or separately, during a radiological emergency involving GGNS.
 - 1. Traffic Control is the efficient movement of traffic through a specific area. Traffic Control Points (TCPs) facilitate evacuee travel along designated evacuation routes while discouraging the flow of traffic in other directions.
 - 2. Access Control is the discouragement of unauthorized people from entering a specific area. Access Control Points (ACPs) are located at key intersections on the periphery of the Emergency Planning Zone (EPZ). The control area may include all or part of the EPZ.
 - a. Before or during the early stages of an evacuation, the main purpose of the ACP is to advise persons of the emergency condition thereby limiting unnecessary trips into the EPZ.
 - b. An EXCLUSION AREA may be established upon completion of an evacuation. This area is an area, which may be subject to radiological contamination. If any exclusion area has been established, more stringent controls for entry need to be enforced. Entry will be allowed only to those people with an Exclusion Area Pass issued by the MSDH/DRH. Anyone needing an Exclusion Area Pass will be instructed to obtain it at the State Emergency Operations Center (SEOC) in Jackson, Mississippi.
 - c. An Access Control Log will be kept on all persons entering and leaving a controlled area. This will ensure a record of pertinent information including pass number, dosimetry, In/Out and dates of ingress/egress is maintained.



Traffic Management Organizations

- A. Nineteen TCPs (thirteen State and six local) will be set up to effectively limit ingress/egress to/from the GGNS 10 mile EPZ within Port Gibson/Claiborne County. These TCPs will impact federal, state and local roadways. Three state TCPs are set up at Site Area Emergency (SAE) within the EPZ. At General Emergency (GE), the three SAE TCPs are withdrawn and seven GE TCPs are established on the 10 mile EPZ periphery to affect EPZ traffic flow. Three additional GE TCPs are established on the Natchez Trace Parkway to limit its use only to emergency vehicles. Six local TCPs are set up at SAE around Port Gibson to remain in position through GE and withdrawn upon the completion of the evacuation.
- B. Key Groups involved in GGNS Traffic Management
 - 1. Mississippi Highway Patrol (MHP)

MHP is responsible for establishing traffic and access control at ten State TCPs, SAE 1-3 and GE 4-10. There will be one MHP unit assigned to each TCP.
 - 2. Local Law Enforcement
 - a. The Claiborne County Sheriffs Office and the Port. Gibson Police Department are responsible for establishing traffic control within their respective jurisdictions by manning local TCPs A1-A6 in and around the town of Port Gibson.
 - b. The Clinton Police Department will establish a State TCP (GE 13) to affect the Natchez Trace Parkway closure at I-20. GE 13 TCP personnel will not be considered as emergency workers based upon their 45 mile distance from GGNS. No emergency worker instrumentation will be required at this TCP location.

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- C. Natchez Trace Parkway (National Park Service)
Natchez Trace Parkway Rangers are responsible for establishing two State TCPs on the Natchez Trace, GE 11-12. There will be a Ranger assigned to each TCP. Natchez Trace personnel will also erect unnamed traffic control devices (barricades) to control access to the parkway at the intersections with Airport Road, Regantown Road and Whitaker Road.
- D. Mississippi Department of Transportation (MDOT)
MDOT is responsible for delivery of access control equipment including traffic cones, drums, signs and barricades. MDOT's EM Coordinator or designee is responsible for notifying the Natchez Trace Parkway and for notifying the Clinton Police Department for assistance in traffic control on the Natchez Trace Parkway.



Evacuation Routes

Evacuation signs have been placed in 135 locations within the Protective Actions Areas. The signs indicate “Evacuation Route” and show a directional arrow. They are 18” in diameter.

A narrative description of the GGNS evacuation routes are listed below:

- Protective Action Area 1 take US Highway 61 north to Vicksburg (Warren County). Proceed to the reception center at Warren Central High School. .
- Protective Action Areas 2A and 2B take US Highway 61 north or Mississippi Route 462 east to Vicksburg (Warren County). Proceed to the reception center at Warren Central High School.
- Protective Action Areas 3A and 3B take Mississippi Highway 18 east to Utica (Hinds County). Proceed to the reception center at Hinds Community College - Utica Campus.
- Protective Action Areas 4A and 4B take Mississippi Route 547 south to Mississippi Highway 28, then east to Hazlehurst (Copiah County). Proceed to the reception center at Joe L. Johnson Safe Room.
- Protective Action Areas 5A and 5B take Mississippi Route 552 east to US Highway 61 south to Natchez (Adams County). Proceed to the reception center at Natchez High School.
- Protective Action Area 6 take Mississippi Route 552 east to US Highway 61 south to Natchez (Adams County). Proceed to the reception center at Natchez High School.
- Protective Action Area 7 take US Highway 61 north to Vicksburg (Warren County). Proceed to the reception center at Warren Central High School.

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Reception Centers

Host County	Reception Center Locations
Warren	Warren Central High School 1000 Highway 27 (3 miles east of Vicksburg) Vicksburg, MS
Adams	Adams County Safe Room 323 Liberty Road Natchez, MS
Copiah	Joe L. Johnson Safe Room 1060 Epps Lane Hazlehurst, MS
Hinds	Hinds Community College Utica Campus Highway 18 (3 miles south of Utica) Utica, MS

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Shelter Facilities

Host County	Primary Shelter Facility	Backup Shelter
Warren	Warren Central High School 1000 Highway 27 Vicksburg, MS	Beechwood Elem. School 999 Highway 27 Vicksburg, MS
Adams	Natchez High School 319 Seargent Prentiss Natchez, MS	Natchez Middle School 1221 Martin Luther King Natchez, MS
Copiah	Joe L. Johnson Safe Room 1060 Epps Lane Hazlehurst, MS	Hazlehurst Elem. School 431 Monticello Street Hazlehurst, MS
Hinds	Hinds Community College Raymond Campus Mayo Field House College Drive Raymond, MS	Hinds Co. Public School will be made available if needed.

NOTE: Shelter capacity is the number of evacuees that can be sheltered in a facility based on the square footage space required for each person. The planning standard for Short Term shelter stay (48-72 hours) is 20 square foot per person and for Long Term shelter stay(> 72 hours) 40 square foot per person.



Emergency Worker Exposure Briefing



Mississippi REP Program Emergency Worker Exposure Briefing

To read your Direct Reading Dosimeters (DRDs) point it at a light source so that you can look through it and see the scale. The scale should be horizontal when read.

The position of the hairline establishes the “baseline” for future readings. Record this as the initial reading on the Emergency Worker Exposure Log.

Read and record your DRD reading every 30 minutes. Use the Emergency Worker Exposure Log for record keeping.

Notify your supervisor or Radiological Officer if you lose a TLD or DRD.

Report to your supervisor or Radiological Officer if:

- You record an exposure exceeding 1 R.
- The 0-200 mR DRD reaches 150 mR.
- You do not see a hairline on your DRD.

If you drop your DRD, read it and report if the hairline moved or disappeared.

Upon completion of your shift, report for monitoring and decontamination. Locations and addresses are found on page 18 of the Emergency Worker Handbook.

If your DRD is reading any exposure to radiation and you are outside of the 10-mile EPZ, report to your supervisor or Radiological Officer.

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Mississippi Emergency Worker Dose Limits

Mississippi workers performing emergency services in radiological events are assigned a base dose limit of 5 rem Total Effective Dose Equivalent (TEDE) for standard response activities, with a turn-back limit of 1R as read on their dosimeters for normal work activities.

Critical situations may justify higher emergency worker dose limits to protect the people of Mississippi. A dose limit of 10 rem is allowed for the protection of key resources and critical infrastructure, with a turn-back limit of 2R as read on self-reading dosimeters. A dose limit up to 25 rem is allowed for life saving activities and the protection of large populations, with a turn-back limit of 5R. These values are summarized in the table below:

Dose and Exposure Limit

Dose Limit	Turn-Back Limit	Response Activity
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For a Hostile Action Based (HAB) incident, the dose limits follow the EPA dose limit guidance for life-saving and the protection of large populations.

There are no turn-back limits for responders working outside the EPZ or outside of an area under a protective action.

Permission to exceed the dose limits from the state is only required if you are exceeding a limit in a particular response activity identified above. Local jurisdictions determine the type of response activity and use the corresponding dose limits.

The guidance to establish these limits comes from the *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* and uses the same limits for federal responders in a radiological emergency.

Mississippi Contamination Limits are as Follows	
Return Home	Less Than 300 CPM + Background
Return to Duty	Less Than 1000 CPM + Background

Items exceeding the contamination levels identified above must be decontaminated before being release or returned to service.

If you have any questions contact your supervisor.
By signing this form; I state that I have read and understand the contents of this card.

Signature _____

Date _____

Agency: _____ Assignment: _____

City: _____ Zip code: _____

Read and Record Every 30 Minutes

[illegible]



Potassium Iodide (KI) Ingestion Record

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Mississippi REP Program Potassium Iodide (KI) Ingestion Record

Warning

Do not take KI if you are allergic to iodine.

Side effects may include skin rashes, swelling of the salivary glands, and “Iodism” (metallic taste, burning mouth and throat, sore teeth and gums, symptoms of a head cold, and sometimes upset stomach and diarrhea).

A few people may have an allergic reaction with more serious symptoms. These could be fever and joint pains, or swelling of parts of the face or body and at times severe shortness of breath, requiring immediate medical attention.

In rare cases taking iodide may cause over activity of the thyroid gland, under activity of the thyroid gland, or enlargement of the thyroid gland (goiter).

Instructions

Take only when instructed by an authorized Mississippi Department of Health official. This instruction will be passed through the respective EOC local chain of command.

Complete the information on the front side of this card. Take two tablets (whole or crushed) daily (130mg) until you are directed to stop. Report any side effects to your supervisor or Radiological Officer.

Mississippi REP Program Potassium Iodide (KI) Ingestion Record



Name: _____ Issue Date: _____

Amount Issued: _____ Days Supply

Do not take KI until advised by your supervisor or Radiological Officer. Complete this section at the time of self-administering KI.

By signing this form, I state I have read the warning and instructions for administering KI and understand the rationale for its use as well as potential side effects that may occur from its administration. I understand that taking KI is voluntary.

Signature:

Date of Administration:

Record Date and Time that KI is Administered Below

Date	Time Taken

Date	Time Taken

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Equipment Checklist

Ludlum Model 25

✓	STEP (COMPLETE ALL STEPS PRIOR TO USE)
	1. Press and hold On/Acknowledge button for three seconds until LCD screen turns on.
	2. Screen should normally read 0.00 mR/ hr, but may pick up background radiation .03 to .05 mR/ hr.
	3. Make sure battery indicator shows full.
	4. Pressing the ACK button allows user to silence the alarm. The alarm will resume alarming again after 60 seconds.
	5. You may use a check source to check the equipment. Equipment will read an "F" and 0.00 will flash if the unit is not reading properly.



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







ATTACHMENT 11 – HANDHELD SURVEY METER – SETUP FOR OPERATION

HANDHELD CONTAMINATION SURVEY METER OPERATION

Setup Checklist for the Ludlum Model 26 Handheld Contamination Survey Meter

The Ludlum Model 26 is equipped with an integrated pancake-style Geiger-Mueller contamination detector and is powered by (2) AA batteries. It measures alpha, beta, gamma, and x-ray radiation and is used for detecting surface contamination, screening for environmental contamination, and detecting noble gases and other low energy radionuclides. It should be calibrated annually by a qualified operator using a certified calibration source or electronically using a pulse generator.

✓ STEP- (COMPLETE ALL STEPS PRIOR TO USE)		
WARNING: Do NOT press the red button . This button is used to set specific features of the meter.		
1.	Check for calibration label on the instrument. Do not use if the due date has been exceeded or if a calibration label is not found. Verify meter is in "working" condition.	
2.	If battery installation is needed, turn the probe over and open the battery lid by turning the wrist connector eyelet counter-clockwise with a ¼ turn. Load the 2 AA batteries with the + sign end towards the probe. Replace the battery cover and fasten by pushing in and twisting the eyelet clockwise ¼ turn.	
3.	Turn the instrument ON by pressing the GREEN OK button for about a second and then releasing. The instrument will activate all the LCD segments and audio feature for testing and then display readings in "cpm". Allow a 30 second warm up/internal electronic check of meter.	
4.	Ensure the low-battery indicator is not present. If shown on readout go to step 2.	
5.	Remove the clear heavy plastic probe cover.	
6.	Using the small "button" source located on the inside cover of the case behind the egg shell packing, place the open probe window directly over the check source.	
CAUTION: The meter has a digital readout. From 0 to 999 cpm the readout is what you see on the display screen; starting at 1000 cpm the meter switches to "kcpm" readout. BE AWARE WHEN THE "K" IS IN FRONT OF THE "CPM" . When this occurs move the decimal point three numbers to the right. For example; the readout indicates, "1.345kcpm"; this is actually "1345 cpm"; "12.435kcpm" = "12435 cpm".		
7.	The CPM shown on the display should increase. More frequent clicking should be heard with the AUDIO FEATURE enabled. Allow the number to settle out for ~ 1 minute.	
8.	The CPM displayed must fall within the RANGE that is printed on a label located on the probe side of the instrument and/or on the top of the storage box. Do not use if the instrument's readings remain outside (above or below) the labeled RANGE.	
9.	Determine Normal Background radiation levels (in CPM) for the assigned work area by observing the average CPM display after 30 seconds. Record on a Background Placard	
10.	Wrap the entire meter with one layer of Press 'n Seal, Cling Wrap or Saran Wrap. Smooth out the areas around the probe and digital readout screen. The wrap will cling to itself and provide contamination control for the entire meter.	
11.	When meter is not in use, turn the meter off by pressing the GREEN OK button for about 5 seconds (a countdown timer will show the meter responding)	
DO NOT USE meter if the following occur:		
<ul style="list-style-type: none"> • Calibration is not current. • Physical damage to the instrument. • Low-battery indicator is present • The display is flashing after you turn the instrument to ON. • Maximum relative humidity is greater than 95% 		<ul style="list-style-type: none"> • Meter does not pass the source response check. • Meter flashes a ZERO reading. • The meter flashes the maximum count rate of 99900 cpm and you verify you are not in a radiation field that would cause this reading.

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ATTACHMENT 11 – HANDHELD SURVEY METER – SETUP FOR OPERATION

HANDHELD CONTAMINATION SURVEY METER OPERATION

Setup Checklist for the Ludlum Model 14C Handheld Survey Meter

This is a specific purpose, handheld analog ratemeter that supports operating two separate radiation detectors. The internal is a mounted Geiger-Mueller detector. The external detectors can be a GM or Scintillator. The meter is equipped with an integrated pancake-style Geiger-Mueller contamination detector (Model 44-9) measuring alpha/beta/gamma. The meter is powered by (2) D batteries. It should be calibrated annually.

✓ STEP- (COMPLETE ALL STEPS PRIOR TO USE)	
NOTE: When surveying a person or item the probe should be ~ 1/2" away from surface.	
NOTE: The maximum reading on the internal GM detector is 2,000 mR/hr. The X1000 scale is used.	
1.	Check for calibration label on side of the instrument. DO NOT USE if the due date has been exceeded or if a calibration label is not found. Verify meter is in "working" condition.
2.	If battery installation is needed, ensure the Range Selector Switch is in the "OFF" position. Open the battery lid by turning the thumb screw counter-clockwise. Install the 2 D batteries. Match the battery polarity to the + and - marks identified on the battery housing lid. Close the battery lid and turn thumb screw clockwise to close.
3.	Connect the appropriate detector to the ratemeter by firmly pushing the connectors together while twisting clockwise until the connect latches (about one quarter-turn).
4.	Place the "AUD ON/OFF" toggle switch to the "ON" position.
5.	Turn the Response Toggle Switch to "S" or SLOW position.
6.	Turn the Range Selector Switch to "X1000" position.
7.	Perform a battery check by depressing the "BAT" button. Ensure the needle deflects to the battery check portion of the meter scale located in the lower right of the meter face.
8.	Turn Range Selector Switch to the "X100" scale.
9.	Remove the red protective probe cover. DO NOT have cover on meter while surveying.
10.	Place open pancake probe window directly on the check source that is provided. NOTE: This check source must be assigned to this specific meter and type of probe.
11.	Turn the Range Selector Switch downscale until the needle deflects on the scale. Hold for about 30 seconds until the needle stabilizes.
12.	Press the "RESET" button. The meter should zero out.
13.	After 30 seconds compare the average meter reading to the range label provided on the side of the meter. If the meter reading falls within the range, the meter is responding to a known radioactive source. If the reading does not fall within the range, DO NOT use.
14.	Determine Normal Background radiation levels (in CPM) for the assigned work area by observing the average CPM display after 30 seconds. Record on a Background Placard
15.	Place the "RESPONSE SWITCH" to the "F" or "FAST" position.
16.	Wrap the detector cover with one layer of Press'n Seal, Cling Wrap or Saran Wrap. Smooth out the areas around the detector.
17.	The ratemeter setup for contamination readings is now ready for use.
18.	When meter is not in use, turn the meter off by turning the Range Selector Switch to "OFF".
19.	When not using the meter for a prolonged period of time remove the batteries, disconnect the detector from the meter, and store in carrying case provided.

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Radiological Transportation



Initial Response

Transportation incidents involving radioactive materials need to first establish an **initial isolation zone** 75 feet in all directions. Priorities for rescue, life-saving, first-aid, fire control and other hazards are higher than the priority for measuring radiation levels.

Vehicle Placards

Standard Placard



Vehicle placarding is required when transporting:

- Packages with Yellow-III labels
- Exclusive Use LSA/SCO shipments
- Highway Route Controlled Quantity Shipments

Highway Route Controlled Quantity (HRCQ) Placard



HRCQ is a high activity shipment transported in a Type B package. The package will always have a Yellow-III label regardless of radiation level. HRCQ shipments by highway will require the standard placard on a white square background with a black border as shown at left.

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Package Labels



Radioactive White-I
Expect up to 0.5 mrem/hr at surface of package

No Transport Index associated with this label



Radioactive Yellow-II
Expect > 0.5 mrem/hr up to 50 mrem/hr at surface of package

Maximum Transport Index is 1 or 1 mrem/hr at 1 meter



Radioactive Yellow-III
Expect > 50 mrem/hr up to 200 mrem/hr* at surface of package

Maximum Transport Index is 10 or 10 mrem/hr at 1 meter*



Fissile Label
For packages containing fissile material, this label will appear with one of the three labels shown above. Criticality Safety Index on label is used by shipper to limit the number of packages on a conveyance



EMPTY Label
For packages that previously contained radioactive material. Package may still contain internal contamination

* May read up to 1,000 mrem/hr at package surface and up to 10 mrem/hr at 2 meters (6.6 feet) if package is transported in a closed transport vehicle under exclusive use provisions. Shipping papers will denote "Exclusive Use."

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Notes

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