

DENVER FIRE DEPARTMENT

STANDARD OPERATING GUIDELINE

Section: OPERATIONS  
Topic: Securing the Cities - Radiation Response

Topic No:	DRAFT
Date:	
Approved:	
Review Date:	
Replaces:	

**PURPOSE:** The Denver Fire Department policy regarding Radiological or Nuclear incidents is to conduct preventative radiological/nuclear (R/N) detection (PRND) activities to support early detection and response to R/N threats and potential incidents to provide the maximum amount of safety to citizens and officers.

**SCOPE:**

**I. Overview**

Preventative Radiological/Nuclear Detection (PRND) systems may be deployed:

- Throughout the City and County of Denver, and the cities of Englewood, Sheridan, Glendale, and Skyline, during daily activities and daily response-related activities, along with operational transits that include, but are not limited to roadways, mass transit, rail, and air.
- To assist with the detection and screening of commercial vehicles at various locations throughout the entirety of the jurisdictions served.
- During Special Events, such as all National Special Security Events (NSSE) or via the Special Event Assessment Rating (SEAR), as well as events with large attendance or as deemed necessary by the Mayor, Director of Public Safety, and/or the Chief the Denver Fire Department.
- In response to incidents involving or suspected of involving radioactive materials.
- The operational environment will dictate whether operations should be overt, low profile, or a combination of both.

**II. General**

This Order aims to adjudicate an R/N alarm at the lowest level.

- The PRND equipment is already set to the highest possible alarm settings to avoid unnecessary alarms. Primary and Secondary Equipment is calibrated to sensitive levels commensurate with the NFPA 470 standard and will detect low radiation levels. When the incident dictates a change in action level, authorized department personnel shall change the alarm settings on the PRND equipment.
- The use of PRND equipment will be limited to trained and qualified personnel. Personnel shall be trained before utilizing PRND equipment and must participate in annual refresher training.

STANDARD OPERATING GUIDELINE

Section: OPERATIONS  
Topic: Securing the Cities - Radiation Response

Topic No:	DRAFT
Date:	
Approved:	
Review Date:	
Replaces:	

**II. General (con't)**

- Denver Police Department and the FBI will be notified through the Communication Center of all Denver Fire Department Secondary Screening responses when indicated by the CONOPS. This notification will require a response if the screening produces an identification of a nefarious isotope, both natural and artificial. Suppose the source material is suspected or confirmed as being out of the source holder at any time during the screening process, or a contamination risk exists. In that case, primary screeners will request a Level II HAZMAT response from the Denver Fire Department.

**III. Radiation Detection Response Protocol**

- Step 1  
Primary Detection  
Detect, Verify, Locate/Localize
- Step 2  
Secondary Detection  
Note Readings, ID
- Step 3  
Technical Assistance  
Reachback – DOE Triage
- Step 4  
Operational Response  
Federal Assets
- Step 5  
Post Alarm Resolution  
Record, Report, Adjudicate

At any point during this process, an alarm may be adjudicated if it is determined that the source is legitimate. The FBI WMD Coordinator should be notified as soon as a threat is resolved.

STANDARD OPERATING GUIDELINE

Section: OPERATIONS  
 Topic: Securing the Cities - Radiation Response

Topic No:	DRAFT
Date:	
Approved:	
Review Date:	
Replaces:	

**IV. Operational Guidance: Primary Screening**

During the Primary Screening phase, a radiation source is detected, causing an alarm on the primary screening detection equipment:

- Personal Radiation Detector (PRD)
- Backpack
- Mobile System

Utilizing tactics and techniques learned in training, operators will detect, verify, and locate the source of the elevated radiological emission. Operators will use the totality of the available information, including behaviors, interview information, and the nature/location of the possible radiological concern, to support a preliminary assessment of the alarm and determine if further investigation is required.

**The Primary Screening Process is summarized below and in [Please list Annex # of STC ConOps – DFD Primary Screening Flowchart]**

When a radiation alarm condition is encountered during primary screening activities:

1. Immediately note the dose rate alert level and type of radiation displayed on the detector.
  1. Attempt to verify the alarm and localize the source. An alarm is considered confirmed if it is repeatable. The same instrument can perform this.
  2. Once the source is localized, the primary screener, based on reasonable suspicion and the totality of the circumstances, will contact Denver Fire Dispatch to ask for Denver Police to detain the individual(s) for further investigation.
  3. If the perceived source is a vehicle or object, isolate the individuals(s) from the vehicle object(s) to determine the location of the detected radiation source.
  4. Denver Fire will request Denver Police in the event the need to investigate or question to determine if the source is a non-threat.

DENVER FIRE DEPARTMENT

STANDARD OPERATING GUIDELINE

Section: OPERATIONS  
Topic: Securing the Cities - Radiation Response

Topic No:	DRAFT
Date:	
Approved:	
Review Date:	
Replaces:	

2. DFD Primary Screeners will request Secondary Screening isotope identification if:
  1. Primary screening procedures do not reveal the source of the confirmed alarm.
  2. Radiation levels do not appear to be consistent with shipping paper documentation or interview comments.
  3. Radiation source appears to be a potential threat to material condition.
  4. Consistent, unexplainable neutrons detected.
  5. Other inconsistencies and uncertainties are encountered.
3. Readings above 5 mR/hr may be encountered during the investigation, especially close to the person or object producing the radiation; however, if consistently elevated readings more than a foot away from objects or walls are encountered, that cannot be immediately explained (above 2 mg/hr, or "8" on pagers), personnel should take the following protective measures:
  1. Move away from the location of the suspected radiation source until a valid rate reading (less than 2 mg/hr or "8") is displayed. This will help ensure that personnel is not within a high radiation exposure area.
  2. Secure the area
  3. Establish control perimeter at the 2 mR/hr boundary (or where the pager is reading transitions to less than "8").
  4. Advise Denver Fire dispatch and FBI to contact the Secondary Screening Team and continue to investigate if safe to do so. If not safe, seek protective shielding until the Secondary Screening team arrives.
4. If the 2 mR/hr boundary is greater than ten feet from the source, or the PRD is overloaded or indicating 9-inches, ten feet or more away from the source, request radiation safety support (e.g., electronic dosimeters PRD's and equipment capable of measuring at least 1 R/hr may be needed for investigation and public safety if the source is not immediately identifiable and secured.)

STANDARD OPERATING GUIDELINE

Section: OPERATIONS  
Topic: Securing the Cities - Radiation Response

Topic No:	DRAFT
Date:	
Approved:	
Review Date:	
Replaces:	

**V. Operational Guidance: Secondary Screening**

Secondary screening involves using specialized radiation detection instruments, including radioisotope identification devices (RFIDs), to gather more information regarding the nature of the radiological alarm. The investigating primary screener will validate the nature of the radiological concern using dose measurement, visual clues, and initial isotopic identification to support an assessment of the alarm. It should be noted that RIIDs are not 100% accurate in identifying radioisotopes, and Reachback should be utilized if the initial analysis is inconsistent, inconclusive, or any suspicions exist.

**Team Structure**

A certified Secondary Screening Team shall be available 24 hours a day, seven days a week. This standby team should be able to respond to any location within the City and County of Denver within a reasonable time to prevent any extensive detentions times incurred by primary screeners with potential suspects in the field. Each team should consist of two qualified members. During a Secondary Screen event, DFD will request DPD for detention capability.

**Capability/Equipment**

Every Fire apparatus will have, at a minimum, a Personal Radiation Detector (PRD). Additional, specialized equipment will be issued to the units of the Hazardous Materials Response Team (HMRT) of the Denver Fire Department. This equipment includes, but is not limited to:

- PRD – Personal Radiation Detector with an incorporated dosimeter
- RIID – Radiological Isotope Identification Device
- Backpack (Man-portable detector)
- Mobile Detection System
- Tablet capable of transmitting data and files over the internet
- Tape Measure
- Check Source

**Secondary Screening**

Make telephonic contact with the FBI and the Primary Screener to confirm and receive any additional information that may be needed to guide response, isolation distances, or other concerns.

1. Conduct Secondary Screening, e.g., perform isotope identification spectrum collection and additional surveys following equipment procedures. Review all information obtained by the Primary Screening operator.

DENVER FIRE DEPARTMENT

STANDARD OPERATING GUIDELINE

**Section:** OPERATIONS  
**Topic:** Securing the Cities - Radiation Response

<b>Topic No:</b>	<b>DRAFT</b>
<b>Date:</b>	
<b>Approved:</b>	
<b>Review Date:</b>	
<b>Replaces:</b>	

2. If there are multiple hot spots on the incident, spectra are required.
3. The following measurements should be obtained (shorter spectra acquisition times may be used as the situation safety conditions warrant):
  1. 5-minute spectrum of the unknown isotope source
  2. 5-minute spectrum of a known isotope (check source)
  3. 5-minute background spectrum
  4. Two gamma dose rate measurements at two different distances – near and far, such as 1’ and 2’ or 30” and 60”.
  5. Neutron count rate
4. Request Reachback if:
  1. Unexplained Special Nuclear Material is identified.
  2. Secondary screening procedures do not reveal the source of the confirmed alarm.
  3. Radiation levels do not appear to be consistent with manifest shipping documentation or interview comments.
  4. Radiation source appears to be a potential threat material condition.
  5. Consistent, unexplainable neutrons detected – all neutron detections should be treated as potential threats until determined to be non-threatening and legitimate.
  6. Other inconsistencies and uncertainties are encountered.
5. Document alarm resolution

STANDARD OPERATING GUIDELINE

Section: OPERATIONS
Topic: Securing the Cities - Radiation Response

Table with 2 columns: Field Name and Value. Fields include Topic No: DRAFT, Date, Approved, Review Date, and Replaces.

All Secondary Screening activations will require notification to relevant stakeholders identified in the Information Exchange Plan and the FBI WMD Field Office.

- Regardless of the screening stage, criminal and terrorist threats involving RN materials require immediate notification to the FBI for coordination of a time sensitive response to potentially prevent harm or substantial loss of life or substantial damage to property.
• The Denver FBI WMD Field Coordinator can be contacted 24/7 by the FBI Denver switchboard at:
o (303)-630-6097 (press 0 at the prompt and ask for the WMD Coordinator).

VI. Adjudication Protocol

Adjudication occurs when the nature of the alarm has been determined, and the event is suspended. The adjudication process involves determining if the cause of the radiation alarm is a threat, benign, or regulatory concern. Adjudication can occur at any phase in the alarm response process and should be performed at the lowest possible organizational level.

Alarms Can Be Resolved into Two Possible Categories:

- Non-Threat
• Threat

Most radiological/nuclear alarms can be resolved with proper training at the primary screening level. Unresolved alarms will require secondary screening inspection and may require the response of other specialized resources such as DFD HAZMAT, Bomb Unit, or the FBI WMD Coordinator to support the alarm adjudication.

Non-Threat

- Naturally Occurring Radioactive Materials (NORM)
• Exempt Consumer Products containing Radioactive Material
• Medical treatments, such as injection of radiopharmaceuticals
• Transport or use of radioactive material, including improperly shipped or managed material without intent to harm. Safety and regulatory follow-on actions may be required for radioactive material that is improperly shipped or used.

Non-Threat: Individual/Conveyance released.

DENVER FIRE DEPARTMENT

STANDARD OPERATING GUIDELINE

Section: OPERATIONS  
Topic: Securing the Cities - Radiation Response

Topic No:	DRAFT
Date:	
Approved:	
Review Date:	
Replaces:	

- Non-Threat/Illegal Activity or Regulatory violation: notify the proper governing agency for action.

**Threat**

The event can be adjudicated as a potential threat at any time. Primary threat indicators listed below will help identify potential hazards that are cause for immediate notification of the FBI WMD Coordinator, in addition to:

- Shift Commander On-Duty
- Assistant Chief of Special Operations
- Captain of Special Operations
- Hazmat Branch Director or Team Leader of DFD HAZMAT

Primary threat indicators include:

- Discovery or possibility of explosives or improvised explosive devices in conjunction with the radiation alarm
- An indication of threat material or a terrorism nexus
- Any unexplained detection/indication of neutrons
- Special Nuclear Material (SNM) is identified

Threat determinations are generally made in coordination with the FBI through a unified command structure. The threat level must be made using the totality of information available to the investigating officer. Additional radiological indicators that warrant further investigation include:

- The level and distribution of the radioactivity do not correlate with the materials described in the shipping documents.
- Interview responses and/or shipping documents are inconsistent with additional information provided by the radioisotope identification device.
- The isotope cannot be identified, or the detection equipment, law enforcement data, and other relative information cannot conclusively identify the source of radiation.

Radiation levels exceed regulatory limits:

- 500  $\mu$ R/h at the surface of an unmarked package
  - Per the Department of Transportation Regulation, 49CFR173, properly shipped packages should not exceed these values
- 10,000  $\mu$ R/h at 1 meter from a placarded vehicle or labeled package
- 2,000  $\mu$ R/h in public areas



STANDARD OPERATING GUIDELINE

Section: OPERATIONS  
Topic: Securing the Cities - Radiation Response

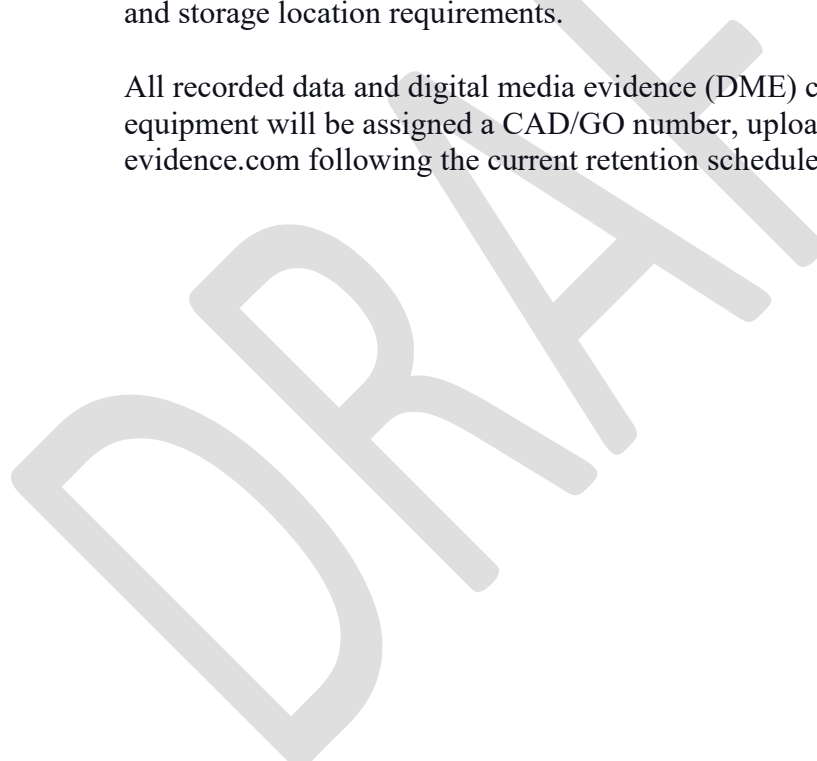
Topic No:	DRAFT
Date:	
Approved:	
Review Date:	
Replaces:	

- Per the Nuclear Regulatory Commission, this is the maximum exposure rate in uncontrolled, public areas

**VII. Evidence Collection**

Crimes potentially resulting in Federal violations and involving radioactive materials are solely the investigative responsibility of the Federal Bureau of Investigation (FBI). Accordingly, recovery of evidence will be directed by the FBI and may require coordination with other local, state, or federal agencies depending on the specifics of the response. Activities involving radioactive material, not within the jurisdiction of the FBI will be handled by the Colorado Department of Public Health and Environment or Denver Department of Public Health and Environment, as determined appropriate per the specific incident. The FBI WMD Coordinator or CDPHE/DDPHE representative (for non-threat regulatory or safety issues) will determine radioactive material evidence retention and storage location requirements.

All recorded data and digital media evidence (DME) captured by the PRND equipment will be assigned a CAD/GO number, uploaded, and retained in evidence.com following the current retention schedule.



Fire: Primary Screening Flow Chart

