



Department of
**Environment &
Conservation**

FedEx Source Recovery(s)

Event 1 initial notification

REPORTING PARTY

Name: TEMIKA JOHNSON
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MEMPHIS, TN 38118
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Type of Organization: PRIVATE ENTERPRISE

SUSPECTED RESPONSIBLE PARTY

Name: UNKNOWN
Organization:
Address:

Type of Organization: UNKNOWN

INCIDENT LOCATION

2903 SPRANKLE AVE County: SHELBY
City: MEMPHIS State: TN Zip: 38118
LARGE TRANSFER AND SORTING FACILITY.

RELEASED MATERIAL(S)

CHRIS Code: RAM Official Material Name: RADIOACTIVE MATERIAL
Also Known As: RADIOACTIVE MATERIAL (IRIDIUM 192)
Qty Released: 0 UNKNOWN AMOUNT

DESCRIPTION OF INCIDENT

CALLER IS REPORTING THAT DURING A ROUTINE SCAN OF A SECTION OF THEIR FACILITY THE RADIATION READINGS BEGAN RISING TO EXTREME LEVELS. THIS WAS DUE TO TWO SOURCES OF RADIATION (IRIDIUM 192) NOT BEING IN THEIR PROPER PACKAGING. THE CAUSE OF THE INCIDENT IS UNKNOWN AND WILL BE UNDER INVESTIGATION ONCE THE SCENE HAS BEEN CLEARED.

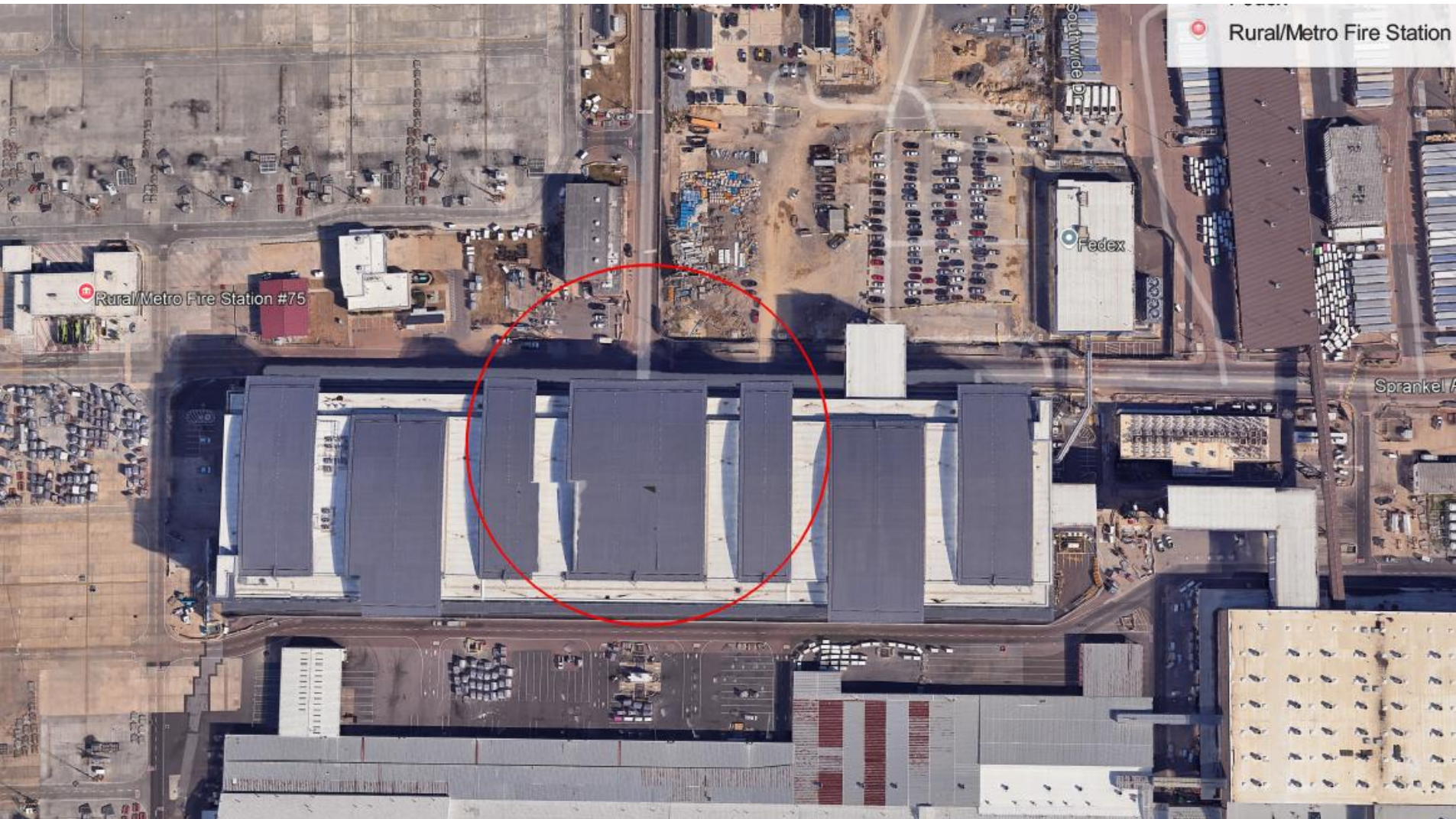
Agencies Involved



Survey and Recovery Plan

- Evacuate the area
- Authorize a source recovery team
- Set 2 mR/hr boundary
- Determine exact source location
 - Building (X,Y)
 - Floor (Z)
- Recover sources
- Dose reconstruction

Building affected



FEDEX Sources

REQUEST FOR RECIPROCAL OPERATION IN TENNESSEE

Company making the request: QSA Global, Inc.

P.O. Box / Street Address: 40 North Avenue

City: Burlington State: MA Zip Code: 01803

Person Making this Request: Mary Flanigan

Telephone: (781) - 505-8266 FAX: () -

License number: 12-8361 State: MA Copy provided during Calendar Yr. 2025

Job Location: FedEx Hub, Memphis, TN

Isotope source(s)

Isotope	Curies	Equipment Model number	Manufacturer
Ir-192	12.8	875 Capsule	QSA Global, Inc.
Ir-192	13.2	875 Capsule	QSA Global, Inc.

Description of work to be performed:

Emergency retrieval of (2) Ir-192 sources (Model 875, USA/0392/S-96) that escaped a Type A package. Package to be either reloaded in the shielded pot and original packaging or the sources are to be repackaged.

FEDEX Sources

Rad Pro Calculator Version 3.26 (Legacy and 64 Bit)

File Select Output Format Help

RAD PRO CALCULATOR

ISOTOPE DECAY DOSE RATE & ACTIVITY U & PU GRAMS CONVERSIONS URANIUM ENRICHMENT MDC/MDA
GAMMA EMITTERS BETA EMITTERS BREMSSTRAHLUNG X-RAY DEVICES ALARA INVERSE SQUARE LAW

Select Calculation
 Activity and Dose-Rate Shield Thickness

Enter Item ID

Select Isotope (Point Source)
Ir-192

Select Dose-Rate Units
R/hr

Select Activity Units
Ci

Select Distance Units
Feet

Select Activity Calculation
 Activity to Dose-Rate Dose-Rate to Activity

Enter Activity
 Ci

Enter Distance
 Feet

Calculated Dose-Rate
 R/hr

Add Shielding

26 Ci of Ir-192 at 10 Feet

Calculate Start Excel Show Workbook Exit

FEDEX Sources

Rad Pro Calculator Version 3.26 (Legacy and 64 Bit)

File Select Output Format Help

RAD PRO CALCULATOR

1000001808

ISOTOPE DECAY DOSE RATE & ACTIVITY U & PU GRAMS CONVERSIONS URANIUM ENRICHMENT MDC/MDA

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Select Calculation
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Enter Item ID

Select Isotope (Point Source)
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Select Dose-Rate Units
R/hr

Select Activity Units
Ci

Select Distance Units
Feet

Select Activity Calculation
 Activity to Dose-Rate Dose-Rate to Activity

Enter Activity
26 Ci

Enter Distance
1 Feet

Calculated Dose-Rate
133.920531315228 R/hr

Add Shielding

26 Ci of Ir-192 at 1 Feet

Calculate Start Excel Show Workbook Exit

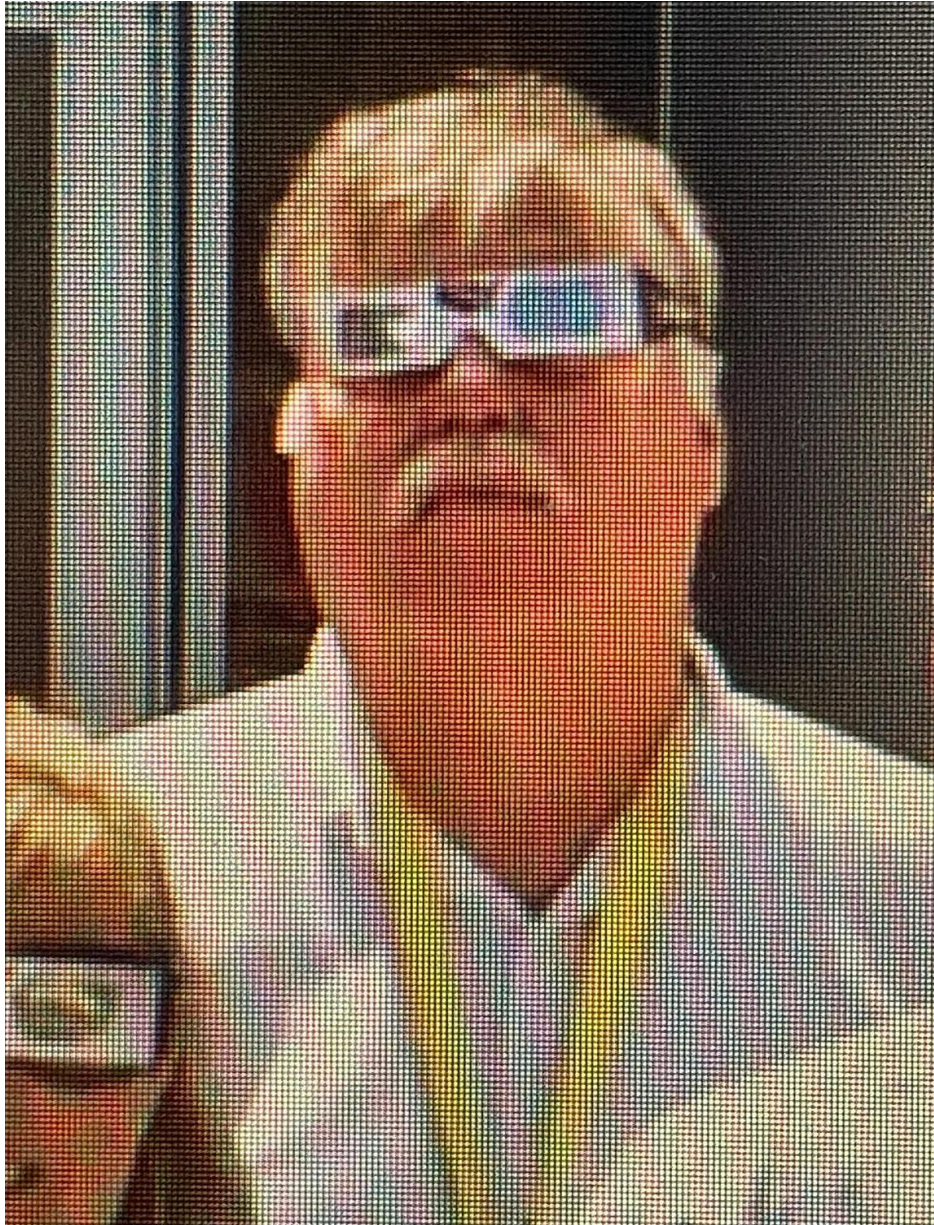


FEDEX Sources

Source Recovery Dose Info

- Stay Time for 5 Rem
 - 10 feet : 3.7 hours
 - 1 foot: 2.25 minutes
- requires responders with specialized training
Not a conventional hazmat crew

ALARA; Always Let Allen Run Ahead



FEDEX Sources

Narrative Summary event 1

- Jan 21, Allen Grewe met with FedEx staff, FBI, and Fire Dept to set boundary while we waited for FedEx to Authorize QSA Global (manufacturer) to come onsite. Emergency Reciprocity already approved
- The next morning the 45th Civil Support Team used a robot to survey and locate the sources.
- QSA Global arrived that afternoon and began source recovery operations.
- Sources recovered and building surveys clear at 2:12 pm on Jan 22

FEDEX Sources

Narrative Summary event 2

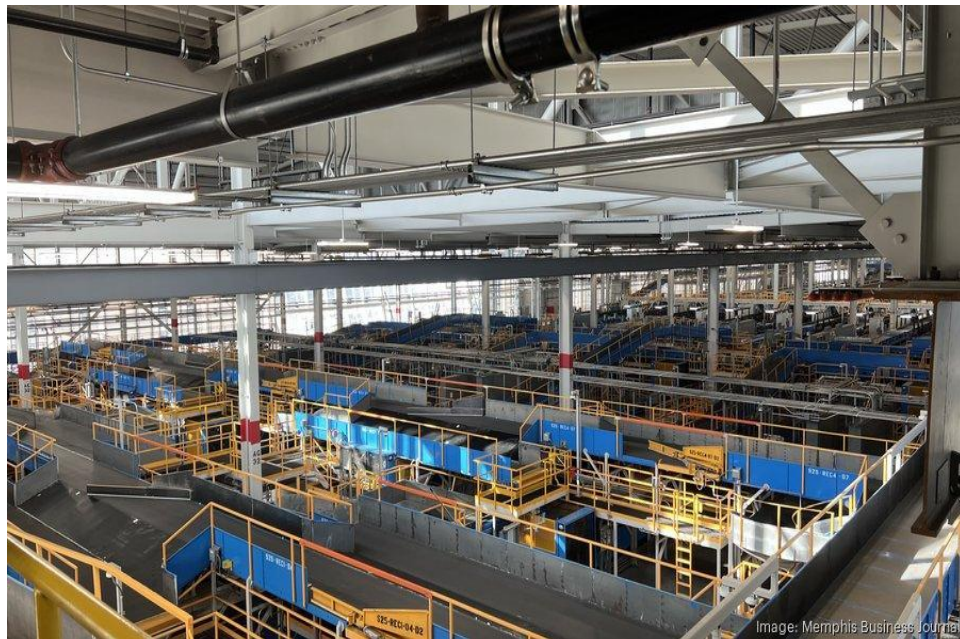
- Jan 27, 2nd set of sources discovered, Memphis Fire responded and building evacuated for second time
- Sources ID'd as Ir-192
- FedEx attempted to hire hazmat contractor to recover sources – Division of Radiological Health (TN Radiation Control Program) said no – no rad recovery qualifications
- Contractor against our advisement did apply lead blankets
- QSA Global contracted to perform recovery
- QSA Global arrived that evening and both sources recovered by 9:24 pm

FEDEX Sources





Location



**New FedEx Sorting Facility
Over 1,000,000 sqft
As tall as the Empire State Building on its side**





Entry



- 2mR Line was re-established on third floor
- We then pushed past the 2mR line until we found the highest radiation readings possible on foot utilizing R400 and Identifinder
- Robot deployed with R400 attached, along with multiple two person teams to gather readings from other floors
- Location was determined to be in the conveyor system overhead of a 10-15 square foot area

UNCLASSIFIED



Entry



UNCLASSIFIED

TN



Entry





UNCLASSIFIED

Post Entry



- Once determination was made of the location scene was turned over to the manufacturer QSA Global
- 2 hours after leaving the scene the 45th was notified of successful recovery of the IRIDIUM-192 sources
- 4 days after the event 45th Civil Support Team was notified of another loose source in the same facility, but was not requested
- 6 days after the event, the Dept of Transportation (DOT) investigator requested 45th interview for the purposes of additional investigation into FedEx facility criminal/accidental/negligence?

UNCLASSIFIED



Dose Reconstruction Results

- QSA Recovery Team
 - Event 1: 2 Individuals 70mR and 100mR
 - Event 2: 3 Individuals, 70mR each
- FedEx Employees:
 - The highest doses observed were to maintenance workers that were identified to have been working on equipment near sources during event 2 for approximately 3 hours, at 20 feet from sources for an hour and 6 feet from sources for 2 hours. Those doses are at 4.1 rem for the event.
 - Doses to approximately 14 workers working around conveyor belts that the sources sat on, between 1 to 1.8 rem of dose for the event.

Investigation

- Determination made by the Federal Bureau of Investigations (FBI) that sources were shipped together in a "tote" and not intended for sort but were separated in Massachusetts prior to shipping to Memphis, Tennessee
 - This resulted in the packages being sent through the sort facility
- The Tennessee Division of Radiological Health (DRH) limited to no authority beyond public safety – no release and sources recovered. Considered Subject Matter Experts to other agencies
- Federal OSHA Nashville office contacted DRH for info on our actions, but State DRH has no regulatory authority over these shipments at FedEx only the recovery (under reciprocity)
 - Investigators- coordinated with the Federal Aviation Administration and FedEx for survey data

Investigation

- Federal Occupational Safety & Health Administration (OSHA) contacted Tennessee OSHA (TOSHA)
 - Any findings must be based upon TOSHA independent surveys. Sources off site by this time
 - TOSHA dose limit is 1.25 Rem per quarter whole body
 - 29 CFR 1910.1096
 - Confirmed that FedEx informed employees of exposure and risks
 - FedEx provided report to TOSHA outlining plan to mitigate future occurrences by communicating with shipper, FedEx employees and vendors
 - This was acceptable to TOSHA given the circumstances and no deterministic doses that would result in measurable health effects

Jurisdictional Complications

- Tennessee Division of Radiological Health has no authority over items in transit
- Sources were shipped in compliance with DOT at point of shipping in Massachusetts
- Massachusetts is under federal OSHA jurisdiction
 - No exposure in Massachusetts; no investigation findings
- Exposure to employees in at FEDEX is ultimately under TOSHA authority
 - FedEx response accepted, case closed

Questions?

Contact information:

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Nashville, TN 37243

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