
Emergency Response to a Highway Accident in Springfield, Massachusetts, on December 16, 1991

U.S. Nuclear Regulatory Commission

Office of Nuclear Material Safety and Safeguards



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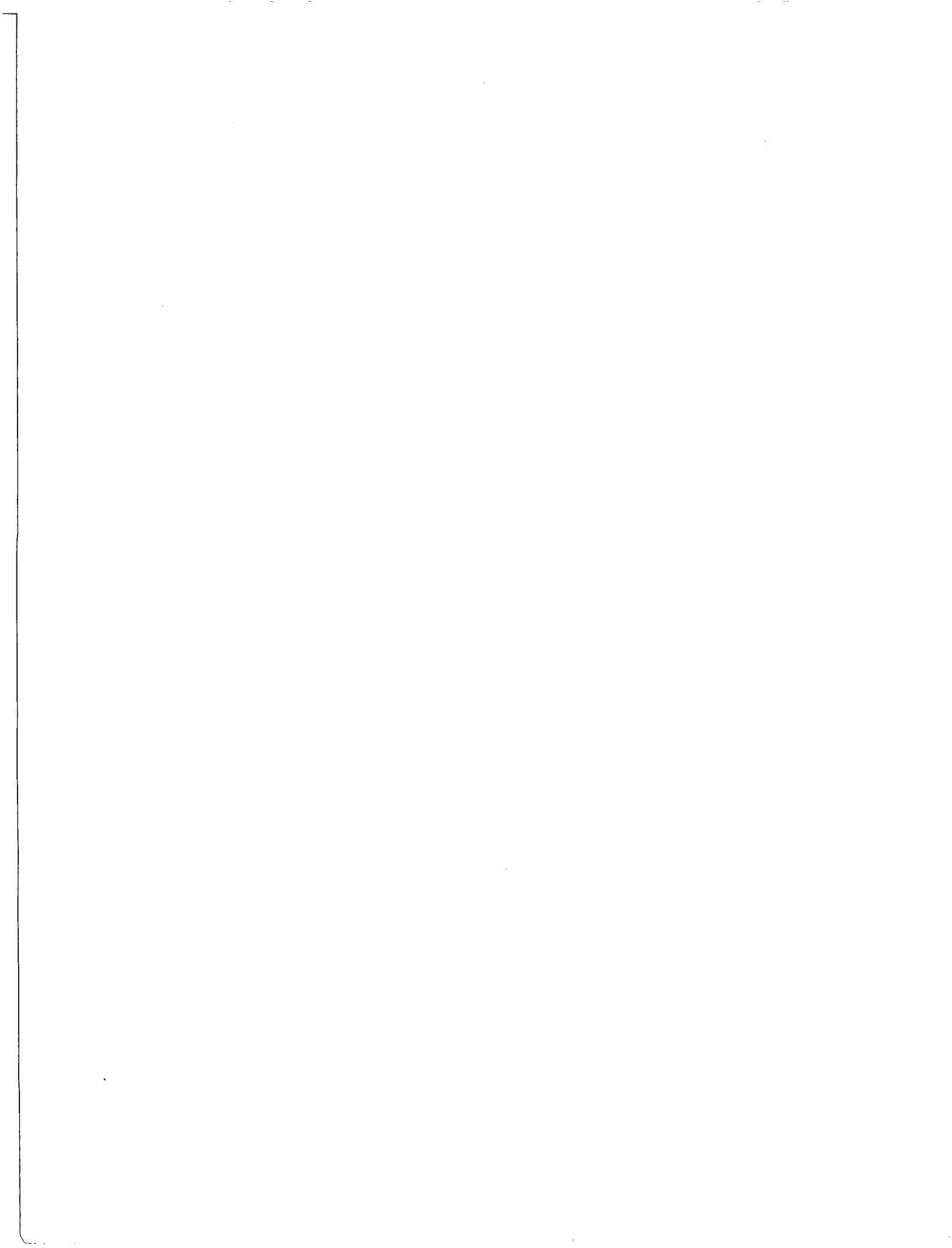
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ABSTRACT

On December 16, 1991, a truck carrying unirradiated (fresh) nuclear fuel was involved in an accident on U.S. Interstate 91, in Springfield, Massachusetts. This report describes the emergency response measures undertaken

by local, State, Federal, and private parties. The report also discusses "lessons learned" from the response to the accident and suggests areas where improvements might be made.

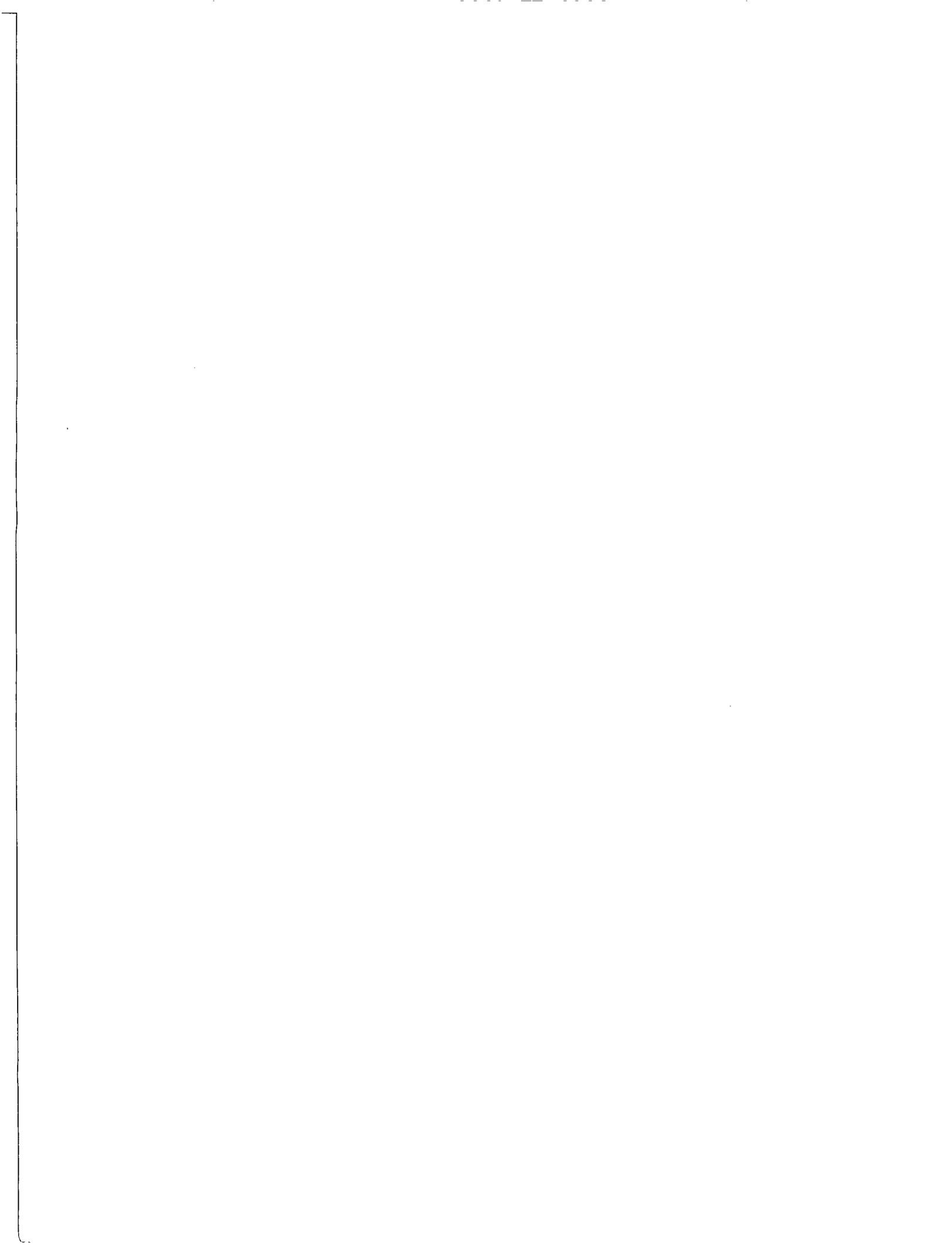


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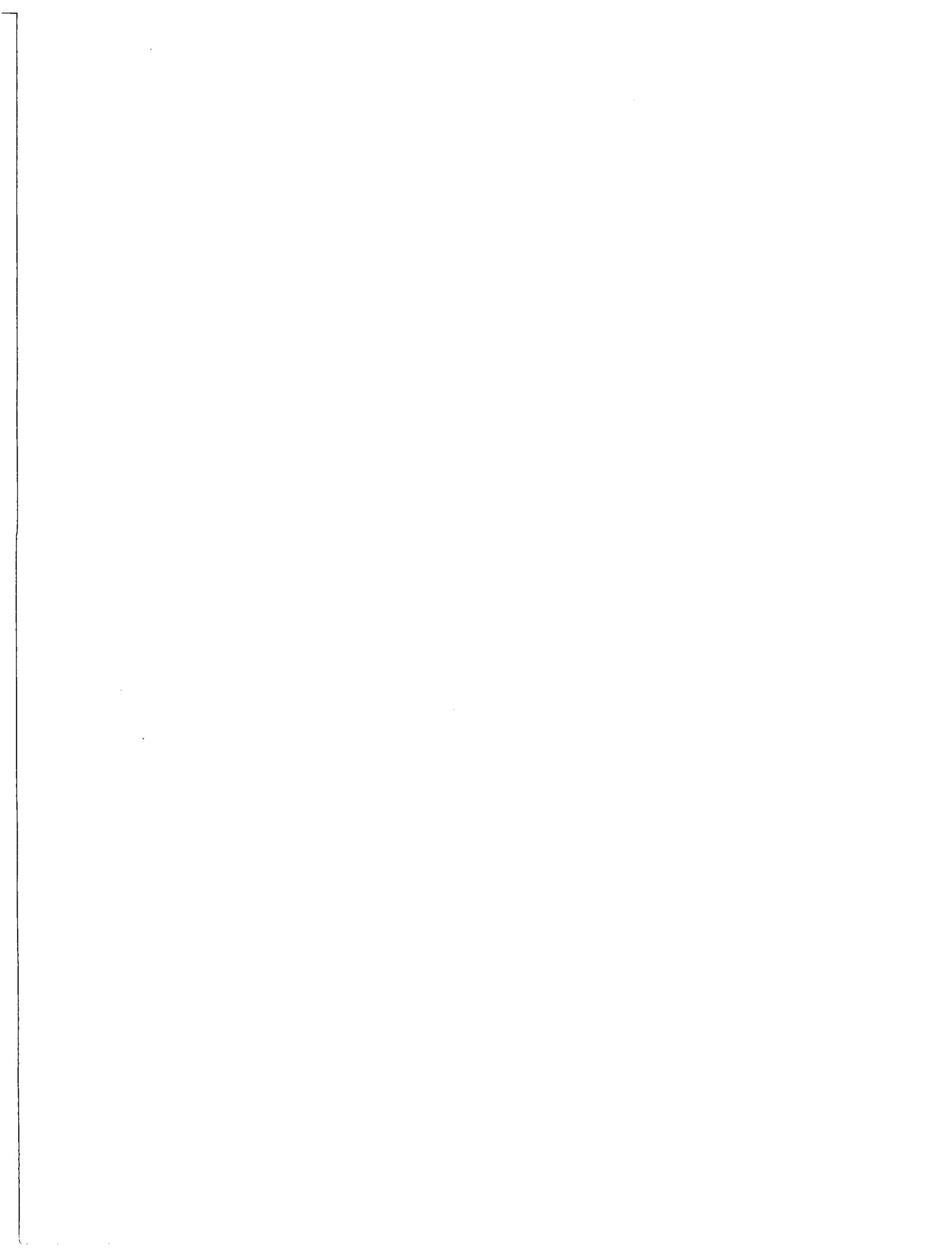
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ABBREVIATIONS

BWR	boiling water reactor
CAMEO	computer aided management of emergency operations
CHEMTREC	Chemical Emergency Transportation Emergency Center
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
ERP	emergency response plan
FEMA	Federal Emergency Management Agency
GE	General Electric Company, Wilmington, North Carolina
LLNL	Lawrence Livermore National Laboratories
NIAT	Nuclear Incident Advisory Team
NOAA	National Oceanic and Atmospheric Administration
NRC	U.S. Nuclear Regulatory Commission
MDPH	Massachusetts Department of Public Health
MEMA	Massachusetts Emergency Management Agency
MSDS	material safety data sheet
MSP	Massachusetts State Police
RIDS	response information data sheets
SCBA	self-contained breathing apparatus
UN	United Nations
UO ₂	uranium dioxide
USDA	U.S. Department of Agriculture
VY	Vermont Yankee Nuclear Power Station, Vernon, Vermont
WAFB	Westover Air Force Base



CHRONOLOGY OF EVENTS ACCIDENT IN SPRINGFIELD, MASSACHUSETTS

December 16, 1991

3:15 am Accident occurs on I-91.
3:18 am Springfield MSP receive report of accident.
3:24 am MSP arrive at scene.
3:24 am MSP request ambulance and fire department assistance at scene.
3:26 am Level 1 Hazardous Materials Emergency declared.
3:30 am Springfield Fire Department arrives at accident scene.
3:32 am Ambulances arrive at scene.
3:35 am Fire Department verifies identity of cargo from shipping papers.
3:50 am Command Post established.
3:50 am Fire Department contacts GE.
3:50 am Fire Department contacts VY.
3:56 am Ambulance carrying truck drivers leaves scene.
4:00 am Ambulance with automobile driver arrives at hospital.
4:02 am Fire Department speaks with individual incorrectly assumed to be an employee of NRC.
4:04 am Truck drivers arrive at hospital.
4:15 am Decision made by fire chief not to fight fire.
4:43 am NRC Operations Center notified of accident by GE.
4:50 am Incident upgraded to a Level 2 Hazardous Materials emergency.
4:50-5:10 am GE returns call to Command Post.
4:53 am Chicopee Police Department contacts CHEMTREC.
5:00 am Conference call coordinated by NRC.
5:02 am CHEMTREC returns call to Chicopee Police Department.
5:26 am NRC notifies DOT National Response Center followed by DOE, FEMA, EPA, FDA, and USDA.
5:30 am VY representative arrives at accident scene.
5:54 am NRC contacts Command Post.
6:00 am VY completes radiation survey of scene.
6:00 am NIAT arrives at accident scene and conducts radiological survey. Fire is essentially out.
12:15-2:30 pm Inner containers are bound with metal straps and loaded on replacement trucks.
3:00 pm Trucks depart for Westover Air Force Base.
3:15 pm Bound containers arrive at Westover Air Force Base.
4:45 pm NRC informed that GE has classified this event as a Site Area Emergency.

December 17, 1991

5:45 pm DOT issues Emergency Exemption for transporting containers back to GE-Wilmington.

December 18, 1991

10:00 am Trucks with repackaged containers depart Westover AFB en route to Wilmington, North Carolina.

December 19, 1991

10:00 am Shipment arrives at GE-Wilmington. GE declares Site Area Emergency over.

1. INTRODUCTION

On December 16, 1991, a truck carrying unirradiated (fresh) nuclear fuel was involved in an accident on U.S. Interstate 91 in Springfield, Massachusetts. The shipment of fresh fuel was the third of five being made from General Electric Company's (GE's) fuel fabrication plant in Wilmington, North Carolina, to the Vermont Yankee Nuclear Power Station (VY) in Vernon, Vermont, for a refueling outage scheduled for March 1992. The fuel shipment consisted of 24 fresh fuel assemblies,¹ packaged two each, in 12 Model RA-2/RA-3 shipping containers.²

The accident occurred at approximately 3:15 a.m., when an automobile traveling in the wrong direction on Interstate 91 collided head-on with the oncoming truck. As a result of the accident, the truck and shipping containers carrying the fresh fuel were engulfed in a fire that lasted for almost 3 hours. Despite the collision and subsequent fire, there were no deaths or serious injuries, and there was no release of radioactive material. The accident did, however, result in substantial property loss, including the truck, shipping containers, and damaged fuel assemblies.

2. OBJECTIVES

The primary objectives of this report are to review the guidance available to State and Federal authorities in responding to the Springfield accident, and to determine what actions were taken by the various parties involved. The report focuses on two critical aspects of emergency response: organizational responsibility, and hazardous material and emergency response communications. The report also identifies areas for improvement.

This report does not try to quantify the damage suffered by individual shipping containers during the accident nor assess whether the Model RA-2/RA-3 shipping containers performed as expected. The accident environment and damage that the shipping containers and fuel assemblies experienced during the accident are the subjects of a separate report prepared by Lawrence Livermore National Laboratory (LLNL) (See NUREG/CR-5892, "A Highway Accident Involving Unirradiated Nuclear Fuel in Springfield, Massachusetts, on December 16, 1991.")

¹The assemblies were GE 8x8 boiling water reactor (BWR) assemblies with an average uranium dioxide enrichment of 3.2 percent. The uranium dioxide fuel in the assemblies is in the form of ceramic pellets housed in sealed zircaloy tubes (fuel rods).

²The U.S. Nuclear Regulatory Commission (NRC) has certified the Model RA-2/RA-3 shipping container as a Type A container for fissile materials. It consists primarily of an inner steel container approximately 12 in. by 18 in. by 15 ft. long, packaged within a wooden over-pack.

3. SOURCES OF INFORMATION

The information used to prepare this report was supplied by the parties listed below and comes primarily from official agency reports, personal records of telephone conversations, eyewitness reports, interviews, video tapes, and logbooks.

- Springfield Fire Department
- Springfield Office of Emergency Preparedness
- Springfield Police Department
- Station WWLP-TV, Springfield
- Commonwealth Ambulance Service, Springfield
- Massachusetts State Police
- Massachusetts Department of Public Health Nuclear Incident Advisory Team (NIAT)
- General Electric Company in Wilmington, North Carolina
- Vermont Yankee Nuclear Power Station in Vernon, Vermont
- Chemical Transportation Emergency Center (CHEMTREC)
- U.S. Department of Transportation Office of Hazardous Materials Technology
- U.S. Department of Transportation Federal Highway Administration, Region I
- Lawrence Livermore National Laboratory
- U.S. Nuclear Regulatory Commission, Operations Center
- U.S. Nuclear Regulatory Commission, Region I
- Truck Driver involved in accident

Since some of the information supplied by the various parties is inconsistent or contradictory, an attempt has been made to include the most significant information (in its original form) in the appendices to this report.

4. DESCRIPTION OF THE ACCIDENT AND EMERGENCY RESPONSE

At approximately 3:15 a.m., on December 16, 1991, a truck carrying unirradiated nuclear fuel packaged in NRC-certified Model RA-2/RA-3 shipping containers was involved in an accident in Springfield, Massachusetts. The truck was traveling north on Interstate 91 when it was approached head-on by a Toyota Tercel heading in the wrong direction. The truck driver was unable to avoid the automobile and the vehicles collided on their right front sides. The truck then impacted the center steel guardrail,

crossed the highway and hit the right shoulder concrete barrier, then recrossed the highway, impacting the center guardrail again before coming to rest.

The Massachusetts State Police (MSP) received a report of the accident via CB radio at approximately 3:18 a.m. The MSP responded to the accident within minutes and blocked traffic on Interstate 91 in both directions. At approximately 3:24 a.m., the MSP requested assistance from the Springfield Fire Department and emergency medical personnel. The MSP were able to identify the truck's cargo as radioactive material from the shipping papers supplied by the truck driver. The truck's cargo could not have been identified by placarding, since U.S. Department of Transportation (DOT) regulations did not require the shipment to be placarded. It was also impossible to identify the cargo from the radioactive labels on the shipping containers, since the containers were covered by a tarpaulin.

Records from the Commonwealth Ambulance Service show that two ambulances were dispatched at 3:24 a.m. The ambulance drivers were informed, en route, that the accident involved a truck carrying hazardous materials, but were not told that the truck was carrying radioactive material until they reached the accident scene.³ Both ambulances reached the scene at approximately 3:32 a.m. The truck driver and alternate driver (his wife) were helped into the back of one of the ambulances by its crew, but were left unattended during the trip to the hospital because of concerns of possible contamination. The ambulance carrying the truck drivers left the accident scene at 3:56 a.m. While en route to the hospital, one of the ambulance drivers radioed ahead to inform the emergency room staff that the accident had involved an unknown radioactive material and that the incoming patients could be contaminated. (The hospital did not receive detailed information on the type of radioactive material involved until nearly a half-hour after the patients had arrived at the emergency room.)

The ambulance carrying the truck drivers arrived at the hospital at approximately 4:04 a.m. The driver of the automobile was transported to the hospital in the second ambulance, which arrived at about 4:00 a.m. As the patients arrived at the hospital, they were taken to a decontamination room to await examination. The patients were later examined by a doctor from the Radiation Safety Unit and found to be uncontaminated. All three patients were treated for minor injuries and released.

³Emergency Medical Services Report Nos. 918088, 918089, and 918551, Commonwealth Ambulance Service, Inc., dated December 16, 1991. (See Appendix E.)

The Springfield Fire Department dispatched units at approximately 3:25 a.m. When the responding fire units arrived, the State police transferred control of the accident scene to the fire department. There are conflicting descriptions of the extent of the fire when the fire department arrived. Some witnesses have described the fire as initially involving only the cab area and rear tires.⁴ Others describe the fire as more widespread.⁵

The MSP advised the fire department that the truck was carrying a radioactive material—uranium dioxide (UO₂). Based on this information, the fire department declared a Level 1 Hazardous Material Incident. A Level 1 Hazardous Material Incident is defined as an incident that police, fire department, Department of Public Works, and emergency medical personnel can *easily* handle with initial emergency response crews. Evacuation is not necessary.⁶

The fire department was able to verify the identity of the cargo at approximately 3:35 a.m., when the shipping papers were supplied by the MSP. The shipping papers listed the cargo as "RADIOACTIVE MATERIAL, Fissile, n.o.s., UN 2918"⁷ and as solid uranium dioxide. The shipping papers also referenced Guide 63 in the DOT *Emergency Response Guidebook* as the appropriate guidance to be used for emergency response. After consulting Guide 63, the fire department attempted to obtain additional guidance from CAMEO (Computer Aided Management of Emergency Operations), a hazardous material database. However, CAMEO did not contain an entry for uranium dioxide.

At this point the fire department decided to let the fire burn until additional information could be obtained about the truck's cargo from the shipper. At the time the decision was made, the shipping containers on the rear section of the trailer were still intact and not on fire. However, the shipping containers on the front section of the trailer were on fire, and two of the containers had apparently fallen off the trailer, landing on the highway between the truck and the center median strip.⁸

At approximately 3:50 a.m., a command post was established at a nearby hotel to monitor response efforts. The Springfield Fire Department contacted GE in Wil-

⁴The truck drivers, in an interview with LLNL, reported that the fire was initially confined to the cab and rear tires. R. Carlson, LLNL, personal communication.

⁵The ambulance drivers reported that the truck was fully engulfed in fire, when they arrived at 3:32 a.m.

⁶"City of Springfield Integrated Hazardous Materials Incident Response Plan," page 24. (See Appendix F.)

⁷The proper shipping name required by DOT regulations. The abbreviation "n.o.s." means not otherwise specified.

⁸Memorandum from J. F. Friberg, Lieutenant, Rescue Squad, to Fire Chief Gary Cassanelli, dated December 29, 1991.

mington, North Carolina, from the command post, via the 24-hour emergency response number listed on the shipping papers.⁹ According to fire department officials, GE advised the fire department "...not to approach the vehicle, to let the fire burn and to keep everybody away," and promised to call back with additional information.¹⁰ A summary of telephone contacts that GE supplied for the morning of December 16 show that a call was received from the Springfield police between 3:53 and 4:04 a.m. The GE summary does not reference any advice that may have been given out during the initial phone call. It does show that the GE manager for Nuclear Safety Engineering advised the fire department to put out the fire in a subsequent call. However, the return call was not placed until 4:50 a.m.¹¹

The fire department also contacted VY, in Vernon, Vermont, at approximately 3:50 a.m. to notify it of the accident and to request information about the hazard of the material. The fire department believed that the information given them was consistent with that given by GE, that is, to isolate the area, keep people away, do not attempt to approach the vehicle. The fire department was also informed that a response team would be sent from VY and would arrive within an hour.

According to VY records, VY advised the fire department that water could be used to fight the fire with precautions. These precautions included having all fire fighters down wind of the fire wear full turn-out gear and SCBAs (self-contained breathing apparatus), and treating all personnel, water, and equipment as contaminated until they could be surveyed. If the fire department chose not to fight the fire, VY stated that an evacuation area of 100 yards surrounding the fire would be adequate to protect the public. The fire department indicated to VY that it would probably let the fire burn, since it appeared that the hazard to the public would be minimal.¹²

At this point, the fire department upgraded the event to a Level II incident. Declaring a Level II Hazardous Mate-

⁹A 24-hour emergency response number is required by DOT regulations (49 CFR 172.604). The number must be monitored at all times and must be the number of a person who is knowledgeable about the hazardous material being shipped and has emergency response information for that material, or has *immediate* access to a person who possesses such information or knowledge.

¹⁰Memorandum from Captain Robert Pereira to Jim Controvich, dated February 27, 1992. (See Appendix D.)

¹¹See Appendix H, "Summary of Telephone Contacts," GE.

¹²Memorandum from B. N. Leach to R. E. Sojka, dated January 29, 1992. (See Appendix G.) The time that the exchange took place between VY and the fire department is not consistent with the records for the two organizations. VY control room logbook records show it received notification of the incident at 4:25 a.m. It in turn, called B. N. Leach, who then called the fire department. Mr. Leach's memorandum states he believed he talked to the fire department at about 4:15 a.m. Fire Department records show the call taking place at 3:50 a.m.

rial Incident¹³ allows the responders to call in additional resources to contain and mitigate the hazard. The upgrade was not communicated to the Springfield Police Department or other Springfield response agencies at this time. The fire department declared a Level II incident again, approximately 50 minutes later, allowing the police department to call in additional assistance for directing traffic.

At approximately 4:00 a.m., fire department personnel talked to an individual whom they believed worked for NRC.¹⁴ This individual stated that the shipping containers involved in the fire could withstand temperatures up to 3500 degrees Fahrenheit and that it was virtually impossible for these containers to fail under exposure to fire. He advised that the fire could be approached and fought in regular turnout gear.

The fire chief then moved closer to the scene of the accident to further assess the situation. The chief observed that the area was widely covered with diesel fuel and the fire was nearly out. Since there was concern about creating an environmental hazard by washing the fuel down the storm drains, as well as onto the area beneath the highway, at approximately 4:15 a.m. a decision was made not to fight the fire. The threat of thermal shock from cold water causing additional damage to the metal inner fuel containers was also considered in this decision.

At about 4:50 a.m., CHEMTREC was contacted by the Chicopee Police Department to obtain information for responding to an accident involving uranium dioxide. CHEMTREC read a definition from a chemical dictionary database to the police that described the material as a high radiation risk. The dictionary also listed uranium oxide as synonymous to uranium dioxide. CHEMTREC then telefaxed to the police department a Material Safety Data Sheet (MSDS) for uranium oxide that contained emergency response information.

GE informed the NRC Operations Center of the incident at 4:43 a.m. NRC then proceeded to notify the DOT National Response Center (at approximately 5:25 a.m.) as well as the Federal Emergency Management Agency (FEMA), Massachusetts Emergency Management Agency (MEMA), Environmental Protection Agency (EPA), Department of Health and Human Services, and the U.S. Department of Agriculture (USDA). NRC

¹³"City of Springfield Hazardous Materials Incident Response Plan," page 24. The need to declare a Level III Hazardous Materials Incident would have occurred if the incident had been beyond the capability of the city and local resources, or the incident had been anticipated to last longer than 24 hours; State and Federal resources would have been needed.

¹⁴NRC does not employ anyone with the name the fire department gave. However, there is an individual with the same surname employed by the shipper, GE. The GE individual participated in conference calls with NRC, shipper, DOT, and the DOT National Response Center.

contacted the Springfield Command Post at approximately 5:55 a.m. to offer assistance. The fire department reported that the fire was virtually out at this point. The NRC resident inspector from Vermont Yankee was in the Springfield area at this time, and proceeded to the scene to provide further assistance, as needed.

A VY representative arrived at the scene at approximately 5:30 a.m. and proceeded to survey the area for contamination. At 6:00 a.m. the survey was completed, and no radiation contamination was detected. At this time the fire was out, but the packages were still smoldering.

Several conference calls were held throughout the morning between NRC, DOT and State and local officials to discuss where the damaged containers could be sent until GE arrived and prepared them for a return shipment to its facility in Wilmington. After reviewing several options, State representatives decided to transfer the containers to the Westover Air Force Base (WAFB) in nearby Chicopee, Massachusetts. NRC participated in the discussions relating to the transfer of the damaged containers and supported the decision to use WAFB.

At approximately 3:00 p.m. the containers were transferred to WAFB. The damaged inner containers were bound with steel straps and repackaged in new wooden overpacks. On the morning of December of 18, 1991, the containers were returned to the GE facility without further incident.

5. REVIEW OF EMERGENCY RESPONSE EFFORTS

Review of the emergency response efforts undertaken during the Springfield accident focused on two major areas: organizational responsibility, and hazardous material and emergency response communications. These areas provide the setting in which the emergency response measures were taken and provide indications of where improvements might be made.

5.1 Organizational Responsibilities in Emergency Response

Because of the number of parties involved in responding to most accidents, it is essential that the roles of the various parties be well-defined and coordinated.¹⁵ Responding parties should have established guidance or re-

¹⁵FEMA has developed guidelines for Federal, State, tribal and local officials to use in developing emergency response plans for transportation accidents involving radioactive materials. (See "Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents," FEMA-REP-5, March 1983. A draft version of FEMA-FEP-5, Revision 1, was published in July 1991.)

sponse plans that ensure that the primary responsibilities for emergency response to transportation accidents have been assigned, and that emergency response responsibilities have been defined and documented in writing. An emergency response plan should establish procedures to ensure that the proper parties are involved in the response, that adequate resources are made available, that required notifications and communications are made, and that there is a clear chain of command among responding parties. The following sections discuss the emergency response guidance or plans in place for each of the major responders.

5.1.1 State and Local Authorities

In practice, State and local authorities are almost always the parties providing the initial response to a hazardous material accident. The local and State authorities who provided the initial response to the Springfield accident included the MSP (Springfield Barracks), and the Springfield Police and Fire Departments. The Commonwealth Ambulance Service provided emergency medical services.

The initial response by these parties proceeded largely in accordance with the Springfield Emergency Response Plan (ERP) that the City of Springfield has in place for dealing with hazardous material incidents.¹⁶ The key elements of the plan invoked during the initial response included:

- **Establishing an Incident Commander**—the MSP who initially responded to the accident relinquished control to the Springfield Fire Department. The ERP calls for the first responding chief officer from the fire department to be designated the INCIDENT COMMANDER.
- **Classifying the Level of the Event**—In accordance with the ERP, the INCIDENT COMMANDER (fire department officer) declared the accident a LEVEL I incident. The level of the incident determines what resources are available and requires an assessment by the Incident Commander. The incident was later upgraded to a Level II incident.
- **Establishing a Command Post**—The INCIDENT COMMANDER established a command post from which important decisions could be coordinated.

These activities indicate that the lead responsibility was clearly designated, that the responders considered what resources were needed and acted to obtain those resources, and that the response was coordinated from a central location. The incident commander remained in

¹⁶"City of Springfield Integrated Hazardous Material Incident Response Plan," revised Feb. 28, 1990. (See Appendix F.)

charge of the accident scene until the emergency phase was over.¹⁷

A critical decision, made during the emergency phase of response, was whether to extinguish the truck fire. Based on the hazardous material and emergency response information available during the accident and its training, the fire department decided not to fight the fire. (The hazardous material and emergency response information available during the accident and its impact on the fire department's decision are discussed in more detail in Sections 5.2 and 5.3.) The fire department used the "DECIDE Action Guide", for responding to hazardous material incidents, in arriving at its decision.¹⁸

The "DECIDE Action Guide" defines six key points for analyzing and responding to hazardous material incidents:

- D - Detect hazardous material present.
- E - Evaluate likely harm with no intervention.
- C - Choose action options.
- I - Identify the best options.
- D - Do best option now.
- E - Evaluate progress.

The fire department was able to "detect" the hazardous material present from the shipping papers. However, the fire department did not believe that it had sufficient information (from the shipping papers and Emergency Response Guidebook) to determine whether to fight the fire. The determination not to intervene (i.e., fight the fire) was based, in part, on the inconsistencies in emergency response information received during the accident and on several precautions listed in the Emergency Response Guidebook. The Emergency Response Guidebook, for example, states that runoff from fire control may cause water pollution, and that SCBAs and structural firefighter's protective clothing will provide limited protection. These precautions imply that there may be a risk to persons fighting the fire, and to the general public,

¹⁷The emergency phase (as used here) ended after the fire had burned itself out and the packages were surveyed and determined not to have released any radioactive material. The recovery phase began when the damaged shipping containers were loaded on trucks to be relocated to a temporary storage site.

¹⁸According to the DOT National Response Center, the "DECIDE Action Guide," which was developed by Ludwig Benner, is widely used in hazardous material incident response literature and training. It is specifically referenced in the *Hazardous Materials Response Handbook* published by the National Fire Protection Association. The Springfield Fire Department employs the "DECIDE Action Guide" in its in-house training.

from contaminated runoff. It should be noted that the accident occurred on a elevated highway that drains into the nearby Connecticut River.

At one point in deciding how to respond to the fire, the fire department asked a representative from VY, the intended receiver of the cargo, whether public safety would be endangered if the fire were not extinguished. The VY representative replied that there would be no threat to public safety outside an evacuation zone of 100 yards. The fire department then informed VY that since the fire was no threat to public safety where it was located, there would be no attempt to extinguish it, and that the fire department would wait until a team from VY arrived on the scene to evaluate the potential contamination problem.¹⁹ The fire department cited this interchange with VY as support that public safety would not be affected by its decision to let the fire burn out. In short, the fire department acted reasonably to protect public safety, consistent with its training and understanding of the emergency response information made available.

The Commonwealth of Massachusetts has identified its Department of Public Health as the lead State agency for responding to transportation incidents involving radioactive material. The Massachusetts Nuclear Incident Advisory Team (NIAT) serves as a support agency in responding to such incidents.²⁰ Representatives from the Massachusetts Department of Public Health (MDPH) and from NIAT arrived at approximately 6:00 a.m. and conducted radiological monitoring of the accident scene and adjacent areas. NIAT continued to conduct radiological assessments during the emergency response and recovery phases.

The MDPH assumed responsibility for arranging to transfer the damaged shipping containers to a temporary site, where the containers could be inspected and repackaged in new outer wooden overpacks. Several sites in the Springfield and Chicopee areas were considered. MDPH selected WAFB, after consultation with Federal and local officials.²¹

¹⁹Memorandum from B. N. Leach to R. E. Sojka, dated January 29, 1992. (See Appendix G.)

²⁰Massachusetts has an emergency response plan written specifically for radioactive material incidents. The lead agencies and responsibilities for dealing with radioactive material accidents are defined in the *Nuclear Incident Advisory Team Handbook*. The resources and capabilities of the Commonwealth in providing emergency response to radioactive material transportation accidents are further described in "Survey of State and Tribal Emergency Response Capabilities for Radiological Transportation Incidents," NUREG/CR-5399, Indiana University, November 1990.

²¹The Mayor of Chicopee later expressed concern, in a letter to the Chairman of NRC that he was not contacted about the storage of hazardous material at WAFB. The containers were transported through Chicopee en route to WAFB.

5.1.2 Federal Agencies

In general, Federal agencies do not become involved in responding to transportation accidents unless specifically requested to do so by a State or local authority.²² In instances where Federal assistance is requested, the Federal government's role is primarily one of supporting the lead role of State and local governments. In most cases, the Federal role is limited to monitoring the event and providing technical information and assistance. FEMA, the U.S. Department of Energy (DOE), or EPA may provide coordination of Federal agency activities when two or more Federal agencies are requested to respond to an accident.

State and local governments can also request direct Federal help in monitoring and assessing the effects of a radiological transportation accident.²³ In these cases, DOE has the lead Federal role for coordinating radiological monitoring and assessment until emergency conditions have subsided, at which time the lead Federal role is transferred to EPA. FEMA, DOE, and EPA were notified of the Springfield accident by the NRC Operations Center. DOE and EPA played no significant role in the response since their assistance was not requested. FEMA assistance was requested to facilitate the transfer of the damaged shipping containers to WAFB. However, FEMA was unable to provide timely assistance and the issue was resolved through direct contact with the base commander. The primary Federal agencies providing assistance during the Springfield accident were NRC and DOT. Their roles are discussed in the following sections.

5.1.2.1 NRC

NRC's role in responding to transportation accidents is defined in a general policy statement published in the *Federal Register* on March 29, 1984.²⁴ As stated in the policy statement, NRC's primary responsibilities during a transportation accident are to:

1. Contact the designated State agency, as soon as practicable, to ensure that the agency has been informed of the incident;

²²Some Federal agencies have statutory authority to respond to certain situations without a State request (e.g., situations involving nuclear weapons or occurring within specially designated areas). There was no statutory requirement for Federal agencies to respond to the Springfield, Massachusetts accident.

²³DOE has the capability for providing radiological monitoring and assessment, if requested. Response teams consisting of Federal and contract personnel are located at most DOE laboratories.

²⁴"NRC Response to Accidents Occurring during the Transportation of Radioactive Material; General Statement of Policy," 49 *FR* 12335, March 29, 1984.

2. Offer the State technical assistance, advice, and evaluations when the State is initially notified;
3. Make sure that DOE and other affected agencies are aware of the incident;
4. Maintain awareness of the situation until normal conditions are restored;
5. Provide information on packaging characteristics;
6. Ensure that the shipper (if an NRC licensee) provides complete and accurate information to emergency personnel; and
7. Provide recommendations to emergency response personnel on radiological issues, if requested by the on-scene coordinator or if a need is recognized by NRC personnel.

The responsibility to contact the designated State agency was not applicable in the Springfield accident since the State was aware of the incident before NRC. The Commission did offer, through its Region I Office and Headquarters, technical assistance, advice, and evaluations to the State during the incident and the recovery operations that followed. Communications among the State, shipper, Region I, and Headquarters were facilitated by conference call bridges established through NRC Headquarters Operations Center. Region I was the lead for NRC, with Headquarters providing technical information on the packaging. The first conference call was logged in at 5:00 a.m., on December 16, and subsequent calls were held frequently throughout the response. These calls helped ensure complete discussion of health and safety issues during decision-making.

At about 5:30 a.m., NRC notified DOE, FEMA, EPA, the Food and Drug Administration (FDA), USDA, and DOT. DOT regional personnel went to the accident site early. However, NRC did not interact extensively with DOT Headquarters until the second day of the incident, when the recovery operation was the primary issue.

GE declared the event as a Site Emergency early on Day 1 of the incident. A review of the licensee's emergency response plan does show that a transportation event, such as the Springfield accident, could be appropriately classified as a Site Emergency under its existing plan. However, the NRC Operations Center did not become aware of the classification until late in Day 1. The Site Emergency lasted approximately 3 days and 6 hours, until the shipping containers were returned to the GE facility.

Site Emergency classifications have specific meanings for fixed facilities such as reactors or fuel facilities. The use of the Site Emergency classification for an offsite transportation emergency is confusing. It may be appropriate to consider developing a standard classification for transportation emergencies.

5.1.2.2 DOT

Carriers notify DOT of transportation incidents in which fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive material. DOT's Federal Highway Administration, Region I, staff went to the accident scene, and subsequently prepared a memorandum describing the circumstances and cause of the accident. DOT Headquarters was principally involved with the recovery phase of the accident and issued an exemption, under 49 CFR 107.113, to permit the transportation of the damaged packages, under emergency conditions, to a nearby utility for temporary storage and repackaging before being returned to the shipper. State and local authorities later decided to transport the damaged fuel to the WAFB instead of the utility. NRC supported this decision. In choosing the new location, the need to revise the DOT exemption was overlooked, and the exemption was not revised to reflect the change in storage/repackaging site.

5.1.3 Shipper

The responsibility of the shipper is to know and comply with all applicable Federal, State, tribal, and local regulations pertaining to the shipment of radioactive materials. These responsibilities include:

- offering packages of radioactive materials in full compliance with the applicable DOT and NRC transportation requirements;
- supplying properly completed shipping papers; and
- providing a 24-hour emergency response number.

GE, Wilmington, NC (shipper of the unirradiated fuel involved in the Springfield, MA accident) used an appropriate package (RA-2/RA-3) for the shipment. The shipping container is certified as a Type AF container by NRC (NRC Certificate of Compliance No. 4986). The shipment was offered for transportation in compliance with applicable requirements, including properly completed shipping papers. The shipper also took an active role in preparing the damaged shipping containers for return to the GE facility in Wilmington, North Carolina. The shipper, however, was not prepared to provide timely emergency response information when requested.

5.1.4 Carrier

The primary responsibilities of a carrier during an accident are to notify local authorities, to ensure that a prompt response is initiated, and to ensure that emergency response information is available. The truck driver was able to retrieve the shipping papers from the truck cab and give them to a Massachusetts State trooper.

5.1.5 Receiver

The intended receiver of the shipment, VY, had no responsibility to respond to the accident, although the unirradiated fuel was being shipped to its facility. However, VY was contacted by emergency response personnel at the scene of the accident for information on fighting the fire. VY personnel responded to requests for information, dispatched a team to the accident scene, with detection equipment, and performed radiation surveys.

5.2 Hazards Communications

To respond effectively to hazardous material accidents, first responders must be able to determine what hazardous materials are involved. DOT regulations require shippers to communicate the hazardous nature of shipments through the use of shipping papers, the marking and labeling on individual packages, and by placards on the transportation vehicle.²⁵ A primary objective of these regulations is to enable first responders to identify the hazardous material by its proper shipping name, its United Nations (UN) Identification number, or its hazard class. The shipping name, identification number, or hazard class can be used to find emergency response guidance, for a specific hazardous material, from DOT's *Emergency Response Guidebook*.²⁶

The shipment involved in the Springfield accident fully complied with DOT's requirements for marking, labeling, and shipping papers. In this case, the shipping papers were crucial in enabling the local fire department and police to identify the truck's cargo. As mentioned previously, the truck was not required to have a placard, and the labels on individual shipping containers were hidden by a tarpaulin covering the containers when the police and fire department first responded. Using the shipping papers, the police and firemen were able to determine the proper shipping name, RADIOACTIVE MATERIAL, Fissile, n.o.s., and material identification number, UN2918, for the cargo.

5.3 Emergency Response Communications

First responders often need additional information to determine or confirm their planned response during emergency situations. In recognition of this, DOT regulations require that certain emergency response information be provided in addition to the information required on the shipping papers. This information may be con-

²⁵Requirements for shipping papers, package marking and labeling, and placarding are given in DOT regulation 49 CFR Part 172, Subparts C, D, E, and F.

²⁶1990 *Emergency Response Guidebook*, DOT P 5800.5. DOT developed the guidebook for use by responders; it has been widely distributed to carriers and to State and local public safety authorities.

tained directly on the shipping papers, or be included, along with the shipping papers, as a separate document. The required emergency response information must include the following:

1. Basic description and technical name of hazardous material;
2. Immediate hazards to health;
3. Risks of fire and explosion;
4. Immediate precautions to be taken in case of an accident or incident;
5. Immediate methods for handling fires;
6. Initial methods for handling spills or leaks; and
7. Preliminary first-aid measures.

DOT regulations also require that a 24-hour emergency telephone number be listed on the shipping papers.²⁷

Additional emergency response assistance is also available from the Chemical Transportation Emergency Center (CHEMTREC). CHEMTREC provides 24-hour assistance to emergency responders, carriers, shippers, and other parties handling hazardous materials, via a toll-free telephone number. The *Emergency Response Guidebook* recommends that CHEMTREC be consulted to obtain additional emergency response guidance.

Information supplied by the shipper and responding parties shows that the shipper provided the required emergency response guidance and 24-hour emergency response telephone number for the Springfield shipment. The emergency response information was supplied by including a copy of *Emergency Response Guidebook* Guide 63 with the shipping papers. The shipping papers listed a telephone number at GE's fuel fabrication facility in Wilmington as the required 24-hour emergency response number.

The first responders were made aware of and used Guide 63 in determining how to respond to the truck fire. After initially consulting the guide and a hazard material database, CAMEO, the fire department called GE to obtain information that would clarify or confirm the recommendations given in Guide 63. The fire department also contacted the intended receiver for the cargo, VY in Vernon, Vermont. Based on the perceived inconsistencies between the guidance received from GE and VY and that

²⁷DOT regulation 49 CFR 172.604 requires a 24-hour emergency response number which must be monitored at all times, and must be the number of a person knowledgeable about the hazardous material being shipped, and who has emergency response information for that material or has immediate access to a person with such information or knowledge.

given in Guide 63, and the lack of information in the CAMEO database, the fire department reaffirmed its initial decision to let the fire burn.

The Chicopee police also called CHEMTREC on behalf of the Springfield police and fire department. However, the call was placed too late, approximately 4:53 a.m., to have an appreciable impact on the decision to let the fire burn. Even if the call had been earlier, an examination of the data supplied by CHEMTREC indicates that it would not have been useful in responding to this event or in confirming the information given in Guide 63.

Since the initial response was largely determined by the emergency response information received from the shipper, receiver, CAMEO, and DOT's Emergency Response Guidebook, these sources of information are discussed in more detail in the following sections. The emergency response information received from CHEMTREC is also discussed in Section 5.3.5.

5.3.1 Emergency Response Guidebook

The shipping papers were sufficient to allow the first responders to identify the material by its proper shipping name and locate the appropriate guidance (Guide 63) in DOT's Emergency Response Guidebook. (In this instance, the shipping papers actually included a copy of Guide 63.) However, there is some indication that the "generic nature" of the shipping name itself may have led to uncertainty in the initial response to the fire. Since the proper shipping name, RADIOACTIVE MATERIAL, Fissile, n.o.s, is used for all fissile radioactive material, it applies to materials with vastly different radiological hazards (e.g., unirradiated fuel (low-level radioactivity) and irradiated fuel (high-level radioactivity)). Guide 63 contains cautions against unshielded exposures, internal inhalation and ingestion, and contamination that are more appropriate to the hazards posed by highly radioactive materials, such as spent fuel. Therefore, Guide 63 may be misleading when used for fresh fuel shipments.²⁸ It appears that the use of Guide 63 may have caused the responders to overestimate (or at least be uncertain of) the limited radiological hazards associated with fresh fuel. Because of this uncertainty, the responders decided to let the fire burn until additional guidance could be obtained.

5.3.2 CAMEO

After consulting Guide 63, the fire department attempted to obtain additional guidance from CAMEO, a software package designed for emergency planning and life-saving response to chemical accidents. CAMEO was developed by the National Oceanic and Atmospheric Administration (NOAA) and EPA, with distribution and

²⁸Especially in this instance, where the responders were not initially aware that the shipment contained fresh fuel.

technical support provided by the National Safety Council. CAMEO contains over 3300 commonly transported hazardous chemicals, 60,000+ synonyms for those chemicals, identification numbers, and labeling conventions. The system provides Response Information Data Sheets (RIDS) for a variety of chemicals, which specify fire and explosive hazards, health hazards, firefighting techniques, cleanup procedures, and protective clothing. CAMEO is currently in use in fire departments and hazardous material response units for responding to hazardous material accidents.

The Springfield Fire Department routinely uses the CAMEO in responding to hazardous materials emergencies. When the fire department queried CAMEO, there was no information available on uranium dioxide.

CAMEO currently has eleven chemical names for radioactive materials, and these names are similar to those found in DOT's Emergency Response Guidebook. As with the *Emergency Response Guidebook* guides, CAMEO entries for radioactive material may be too broad to address specific types of radioactive material being transported.

5.3.3 Shipper

The Springfield fire department contacted the shipper, GE-Wilmington, at approximately 3:50 a.m., using the 24-hour emergency response number listed on the shipping papers. There are conflicting accounts on what advice GE gave the fire department during the initial call. Information submitted by the fire department suggests that GE advised it, at that time, not to fight the fire and to maintain an evacuation zone around the accident. GE believes that no "official" advice was given until the GE Manager for Nuclear Safety Engineering called back the Springfield fire department between 4:50 and 5:10 a.m. The advice given at that time was to put out the fire.

On either account, it does not appear that the 24-hour emergency response number was effective in assisting the Springfield Fire Department. The shipper required almost an hour to respond with its emergency response information. Meanwhile, the fire department believed it had received guidance from GE not to attempt to put out the fire. By the time the fire department received guidance from GE to fight the fire, it was too late to have an impact on the fire department's decision.

5.3.4 Receiver

VY, the intended receiver of the unirradiated fuel shipment, was contacted by the Springfield Fire Department at about 4:15 a.m. according to the station control room log. A VY representative immediately returned the call to the fire department, was advised that the truck and

cargo were on fire, and was requested to provide information on how to fight the fire. The VY representative responded that water could be used to extinguish the fire, but that precautions should be taken, including:

- use of full turn-out gear and SCBA for firefighters downwind of the accident;
- survey of firefighters and equipment;
- treatment of water runoff as contaminated.

The Fire Department also requested information on the hazards of letting the fire burn itself out. The VY representative responded that an evacuation of 100 yards around the fire would be adequate, and that there would be no hazard to the public from the radioactive material outside that area.

The response provided by VY, concerning cautions in fighting the Springfield fire, appear to agree with those provided in Guide 63. The VY cautions may have reinforced the impression, left by Guide 63, that the material involved in the fire posed a significant radiological hazard. For example, Guide 63 states, under the heading "Health Hazards", that runoff from fire control or dilution may cause pollution. Controlling the runoff water in this incident would probably have been a difficult operation and, according to Guide 63, could have led to potential contamination and exposure. The progress of the fire, potential difficulty in complying with firefighting precautions, and the simplicity and low-hazard assessment of the no-action option appear to have contributed to the fire department's decision to let the fire burn.

5.3.5 CHEMTREC

The Chicopee police called CHEMTREC at approximately 4:53 a.m. to request assistance in responding to an accident involving uranium dioxide. (The shipping papers describe the cargo at one point as enriched solid uranium dioxide.) CHEMTREC's initial response was that there was no information available on uranium dioxide in the optical storage and retrieval database.²⁹ CHEMTREC was, however, able to provide the Chicopee police with information on uranium dioxide from the *Condensed Chemical Dictionary*. The *Condensed Chemical Dictionary* stated that uranium dioxide has a "high radiation risk" and ignites spontaneously in finely divided form. The *Condensed Chemical Dictionary* also listed uranium oxide, uranic oxide, urania, and yellowcake as synonymous to uranium dioxide. The initial contact closed with CHEMTREC promising to call back the Chicopee police if any additional information became available. CHEMTREC followed up on the initial call at approximately 5:02 a.m. when it telefaxed an MSDS on uranium oxide, yellowcake, to the Chicopee police.

²⁹CHEMTREC Report Number 11838, dated 12/16/91. (See Appendix I.)

The information received from CHEMTREC was not useful in determining whether to fight the fire. The information was requested at a point when the decision to let the fire burn had become irreversible. By 4:53 a.m. the fire had been burning for about 1½ hours and the fire department had decided that using water on the shipping containers might induce additional damage from thermal shock. However, even if the information had been requested earlier, it is doubtful that it would have been useful in responding to an accident involving a shipment of fresh fuel rods. The information provided by CHEMTREC (which was for uranium oxide or yellowcake) was not consistent with the guidance given by the shipper and receiver.

DOT permits shippers to use CHEMTREC to fulfill their requirement for a 24-hour emergency response number. Potential advantages of using CHEMTREC in this manner are that the emergency response information from the shipper and CHEMTREC would be identical, and that CHEMTREC has knowledgeable staff on duty 24 hours a day. The disadvantage is the cost. Even if shippers did not want to undertake the cost of using CHEMTREC as a 24-hour emergency response number, they should consider supplying emergency response information to CHEMTREC on the hazardous materials they ship. This should ensure that CHEMTREC has available appropriate emergency response information for the specific materials being shipped.

The availability and timeliness of accurate emergency response information is important not only to first responders but to the public as well. During the Springfield event, CHEMTREC was contacted by a major wire service for information on the material involved in the accident. The wire service was also given the information, from the *Condensed Chemical Dictionary*, that uranium dioxide posed a **high radiation risk**. When this information was subsequently used in the news media, many in the public may have been unduly alarmed.

6. SUMMARY—LESSONS LEARNED FROM THE SPRINGFIELD ACCIDENT

The emergency response efforts during the Springfield accident involved the concerted activities of numerous local, State, Federal, and private parties. In general, each of these parties responded in accordance with established guidance and emergency response plans. Required notifications and communications were made, and there was a clear chain of command among the responding parties. In short, the mechanism in place for responding to emergencies worked.

Key decisions made during the response were influenced by the emergency response information received during the accident, and quite possibly from the lack of adequate survey equipment. The responding parties did not believe that the emergency response information received from the various sources was consistent. In addition, the first responders may have been unable to accurately determine the radiological risk from the shipment because their equipment was outdated and may not have been calibrated. This could have contributed to the decision not to fight the fire. However, it should be noted that first responders are not practiced in the use of radiological survey equipment and should not depend on survey equipment to determine their response.

On January 13, 1992, a critique of the response to the December 16, 1991, accident was held at the Springfield Fire Center.³⁰ Representatives from local, State, and Federal agencies involved in responding to the incident participated in the critique, which was moderated by the City of Springfield Office of Emergency Preparedness.³¹ The representatives discussed issues that arose as a result of the incident and made recommendations for improvements. Selected issues and recommendations are discussed below.

One issue raised by the fire department was whether their 1950s Civil Defense monitoring devices were adequate for the response. The discussion indicated that there is considerable variability in radiological-monitoring-equipment maintenance and calibration practices among the agencies represented. There was agreement that modern equipment would provide greater assurance to emergency responders.

The MSP concluded that the incident was an example of the importance of up-to-date reference material, and that if sufficient information had been available to the fire department on a more timely basis, the truck fire could have been extinguished instead of being allowed to burn. The MSP also suggested that it would be helpful if it

³⁰Report dated January 29, 1992, Captain Robert J. Bradley, MSP.

³¹Agencies represented included:
Springfield Fire Department
Springfield Fire Commissioner
Springfield Police Department
Springfield Department of Public Works
Springfield Office of Emergency Preparedness
Commonwealth Ambulance
Massachusetts Nuclear Incident Advisory Team
Massachusetts Department of Environmental Protection
Massachusetts Emergency Management Agency
U.S. Nuclear Regulatory Commission
U.S. Department of Transportation
U.S. Occupational Safety and Health Administration
Federal Emergency Management Agency
Vermont Yankee Nuclear Power Station
Baystate Medical Center
Monsanto Chemical Company (observer)
Massachusetts Legislature (observer)

received additional training in the recognition of nuclear material packaging.

The Springfield Police Department indicated that since the fire department had declared only a Level I situation initially, the Police Department was unable to call in additional personnel for traffic control and related duties. Further, when the fire department did upgrade the incident to a Level II status, the upgrade was not communicated to the police department. Most of the issues discussed at the January 13, 1992, meeting involved improvements in communications, equipment, or procedures. Most of these improvements can be implemented at the local and State level. A notable exception is the need to improve hazardous material and emergency response information. A more detailed discussion of the issues is contained in Appendix C.

In addition to the issues identified at the meeting, NRC has identified the following additional items for consideration:

Emergency Response Organizational Responsibilities

1. NRC does not have an adequate classification standard for categorizing transportation accidents. GE declared the Springfield event as a "Site Emergency." This classification is confusing since it does not have the same meaning as a site emergency for a fixed facility. Consideration should be given to developing a standard classification, for transportation events, that has its own terminology.
2. State agencies have the responsibility for directing emergency response activities. As part of this responsibility, they should keep local officials informed of decisions affecting their jurisdictions. The responsibility to notify local officials should remain with the State.

Hazardous Material and Emergency Response Communications

1. Use of the 24-hour emergency response number listed on the shipping papers was not effective. Although a recommendation to fight the fire was eventually provided to the responders, it was received too late to guide response actions. DOT regulations require that the person monitoring the number either be knowledgeable, or have immediate access to a person who has knowledge, of comprehensive emergency-response and incident-mitigation measures, and be responsible for providing detailed information concerning the hazardous

material. Shippers need to ensure that they can promptly satisfy this requirement at any hour.³²

2. Emergency Response Guide 63 may not be appropriate for responding to transportation emergencies involving unirradiated (fresh) fuel. Because this guide is used for all fissile materials, it is quite broad in scope, providing cautions against the more highly radioactive fissile materials (i.e., spent fuel). These cautions, however, may not be appropriate for low-level fissile materials, in that they may cause first responders to overestimate the limited radiological hazard associated with these materials. Alternatives to assigning all fissile materials to Guide 63 should be considered, including assigning low-level fissile materials to a different guide, or developing additional guides that more closely address the hazards of different fissile materials.
3. In general, the emergency response guides in the 1990 Emergency Response Guidebook may be too generic. All radioactive materials, other than a few uranium and thorium compounds,³³ are grouped under nine DOT proper shipping names.³⁴ Five of these proper shipping names carry the descriptor "n.o.s.", or "not otherwise specified." The emergency response guidance for the numerous materials classified under the nine shipping names is contained in just three guides, Guides 61, 62, and 63. Consideration should be given to the possibility of using packaging type and end use in assigning DOT shipping names to radioactive material cargoes. The use of packaging type may be appropriate since radioactive material is the only category of hazardous materials with the shipping packaging designed to meet hypothetical accident conditions.
4. CHEMTREC was not able to provide appropriate emergency response information for uranium dioxide. Although the information received from CHEMTREC did not play an important role in determining the initial response to the Springfield accident, it could play a significant role in future accidents. The 1990 *Emergency Response Guidebook*,

³²49 CFR 172.604(a) and (b).

³³They are THORIUM METAL, pyrophoric; THORIUM NITRATE, solid; URANIUM ACETATE; URANIUM HEXAFLUORIDE, fissile; URANIUM HEXAFLUORIDE, non-fissile; URANIUM HEXAFLUORIDE, low specific activity; URANIUM METAL, pyrophoric; URANIUM NITRATE HEXAHYDRATE SOLUTION, URANYL NITRATE, solid; and URANYL ACETATE.

³⁴The proper shipping names are: (1) RADIOACTIVE MATERIAL, empty package; (2) RADIOACTIVE MATERIAL, excepted package; (3) RADIOACTIVE MATERIAL, instruments and articles; (4) RADIOACTIVE MATERIAL, articles manufactured from natural or depleted uranium or natural thorium; (5) RADIOACTIVE MATERIAL, fissile, n.o.s.; (6) RADIOACTIVE MATERIAL, limited quantity, n.o.s.; (7) RADIOACTIVE MATERIAL, low specific activity, n.o.s.; (8) RADIOACTIVE MATERIAL, n.o.s.; and (9) RADIOACTIVE MATERIAL, special form.

which is widely disseminated to fire, police and other emergency response organizations, advises first responders to call CHEMTREC for emergency response information on hazardous materials. Shippers of radioactive material should be aware that CHEMTREC may not have emergency response information on the materials they ship and should consider supplying appropriate emergency response information to CHEMTREC.

5. CAMEO, the hazardous materials database used by

the Springfield fire department, did not contain any information on emergency response measures appropriate for accidents involving uranium dioxide. As with the *Emergency Response Guidebook*, CAMEO entries for radioactive materials may be too broad to address the specific hazards of the wide range of materials being transported. Consideration should be given to adding emergency response information to the CAMEO system for radioactive materials.

APPENDIX A
Shipping Papers

GENERAL ELECTRIC

2117 CASTLE HAYNE ROAD
WILMINGTON, NC 28402

IDENTIFICATION NUMBER	M/S 334-86889
706800152	Ref. VERMONT # 3
	DATE 12-15-91

This Memorandum

is an acknowledgement that a Bill of Lading has been issued and is not the Original Bill of Lading nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, counted, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party of any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Uniform Freight Classification in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

CONSIGNEE:

VERMONT YANKEE NUCLEAR POWER STATION
VERMONT YANKEE NUCLEAR POWER CORP
VERNON, VERMONT

CONTACT: M.P. BOROIT OR GREG WALLIN
8-802-257-7711

CARRIER/ROUTE

Carrier MGSL Trailer # 44577X

Delivery 08 0700 on 12-16-91

Emergency or Delay: See Drivers' Instructions!!!

SHIPPER

GENERAL ELECTRIC CO., Castle Hayne Rd.
Wilmington, North Carolina 28401
For Freight Payment Send
A. Original Freight bill
B. Copy of the Bill of Lading

TO: Corp. Freight Payment Ctr.
PO Box 061000
Ft. Myers, FL 33906

AT (IF DIFFERENT)

The carrier shall not make delivery of the shipment without payment of freight and all other lawful charges. (Signature of Consignor)

If charges are to be prepaid, enter "To be Prepaid"
PPO/ 31097275460102537

QUANTITY, DESCRIPTION AND IDENTIFICATION OF ARTICLES

QUANTITY	DESCRIPTION AND IDENTIFICATION OF ARTICLES	WEIGHT
12	WOOD & STEEL BOXES, NO. RADIOACTIVE MATERIAL, FISSILE, N.O.S. UN2918	31500
	TOTAL QUANTITY: <u>4864</u> KGS., U-ENRICHED <20%, SOLID, URANIUM DIOXIDE	
	ACTIVITY PER PKG: <u>648</u> CURIES OR LESS	
	HAZARD LABELS ON PKG: RADIOACTIVE	
	TRANSPORT INDEX PER PKG: <u>4.15</u> , TOTAL <u>Yellow II</u>	
	NRC PKG CERT NO./IAEA PKG IDENT NO.: <u>USA/4986/AF</u> , PKG MODEL RA-2/RA-3	
	PKG IS FISSILE CLASS I,	
	PLACARDS: NONE REQUIRED ** EMERGENCY RESPONSE GUIDEBOOK: Guide# 63**	

DRIVER'S INSTRUCTIONS: TEAM REQUIRED: Yes No

- DO NOT ARRIVE AT DESTINATION MORE THAN 1 HOUR PRIOR TO ESTABLISHED DELIVERY TIME STATED ABOVE UNLESS AUTHORIZED BY GE-TRAFFIC (CALL YOUR DISPATCHER FOR APPROVAL).
 - CARRIER SHALL MAINTAIN CONTROL OF SHIPMENT UNTIL RECEIPT BY CONSIGNEE.
 - ANY CONDITION WHICH MAY CAUSE DEVIATION TO ABOVE REQUIRED DELIVERY TIME, OR
 - IF EMERGENCY, ACCIDENT, THEFT, OR THREAT OF THEFT, DRIVER (OR DISPATCHER) MUST CALL GENERAL ELECTRIC IMMEDIATELY.
- TRAFFIC PHONE: 7am-3pm, Monday-Friday (except holidays) 919/675-5626 or 5474
-EMERGENCY/SECURITY PHONE: (After Regular Hours): 919/675-0501 or 6181

CARRIER/DRIVER STATEMENT: I have read and understand the above instructions.

Driver Signature (x)

Tractor #

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

SIGNATURE _____

TOTAL COUNT	Shipper, Per _____	Agent, Per _____	TOTAL WEIGHT
-------------	--------------------	------------------	--------------

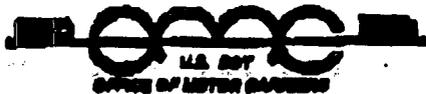
4 1) Original: GE (2) Driver (3) Driver "Billing Copy" (4) Consignee

APPENDIX B

Accident Investigation Report

**U.S. Department of Transportation
Federal Highway Administration**

Memorandum



Subject: Radioactive Material
Accident Memorandum

Date: December 20, 1991

From: R.L. Mollis, Officer-in-Charge
Providence, Rhode Island

Reply to:
Attn. of: HMC-RI

To: Stephen Crane, ROOMC
Albany, New York 12207

Please find memorandum regarding the accident of December 16, 1991 involving radioactive nuclear fuel that occurred in Springfield, Massachusetts.

I have a complete set of photographic prints available and have one roll of excellent slides for viewing.

Radioactive Material
Accident Investigation Memorandum Report
Date of Accident: 12/16/91
Carrier: McGill Specialized Carriers, Incorporated
Joplin, MO 64802

Date & Time of Accident: 12/16/91 3:18 a.m. EST

Location: US 91 North Springfield, Massachusetts
Between Exits 7 & 8
Weather Clear - Cold Dry Highway

Carrier: McGill Specialized Carriers, Incorporated MC 11845
East 7th Street, Duonweg, MO
P.O. Box 113, Joplin, MO 64802
Telephone 800-641-7680

Other Vehicle: John F. Bryne
14 Jeffery Lane
Bloomfield, CT 06002

Vehicles involved: Tractor
White/GMC 1990 Sleeper
MGUWR 80,000 lbs.
Utah Registration 021767
VI 4VIM08DFXLY607124

O.M.C.
REGIONAL
DEC 23 1991

RECEIVED

Semi-Trailer
Fountain 1989 Flat Bed
48 ft. Georgia Registration T2278
VI 13N1482CEK1545768

Passenger Vehicle: 1988 Toyota Tercel, 2 door
CT Registration 198 FRE
VI JT2EL32DBJ0297821

Drivers: Commercial Vehicle
Joseph P. Dunn - DOB 04-22-33
716 Northwest 96th Street
Oklahoma City, Oklahoma 73114
License Number OKS18 341777
Status - Commercial License
(No CDL Status)

Passenger Vehicle: John F. Bryne DOB 07/21/64
14 Jeffery Lane
Bloomfield, CT 06002
License Number - CT 1B4334718

Fatalities: NONE

Injuries: Three (3)
Driver Commercial Vehicle - Treated and Released
CO Driver - Treated and Released
Driver Passenger Vehicle - Treated and Admitted to the
Hospital

Cargo: Hazardous Material
Twelve (12) - Wood & Steel boxes containing total gravity
4864 K83, U-Enriched less than 20% solid Uranium dioxide.
Total Activity each package .648 curies or less or
approximately 7.77 curies total activity transport index 2.7

Hazardous Material: USA/4986/AF
Packaging: Package - Fissile Class I
PLACARDING: None Required
See attached shipping documents

Property Damage: Extensive DOE to the
Accident and Fire
Estimated on 12/18/91 to be in excess of
\$200,000.00

SYNOPSIS: Driver Joseph Dunn was operating North on US 91 between
Exits 7 & 8 in Springfield, Massachusetts at approximately 0318 hours
on December 18, 1991. The trip had originated in Wilmington, North
Carolina, and was destined for the Vermont Yankee Nuclear Power Station
located in Vernon, Vermont. The cargo of the vehicle were 12 wood
and steel boxes which contained Fissile Class I radioactive material,
solid U-enriched less than 20%, Uranium Dioxide.

At the above stated time and place, driver Dunn observed a vehicles headlights coming toward him which would be South in the North Lanes of the divided highway. Driver Dunn made an attempt to avoid the oncoming vehicle which he could not do. Both vehicles made contact on their respective right front sides. The tractor semi-trailer unit then made contact with the righthand bridge rail and barrier, then crossed the highway striking the center median barrier, bursting into flames.

The passenger vehicle after striking the T-T Unit continued south and came to rest against the right bridge rail and barrier. The driver of the T-T Unit and co-driver exited the burning unit taking only the shipping papers and emergency response information with them.

The Springfield Fire and Police Units responded with the Springfield Fire Chief taking command of the incident.

The Massachusetts State Police on arrival took control of the accident and information gathering of the accident. The Massachusetts State Police notified all appropriate State and Federal officials that may have had a concern about the accident or incident.

Action taken at the scene: The Springfield Fire Chief made a determination to let the fire burn itself out instead of taking any other action. The immediate area around the scene was secured and the highways that connected with Interstate 91 in downtown Springfield were closed to traffic in all directions. These included in part Interstates 91, 291 and 391.

The Hazardous Material Packaging: USA/4986/AF Modes RA.2/RA.3.

The External wood casing burned completely. The inner metal container became distorted and in some areas appeared to have burned through.

The inner most stainless steel portion of the package held its integrity, although the extreme heat did distort some of the packages. No radioactive material release occurred.

Action taken to remove the radioactive material packages: Cranes were used to transfer the packages from the rubble of the accident site, loaded on to other vehicles and transferred to a safe location for overpacking and reshipment back to the original shipper General Electric, Wilmington, North Carolina.

This process was one of the more difficult to effect. Several of the political heads of the local states, cities and towns did not want the material to enter, travel through or be stored within their borders.

Cause of Accident: The operator of the passenger vehicle was traveling south in the north travel lane of Interstate 91. It was determined that he was operating under the influence of alcohol.

CONCLUSIONS:

1. That the direct result of the accident was an intoxicated driver traveling in the wrong direction on an interstate highway.
2. That the driver of the commercial vehicle took whatever evasive action he could take in an attempt to avoid the initial collision.
3. That the radioactive material packaging appeared to have met or exceeded its safety expectations.
4. That the Emergency Response information required with the shipping papers provided valuable information to the response personnel.
5. The driver had sufficient training in that when he became aware of his vehicles condition that he exited with the Emergency Response information and Shipping papers, and provided them to Response personnel.

COMMENTS:

1. Although the driver provided the shipping papers to response personnel, it took several hours to identify the Motor Carrier. The only description on the B/L was Carrier McGill.

More information should be provided on shipping documents identifying all parties involved when hazardous materials are transported.

2. That the inspection of the recovered radioactive material packaging and preparation prior to it re-entering the highway transportation system would have been within the criteria of HMTUSA Section 16(a)(2).

Attachments:

Photographs
Shipping Document
Package Specifications
Newspaper Reports

APPENDIX C
Accident Investigation Report
Massachusetts State Police



The Commonwealth of Massachusetts
Department of Public Safety

Massachusetts State Police
Staff Inspections Unit
470 Worcester Road
Framingham, MA 01701

January 29, 1992

To: Colonel Charles F. Henderson, Deputy Superintendent
Lt. Colonel Thomas J. Kennedy, Office of Staff
Operations
Lt. Colonel Edward J. Cronin, Office of Field
Operations

From: Captain Robert J. Bradley, Staff Inspections Unit

Subject: After-Action Report and Analysis of Nuclear
Material Transportation Accident, Route 91
Springfield, Massachusetts on December 16, 1991.

1. In the early morning hours of December 16, 1991, a 1990 GMC Tractor with flatbed trailer, operated by Joseph P. Dunn of 2603 East 88th Street, Tulsa, Oklahoma, and owned by McGil Specialized Carriers, 1425 Franklin Road, Marietta, Georgia, was operating north on Route 91 in Springfield, Massachusetts. The truck was transporting 4864 kilograms of 20% solid uranium dioxide from the General Electric Company, Castle Hayne Road, Wilmington, North Carolina to the Vermont Yankee Nuclear Power Station in Vernon, Vermont, to be used as fuel in the Vermont Yankee atomic reactor. The uranium dioxide, a Fissile Class I material, N.O.S. UN 2918, consisted of small pellets encased in metal fuel rods. The fuel rods were enclosed in 12 metal boxes known as casks, protected by a wooden packing case as required by Federal regulations.

2. At approximately 0315 hours, at the 5.7 mile-marker northbound, the driver of the tractor-trailer observed a white Toyota Tercel owned and operated by John F. Byrne of 14 Jeffrey Lane, Bloomfield, Connecticut, travelling south in the northbound lane, on a collision course with his truck. Despite evasive action by both operators, the tractor-trailer struck the passenger side of the Toyota, jackknifed, and hit the jersey barrier on the east side of the roadway. After impact with the barrier, the truck rebounded across the highway, striking the guard rail on the west side of the northbound lane, where it came to rest. The impact with the

cab of the tractor. The Toyota, after impact, struck the jersey barrier on the east side of the northbound lane, coming to rest facing south against the barrier.

3. At 0318 hours, numerous reports of the accident were received at the State Police Springfield sub-station. Troopers Brojan and Sanford were dispatched to the scene. At 0324 hours, Trooper Brojan contacted SP Springfield requesting that the Springfield Fire Department and an ambulance respond to the scene. At 0326 hours, after being advised of the nature of the cargo by the tractor-trailer operator, troopers at the scene notified SP Springfield that the truck was carrying nuclear material. **This information was immediately transmitted to the Springfield Fire Department.** State Police personnel closed Route 91, and established an isolation zone at the scene. The injured parties were transported to Springfield Hospital for treatment, and the operator of the Toyota, John F. Byrne, was subsequently arrested by Trooper Brojan for: 1. Operating Under the Influence of Alcohol, 90-24, 2. Operating to Endanger, 90-24, and 3. Violation of One Way Traffic, 89-10. **Upon the determination that a hazardous material was involved, the statutory responsibility for command of the entire incident evolved to the Chief of the Springfield Fire Department.**

4. By the time sufficient information on the nature of the nuclear material and its threat to emergency responders and the community could be ascertained, the trailer and its contents of nuclear fuel was totally involved in fire. The Springfield Fire Department made the determination to let the trailer and its contents burn out. Incident operations at this time took a defensive posture, concentrating on such issues as perimeter and isolation zones, and the re-routing and management of traffic. Subsequently, many other issues and concerns would present themselves to the **twenty six** Federal, State, local, and private sector participants involved in this incident during its **13 hour and 37 minute** duration.

5. This report consists of **three sections: a Chronology of Events and Actions, the results of a Critique by Participating Agencies** held at the Springfield Fire Academy on January 13, 1992, and **Issues of Concern and Recommendations for Future Improvement.** The Chronology of Events and Actions has been constructed from the various reports submitted on this incident, the Daily Administrative Journals of General Headquarters, Boston, Troop "B" Headquarters, Northampton, and SP Springfield, as well as this officer's personal knowledge. State Police reports utilized were those of Major C.N. Appleton, Captain J.M.

Sheehan, Sergeants M.A. Lapointe and G.E. Chaisson, Commercial Vehicle Enforcement Unit, Sergeant D.J. Kennedy, and Trooper J.E. Gura. Also incorporated were the reports of the following members of the Springfield Fire Department: Acting District Fire Chief R.A. Pereira, Lieutenants A. Amato, J.F. Friberg, and D. Larson, as well as the reports of Commonwealth Ambulance Dispatch, Unit 38, and Unit 60, and the draft report on the overall incident prepared by James T. Controvich, Director of the City of Springfield Office of Emergency Preparedness. No reports were available from the Springfield Police Department. Daily Administrative Journal and dispatch entries provided the most accurate chronological data. In cases where events and actions were not documented in specific chronological terms, their times were estimated, utilizing the various reports and known times as standards. There also appeared to be a deviation in time between the clocks utilized by SP Springfield and those used by the Springfield Fire Department.

6. CHRONOLOGY OF EVENTS AND ACTIONS

December 16, 1991

- 0318 SP Springfield receives reports of a motor vehicle accident involving a tractor-trailer unit and car, Route 91, northbound lane at 6 mile-marker, Baystate West. Tprs. Brojan and Sanford assigned.
- 0324 Tpr. Brojan requests ambulance and Springfield Fire Department - Truck cab on fire and 3 parties injured - Springfield Fire and Commonwealth Ambulance (contract provider for the City of Springfield) contacted by SP Springfield.
- 0324 Commonwealth Ambulance dispatches Units 38 & 60 to accident scene, Route 91, Springfield.
- 0324 Springfield Fire Department dispatches Engine Company 7 to accident scene, Route 91, Springfield.
- 0326 Troopers Brojan and Sanford advise that the tractor-trailer involved in the accident is carrying radioactive material - MSP Commercial Vehicle Enforcement Unit requested at scene. Springfield Fire notified of radioactive material on truck.
- 0326 Route 91 closed in both directions by State Police personnel.

- 0326 Engine Company 7 advised of radioactive cargo and decides to stage at Boland Way due to potential hazard. Lt. Larson, Company Officer of Engine Company 7 declares a **Level I HAZMAT Situation**. Springfield Fire Department dispatches Ladder 1 (Group B), Rescue Squad, and HAZMAT truck to accident scene, Route 91, Springfield.
- 0330 BHQ desk contacts Sgt. MA Lapointe, Commercial Vehicle Enforcement Unit, re Route 91 accident. Sgt. Lapointe contacts Tpr Ahearn, CVEU, to report to scene.
- 0332 Commonwealth Ambulance Units 38 & 60 arrive at scene.
- 0335 Tpr. Gura, BHQ K-9, advises he has the truck's shipping manifest. Load consists of 4864 kilograms of Fissile Class I, 20% solid uranium dioxide, N.O.S. UN2918 - **Emergency Response Guidebook: Guide #63**.
- 0336 Springfield Fire calls SP Springfield re radioactive cargo at Route 91 accident. Advised of information on shipping manifest and discussion of precautions conducted.
- 0340 BHQ desk advised of Route 91 incident by SP Springfield. **Request made for additional MSP officers at scene.** Sgt. DJ Kennedy enroute from B-5 area.
- 0345 Sgt. Kennedy arrives at scene - assumes command of State Police operations.
- 0345 SP Springfield calls Vermont Yankee Nuclear Power Station, consignee of nuclear fuel shipment. They advise Vermont Yankee representative will be enroute to scene & will notify appropriate agencies (Nuclear Regulatory Commission, etc.)
- 0345 Springfield area Massachusetts DPW supervisor monitors incident on scanner and calls SP Springfield regarding MDPW assistance in traffic management.

- 0347 Commonwealth Ambulance Unit #60 departs accident scene enroute to Springfield Hospital Emergency Room with one patient. Requests Springfield and Mercy Hospitals be notified re possible radiological contamination.
- 0350 Captain Pereira, Acting District 1 Fire Chief, arrives on scene. Command Post set up in lobby of Marriott Hotel, Vernon Street, Springfield, just east of accident scene. Acting Chief Pereira contacts General Electric Company, Wilmington, NC, and Vermont Yankee Nuclear Power Station, Vernon, Vermont, for information on nuclear material involved in Springfield incident. Chief Pereira is advised there is little chance of leakage from casks. Springfield Fire HAZMAT access unit computer for information on uranium dioxide - only information available is that material is radioactive and an evacuation area should be established. Emergency Response Guide (1990), Guide #63 seemed to conflict with information received from GE and Vermont Yankee. The Guide stated " External radiation hazard from unshielded radioactive material; Internal radiation hazard from inhalation, ingestion, or breaks in skin; Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection."
- 0355 SP Springfield notifies SSGT Catellier, Station Commander, of Route 91 nuclear incident.
- 0355 BHQ Desk notifies Captain Sheehan, Troop "B" Commander, of Route 91 nuclear incident.
- 0356 Commonwealth Ambulance Unit #38 enroute to Springfield Hospital from scene with 2 patients - Unit #9 dispatched to Command Post, Vernon Street, on standby status.
- 0400 Sgt. Lapointe, MSP Commercial Vehicle Enforcement Unit arrives at Command Post. Observes **truck and trailer fully engulfed in flames.**
- 0400 Acting District Fire Chief Pereira upgrades incident to Level II situation - requests Fire Department Public Information Officer at Command Post and that Springfield Fire Chief Cassanelli

be notified. The upgrade to Level II status is not communicated to the Springfield Police Department or other Springfield response agencies.

- 0402 Acting Chief Pereira calls Timothy Bradbury of the Nuclear Regulatory Commission (NRC), who advises uranium dioxide is shipped in containers designed to withstand temperatures in excess of 3500 degrees fahrenheit and it was virtually impossible for containers to fail under fire exposure. Bradbury further advises that the fire can be fought in regular turnout gear with SCBA.
- 0403 Commonwealth Ambulance Unit #38 arrives at Springfield Hospital Emergency Room.
- 0407 BHQ advises GHQ Communications Section via TT of Nuclear incident, Springfield, and that highway is closed from Exit 4, northbound to Exit 7, southbound.
- 0407 Acting District Fire Chief Pereira out to incident scene for size-up.
- 0410 Springfield Police Department closes the North End, Memorial, and South End bridges; city streets extending east from East Columbus Avenue to Main Street are also closed.
- 0415 Acting District Chief Pereira **makes the decision not to fight the truck fire** due to the possibility of further damage to the casks from temperature stress, and diesel fuel and radioactive material washing down catch basins. Truck fire is almost burned out.
- 0425 SSGT Catellier, SP Springfield Calls GHQ re Springfield incident. Colonel Henderson, LTC. Cronin, Majors Morse, Appleton, Roche and Cody notified; CVEU and Helicopter 1 activated. **NIAT contacted.**
- 0430 BHQ desk contacts Troop "B" 55 Team (6 Officers) to report to Springfield incident.
- 0430 Massachusetts DPW personnel begin arriving to assist with traffic control and the re-routing of Route 91 traffic to Route 5.

- 0440 SP Springfield requests Chicopee PD close Route 391 re traffic control at incident scene. Route 291 closed as smoke from truck fire now affecting that highway.
- 0445 BHQ desk contacts BH, B-1, B-2, B-4, B-5 to contact one day shift officer and send immediately to Springfield incident. **Total of 11 MSP day shift officers enroute to assist.**
- 0450 James T. Controvich, Director of Springfield Office of Emergency Preparedness arrives at the Command Post, Marriott Hotel.
- 0450 **Springfield Fire Chief Cassanelli upgrades incident status to Level II situation**, allowing Springfield PD to call in additional officers on time off for traffic control and other incident related duties.
- 0450 **Media announcements made** from Command Post that Routes 91, 291, 391 and municipal parking lots under Route 91 were closed.
- 0510 Sgt. Higgins, SP Springfield, calls BHQ requesting SP Helicopter for traffic monitoring. BHQ desk contacts GHQ & is advised Helicopter 1 will be enroute shortly with Col. Henderson and LTC. Cronin.
- 0530 Robert Leach and James Sinclair, Vermont Yankee Nuclear Power Station arrive on scene and begin radiological monitoring at accident site.
- 0540 Captain Sheehan, Troop "B" Commander arrives at SP Springfield.
- 0545 **Troop "C" Holden advise 5 Troopers and 1 NCO enroute to SP Springfield to assist at incident scene.**
- 0545 Massachusetts DPW personnel have detour signs and traffic cones in place - MSP Officers at traffic control points. Traffic plan is to exit all southbound Route 91 traffic at Exit 13 (Route 5), all northbound Route 91 traffic at Exit 3 (South End Bridge to Route 5), all Route 291 west traffic at Exit 3 (Armory Street), and Route 391 south traffic at Exit 1 (Route 91 North). Springfield Police Department will man traffic control points at entrances and exits of Route 91 in Springfield

area. Columbus Avenue to remain closed. Municipal parking lots under Route 91, affected by fuel spill and accident debris are to remain closed. Only the municipal parking lots at the Springfield Civic Center and Morgan Square will be open for parking.

- 0600 Major Appleton, Bureau of Western Field Operations arrives at SP Springfield.
- 0600 Mr. Robert Leach of Vermont Yankee Nuclear Power Station **advises monitoring indicates there is no radiation leakage from nuclear fuel casks.** Truck fire is out - only smoldering debris remains.
- 0600 Robert T. Watson, Senior Radiation Scientist for the Massachusetts Department of Public Health arrives with NIAT Team (O'Connell & Hill-Williamson) and begin radiological monitoring of accident scene and adjacent areas.
- 0600 Springfield Mayor Mary Hurley contacted and advised of incident status.
- 0605 Springfield Superintendent of Schools contacted re incident and traffic situation - Determination made that Public Schools will remain open. No schools in incident area and no buses utilize Route 91.
- 0615 Sgt. Chaisson, MSP Commercial Vehicle Enforcement Unit, arrives at Command Post and is briefed by Sgt. Lapointe. Both out to scene for size-up.
- 0630 Mr. Controvich, Springfield Fire and Springfield Police activate **contingency evacuation plan.** Springfield PD have held 50 school busses to be utilized if evacuation becomes necessary. If the isolation zone is 100 yards, only a small office building housing a public television station will require evacuation. If the zone extends to 2,000 feet, two to three thousand people will have to be evacuated.
- 0630 **NIAT personnel on scene advise MSP Sgts. Chaisson and Lapointe that there is no leakage of radiation from the nuclear fuel shipping casks.** Robert Leach, Vermont Yankee, **advises that the casks should be allowed to cool before being moved to**

reduce the possibility of further damage. Two of the casks have sustained 1/2 inch cracks along the sides, exposing the metal fuel rods.

- 0700 Sgt. Kennedy arranges for use of the West Springfield Fire Department Emergency Response Truck for use by MSP Personnel. There is only one house phone available in the Marriott Lobby, and the pay phones are being constantly used by the numerous media representatives who have responded to the Command Post. The West Springfield Response truck has telephones allowing the State Police on-scene officers to communicate with SP Springfield and BHQ. Tpr. Ahearn, CVEU, is assigned to handle communications from that vehicle.
- 0725 Captain Bradley, MSP Staff Inspections, arrives at the Command Post and is briefed by Sgts. Kennedy and Lapointe. Incident operations are well under control; the incident traffic plan is functioning smoothly. State Police personnel are performing in an excellent, professional manner. Sgt. Kennedy is coordinating MSP operations with both the Springfield Fire Department and Police Department. **The Command Post atmosphere is chaotic**, with emergency response personnel besieged by news media representatives. Communications from the command post also pose problems due to the fact that the repeaters being used by State Police personnel have difficulty transmitting from the Hotel Lobby.
- 0730 MSP Helicopter 1 lands at SP Springfield with Col. Henderson and LTC. Cronin.
- 0740 There is discussion at the Command Post on whether to open the southbound lane of Route 91, allowing southbound traffic to pass the incident scene, in order to reduce the traffic impact on the City of Springfield. **It was the position of the State Police that the entire road remain closed for the following reasons:**
1. Traffic, although of greatly increased volume, was moving steadily on Route 5 and adjacent roadways, with no congestion related blockages or incidents.

2. The various news media accounts of the incident had created a public perception that the radiological risk at the scene was far greater than it actually was. This would have caused apprehension to motorists passing the scene in the southbound lane of Route 91.
3. "Rubber-necking" by motorists passing the incident scene would create the potential for secondary accidents which would cause additional traffic management problems.
4. The southbound lane was being utilized as a staging area for response personnel.
5. The entire roadway would have to be closed in order to off-load the nuclear material from the burned trailer, and remove the vehicles involved in the accident. This would involve re-routing all southbound traffic a second time, creating confusion, and consuming incident resources.

0750 Col. Henderson, LTC. Cronin, and Captain Sheehan arrive at the Command Post in the lobby of the Marriott Hotel.

0800 Col. Henderson requests that a hotel conference room be obtained and set up with several telephones to alleviate present confusion and isolate incident personnel from the news media and other distractions. After some initial resistance, a sixth floor conference room, with roof access to monitor the scene, is set up and an incident planning and strategy meeting is held. Agencies involved were:

CITY OF SPRINGFIELD

Fire Department

Chief Gary G. Cassanelli
Deputy Chief Mellis
Acting District Chief Pereira
Captain Donald Elliot, HAZMAT Training

Police Department

Chief Ernest Stelzer
Deputy Chief Daniel Spellacy

Sgt. Richard Whitehead
Sgt. Donald Sicard

Department of Public Works

Alex Chwalek, Traffic Engineer
Michael Ottomaniello, Supervisor

Office of Emergency Preparedness

James T. Controvich, Director
George Copeland, Radiological Officer
Robert Shonak, Safety Director

Health Department

Randall White

Parking Authority

Al Andrews
Christopher Moskel

Mayor's Office

Mayor Mary Hurley
Mayor-elect Robert Markel

Law Department

Harry Carroll
Bruce Leiter

Contract Ambulance Provider
(Commonwealth Ambulance)

Robert Turner
David Clark

Personnel Department

Robert Shonak

STATE AGENCIES

Massachusetts State Police

Colonel Charles F. Henderson
Lt. Colonel Edward J. Cronin
Major Charles N. Appleton
Captain James M. Sheehan

Captain Robert J. Bradley
Sergeant Daniel J. Kennedy
Sergeant Michael A. Lapointe

Nuclear Incident Advisory Team (NIAT)

Robert T. Watson
Thomas O'Connell
Laura Hill-Williamson

Massachusetts Department of Public Health

Robert Hallisey, Director, Radiation Control
Program

Massachusetts Department of Public Works

Joseph Supraneau

**Massachusetts Department of Environmental
Protection**

Robert Terenzi
Craig Golf

Massachusetts Emergency Management Agency

John Pappas, Regional Director

FEDERAL AGENCIES

Nuclear Regulatory Commission (NRC)

Paul Harris

Environmental Protection Agency (EPA)

Federal Emergency Management Agency (FEMA)

William Creamer
Richard Quinlan

Department of Transportation (DOT)

James Hall

**Occupational Safety and Health Administration
(OSHA)**

Robert Bak
Michael Goyda

Westover Air Force Base

Colonel Paul Hargis, Base Commander
Captain Robert Mooney, Base Security
George Copeland, Disaster Officer

PRIVATE SECTOR PARTICIPANTS

Vermont Yankee Nuclear Power Station

Robert Leach
James Sinclair
Michael J. Martin

General Electric Company

A. David Himle

Baystate Medical Center

Dr. John Santoro, Director of Emergency
Services

American Red Cross

- 0900 Col. Henderson and LTC. Cronin out to SP
Springfield then GHQ in Helicopter 1. Colonel
requests frequent updates on incident status.
- 0900 After consultation with Robert Leach, Vermont
Yankee, Robert Watson, NIAT, and Paul Harris, NRC,
**the isolation zone at the incident scene is reduced
to 100 yards**, allowing the Memorial and North End
bridges to be opened. Municipal parking areas
south of the incident site are also being opened to
the public.
- 0930 Extensive discussion takes place at the Command
Post as to who is responsible for the nuclear
material involved in the incident. Vermont Yankee
refuses to accept the material due to the

possibility it is damaged. It is the general consensus that the General Electric Company is the present owner of the material and is the responsible party.

- 0930 NRC and NIAT officials approve the removal of the 1988 Toyota involved in the accident/incident and advise that the clean-up of the diesel fuel spill can commence. Environmental Products and Services of Springfield, MA, contacted to clean up diesel fuel spill on Route 91 and the parking decks below.
- 0945 Environmental Products and Services arrive at scene and commence clean-up operations.
- 0950 Major Appleton, MSP Bureau of Western Field Operations arrives at Command Post.
- 1000 Paul Harris, NRC representative, determines that **the twelve casks containing the uranium dioxide fuel will have to be re-packaged before the material can be transported out of state** due to cracks in two of the metal casks. **Inspection and re-packaging is expected to take 24-48 hours.** A secure location in close proximity to the incident scene will be required. Various locations in the Springfield area are mentioned and discussed.
- 1000 Concerns are raised about the overall traffic situation. Captain Bradley makes arrangements for City Traffic Engineer Alex Chwalek to utilize MSP Helicopter 2, which will also be used by Tpr. Hanafin to videotape incident activities.
- 1040 Traffic Engineer Chwalek advises traffic is generally flowing smoothly throughout Springfield area. Minor adjustments made by Springfield PD.
- 1046 General Electric Company, Worcester, MA, calls SP Springfield advising they have a representative enroute to the scene.
- 1100 Meeting held with Mayor Hurley regarding a location **for the nuclear fuel to be inspected and re-packaged.** Three sites are possible: The National Guard Armory on Roosevelt Avenue, Springfield, The Western Massachusetts Electric Company yard on Caldwell Street, Springfield, and Westover Air Force Base in Chicopee. The National Guard Armory site is discounted because it is situated adjacent to a hospital and an elderly

housing project, both within the 100 yard isolation zone recommended for the material. NRC and NIAT officials preferred the WMECO yard, which is fenced, due to its proximity to the incident scene. Mayor Hurley and James Controvich recommended against the Caldwell Street site, due to its proximity to a residential neighborhood 200 yards away, which would create a public perception of danger there. In addition, intelligence had been received by the mayor's office that nuclear protest groups were mobilizing because of the incident. There were also concerns as to whether sufficient security could be provided at the Caldwell Street location. Utilization of the Westover Air Force Base site had elicited strong opposition from Chicopee Mayor Richard Chessy, who did not want the nuclear material in his jurisdiction. **The Westover site had a number of advantages:** 1. it had isolated areas to store the material, 2. adequate security was already in place, 3. base personnel had handled tactical nuclear weapons and materials in the past, and 4. access to the base could be achieved with little exposure to populated areas.

1115 A. David Himle, General Electric Company, Worcester, MA, arrives and is briefed on incident status and discussions on a site for inspection and re-packaging. He advises it will take a GE team approximately 24 hours to prepare the material for transportation back to the GE nuclear fuel facility in Wilmington, North Carolina. A conference call is made by Mayor Hurley to Colonel Paul Hargis, Westover Air Force Base commander, and a request is made to store the nuclear material there during inspection and re-packaging operations. Colonel Hargis advises he will investigate the possibility, and a second conference call with Westover is set up for 1300 hours.

1130 Captain Bradley calls Col. Henderson and advises him of developments at the Springfield incident. Col. Henderson advises that the Secretary of Public Safety and the Governor are prepared to intercede in the site location issue if necessary in the interest of public safety.

1130 Team from Vermont Yankee Nuclear Power Station arrives at the scene for transfer of nuclear fuel and cleanup. Trailer trucks from New England Electric Systems and Northeast Utilities will be used to transport the material from the scene. Mr.

- Gordon Faulkner, Vermont Yankee, will supervise removal operations.
- 1200 A formal press conference is held on the 7th floor of the Marriott Hotel. Major Appleton, Mayor Hurley, Fire Chief Cassanelli, Robert Leach, Paul Harris and Chief Stelzer out to above.
- 1205 Captain Bradley requests SSGT. Catellier, SP Springfield station commander, at Command Post re planning route of travel to Westover Air Force Base if that site is approved.
- 1210 Vermont Yankee Nuclear Power Station Team begins transfer of nuclear fuel casks from burned truck to new trailers.
- 1227 Diesel fuel spill clean-up sufficient to allow removal of 1988 Toyota involved in accident/incident. Roy's Towing of Springfield contacted.
- 1235 MSP Helicopter 2 advises area traffic is slow but flowing steadily.
- 1245 Roy's Towing of Springfield removes 1988 Toyota from incident scene.
- 1300 Second conference call held with Colonel Hargis, Westover Air Force Base commanding officer. **Westover agrees to accept the nuclear material.** A discussion is held between Command Post personnel and Westover AFB on transportation routes, security issues, and facilities required for the inspection and re-packaging of the nuclear fuel. Westover can provide hanger space for that operation. **Command Post personnel agree that the Westover site should be utilized.** Captain Mooney, Westover security, will be enroute to the Command Post to discuss base entrance options. It is agreed, with some dissension, that **no public disclosure will be made on the destination of the nuclear material.**
- 1310 Mayor Hurley calls Chicopee Mayor Chessy to advise the decision has been made to transport the nuclear fuel to Westover Air Force Base.
- 1320 Tpr. Bennett, MSP Public Affairs, calls for incident update. Advised by Tpr. Gura.
- 1400 Colonel Henderson updated on incident status.

- 1400 Second Formal Press conference held on 7th floor of Marriott Hotel. Several representatives of national news media present.
- 1430 Captain Mooney, Westover Air Force Base security arrives at Command Post.
- 1430 Vermont Yankee personnel have completed the loading of all twelve nuclear fuel casks onto three flatbed trailers. Trucks are staged in northbound lane pending escort.
- 1430 Harold's Garage, Northampton, MA, begins removal of tractor-trailer involved in incident. Harold's requested by Sgt. Lapointe, CVEU, due to that firm's past performance and expertise.
- 1448 Major Appleton out to incident scene to supervise escort of nuclear fuel to Westover Air Force Base in Chicopee. Route of travel will be Route 291 to Fuller Road, entering the Base through the Industrial Gate.
- 1500 Transportation of nuclear material begins from incident scene with State Police escort (Major Appleton, Commercial Vehicle Enforcement Unit, and Sgt. Kennedy). Chicopee PD advised by SP Springfield.
- 1500 Tires of trailer involved in the incident ignite as trailer is lifted from the smoldering debris. Fire extinguished by Springfield Fire Department. Harold's continues removal operations.
- 1530 Removal of tractor-trailer involved in incident is completed by Harold's Garage. Same removed from scene on flatbed trailers.
- 1530 Massachusetts DPW personnel at incident scene contact SP Springfield and advise they want to open Route 91 southbound and Route 291. SP Springfield advises officers at traffic control points to allow southbound traffic. **The incident Command Post is not made aware of this action.**
- 1530 Massachusetts DPW crews commence clean-up of fire debris at site of truck fire, and inspection of bridge structures for accident related damage.
- 1540 Route 91 southbound is now fully open to traffic. All southbound access ramps to Route 91 have been

opened, and all city streets in the vicinity of the incident, with the exception of Liberty Street, are being opened by the Springfield Police Department.

- 1540 Major Morse, GHQ Boston, advised that southbound lane of Route 91 is now open to traffic. Will advise Col. Henderson.
- 1545 Massachusetts DPW supervisor Supraneau advises that guard rail repairs will have to be made before the northbound lane can be opened. Damaged guard rails at scene pose a threat to passing motorists.
- 1600 Nuclear material and escort has arrived at Westover Air Force Base without incident. State Police will provide one officer for security until the material is shipped.
- 1652 Massachusetts DPW clean-up and guard rail repairs are completed. Two lanes of Route 91 northbound are opened. The high speed lane is barricaded and will remain closed pending repair of pavement damaged by the truck fire.
- 1655 Command Post is closed.
- 1700 Major Morse, GHQ Boston, advised Route 91 northbound is now open to traffic and that Command Post has been closed.

The involvement of the Massachusetts State Police continued until the nuclear fuel left Massachusetts at approximately 1117 hours on December 18, 1991. Twenty-four hour security was provided at Westover by State Police personnel. Troop "B" Headquarters also interceded when U.S. Department of Transportation officials decided to begin transport of the material on the evening of December 17, 1991, during a snow storm that resulted in hazardous driving conditions on Route 91 in Massachusetts and Connecticut. The chronology of these events follows.

December 17, 1991

- 1230 Tpr. Brojan advises from Westover security detail that original plans made by DOT and Transportation Company to fly nuclear fuel out of Westover have been changed. At this time transportation by truck is being considered.

- 1700 Robert Hallisey, Massachusetts Department of Public Health, Radiation Control Program, calls BHQ re nuclear fuel from Springfield incident. Material will be transported from Westover this date between 1900-2000 hours in two trucks accompanied by NIAT personnel. Requests State Police escort to the Massachusetts/Connecticut line on Route 91.
- 1800 Captain Mooney, Westover Air Force Base, calls regarding the transportation of the nuclear fuel from Westover. Move is now scheduled to take place between 2000-2400 hours this date.
- 2101 Captain Sheehan, Troop "B" Commanding Officer is advised of plans to transport the nuclear fuel tonight. It is now snowing heavily, and numerous accidents are being reported on Route 91. Captain Sheehan advises the Troop Duty Officer to contact Captain Mooney at Westover to advise that the State Police strongly object to the material being transported in such adverse weather conditions due to the risks involved.
- 2110 Lt. McDonald, BHQ desk, calls Captain Mooney regarding State Police objection to the move under adverse weather conditions. Captain Mooney advises he also raised strong objections for similar reasons. The decision to move has been made by DOT personnel with the concurrence of NRC officials. Captain Sheehan advised.
- 2125 Captain Mooney calls BHQ advising the decision to transport the nuclear fuel is now being reconsidered. Both trucks to be used in the transportation are one hour and twenty-five minutes late at present.
- 2208 Captain Mooney, Westover, calls re DOT has decided to reschedule transportation of nuclear fuel from the Springfield incident until 0800 hours on December 18, 1991 due to the objections of the State Police and Westover officials.

December 18, 1991

- 0930 Department of Defense Police, Westover Air Force Base, call SP Springfield requesting State Police escort of nuclear material from Springfield incident from the base to the Massachusetts/Connecticut line. Tprs. Ashman and Lockhart,

Troop "B" 55 team assigned, assisted by Tprs. Ye and Frigone, SP Springfield.

1117 Nuclear fuel leaves Massachusetts enroute to General Electric Company, Wilmington, NC.

7. **CRITIQUE BY PARTICIPATING AGENCIES**

On January 13, 1992 a formal critique of the response to the December 16, 1991 nuclear incident on Route 91 in Springfield, Massachusetts was held at the Springfield Fire Training Center. The critique was moderated by James T. Controvich, Director of the City of Springfield Office of Emergency Preparedness. Agencies and representatives were:

Springfield Fire Department

Chief Gary G. Cassanelli
District Chief Walter Harmon
Acting Chief 1 Robert Pereira
Lt. David Larson
Lt. Anthony Amato
Lt. John Friberg
Dispatcher Richard Hanna
Bernard Welz, Public Information Officer
9 Additional Springfield FD members

Springfield Fire Commissioner

John Keough

Springfield Police Department

Sgt. Donald Sicard

Springfield Department of Public Works

Michael Ottomaniello
James Poehler

Springfield Office of Emergency Preparedness

James T. Controvich, Director
Robert Shonak, Safety Director
George B. Copeland, Radiological Officer

Commonwealth Ambulance

Robert Turner
David Clark

Massachusetts State Police

Major Charles N. Appleton, Western Field
Captain James M. Sheehan, Troop "B" Commander
Captain Robert J. Bradley, Staff Inspections
Sgt. Robert W. Scofield, MEMA Liaison
Sgt. Peter J. Higgins, SP Springfield
Sgt. Michael A. Lapointe, CVEU
Tpr. Jeffrey Ahearn, CVEU

Massachusetts Nuclear Incident Advisory Team (NIAT)

Thomas O'Connell
Laura Hill-Williamson

**Massachusetts Department of Environmental
Protection (DEP)**

Robert Terenzi

Massachusetts Emergency Management Agency (MEMA)

John T. Pappas, Regional Director

U.S. Nuclear Regulatory Commission (NRC)

William Lazarus
Joseph Furia

Federal Emergency Management Agency (FEMA)

William Creamer
Richard Quinlan

U.S. Department of Transportation

James Hall

**U.S. Occupational Safety and Health Administration
(OSHA)**

Robert Bak
Michael Goyda

Vermont Yankee Nuclear Power Station

Robert Leach
Edward C. Porter

Baystate Medical Center

S.M. Brahmauar, PhD
Dr. Paul A. DiStefano, MD
Dr. John Santoro, MD

Monsanto Chemical Company

Phillip Silensky (Observer status)

Massachusetts Legislature

Representative Paul Caron, Chairman, House
Committee on Public Safety

The critique began with discussion and comment on the initial response phase of the incident, with each agency being afforded the opportunity to address issues of concern.

Massachusetts State Police

Sgt. Peter J. Higgins, SP Springfield desk officer during the incident, discussed **communication difficulties** experienced by the State Police. From the initial notification of the incident, **the phone lines at SP Springfield were constantly tied up with incoming calls for information.** At times it was impossible for the incident Command Post to contact SP Springfield or SP Springfield to make necessary out-going calls. This, and the lack of a common radio frequency, made it **extremely difficult to maintain the necessary communications link with the Springfield Fire and Police Departments.** In addition, **State Police radio communications were hampered by the poor performance of the repeaters being used by officers at the incident scene.** The group discussion that followed focused on the use of **cellular telephone technology** to resolve some of the communications problems experienced at major incidents such as this. This officer introduced the concept of a common statewide radio frequency for all Massachusetts emergency response agencies. This would require strong leadership and financial support from the upper echelons of State government.

Mr. Controvich related that a question had been raised about the number of State Police cruisers (6) involved in the escort of the nuclear material from the incident scene to Westover Air Force Base, in light of the Command Post decision to not make the material's destination public. Captain Sheehan explained that the decision had been made to utilize 2 cruisers per truck to be able to control intersections and other traffic related obstacles along the route of travel. In addition, there was a threat that nuclear protest groups might attempt to interfere with the transportation of the material.

Captain Sheehan also expressed concern that the State Police had no input into the decision to transport the nuclear fuel on December 17, 1991 during adverse weather conditions. There was no response to this issue by Federal authorities present.

Commonwealth Ambulance

Mr. Robert Turner, representative for Commonwealth Ambulance, the contract provider of ambulance service to the City of Springfield, related that two of his firm's ambulance units had approached the scene from the northbound lane of Route 91. Both units learned that the truck was carrying possible radioactive material from State Police personnel at the scene. **Neither SP Springfield nor Springfield Fire Department had relayed information on the truck's cargo to ambulance dispatch.** Upon arrival, one ambulance was directed by State Police personnel to drive through smoke from the truck fire to reach a patient. The ambulance driver, unsure of the nature of the threat, reversed direction, and approached the scene from the opposite direction, avoiding the smoke from the truck.

Springfield Fire Department

Richard Hanna, Springfield Fire Department dispatcher, related the sequence of events during the Fire Department's initial response. Acting District Chief 1 Robert Pereira explained his actions as the ranking Fire Department representative in the initial stages of incident operations. **Information from Vermont Yankee and the General Electric Company as to the radiological hazard seemed to conflict with the Emergency Response Guide, Guide #63,** and little information was available from the Springfield Fire Department's HAZMAT computer data base. **In addition, there was a question as to whether the radiological monitoring devices being utilized by fire department responders (1950's civil defense issue) were accurate and providing true readings.** There was then a lengthy discussion on whether

radiological monitoring equipment utilized by emergency response personnel was being periodically maintained and calibrated. Some agencies responded that their instruments were maintained at the prescribed intervals, others had instruments that had not been checked for years. **Modern, technologically advanced equipment would provide greater assurance to emergency responders.**

Acting Chief Pereira also stated that the extensive diesel fuel spill at the scene affected his decision not to fight the fire for environmental considerations. By the time sufficient information had been obtained on the nuclear material and its hazards, the fire was almost out, and the threat of thermal shock from cold water causing additional damage to the metal fuel casks was a factor.

William Lazarus of the Nuclear Regulatory Commission explained to the group that the nuclear casks used to transport uranium dioxide are designed to withstand any type of transportation accident, including fires involving high temperature. **It should be noted, however, that two of the metal casks were severely twisted, with 1/2 inch cracks extending along the sides.**

Springfield Police Department

Sgt. Donald Sicard of the Springfield Police Department advised that his department had been notified of the truck's nuclear cargo by State Police Springfield, and had been requested to provide assistance in closing entrances and exits to Route 91. **Because the Fire Department had declared only a Level I situation initially, the police department was unable to call in additional personnel, and the demand for their services quickly outstripped available manpower.** Sgt. Sicard stated that an incident being handled as a Level I situation for the fire department, may, due to manpower commitments, be a Level II situation for the Police Department. Under the City of Springfield Emergency Response Plan, a Level II situation is required before additional personnel can be called to duty on overtime status. Mr. Controvich agreed to investigate this issue further.

In addition, when Acting Chief 1 Pereira upgraded the incident to Level II status at 0400 hours, this information was **not communicated to the Police Department,** which continued to operate under severe manpower shortages.

Sgt. Sicard brought up another police department concern. Because the nuclear fuel did not require placards under Federal regulations, it would be difficult for incident responders to know what the truck was carrying if the driver

had been severely injured, or unconscious. The same concern had been considered by this officer during initial analysis of this incident. I had previously spoken with Sgt. Lapointe of the Commercial Vehicle Enforcement Unit on the possibility of presenting a short block of instruction on the recognition of nuclear packaging, which is uniform and standard under Federal regulations. A short familiarization segment during in-service training would assist State Police personnel in recognizing materials at transportation accidents. Colored slides depicting the various packaging are readily available from the U.S. Department of Transportation. Springfield PD will consider such training.

Springfield DPW

Michael Ottomaniello, Springfield Department of Public Works supervisor, stated that due to the fact that no catch basins or manholes were affected, his department was able to concentrate its resources at providing barricades and other assistance to the Springfield PD at traffic control points. Mr. Ottamaniello's perception was that incident operations went very well.

Massachusetts DPW

Massachusetts Department of Public Works representatives had not been made aware of the critique, and were not in attendance. It was noted, however, that their response was excellent in the re-routing of traffic off Route 91 onto Route 5. Scene clean-up, guardrail repair, and bridge inspection were also conducted in a similar manner.

Baystate Medical Center

Doctors DiStefano and Santoro discussed the problems encountered by physicians called into duty at the hospital when a radiological emergency was declared. Doctors attempting to reach the hospitals encountered traffic control points, and were turned away. With limited or no information on the traffic situation, many experienced great delay in their arrival at the hospital, which would have impacted on medical care in a multiple casualty situation. This situation can be rectified by improved communications. Upon notification by hospital and EMS, traffic control points can be notified to assist medical response personnel in reaching their assigned facilities.

Also discussed was the lack of a communications link between Medical services and incident operations. Hospital personnel had no knowledge of incident activities or the potential hazards involved. The hospital had received a

call that a black cloud was approaching Springfield Hospital, which caused apprehension and concern on the part of medical personnel. At 0545, one doctor reporting for duty reported that a local radio station was talking about the evacuation of the city. Improved communication with medical facilities will be discussed at future meeting of the Local Emergency Planning Committee.

The critique then focused on Command Post issues. There was extensive discussion by emergency response representatives on the reporting of the incident by the news media. **Media accounts created a public perception of danger that was far out of proportion to the actual risk involved.** Local television coverage on the evening of the incident used such descriptions as "Nuclear winter averted in Springfield", and others that reinforced the public's perception of danger.

This officer suggested that in future incidents the Incident Command System concept be utilized to deal with the media. This requires that all information on incident activities be released only by the Incident Commander or the Information Officer assigned to handle that function. In this manner only accurate information approved by the Incident Commander is released, eliminating conflicting accounts.

A second related issue, which provided a major problem in the management of the incident, was the establishment of the Command Post in the lobby of the Marriott Hotel. Initially the lobby was acceptable, but as the incident escalated, and the press began arriving, contact with the media began to have a detrimental effect on management operations. **The movement of the Command Post to a sixth floor conference room, allowing control of media representatives, mediated this problem.**

Sgt. Sicard, Springfield Police Department, discussed **communications problems at the sixth floor Command Post.** Although three telephones had been provided, phone access was periodically difficult. Sgt. Sicard felt that Federal and State agency representatives were tying up the phone lines with lengthy conversations. It should be noted that except for brief calls to SP Springfield to respond to incident requests, the majority of out-going State Police calls were made at public phones, using credit cards.

Mr. Controvich also addressed communication problems with the General Electric Company. A call had been made to General Electric to ascertain who was going to be the clean-up contractor for the incident scene. Mr. Controvich stated he was advised GE would discuss the issue and call the

Command Post with the information. There was no further contact from the company. Environmental Products and Services was then utilized.

There were no other problem areas that surfaced during the critique. The consensus was that overall, there was a very good integrated response to the incident.

8. ISSUES OF CONCERN AND RECOMMENDATIONS FOR FUTURE IMPROVEMENT

Issues of concern affecting the performance of the Massachusetts State Police are listed below, along with any recommendations for improvement:

Communications Equipment

This multi-agency response emphasizes the need to reevaluate State Police communications capabilities for major incidents. Currently telephone systems at State Police installations are designed to transfer calls to the next available line. The experience with this incident indicates that this system fails under a heavy volume of incoming telephone calls. This officer recommends that **at least one separate non-published telephone line be installed in all State Police sub-stations.** This separate line, in conjunction with the station's Centrex line, will solve the telephone related communications problems encountered in this incident.

The inability of on-scene State Police personnel to maintain a communications link with other incident response agencies, and to make secure communications within the incident area and to State Police installations, is another area that has to be addressed. **Providing mobile cellular phones to supervisors, with a number of portable units at each sub-station and Troop Headquarters would greatly improve communications capability in this area.**

The performance of the State Police radio system and repeaters continues to present problems. The only solution is an upgrade of the entire system, which is under consideration.

Communication as a Process

There were several instances of the failure to communicate necessary information during the course of this incident. Those involving the State Police were the failure to notify Commonwealth Ambulance of the radiological hazard

immediately upon recognition, and the re-opening of the southbound lane of Route 91 without communicating with the Command Post. As the Incident Command System becomes assimilated into State Police operations, communication as a process should improve.

Personnel Performance

This incident, especially in the initial stages, placed numerous demands and responsibilities on State Police personnel both on-scene, and at sub-station and Troop levels. Perimeter control was quickly established, notifications were made, traffic plans were developed, and coordination with other response agencies was ongoing. Personnel performance was excellent through the entire operation.

Equipment

There is a definitive need for mobile command posts for hazardous material transportation accidents and other major incidents. These units should have state of the art communications capability, as well as CAMEO (Computer Aided Management of Emergency Operations) access.

This incident also illustrates the need for calibrated, functioning, radiological monitoring equipment to be available to field personnel.

The State Police Commercial Vehicle Enforcement Unit (CVEU) is an integral part of the Department's response to hazardous materials transportation accidents. The unit's response was excellent to this incident; Sgt. Lapointe was on-scene within 42 minutes from the accident's occurrence, providing guidance to State Police personnel. **The unit's personal protection equipment is damaged and obsolete, and it's HAZMAT reference material is outdated.** This incident is an example of the importance of up to date reference material; if sufficient information was available to the Fire Department on a more timely basis, the truck fire could have been extinguished, instead of being allowed to burn out. **This would have resulted in the incident scene being cleared 3-4 hours sooner.** Rapid clearance is a prime objective of the State Police traffic incident management effort.

Training

The rapid recognition of hazardous materials by State Police personnel responding to transportation accidents is an important responsibility that greatly impacts on incident outcome. In this incident, the truck driver was able to advise State Police personnel of the nature of the

cargo, which did not require placards under Federal regulations. Had the driver been severely injured, this information might not have been available in a timely fashion, as the labels on the nuclear fuel casks could be easily overlooked in the confusion of the accident.

The packaging of radioactive material is controlled by Federal regulation. It is standard throughout the industry based on the nature of the material being transported. **It is recommended that the State Police conduct a short training segment on the recognition of nuclear material packaging.** Colored slides on the different types of nuclear packaging are available from the U.S. Department of Transportation. I have spoken with Lt. Trepasso, Academy Commandant. A short program (30 minutes) could easily be incorporated into the next in-service training period.

Vehicle Removal

The rapid clearance of incident scenes is a major objective of the Department's traffic incident management efforts. Once the hazardous materials situation has been mitigated, vehicles can be removed, and lane capacity restored. In this incident, the wrecker service utilized to remove the completely destroyed tractor-trailer was selected on the basis of its expertise and past performance. **It should be the policy of the Department that the Incident Commander determine the wrecker service to be used, present policy notwithstanding, to ensure the expeditious resumption of vehicular traffic at the scene.**

Incident Costs

Department costs in a major incident can be substantial. During the State Police response to the Springfield incident, **141 hours of overtime was expended for Troop "B" and Troop "C" personnel,** this does not include overtime for staff and CVEU officers present at the scene. Equipment costs for cruisers and State Police Helicopters were significant. Massachusetts General Law Chapter 21E (Massachusetts Oil and Hazardous Material Release Prevention and Response Act) **provides for the reimbursement of reasonable costs to emergency response agencies by the party or parties liable for the hazardous material incident.**

Section 4 states: "Any person who undertakes assessment, containment or removal action regarding the release or threat of release of oil or hazardous material shall be entitled to reimbursement from any other person

liable for such release or threat of release for the reasonable costs of such assessment, containment and removal."

"Person" is defined in Section 2 of Chapter 21E as: "any agency or political subdivision of the federal government or the commonwealth, any state, public or private corporation or authority, individual, trust, firm, joint stock company, partnership, association or other entity, and any officer, employee, or agent of such person, and any group of persons."

The City of Springfield is currently seeking reimbursement of over \$16,000 in incident related costs. Successful recovery has been made in the past for straight time, overtime, and equipment costs under the statute's provision for the reimbursement of "reasonable costs".

It is recommended that the Massachusetts State Police adopt the policy of seeking reimbursement for hazardous material incident expenses under the provisions of Massachusetts General Law Chapter 21E.

Involvement in Community Planning

The Springfield nuclear incident illustrates the need for the Massachusetts State Police to become involved in the community planning process. Transportation accidents and other incidents on the major highways of the Commonwealth directly affect adjacent communities, which must activate their emergency response plans and commit resources to mitigate that impact. As a result of the Springfield incident, the Troop "B" commander will participate in future Local Emergency Planning Committee (LEPC) meetings. Active participation creates an understanding of the roles and responsibilities of the varied emergency response agencies, and results in greatly improved planning and response.

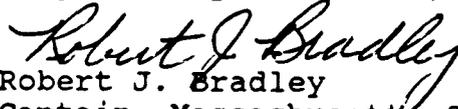
It is recommended that Troop Commanders become actively involved in Local Emergency Planning Committee activities.

9. The January 13, 1992 critique of the Springfield nuclear material incident provided an accurate representation of the problem areas encountered. Although there were communications problems (both equipment and agency related), the integrated response to this incident was very good.

A contributing factor to this success is the excellent LEPC activities of the City of Springfield. As a result of a leaking propane truck incident in December 1987, and a major chlorine fire in June of 1988, Springfield has learned the value of emergency response planning. Elements of the Incident Command System are utilized in the formulation of these plans.

In addition, the Springfield Fire Department is considering the adoption of the National Fire Academy Incident Command System. This would allow the Massachusetts State Police and the City of Springfield to operate under the Incident Command System during major incidents, further improving incident performance.

Respectfully submitted,



Robert J. Bradley
Captain, Massachusetts State Police
Staff Inspections Unit

APPENDIX D
Springfield Fire Department Reports and
Correspondence

S.P.D. Headquarters
605 Worthington St.
Spfld , Mass.

December 18, 1991

Gary Cassanelli, Chief
Spfld., Fire Dept.

Dear Chief,

The following is a report of incident #917308, Dec. 16, 1991 involving a vehicle accident and fire on I-91 Northbound.

At 0318 hrs. on Dec. 16, 1991, E-7 was dispatched for an accident and fire on I-91 Northbound just north of Baystate West. A few minutes later I received a telephone call from dispatch informing me that a truck involved in the accident may have been carrying nuclear fuel. I instructed the dispatcher to dispatch the HazMat Team along with myself.

At 0321, E-7 radioed dispatch that they were going to stage at East Columbus Ave., and Boland Way until they received more information from State Police who were already on scene and in possession of the shipping papers. Lt. Larson, E-7, then announced over the radio a Level 1 HazMat situation.

As I arrived at East Columbus Ave. and Boland Way, we received a report that the truck was carrying 4500 Grams of Uranium Dioxide. I then instructed Lt. Larson to use the HazMat reference library to research Uranium Dioxide. I then instructed dispatch to have State Police and Spfld. Police to close down both the North bound and South bound lanes of I-91, West and East Columbus Ave. and any access routes to I-91.

I then requested the State Police to get the shipping papers to me as soon as possible. A Command Post was set up in the lobby of the Marriott Hotel. The truck appeared to be fully involved in fire from this vantage point. At this point I had decided to let the fire burn and keep everyone, including fire dept. personnel away from the truck. I then took an elevator to the sixth floor of the Marriott Hotel to get a better look at the incident. From the sixth floor, with binoculars, I could see the truck nearly fully involved with fire. There appeared to be 8 or 9 long rectangular shaped crates on the flatbed portion of the truck. Two of these containers were laying on the ground to the left of the flatbed, (looking from the rear of the truck), giving me the impression that they were jarred loose in the accident. The flatbed was upright on it's wheels, but the cab of the truck appeared to be on it's side, although it was hard to be sure, because it was pretty well demolished with parts strewn all over the highway as well as below the highway. About 150 feet south of the truck, a small sports car was up against the guardrail. The car had received extensive damage to the passenger side.

When the shipping papers arrived I realized that the truck was carrying 4500 Kilogram of Uranium Dioxide (approx. 10,000lbs) not 4500grams. I placed a call to the shipper, General Electric Co., Wilmington, N.C. I was informed that the Uranium Dioxide is shipped as pellets, packaged in steel rods, which are in turn encased in double walled steel containers designed to withstand an inferno. I then placed a telephone call to Vermont Yankee Nuclear Plant, Vernon Vermont, the destination of the shipment. I spoke to Robert Leach, a plant official, who gave me the same information that General Electric had given me. Mr Leach informed

me that he would immediately respond with a clean-up team and radioactive testing equipment. I then gave dispatch an update via radio and requested that Chief Gary Cassanelli and D.E.P. be notified. I then requested for Bernie Welz, Fire Dept. Spokesman, to be called in and upgraded the incident to a Level 2. I then spoke on the phone to Tim Bradbury of the Nuclear Regulatory Commission. He informed me that Uranium Dioxide was shipped in containers designed to withstand temperatures in excess of 3500 degrees F. and that it was virtually impossible for the containers to fail under fire exposure. He told me we could approach the fire and extinguish it using regular turnout gear and self contained breathing apparatus and that he would send a representative. I then took a ride up onto I-91 to get a closer look. I discovered that diesel fuel had spilled over a wide area. (about 100 x 150 feet). I decided not to extinguish the fire because at this point the fire had nearly burned out and putting water on it would only complicate clean-up operations as water would wash diesel fuel into the storm drains and the area beneath I-91. Shortly after this Chief Cassanelli, Bernie Welz, Chief Mellis and Capt. Elliott arrived. Robert Leach from Vermont Yankee then arrived and began conducting test for the possibility of radiation. The S.F.D. Rescue Squad assisted Mr. Leach. At approximately 0700 hrs. I was relieved by District Chief William Vedovelli.

Respectively Submitted:

Robert A. Pereira

Acting District Chief I

Robert Pereira

who were contacted and/or responded:

- ✓ Spfld Fire Dept
- Spfld Police Dept.
- State Police
- D.P.W.
- D.E.P.
- Robert Leach - Vermont Yankee Nuclear Plant
- Paul Harris - Nuclear Regulatory Commission
- Jim Controvitch
- Commonwealth Ambulance Service - transported injured victims before our arrival
- Baystate Medical Center - to attempt to get information from truck driver and to warn hospitals of possible radioactive contamination of victims.

Injuries:

Joseph Dunn	Age 58	unknown injuries
(truck driver)		
Janet Dunn	Age 43	" "
(passenger in truck)		
John Byrne	Age 27	" "
(automobile operator)		

Respectfully Submitted
Robert M. Pereira
Robert Pereira

Headquarters Fire Station
Ladder Company #1, Group B
605 Worthington Street
Spfld., MA 01105

Chief Gary Cassanelli
Springfield Fire Department
605 Worthington Street
Springfield, MA 01105

Dear Chief Cassanelli:

As you requested, the following is a report of the actions taken by Ladder Company #1, Group B, on Monday, December 16, 1991, at the Haz Mat fire on I-91. Ladder Company #1 and the Hazardous Material truck responded to Boland Way in front of the Marriott Hotel by way of a vocal alarm at 0322, along with Acting Chief Robert Pereira.

We met Lieutenant Larson in front of the Marriott and he informed us of the situation. There was a car - truck accident; the truck, involved with fire, was carrying radioactive materials. The State Police Sergeant then gave us the manifest from the truck, informing us that the shipment contained uranium dioxide. We then set up the generator for the computer for research purposes.

After Acting Chief Pereira's decision to let the vehicle burn, there was not much work to do. The Hotel Manager let us view the accident scene from the 8th Floor, Room 832. The State Police had closed the highway and were clearing the area. There were no other vehicles in the immediate area of the accident.

We did assist the different local and state agencies by providing whatever information that was available to us. We were relieved by Group D around 0700 and returned to quarters.

Received . . . 12-29-01

Dist. Chief # : B
G. Cassanelli

Respectfully Submitted,
Lieutenant Amato
Lieutenant Anthony Amato



SPRINGFIELD FIRE DEPARTMENT
DEPARTMENTAL CORRESPONDENCE
CITY OF SPRINGFIELD
MASSACHUSETTS

DATE: 12-28-91

TO: Chief of Department

FROM: Lt. David Larson

DIVISION/COMPANY:

DIVISION/COMPANY: Engine 7

COPIES TO:

SUBJECT: Incident # 917308

On December 16, 1992, at 0322 Engine 7 responded to a truck fire on I-91N near Boland Way and E. Columbus Ave. While en-route, E-7 was notified by dispatch that the truck was carrying radioactive material. I instructed the driver to proceed to Boland Way in order to give me a view of the situation from a distance. Upon arrival, I saw a vehicle involved in a fire.

Through a few communications with dispatch, I tried to determine from the police what the situation on the highway was. During this time, dispatch had called for the rest of the Haz. Mat. team and Chief 1. Also, E-7 members noticed one ambulance leaving the scene and another en-route to the accident.

Shortly thereafter, Chief 1, Ladder 1 and Squad arrived on scene and I informed them of the situation up till then.

Dispatch then communicated to me the name of the material loaded on the truck. E-7 started research on the material and shortly thereafter the state police arrived on Boland Way and handed me the shipping manifest.

I spoke to the state trooper about evacuating and isolating the the area around the incident. He informed me that this was being done while we spoke. We also discussed shutting down portions of I-91 north and southbound.

The Haz-Mat team was able to determine little about the characteristics of the material other than it was radioactive and an evacuation area should be established. About this time, I used a geiger counter to take readings in the vicinity of the Marriot Hotel on E.Columbus Ave. There were no detectable readings on the counter in this area.

Since re-routed traffic from the highway was travelling on E. Columbus Ave. northbound, and close to the accident, I asked Springfield Police to block traffic going in that direction. After receiving a report that smoke from the incident was travelling down I-291, I asked the state police to shut down that section of the highway.

E-7 stood by until about 1030 hrs. and gave assistance and provided information to local and state authorities during the remainder of our time on scene.

Received & Forwarded 12-29-91

Dist, Chief # 1- 13

B. Harral

David Larson
Engine 7
Squad B

FORM# SFD 17



SPRINGFIELD FIRE DEPARTMENT
DEPARTMENTAL CORRESPONDENCE
CITY OF SPRINGFIELD
MASSACHUSETTS

DATE: December 29, 1991

TO: Chief Gary G. Cassanelli

FROM: John F. Friberg
Lt. Rescue Squad

DIVISION/COMPANY:

DIVISION/COMPANY: Group B

COPIES TO:

SUBJECT: Inc.#917308

District Chief I
District Chief Mellis

Dear Sir,

On December 16, 1991 at 0318 the Rescue Squad received a vocal alarm to assist E-7 with a truck fire involving possible radio active materials on Interstate 91 north opposite the Marriott Hotel. While enroute to this incident I was listening to E-7 officer giving the Alarm Operator an update on what he was told had happened on the Interstate. I then radioed Alarm and told them that he should have Chief I respond also, he told me he was in the process of doing that at this time. The Squad route to the scene was State St. to E. Columbus to Boland Way. When I arrived on scene I talked with Lt. D. Larson on what info he had as to the incident. All the info that he had was that a truck containing radio active materials was on fire. We then drove the Squad to Main St. and Worthington St. which was about opposite of the truck. I looked from my binoculars and could see the front portion of the truck engulfed in flames and a small fire under the main roadway on what appeared to be a shed roof. Upon returning to Boland Way and E. Columbus Chief I, Capt. R. Pereira had just arrived on scene. I told him what I had seen from my binoculars and Lt. Larson was briefing him on what he knew. While talking to Capt. Pereira, two ambulances were going North on 91 to the scene and shortly thereafter were coming back going South in the North lane, we contacted the ambulance Co. to see what they knew about the incident and to see if people were involved or trapped in the autos. Their dispatcher told Chief I that no ambulances had been sent to that location on Route 91. Meanwhile the State Police that were located on Route 91 had a lot of the traffic from State St. ramp moved back. So Chief I, Myself, and Chief I Aide drove up the State St. ramp to Route 91 North to talk to the State Trooper. He informed us that a car driving South in the North bound lane hit a tractor trailer going North, the injured parties had already been removed from the scene at this time. Chief I and myself thought it was much safer to let it burn until we could find out information about the contents of the truck. Looking at the tractor and trailer from our location it looked like the rear section of the trailers load was still intact and not on fire, the front section

cont.

was involved in fire and it appeared that two of the large cases had fallen off the trailer and were between the trailer and the center strip guard rail. We then returned to the Marriott Lobby where a State Trooper had brought the Shipping papers that he took from the tractors cab when he had arrived on scene. Lt. Larson was the Haz-Mat team leader on this tour of duty so he had the research team start looking up information from our resources and used the Hotel phone to call the shipper which was General Electric. When General Electric had no immediate answer I suggested to Chief I t hat we call Yankee Nuclear Power Plant where it was being shipped as they deal with it daily, maybe they could help us out. When General Electric called back, Chief I informed me that there was no way the cylinders could leak. Meanwhile a return call from Vermont Nyclear plant stated, do not put out the fire and stay clear, they would send people down and be there within an hour. At this time Acting District Chief Pereira decided that we would let it burn until it burned itself out. Rather than put it out and maybe do more damage when the cold water hits hot metal, and by doing it this way we wouldn't have to expose anyone. We then stood by, periodically checking from the eighth floor of the hotel with binoculars the condition of the scene, until other more experienced personnel arrived. I was relieved on scene at 0730 by Capt. Richard Pereira. Other members of the Rescue Squad were W.Posley, T. McQuade, and J. Barker.

Respectfully Submitted,

Lieut John F Friberg

John F. Friberg
Lt. Rescue Squad Group B

*Rec'd + Forwarded
11/192
Capt Richard Pereira*

DEPARTMENTAL AND INTER-DEPARTMENTAL CORRESPONDENCE
CITY OF SPRINGFIELD
MASSACHUSETTS

DATE: 2/27/92
TO: Jim Controvitch FROM: Capt. Robert Pereira
DEPARTMENT: DEPARTMENT: Fire
COPIES TO: SUBJECT: Nuclear Incident
on I-91
12/15/91

Jim,

I couldn't find my copy of the letter I submitted to Chief Cassanelli on the events of the Nuclear Fuel Incident on I-91, Dec 15, 1991.

I have listed for you below the agencies I contacted for advise and the advise they gave me:

- Robert Leech, Vermont Yankee Atomic Plant.
Advised me to isolate area, keep people away, do not attempt to approach vehicle and that he would be on scene within an hour with his own team.
- General Electric Co, Wilmington N.C., shipper
Advised me not to attempt approaching vehicle, let burn, keep everyone away.
- Bob Watkins, Nuclear Incident Advisory Team
same advice as from above

DEPARTMENTAL AND INTER-DEPARTMENTAL CORRESPONDENCE
CITY OF SPRINGFIELD
MASSACHUSETTS

DATE:
TO: FROM:
DEPARTMENT: DEPARTMENT:
COPIES TO: SUBJECT:

- Nuclear Regulatory Commission
Originally spoke with Tim Bradbury who advised us not to approach vehicle and to wait for Mr. Leech from Vermont Yankee to arrive.
Later, I received a return call from the NRC informing me that the product being carried was a very low level radioactive and that we could approach vehicle and extinguish the fire without any danger.

At this point the fire was nearly burned out except for the tires. To put out the fire in the already damaged tires would have required a lot of water which would have compounded the problem of the fuel spilled on the highway. We did not have enough dry chemical extinguishers to put out the fire so I made the decision to let the tires burn.

I will have Ch. Cassanelli forward you a copy of my letter to him as soon as he returns.

APPENDIX E
Emergency Medical Service Reports
Commonwealth Ambulance Service, Inc.

CE INC. 000
A 02148

SP 22783

EMERGENCY MEDICAL SER

No. 91855

27 M F
7-21-64

ent Time unk
phone unk
ician unk

Date 12-16-91
Amb. Co. CWA
Quarters 25
Dispatched 324
Ar. Scene 332
Lv. Scene 347
Ar. Hospital 751
Ret. to Service 400

E
 P
 E
 R
 C

Transport to BSMC ER
Reason protocol
Consult med con 24
Hospital BSMC ER
UHF CH 4-1 VHF
Transmission Quality Good

BLS - EQUIPMENT/PROCED

02 5 L/min
1st + 2nd survey
Immub on long board
philly collar 2 neck r
2 d' Belts: 2" tape

INTUBATION

Size: _____ Attempts: _____ EM
ET NT EOA EGT

MAST

Time _____ Pressure _____
Legs _____
Abdom _____

IV

TIME	FLUID	CATH	SITE	RATE
350	NS	18	LAC	KVU
			Bleeds	

MEDICATION

TIME	DRUG	DOSE	ROUTE

ECG/DEFIBRILLATION

TIME	RHYTHM	JOULES
345	Sinus Tach	132

Allergies: pt allergic dry None None

VITAL SIGNS				PUPILS		RESPIRATIONS R	
TIME	B.P.	P.	R.	R	L	R	L
340	126/80	132	20	<input type="checkbox"/> Normal	<input checked="" type="checkbox"/> Clear	<input checked="" type="checkbox"/>	<input type="checkbox"/>
350	124/110	138	20	<input type="checkbox"/> Constricted	<input type="checkbox"/> Wheeze	<input type="checkbox"/>	<input type="checkbox"/>
				<input checked="" type="checkbox"/> Dilated	<input checked="" type="checkbox"/> Rales or Rhonchi	<input type="checkbox"/>	<input type="checkbox"/>
				<input checked="" type="checkbox"/> Reactive	<input type="checkbox"/> Absent	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Not Reactive			

Not Attempted Unable to Obtain

Eye: Spontaneous 2 To Pain
Opening: 3 To Voice 1 None

Verbal Response: 5 Oriented 2 Incomp. 1 None
 4 Confused 3 Inapprop.

Motof: 6 Obedience 3 Flexion
Responses: 5 Purposeful 2 Extension
 4 Withdrawal 1 None

Coma Scale (3-15)

Add to Trauma Score
(1-4) (5-8) (1-1) (3-4) (6-10-3) (5-7-2) (3-4-1)

Condition Pt. Found

Skin: pink warm + dry

Respiration Rate: 4 10-24
3 24-35
2 36

Expansion: 1 Normal 0 Retractive

Systolic BP: 4 90 1 0-49
3 70-89 0 No Pulse
2 50-69

Capillary Refill: 2 Normal 0 None
1 Delayed

Total Trauma Score

Sitting on side of rd by his car.
CIA: disoriented

Comments

(S) 27 yo M apparently driver of a car that struck a tractor trailer head on on highway. 91 N. Tractor trailer was carrying a radioactive material + the truck was on fire. Unk loc. pt denies meds or allergies. Pt only cla head loc. Vitals as above. 2nd survey shows pt moving all extremities loc. over @ eye. Pupil: dilated. Lungs clear. Abd soft. Pink warm + dry. Pt was 200 meters from truck fire: down wind. Pt didn't appear to have been exposed to haz. material @ loc. survey. 1st + 2nd survey. Amb too close to Haz. mat. Pt put into amb. + driver away. Later immub. on long board. IV NS KVU. Bleeds: 5 LUC via nc. Tr -> BSMC ER. KWS

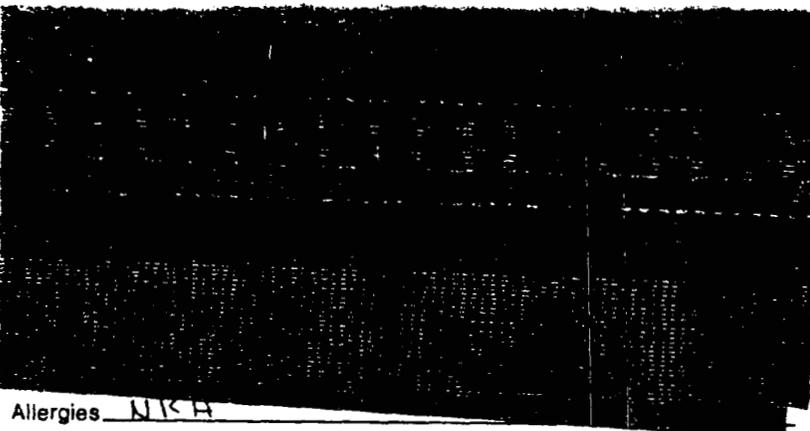
E.D. ID#	MD	Outcome

CREW SIGNATURES	STATUS	NO.	IMPRESSION
K. Sullivan	P	306164	N/A
K. Cormier	P		E-2

EMERGENCY MEDICAL SERVICES REPORT

No. 918088

785



Allergies NKA

VITAL SIGNS				R PUPILS	L PUPILS	L RESPIRATIONS	R RESPIRATIONS
TIME	B.P.	P.	R.	<input checked="" type="checkbox"/> Normal	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Clear	<input type="checkbox"/>
3:40	116/70	108 Reg	18	<input type="checkbox"/> Constricted	<input type="checkbox"/> Wheeze	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Dilated	<input type="checkbox"/> Rales or Rhonchi	<input type="checkbox"/>	<input type="checkbox"/>
				<input checked="" type="checkbox"/> Reactive	<input type="checkbox"/> Absent	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Not Reactive			
				Skin <u>w/o</u>			

Eye Opening <u>4</u> Spontaneous	2 To Pain	Respiration Rate <u>4</u> 10-24	1 1-9
3 To Voice	1 None	3 24-35	0 None
Verbal Response <u>4</u> Oriented	2 Incomp.	2 36	
3 Confused	1 None	Expansion <u>1</u> Normal	0 Retractive
3 Inapprop.		Systolic BP <u>4</u> 90	1 0-49
Motor Response <u>6</u> Obedience	3 Flexion	3 70-89	0 No Pulse
5 Purposeful	2 Extension	2 50-69	
4 Withdrawal	1 None	Capillary Refill <u>2</u> Normal	0 None
Coma Scale (3-15) <u>15</u>		1 Delayed	
Add'l Trauma Score		Total Trauma Score <u>16</u>	

Condition Pt. Found amb @ scene

Speed limit T.T. engulfed in flames

Comments ⊕ sent L&T

⊕ Pt STS @ L.O.C. removed self from T.T.
amb @ scene STS rescued from T.T. when fire started STS @ smoke cloud/contents of Mat. in STS intent low grade radioactive Mat./uranium dioxide in lead cap. inside wood+metal boxes Pt's 1/2 body crms pain (L) knee anten. dry. anticholinergic diff. breathing
⊕ AVPU 58% US. on above BS Coem = PIRAL
Resonance ≈ 1/2" LAC. forearm @ bleeding @ tempo
superficial @ arm @ LAC/dof (L) knee cap @ LAC/dof
⊕ swollen @ neuro 2" diameter @ LAC
⊕ bruising @ LAC @ assessment for US c-spine
precautions Red head w/sock blankets under high back
monitor L.O.C. transport @ sup pt enroute

E.D. ID#	MD	Outcome
CREW SIGNATURES	STATUS	NO.
B Sauney	I	812258
C Nally	P	809263

Date 12/16/91
 Amb. Co. CWA Unit 938
 Quarters 24 BLS/ALS ASSISTANCE
 Dispatched 0324
 Ar. Scene 0332 Bystander
 Lv. Scene 0356 Police Fire
 Ar. Hospital 0403 EMT B/I/C/
 Ret. to Service RN MD
 CPR in Prog.
 Transport to BMC
 Reason 112 MAT
 Consult ED MD
 Hospital BMC
 UHF CH 41(3) VHF Phone
 Transmission Quality good

BLS - EQUIPMENT/PROCEDURES

O2 L/m CPR

patches Red / see
stamps Piller / plan
tape 31 off / ✓

INTUBATION

Size: _____ Attempts: _____ EMT
 ET NT EOA EGTA

MAST

Time _____ Pressure _____ EMT
 Legs _____
 Abdom _____

TIME	FLUID	CATH	SITE	RATE	EMT

MEDICATION

TIME	DRUG	DOSE	ROUTE	EMT

ECG/DEFIBRILLATION

TIME	RHYTHM	JOULES	EMT

- 1) Dispatched to head on collision car vs tractor trailer in front of BSW on 91 Northbound
- 2) Took 291 W → 91 So. in order to check for placard
- 3) As we approached, we saw the truck fully engulfed in flames with no placard visible. Dispatch tol.
- 4) Highway was blocked off @ Exit 7 so we took the exit onto W. Columbus to turn around and enter the on ramp in front of BSW
- 5) We made our way around a few vehicles & saw large debris in the road to the car involved in the accident (extensive front end damage).
- 6) We advised dispatch & Unit 38 of the fire & would advise on the number of patients as soon as we found out from MSP
- 7) Bystander met us at scene, advised us of radioactive hazmat in truck & he thought there were 3 patients total. 2 on 91 So
- 8) Next, the MSP trooper approached as we were loading our ambulatory patient.
- 9) The trooper told us this was a hazmat & that we were downwind & should be more than 150 yards away. We were about 150 away
- 10) We sat the patient down on the bench & immediately left the area due to possible contamination & assessed the patient when we were safe.
- 11) As we were preparing to leave, we tried to advise Unit 38 of the situation & that 2 patients w E-4 in a cruiser in the northbound

- 12) Patient was C-spine immobilized, assessment done. O₂, IV & transport to BMC E/R.
- 13) Dual patch to Mercy & BMC to advise them of incident.
- 14) The radioactive material was unknown until the hospital found out about 1/2 hour later.

- ① RESPONDED TO SCENE VIA N/B 91 ~~TRUCK~~.
- ② UPON ARRIVAL WE WERE ABOUT 100 FEET SOUTH OF ACCIDENT
E WIND GOING EAST.
- ③ TRUCK FULLY ENVELOPED IN FLAMES.
- ④ STATE POLICE ADVISED US THAT THE TRUCK WAS CARRYING
RADIOACTIVE FUEL.
- ⑤ STATE POLICE TOLD US TO PARK OUR RIGS ON THE RIGHT SIDE AND WALK
DOWN THE ROAD PAST THE TRUCK TO GET TO THE OTHER
2 PTS.
- ⑥ WE DECIDED TO ROUTE BACK DOWN 91 TO STATE ST, UP
STATE ST. TO HARMONY, HARMONY TO 291 TO 91 S/B.
- ⑦ UPON ARRIVAL @ 91 & STATE CENTRAL EXIT #6 WE FOUND
2 PTS FROM TRACTOR TRAILER AMBULATING @ SCENE.
TRACTOR & TRANS TO BMC ER VIA RT. 5 TO STAY
OUT OF HOT ZONE.
- ⑧ UPON ARRIVAL @ ER PAT PTS IN DECONTAMINATION ROOM
- ⑨ DR. FROM RADIATION SAFETY RESPONDED TO ER E. GIGER CARR
& CHECKED UNITS 60 & 38 INCLUDING EQUIPMENT USED
& PTS & CREW MEMBERS. ALL CHECKED OUT TO BE
UNCONTAMINATED.

12/16/91 91N HAZ-MAT

(DISPATCH)

am 12/16/91 (1) RECEIVED REQUEST FOR AN AMBULANCE FROM THE MA. STATE POLICE SPFLD BARRACKS FOR A HEAD ON ACCIDENT INVOLVING A TRACTOR TRAILER AND A CAR IN THE REAR OF BAY STATE WEST ON RTE 91 NORTH BOUND. THEY ALSO STATED THAT THE TRACTOR TRAILER UNIT WAS ON FIRE AND ENGULFED IN FLAMES.

(2) DISPATCHED UNIT 60 FROM 25 (K. SULLIVAN/K. LORMIER)

DISPATCHED UNIT 38 FROM 24 (C. NALLY/B. SAVOY)

DISPATCHED BOTH AMBULANCES INITIALLY DUE TO NATURE OF CALL AND INFORMATION RECEIVED THAT I INTERPRETED TO POSSIBLY MEAN MULTIPLE PATIENTS WITH PROBABLE MULTIPLE/SERIOUS INJURIES

am 12/16/91 (3) UNITS 60 & 38 RADIO THAT THEY'VE ARRIVED AT THE SCENE.

(4) UNIT 60 K. SULLIVAN RADIO'S THAT TRUCK IS ENGULFED IN FLAMES.

(5) UNIT 38 C. NALLY NOTIFIES ME BY RADIO THAT THE TRUCK IS CARRYING A HAZARDOUS MATERIAL AND TO CALL THE FIRE DEPT TO NOTIFY THEM OF A HAZ-MAT SITUATION.

(6) UNIT 60 K. SULLIVAN RADIO'S THAT SHE IS INFORMED THAT THE SUBSTANCE IS RADIOACTIVE IN NATURE AND REQUIRES TO HAVE PEOPLE AT LEAST 150 FEET AWAY FOR A SAFE DISTANCE AND THEY WERE PULLING OUT TO COMPLY.

(7) UNIT 38 NOTIFIED OF SAME AND FOLLOWED SAME.

(8) CONTACTED SPFLD FIRE AND INFORMED THEM OF SAME INFO.

am 12/16/91 (9) UNIT 9 (J. SNOWDEN/D. MAXWELL) DISPATCHED TO THE WORTHINGTON HOUSE STREET FOR BACK PAIN FOR A 911 CALL WHILE ENROUTE TO 61.

(10) UNIT 6 (D. PEPIN/P. BUDAS) DISPATCHED TO 61 FROM 23

UNIT 1 (K. PELLETIER/B. DUNWOODY) DISPATCHED TO 51 FROM 26

am 12/16/91 (11) REQUEST FROM UNIT 38 TO NOTIFY SPFLD/MERCY HOSP'S. OF SITUATION (C. NALLY) SO THEY MAY PREPARE FOR POSSIBLE RADIATION EXPOSURE PATIENTS

(12) UNIT 60 CALLS ENROUTE TO SPFLD EIR WITH 1 PATIENT - UNKNOWN ON EXPOSURE - UNKNOWN STILL AT SCENE

⑬ SWITCHED UHF RADIO FROM MED 9 TO MED 4 IDENTIFYING MYSELF AS COMMONWEALTH DISPATCH TO CMED REQUESTING A DUAC INFORMATIONAL MATCH TO THE SPFLD & MERCY ER'S. CMED DO SO SETTING ME UP ON MED 5. I INFORMED BOTH ERS THAT AS A REQUEST FROM AMBULANCE CREW AT THE SCENE OF AN ACCIDENT I WAS NOTIFYING THEM IN ADVANCE OF A POSSIBLE RADIATION EXPOSURE FROM AN UNDETERMINED RADIO ACTIVE SUBSTANCE BEING CARRIED ON A TRUCK INVOLVED IN THE ACCIDENT WHICH WAS NOW BURNING, SO THAT THEY MAY PREPARE FOR SAME. I ALSO INFORMED THEM THAT AT THIS POINT INJURIES WERE CONTAINED TO JUST THE THREE VICTIMS OF THE ACCIDENT AND INJURIES WERE CONSISTENT FROM THE ACCIDENT. THAT THERE WERE NO APPARENT RADIATION INJURIES REPORTED YET AND IT WAS STILL UNDETERMINED IF THEY HAD BEEN EXPOSED.

⑭ NOTIFIED UNIT 38 + UNIT 60 OF NOTIFICATION COMPLETED

11 AM 12/16/91 ⑮ UNIT 60 ARRIVES @ SPFLD ETC

11:36 AM 12/16/91 ⑯ UNIT 38 CALLS ENROUTE TO SPFLD ETC WITH 2 PATIENTS

⑰ CONTACTED SPFLD FIRE TO DETERMINE STATUS OF HAZMAT. INFORMED IT WAS A LEVEL 1 HAZMAT & COMMAND POST / STAGING AREA WAS ON VERNON ST.

⑱ DISPATCHED UNIT 9 FROM MERCY ETC. AFTER COMPLETION OF THEIR CALL- TO STAND-BY ON VERNON ST. WITH COMMAND POST.

1:30 AM 12/16/91 ⑲ UNIT 38 ARRIVES @ SPFLD ETC

⑳ CONTACTED BOB TURNER / DAVE CLARK REGARDING SAME AND THEY BOTH RESPONDED TO WORK.

㉑ INFORMED BY E. CORMIER THAT THE MATERIAL IS A NUCLEAR FUEL NAMED URANIUM DIOXIDE.

㉒ REMAINDER OF TIME SPENT WITH AN AMBULANCE IN STAND-BY @ COMMAND POST WITHOUT FURTHER INCIDENTS OR TRANSPORTS.

DAVID L. #808

APPENDIX F
City of Springfield
Integrated Hazardous Materials Incident Reponse Plan

Plan Revised Feb. 28, 1990
Replaces September 30, 1988
Telephone Numbers Revised 11/30/89

**CITY OF SPRINGFIELD
INTEGRATED HAZARDOUS MATERIALS INCIDENT RESPONSE PLAN**

(SARA Revisions, October 1988)

1. PURPOSE

This plan is intended to establish an integrated operating procedure for the various City Departments and Agencies in responding to a hazardous materials (HAZ-MAT) incident. The interface of State, Federal, and private resources are also reviewed. Where applicable legal citations are listed. These procedures are prepared to assist all responding agencies to understand their own responsibilities and those of the other agencies.

2. NOTIFICATION

- 2.1. ANY DEPARTMENT determining that a haz-mat incident is suspected or in progress SHALL immediately communicate such information over the radio or telephone in clear language to their dispatcher who will immediately notify 9-1-1.

9-1-1 SHALL BE THE PRIMARY ACTIVATION OF THESE PROCEDURES.

- 2.2. Such communication shall include:

- 2.2.1. Identification of HAZ-MAT call. "I am a reporting HAZ-MAT incident."
- 2.2.2. The location of the incident.
- 2.2.3. The type of situation found. (tank truck-auto accident, industrial incident, unknown fumes, etc.) and Level of response.
- 2.2.4. The identification of the hazardous material, if known--use DOT placard number, shipping manifest, etc.
- 2.2.5. To the extent possible further describe the scene situation, particularly, for casualties, wind, smoke, noises, odors etc.
- 2.2.6. (Facility's calling 9-1-1 are requested to use contact procedures as approved by the Local Emergency Planning Committee) See Appendix F

90.02.28

- 2.2.7. The 9-1-1 operator when determining that caller is describing a haz-mat incident shall obtain the address and ask the caller to stand by to be transferred to the Fire Department. The operator shall monitor the call and immediately notify the Watch Commander. The 9-1-1 operator shall also advise contracted ambulance service, via the ring down line, of the call and to stand by for a haz-mat response and for further instructions.

3. FIRST RESPONDER CONSIDERATIONS

(Police, Fire, Ambulance and others)

- 3.1. The first responder has a critical responsibility to initiate the City's response to a Haz-mat incident. His/her responsibility shall be:

- 3.1.1. Confirm and Assess situation

- 3.1.2. Notify Dispatch immediately with confirmation and whether it is a LEVEL 1 or LEVEL 2 incident.

THEN

- 3.1.3. Isolate incident preventing access to scene and order those already there to evacuate scene.

- 3.1.4. Do not attempt to rescue victims from contaminated area unless properly equipped to do so.

- 3.1.5. After isolating area, render medical aide to victims who are outside contaminated area.

4. FIRE DEPARTMENT OPERATIONS

- 4.1. The Department shall follow accepted its rules and regulations.

- 4.2. Procedure Summary:

- 4.2.1. Dispatcher's Duties.

- 4.2.1.1. Upon initial receipt of an reported emergency HAZ-MAT incident, the on duty operator shall:

- 4.2.1.1.1. Dispatch first due pump and truck company according to the box assignment, the District Chief, Pump 7, Truck 1, the Rescue Squad, and Hazmat 1.

- 4.2.1.1.2. Obtain wind direction from either Westover AFB, Bradley, or the next available source, and transmit this information to all responding companies.

90.02.28

4.2.1.1.3. Advise responding District Chief if response is to a SARA facility.

4.2.1.1.4. Ring back Police to advise of the HAZ-MAT incident call and request that they institute their HAZ-MAT procedures.

4.2.1.1.5 Request the following personnel respond when a LEVEL TWO or greater response is declared:
Chief
Deputy of Suppression
Training Division (DC Cassanelli and Capt. Elliott)
Public Relations
Arson Squad

4.2.2. Upon receipt on a non-emergency report from a SARA facility the duty operator shall transfer the call to the District Chief whose district the facility fall into.

4.3. First Responding Company:

4.3.1. Size up situation by:

4.3.1.1. Determining the magnitude of the incident and establishing level of response. .

4.3.1.2. Determining the identification of the material, if able to do so from a safe and up wind location.

4.3.1.3. Assistance needed for control.

4.3.1.4. Wind and topographical considerations.

4.3.1.5. Communicate via radio the above finding immediately.

4.3.1.6. Establish a preliminary HOT ZONE: Evacuating as necessary. The evacuation of the HOT ZONE shall be done with Fire personnel who are properly equipped to do so. A thorough search of the HOT ZONE shall be done to insure that all are removed from the zone.

4.3.1.7. Advise incoming units of safe areas.

4.3.1.8. Senior Fire Officer shall become INCIDENT COMMANDER until relieved.

4.3.1.9. All apparatus shall be placed facing away from incident.

4.4. First Responding Chief Officer:

4.4.1. Shall assume the INCIDENT COMMANDER(On Scene Coordinator) position, and:

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- 4.4.1.1. Establish a COMMAND POST/Incident command system at a safe distance from the incident site, assume control of the incident operations from the COMMAND POST, and direct Fire and other personnel until such time as the incident is terminated or relieved. Communicate the COMMAND POST's location to all responding units.
- 4.4.1.2. Designate a Fire Officer as the HOT ZONE commander until replaced by Capt. D. Elliott for Fire Department operations within it.
- 4.4.1.3. Designate a Safety Officer until replaced DC Cassanelli to oversee operations and report directly to the INCIDENT COMMANDER.
- 4.4.1.4. Designate a recorder for the COMMAND POST to record and confirm actions and orders given at scene. Chief's aide will be the interim recorder.
- 4.4.1.5. Take what ever actions that seem applicable to control the spread of the spilled, leaked or released material and reduce the hazard of fire or other causes of damage to persons or property.
- 4.4.1.6. Insure that the HOT ZONE, INNER PERIMETER, WARM ZONE, OUTER PERIMETER, DECONTAMINATION and STAGING AREAS are established and communicated to responding agencies
- 4.4.1.7. If responding to a SARA covered facility, obtain contingency plan envelope from Command Post or Hazmat Unit Files. Envelope will include, evacuation zone considerations, facility inventories, MSDS info, floor plans-photographs, and emergency contact names and telephone numbers. A facility representative should be assigned to the COMMAND POST. Advise Alarm and Police if Facility is covered by SARA.
- 4.4.1.8. Obtain latest weather report, and keep it updated.
- 4.4.1.9. Insure that all necessary evacuations have been ordered and completed.
- 4.4.1.10. Insure that a licensed clean-up contractor is called to scene to clean up and remove all contaminated materials. Work with DEP personnel as necessary to see that the above is completed.
- 4.4.1.11. Insure that appropriate agencies establish command presence at the COMMAND POST.

90.02.28

- 4.4.1.12. Appoint an Incident Public Information Officer (PIO) to coordinate and direct the release of information to the media concerning incident. Advise all responding agencies that ONLY the PIO will release information concerning the situation. The Evacuation Control Group PIO will coordinate evacuation information needs with Incident PIO.
 - 4.4.1.13. Insure that a PRESS AREA is established and made known to Police Supervisor and PD Headquarters. Press will not be allowed outside the press area without the permission of Public Information Officer.
 - 4.4.1.14. Insure that responding City Departments are aware of their responsibilities. SEE APPENDIX A
 - 4.4.1.15. Institute coordination with abutting municipalities, if appropriate.
 - 4.4.1.16. Insure that communications have established with CHEMTREC and/or NATIONAL RESPONSE CENTER (NRC). NRC notification is required by SARA Regs. for SARA Covered facilities.
- 4.5. Hazardous Material Unit shall follow its procedures as adopted in Notice March 22, 1989.

5. POLICE DEPARTMENT OPERATIONS

- 5.1. The Department shall follow its accepted rules and regulations.
- 5.2. Procedure Summary:
 - 5.2.1. 9-1-1 Operator:
 - 5.2.1.1. Upon receiving a call in which he/she believes is confirmed or a potential haz-mat call, the operator shall:
 - 5.2.1.2. Obtain the address of the incident and call back number.
 - 5.2.1.3. Transfer the call to the Fire Alarm Center.
 - 5.2.1.4. Monitor Fire Department-caller discussion.
 - 5.2.1.5. Notify Dispatch of call.
 - 5.2.1.6. Advise all other 9-1-1 operators of the HAZ-MAT call.
 - 5.2.1.7. Notify Watch Commander of Call.

90.02.28

5.2.1.8. Alert ambulance service to stand-by.

5.2.1.9. Notify DPW Yard of incident and advise DPW to contact Bondi's Treatment Plant.

5.2.1.10. Upon termination of incident submit a report to the Chief of Police through the Watch Commander on actions taken, problems encountered, etc.

5.3. Radio-Dispatch

5.3.1. Unconfirmed Haz-mat Call

5.3.1.1. Dispatch District Car and Street Supervisor to investigate the call.

5.3.1.2. Advise Communication's Supervisor

5.3.2. Confirmed Haz-mat call.

5.3.2.1. Advise all units of level of call.

5.3.2.2. Advise Communication's Supervisor

5.3.2.3. Dispatch District Car and Street Supervisor to incident. Determine from Fire Alarm if a HOT or WARM ZONES have been established.

5.3.2.4. Determine from first responding car situation report.

5.3.2.5. Obtain cars for perimeter security as needed by Street Supervisor.

5.3.2.6. Maintain car location log or map of road block locations.

5.3.2.7. Assign Police radio traffic related to incident to a specific channel.

5.3.2.8. Upon termination of incident submit a report to the Chief of Police through the Watch Commander on actions taken, problems encountered, etc.

5.4. Watch Commander.

5.4.1. Unconfirmed Haz-mat Call.

5.4.1.1. Insure that Street Supervisor and District are assigned to investigate incident.

5.4.1.2. Insure that 9-1-1 has alerted contracted ambulance service and DPW yard.

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- 5.4.1.3. Assign driver to COMMAND POST and have it ready to respond to incident.
 - 5.4.1.4. If call is determined to be unfounded or level one, advise Ambulance, DPW, and COMMAND POST Driver.
 - 5.4.1.5. If call is determined to be a level two or above, see next Section b.
 - 5.4.1.6. Determine if location is a SARA covered facility.
- 5.4.2. Confirmed Level Two or Three Haz-mat calls.
- 5.4.2.1. Determine from Fire Alarm or Police on scene, location of HOT ZONE and establish INNER PERIMETER LINE security needs. Also an interim situation report.
 - 5.4.2.2. If location is a SARA covered facility, obtain Facility File and review response considerations section.
 - 5.4.2.3. Order command van to respond to COMMAND POST site if established by Fire or SARA plan, if not, an interim site.
 - 5.4.2.4. Order Records Bureau to contact those on the emergency personnel list and report back contacts made.
 - 5.4.2.5. Insure that 9-1-1 has notified Contracted Ambulance Service and DPW Yard of call.
 - 5.4.2.6. Order a Superior Officer to the COMMAND POST and establish a Police command presence.
 - 5.4.2.7. Advise Radio of situation and request available resource list.
 - 5.4.2.8. Verify that the Chief and Deputies have been notified.
 - 5.4.2.9. Confirm the activation of the Tactical Response Unit Command Group.
 - 5.4.2.10. Determine WARM ZONE location, and establish OUTER & INNER PERIMETER LINES security needs.
 - 5.4.2.11. Order Police personnel to secure INNER and OUTER PERIMETER LINES and to allow no one to pass through them without the permission of scene COMMAND POST.
 - 5.4.2.12. Determine STAGING AREA locations for incoming resources.

- 5.4.2.13. Advise all incoming resource departments if ACCESS CONTROL POINTS have been established.
- 5.4.2.14. Assign two detectives to the Street Supervisor for any potential criminal and/or epidemiological investigations that maybe ordered.
- 5.4.2.15. If necessary, activate Tactical Response Unit.
- 5.4.2.16. Advise abutter municipalities and state police, if appropriate.
- 5.4.2.17. Wait for further info and requests from Street/TRU Supervisors.
- 5.4.2.18. Advise contracted tow truck company to have a unit to stand-by.
- 5.4.2.19. If necessary, prepare messages to be broadcast by Continental Cablevision using the emergency access system.
- 5.4.2.20. Upon termination of incident submit a report to Chief of Police on actions taken, problems encountered, etc.

5.5. Street Supervisor

5.5.1. Unconfirmed Situation:

- 5.5.1.1. Respond and investigate call and report level of response to Radio and Watch Commander.
 - 5.5.1.1.1. See First Responder considerations if Superior Officer is first to arrive on scene.
- 5.5.1.2. If LEVEL 1, Establish CP with Car and insure that sufficient Police personnel are available, call for COMMAND POST if requested by Fire.
- 5.5.1.3. If LEVEL 2 or 3, see next Section b.

5.5.2. Confirmed LEVEL 2 or 3 Incident.

- 5.5.2.1. Determine COMMAND POST Location from Fire on Scene or Watch Commander, and report to it and assume command of responding Police resources until relieved.
- 5.5.2.2. Determine status of situation, and location of HOT and WARM ZONES, and INNER AND OUTER PERIMETER LINES. Insure that sufficient Police resources are available to secure areas.

- 5.5.2.3. Insure that a communications officer, a perimeter/command post security supervisor are assigned to COMMAND POST.
- 5.5.2.4. Advise Police HQ and OUTER PERIMETER LINE Police personnel of press area and the name of public info spokesperson.
- 5.5.2.5. Establish if necessary ACCESS CONTROL POINTS to WARM and HOT ZONES in consultation with INCIDENT COMMANDER.
- 5.5.2.6. Assist INCIDENT COMMANDER with tasks as requested.
- 5.5.2.7. Keep Police HQ informed of situation status.
- 5.5.2.8. Assign WARM ZONE security in consultation with INCIDENT COMMANDER and COMMAND POST.
- 5.5.2.9. Start evacuation of WARM ZONE areas if directed to by INCIDENT COMMANDER until relieved by a Evacuation Control Group. HOT ZONE will be responsibility of Fire Department.
- 5.5.2.10. If necessary, activate a Evacuation Control Group. See Section 4 for Evacuation Control Group.
- 5.5.2.11. Provide food, drink and necessary relief to officers on perimeter security lines.
- 5.5.2.12. Assign Police Officer to Shelter Managers for each shelter opened for security and communications.
- 5.5.2.13. Order a thorough search of WARM ZONE if directed by INCIDENT COMMANDER to insure that no unauthorized persons are in it.
- 5.5.2.14. If applicable, assign morgue security in conjunction with Medical Examiner.
- 5.5.2.15. Upon termination of incident submit a report to the Chief of Police through the Watch Commander on actions taken, problems encountered, etc.

5.6. Evacuation Control Group:

- 5.6.1. Activated by Street Supervisor or Watch Commander, the Group shall consist of:

- 5.6.1.1. Evacuation Control Officer
 - Responsible for overall supervision of group, determining priority of areas to be evacuated, insuring that INCIDENT COMMANDER and COMMAND POST are kept informed of the status of the Evacuation.

5.6.1.2. Public Information Coordinator

Responsible for Evac Group public information announcements concerning: evacuation warnings, areas being evacuated, evacuation routes if established, shelter locations, general information needs. Shall also keep Watch Commander informed as to the Cable messages that should be transmitted via the cable system. Evacuation PIO shall keep the Scene PIO informed of information given to media and any special needs of the Evac Group.

5.6.1.3. Communications Coordinator/Recorder

Responsible radio communications and for maintaining a log of areas evacuated, resources used, etc.

5.6.1.4. Safety Officer, if warranted.

Responsible for keeping Evac Group personnel aware of potential dangers, and to monitor the issuance and use of personal safety equipment. Shall keep Scene Safety Officer informed of any problems or situations encountered by the Evac Group resources, including Police, Bus transportation, Emergency medical services, or other personnel assigned to the evacuation process.

5.6.2. Determine if personal protection needs for officers, and advise all officer to turn AC on Max. If personal protection equipment is used, appoint safety officer to monitor its use.

5.6.2.1. Respirator filters shall be collected and treated as hazardous material for proper disposal.

5.6.3. Control group determines sequence of area(s) to be evacuated and route(s) to be used for evacuation.

5.6.4. Advise media representatives at PRESS AREA of media needs of Evacuation Control Team. Depending on situation advise media to start pre-warning announcements and what individuals should take with them if evacuated. Medicines, blankets, clothes, etc. Advise neighbors to contact those individuals in their neighborhood that are elderly, disabled, or hearing or sight impaired to be sure that they are aware of situation. Advise Watch Commander of Cable override requirements and information needed to be transmitted. Ask local TV media representatives to provide script overrides of evacuation messages.

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5.7.4. House by house notification by street. (Fire companies should be considered to assist). To extent possible only uniform personnel should be used in the house by house notification process. At the completion of a street, the officer shall advise the Evacuation Control Group that the Street has been warned and proceed to the next assigned street.

5.7.5. Advise COMMAND POST as areas are evacuated.

5.7.6. MUNICIPAL HOSPITAL is to be used unless otherwise specified as the Shelter for neighborhood residents. (use Main entrance on State St.) Secondary shelter locations in order of priority are:

Central High School
Commerce High School
New North School
Kiley Jr. High School
Van Sickle Jr. High School

All the above have emergency electrical power.

5.7.7. When school is in session, schools should be used only as a last resort. Civic Center should be considered as an alternative.

SPECIAL NEEDS PERSONS SHALL BE SHELTERED AT MUNICIPAL HOSP.

5.7.8. Determine from INCIDENT COMMANDER when it is safe to allow the return of evacuees to WARM and HOT ZONES.

5.7.8.1. Arrange for media announcements of areas being allowed to be re-entered.

5.7.8.2. Arrange for transportation needs for persons in shelters needing rides home.

5.7.8.3. Determine from shelter managers when shelters are secured.

5.7.9. Upon termination of incident submit a report to Watch Commander on actions taken, problems encountered, etc.

5.8. First Responding Officer

5.8.1. See First Responder Considerations if Cruiser is first to arrive.

6. EMERGENCY MEDICAL SERVICES OPERATIONS

6.1. The contracted ambulance service shall institute Mass Casualty Response Plan as approved by the EMS Commission, February 15, 1984.

6.2. Procedure Summary:

6.2.1. Contracted Ambulance Dispatcher, shall:

- 6.2.1.1. Designate two ambulances for initial response or stand-by. Move Medical Control info case onto a designated response ambulance.
- 6.2.1.2. Determine from Fire Alarm the situation at scene, the location of the Command Post and EMS Staging Area (if designated), and Wind Direction, whether it is SARA Facility.
- 6.2.1.3. Dispatch two ambulance to location specified by Fire Alarm operator.
- 6.2.1.4. If the location is a SARA facility the Contingency Plan shall be followed and information relayed to the responding units.
- 6.2.1.5. Alert other city ambulance services to stand by for further information.
 - 6.2.1.5.1. Activate back-up ambulances in accordance with EMS Call Up System.
- 6.2.1.6. Coordinate with first arriving ambulance and C-MED to obtain EMS Resources.

6.2.3. First Arriving Ambulance Crew:

See First Responder Considerations if Ambulance is first to arrive; if HOT ZONE is already established:

6.2.4. Senior EMT upon arriving at scene shall:

- 6.2.4.1. Report to COMMAND POST as EMS COMMANDER and take control of EMS resources at scene and obtain a briefing of situation as it is currently known.
- 6.2.4.2. Coordinate with contracted service dispatcher and C-MED to obtain needed EMS resources.
- 6.2.4.3. Determine personal protection considerations for EMS personnel at scene and advise hospitals. Appoint Safety Officer for EMS personnel if personal protection equipment is issued. EMS safety officer will report to Fire Safety Officer.
- 6.2.4.4.. Assign other EMTs as medical communications officer, and order him/her to advise contracted Dispatcher and Hospitals of situation at scene. The report should include if known, the following information:

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- 6.2.4.4.1. Description of incident
- 6.2.4.4.2. Number and type of known casualties
- 6.2.4.4.3. Description of haz-mat substances if known
- 6.2.4.4.4. Need for additional EMS resources
- 6.2.4.4.5. Location of STAGING AREA, OUTER PERIMETER and ACCESS CONTROL POINTS
- 6.2.4.5. Should situation warrant it, following functions will be assigned:
 - 6.2.4.5.1. EMS Commander
 - 6.2.4.5.2. Communications Officer
 - 6.2.4.5.3. Triage Officer
 - 6.2.4.5.4. Transportation Officer
 - 6.2.4.5.5. Safety Officer
- 6.2.4.6. Contact C-MED for a all-hospital patch to advise them of EMS COMMANDER's identification and scene situation.
- 6.2.4.7. Should situation warrant it, request that C-MED obtain from Hospitals their capacities and a designated medical control contacts.
- 6.2.4.8. Assist INCIDENT COMMANDER in obtaining any information or assistance needed.
- 6.2.4.9. Stay at scene until relieved by a contracted ambulance service supervisor or designee, or released back into service by the INCIDENT COMMANDER.
- 6.2.4.10. Determine from Poison Control Info Center, CHEMTREC, National Response Center, or Nuclear Incident Advisory Team (NIAT) appropriate decontamination procedures for victims. Coordinate with INCIDENT COMMANDER to determine a location for the Decontamination Area. Advise Medical Triage Officer of its location. Decontamination of individuals and equipment shall be done by Fire Department teams. See APPENDIX D for Poison Control Info Center procedures
- 6.2.4.11. Advise all alerted or involved services when incident is terminated, and release them back into service.

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- 6.2.4.12. In the event of a fatality, the SCENE COMMANDER and Police Commander shall be notified. A morgue area shall be established, and the Police shall be responsible for notifying the Medical Examiner and security of morgue area.
- 6.2.4.13. Maintain a written log of actions taken and orders issued by Emergency Medical Personnel. Log shall be turned into INCIDENT COMMANDER upon termination of the Incident.

7. CIVIL DEFENSE OPERATIONS

- 7.1. The Civil Defense Director shall comply with those provisions of the revised CIVIL DEFENSE EMERGENCY MANAGEMENT PLAN approved by the Mayor in January, 1985.
- 7.2. Procedure Summary:
 - 7.2.1. The Director upon arriving at scene shall report to the COMMAND POST and report to the INCIDENT COMMANDER. The following are the responsibility of the Civil Defense Director:
 - 7.2.2. Coordinate City departments other than Police, Fire, and EMS. Per request of INCIDENT COMMANDER obtain additional resources from various city and non-city sources such as:
 - 7.2.2.1. Additional communications equipment and personnel.
 - 7.2.2.2. Public buildings.
 - 7.2.2.3. Transportation.
 - 7.2.2.4. Shelter management teams and supplies.
 - 7.2.2.5. Utilities.
 - 7.2.3. If situation warrants it, coordinate evacuation, shelter and shelter staff needs, evacuees needs in cooperation with the Police and American Red Cross.
 - 7.2.4. Assist COMMAND POST in organizing information gathered at scene
 - 7.2.5. If situation warrants it, recommend to INCIDENT COMMANDER and Mayor's Office that a Disaster declaration be made.
 - 7.2.5.1. In accordance with Mass General Laws all State and Local Resources can be activated.
 - 7.2.6. Advise INCIDENT COMMANDER of need to consider operating on a sustained basis (LEVEL THREE).

8. DEPARTMENT OF PUBLIC WORKS OPERATIONS

8.1. The Department shall follow its accepted rules and regulations.

8.2. Procedure Summary.

8.2.1. DPW Yard Operator (or Senior Operator at Wastewater Treatment Plant):

8.2.1.1. Upon receiving a LEVEL ONE Haz-mat call from POLICE, FIRE or CIVIL DEFENSE, the operator shall:

8.2.1.1.1. Request a DPW supervisor to report to the Spill location.

8.2.1.2. Upon receiving a LEVEL TWO hazmat call:

8.2.1.2.1. Notify Senior Operator at Waste Water Treatment Plant of spill and material involved, if not available by telephone use radio.

8.2.1.2.2. Request a DPW supervisor respond to the COMMAND POST location.

8.2.1.2.3. Alert yard personnel of situation and have a driver stand-by for sand truck.

8.2.1.2.4. Dispatch departmental resources (such as sand, barricades, etc.) to the scene as requested by the INCIDENT COMMANDER or DPW supervisor.

8.2.2. DPW Supervisor Assigned to COMMAND POST

8.2.2.1. 1. Upon arriving at scene, report to INCIDENT COMMANDER at the COMMAND POST and take control DPW resources.

8.2.2.2. Assign a Job Number for Response.

8.2.2.3. Order those DPW resources to scene as directed by the COMMAND POST.

8.2.2.4. If situation warrants it, coordinate with MA DPW, the clearing of streets, including plowing, sanding, tree removal, etc.

8.2.2.5.. Insure that Waste Water Treatment Plant Senior Operator has been notified.

8.2.2.6. Insure that DPW personnel are aware of personal protection equipment needs, and obtain from COMMAND POST equipment if needed.

9. HEALTH DEPARTMENT OPERATIONS

9.1. The Department shall follow its accepted rules and regulations.

9.2. Procedure Summary.

9.2.1. Health Commissioner or designee:

9.2.1.1. The Health Commissioner upon arriving at scene shall report to the INCIDENT COMMANDER at the COMMAND POST, and shall insure the following steps are taken:

9.2.1.1.1. Make preliminary public health risk evaluation, this assessment shall include:

9.2.1.1.1.1. Water Supply.

9.2.1.1.1.2. Food Supply.

9.2.1.1.1.3. Environmental Issues.

9.2.1.1.1.3.1. Air contamination

9.2.1.1.1.3.1. Ground contamination

9.2.1.1.2. Establish communications with State and Federal Public Health Agencies to obtain additional information or equipment.

9.2.1.1.3. Assess by Field Survey as soon as practical impact on those concerns found in Section 9.2.1.1.1-3, and report to the INCIDENT COMMANDER.

9.2.1.1.4. Advise Welfare Department of those areas where food or home contamination exist and need for replacement.

9.2.1.1.5. Assign Health Department staff to assist Police Department with epidemiological investigative aspects of the incident.

9.2.1.1.6. Assign Public Health Nurses to each shelter opened.

9.2.1.1.6.1. Assist Red Cross in determining evacuees health problems and needs.

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10. FOLLOW-UP CONSIDERATIONS

10.1. Critique

Within forty-eight hours after a haz-mat response, a critique shall be held to review the response and to consider revisions to this document. The Incident commander shall chair this meeting.

10.2. Stress Debriefing

Scene commander shall institute stress debriefing for emergency responders in consultation with Departmental leadership and Hospital personnel. Emphasis shall be placed on this matter in the cases involving deaths at the scene.

11. REVISIONS TO PLAN

Suggestions for revisions to this plan shall be submitted to the Emergency Response Coordinators Office for consideration. Telephone numbers are reviewed every three months, evacuation consideration listings are reviewed at least once a year.

12. PLAN EXERCISING

This Plan shall be exercised at least four times a year. Exercising shall be done with the Command Post Staff and with field response personnel. At least one exercise a year shall be a transportation accident rail or highway, the others shall involve SARA facilities. The Emergency Response Coordinator shall be responsible for organizing and scheduling exercises.

12.1. Attendance Sheets shall be maintained at the Fire Training Center. Sheet will indicate the Date, Exercise scenario, Attendees.

APPENDIX G
Chronology of Events and Phone Records
Vermont Yankee Power Corporation

**VERMONT YANKEE NUCLEAR POWER CORPORATION
MEMORANDUM**

TO: File **DATE:** December 20, 1991
FROM: R.E. Sojka  **FILE:** VYB 91/268
SUBJECT: December 16, 1991 Fuel Shipment Accident

=====

The following represents an approximate chronology of key events during the December 16, 1991 Fuel Transport Accident in Springfield, Mass.

12/16/91

- 0430 Vermont Yankee Control Room personnel called Bob Leach, who in turn called Chief Cartenelli at the Springfield Marriott.
- 0443 Control Room called Dave McElwee who alerted Mary Schneider and Bill Sherman (Vermont)
- 0530 Leach arrived at accident scene with RP Monitoring equipment.
- 0615 TV 22 News Broadcast from the accident site and reported Vermont Yankee Nuclear was on the scene and that there was no radiation released.
- 0625 Sojka spoke with Jim Sinclair, Tom Schimelpfenig, Ed Lindamood Rick Lopriore and John DeVincentis(YNSD). Asked Sinclair to have Ed Porter get in touch with the Mass. CD center at the Marriott and offer Vermont Yankee's assistance and the others to meet in Vernon and Bolton as soon as possible.
- 0730 Established Recovery Center in Vernon and began developing assistance and recovery plans, if needed at accident scene. Initiated VY update. Notified NEPSCO of the potential need for a crane and trucking assistance.
- 0810 Vernon Recovery Center spoke with Mass. CD (Pappas) and Leach at Marriott and offered (to Leach) sending personnel and equipment to accident scene. Developed a recovery plan to move the fuel without the outer shipping crates to a nearby, unlicensed safe haven.
- 0830 Dean Weyman and Jim Sinclair departed from Brattleboro, VT for the accident scene in Springfield, Mass.
- 0900 Spoke separately to John Opeka (NU), Phil Bain (NU) and Harold Eichenholz (NRC).
- 0910 Established a multi-agency telecon with several representatives of DOT (Al Roberts, Chris Smith), NRC (Ross Chapel, Jere Roth), GE (Scott Murry, Fred Welfare) and others and offered our recovery plan and assistance to retrieve the fuel and move it to a safe haven. The plan was accepted without modification.

Dispatched NEPSCO vehicles (crane, flatbed, and supervisor) to the accident site and coordinated preparation for fuel receipt at the proposed NU safe haven site located three miles from the accident.

MEMORANDUM**To: R.E. Sojka****Date: January 29, 1992****From: B.N. Leach****Subject: Documentation of Phone Conversation on Fuel Accident**

At about 0415 on December 16, 1991, I received a phone call from the Vermont Yankee control room with the message that our fuel shipment had been involved in an accident on I-91, and that it was on fire. The Control Room supplied me with a phone number to call.

I immediately called the phone number, and talked to a Captain in the Springfield Fire Department. He informed me that the fuel truck had been hit head on by a car. He stated that the truck was fully involved in fire.

I asked about the condition of the people involved and he informed me that no one was killed, but that the two truck drivers, and the driver of the car were in the hospital.

I asked him if the containers were open or had been damaged. He stated that the fire was too intense to allow him to determine the condition of the containers.

He asked me how to fight the fire. I told him that he could use water to put the fire out, but to take the following precautions:

1. Have all fire fighters down wind of the fire wear full turn-out gear, and SCBA's.
2. Have all fire fighters involved in fighting the fire and all equipment used, to remain on the scene until I arrive to survey them for contamination.
3. Treat the water used on the fire as contaminated, until I arrive and can determine if there was any contamination problem.

He asked about the hazards to the public if he let the fire burn itself out. I told him that an evacuation of 100 yds around the fire would be adequate, and that there would be no hazard to the health and safety of the public, outside that area, from the radioactive material.

He stated that since there was no threat to the public from the fire where the truck was located, that he would probably let it burn until I arrived to evaluate the potential contamination problem.

I told him that I would be there as soon as possible, with monitoring equipment.

DATE 12/15/91 POWER LEVEL 1600-2400 100%
1800 COMPLETED OPS SURV. ITEMS 1079 SAT

12/16/91 0800-1600 100%

- 0040- STARTED SRGT AND SECURED R/B BLDG VENT FOR SECONDARY CONTAINMENT CAPABILITY CHECK
- 0100- STARTED R/B BLDG VENT AND SECURED SRGT COMPLETED SECONDARY CONTAINMENT CAPABILITY CHECK - SAT
- 0115- APPROVED DP# 91-1020 W/ST 'A' -> CST
- 0130- APPROVED SCPLWR # 91-07 AND # 91-08
- 0425- RECEIVED TELCON FROM MASS ST POLICE THAT THE TRUCK CARRYING NEW PUMP DESTINED FOR V.Y WAS INVOLVED IN AN ACCIDENT AND WAS ON FIRE, AND WOULD LIKE DIRECTION ON HOW TO EXTINGUISH. CONTACTED BOB BRACH AND GAVE HIM THE NUMBER TO CALL MASS. (ACCIDENT @ EXIT 6-7 NORTH IN SPRINGFIELD I 91)
- 0445- MADE CORTASY CALL TO NRC ON ABOVE ENTRY (A GUNTY) HE HAD ALREADY RECEIVED A CALL FROM GE IN WILMINGTON, NC ON SA 44
- 0450- DCO (JTH), M SCHWEIDER, D. McELWEE, AND E LINDANCO NOTIFIED OF ABOVE
- 0500 - COMPLETED OPS SURVEILLANCE ITEMS # 1011, 1012, 1015, 1016, 1019, 1020, 1047, 1049, 1052, 1055, 1061, 1062, 1069, 1080, 1087, 1092, 1096, 1097, 2008, 2084, 2096, 2235, 2255, 2267, 3038, 3119, 3126, 3134, 3163, 3167, 3168, 3190, 39029
- 0525- SUBMITTED PRO ON 0425 ENTRY

[Handwritten signature]

12/16/91 0800-1600 100%

- 0810 - made 4 hour notification to NRC (Korach) on 0425 entry. 10 CFR 50.72 (b)(2)(vi). Notified DK. McElwre of 4 hour notification. Both DCO's, have been notified. Update for accident is fire is out. All the fuel boxes on the ground. No contamination found as yet. One metal box re'ic'

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He asked me how to fight the fire. I told him that he could use water to put the fire out, but to take the following precautions:

1. Have all fire fighters down wind of the fire wear full turn-out gear, and SCBA's.
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He stated that since there was no threat to the public from the fire where the truck was located, that he would probably let it burn until I arrived to evaluate the potential contamination problem.

I told him that I would be there as soon as possible, with monitoring equipment.

APPENDIX H

Summary of Telephone Conversations on December 16, 1991

General Electric Company, Wilmington, North Carolina

INVOLVING TRUCK ACCIDENT IN SPRINGFIELD, MASS. ON 12/16/91

<u>Date</u>	<u>*Time</u>	<u>From</u>	<u>To</u>	<u>Message</u>
12/16/91	0353-0404	Sgt. Higgins, (Springfield, Mass. Police)	[REDACTED] (GE Security)	A McGill truck carrying nuclear material involved in a serious accident and is on fire. Sgt. Higgins left his Police Department number and the Springfield Fire Department (FD) number.
12/16/91	0405	GE Security	[REDACTED] (GE Traffic)	Security relayed information and provided Sgt. Higgins' telephone number to [REDACTED]. GE Traffic
12/16/91	0406	[REDACTED] GE Traffic	Sgt. Higgins	Discussion to determine which truck was involved.
12/16/91	0408	[REDACTED] GE Traffic	[REDACTED] (Emergency Prep. Coord.)	Notification of situation.
12/16/91	0411-0422	GE Security	Emergency Response Organization	Notification of situation.
12/16/91	0415	[REDACTED] (GE Manager Environmental Protection)	[REDACTED] (GE Manager Nuclear Safety Engineering)	Reviewed information.
12/16/91	0425-0445	[REDACTED] Nuclear Safety	1st Call [REDACTED] EP 2nd Call [REDACTED] Traffic	Reviewed information and developed response ([REDACTED] go to plant, [REDACTED] to call Springfield FD). Nuclear Safety
12/16/91	0450-0510	[REDACTED] Nuclear Safety (NS)	Springfield FD Mr. Hanna, Dispatcher #3	Discussed incident, shipment contents, packaging material types, and [REDACTED] recommended they fight the fire. Mr. Hanna stated there was a command center at the scene and he would relay info to them. [REDACTED] provided his home number NS and the GE emergency control center number for contact. NS [REDACTED] did not receive a call at home and left for the plant at approx. 5:45 a.m.

*Actual times may vary by a few minutes

APPENDIX I
CHEMTREC Emergency Report No. 11838

CHEMTREC EMERGENCY REPORT

CHEMTREC Report Number: 11838

Page: 01

Date: 12/16/91

Call Recd: 04:53

Point of Contact

Name: OFFICER LANDRY
Title:
Organization: POLICE DEPARTMENT
Location: CHICOPEE, MASSACHUSETTS
Phone: (413)592-6341
Alternate Phone:

Dot Name: URANIUM DIOXIDE
Common Name:
Mutual Aid: N/A
Shipper: UNKNOWN TO CALLER
Consignee: UNKNOWN TO CALLER
Container: UNKNOWN
Carrier:

Post-It brand fax transmittal memo 7671 # of pages 3
To: Mr. Landry From: H. Tracie
Co. NRC Co. Chemtrec
Dept. Phone #
Fax # Fax #

Location: ON ROUTE 91
SPRINGFIELD, MA.

Time: 04:53
Problem: CALLER STATES THE CHICOPEE POLICE DEPARTMENT HAS BEEN CONTACTED BY THE SPRINGFIELD POLICE TO ASSIST IN RESPONDING TO AN ACCIDENT INVOLVING URANIUM DIOXIDE BUT THEY CAN FIND NO PRODUCT INFO AND ARE CALLING CHEMTREC FOR ASSISTANCE. NO INFO AVAILABLE IN THE OSAR BUT DEFINITION READ FROM THE CCD. ADVISED THAT I WOULD RESEARCH FURTHER AND CALL BACK. HE IS SEEKING INFORMATION ON TURNOUT GEAR IN ORDER TO RESPOND, AS A FIRE IS ALSO REPORTED AT THE SCENE. REQUESTED A CALLBACK IF ANY FURTHER INFORMATION COMES HIS WAY.

Time: 05:02
NOTE: FOUND A GOOD URANIUM OXIDE MSDS IN DATABASE, SYNONYMOUS TO URANIUM DIOXIDE, HENCE...

OUT TO MR. LANDRY, CHICOPEE POLICE. ADVISED OF CHEVRON MSDS AND THAT I WOULD FAX TO 413-594-8396. DID SO.

Time: 05:18
IN FROM ERIC ARVEDON, EPA, BOSTON, SEEKING INFORMATION ON ENRICHED URANIUM. ADVISED OF CALL FROM THE CHICOPEE POLICE AND THAT THE PRODUCT WAS DESCRIBED AS URANIUM DIOXIDE. HE STATES THAT 500 KILOGRAMS OF "ENRICHED URANIUM ARE ENGULFED IN FLAMES IN A TRAILER." MR. ARVEDON THOUGHT HE WAS CALLING MASSACHUSETTS EPA AND WILL ATTEMPT TO DO SO, NOW.

Time: 05:23
IN FROM MR. LANDRY, CHICOPEE POLICE REPORTING HE HAS RECEIVED THE FAX.

SUSAN C. TRACIE

CHEMTREC EMERGENCY REPORT

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Time: 05:45
IN FROM JEFF DONN, ASSOCIATED PRESS, SPRINGFIELD, MA. HE STATES THIS INCIDENT INVOLVED A TRUCK AND CAR COLLIDING AND CATCHING ON FIRE IN DOWNTOWN SPRINGFIELD. THE FIRE BURNED FOR APPROXIMATELY 1/2 HOUR AND IS NOW OUT. HE ADVISES THAT THE SHIPPER IS GENERAL ELECTRIC FROM WILMINGTON, BUT IS NOT SURE THAT WILMINGTON IS DELAWARE. HE ALSO HAS INFORMATION THAT THE SHIPMENT WAS IN FIREPROOF CONTAINERS. READ TO HIM FROM THE CCD ON URANIUM DIOXIDE.
SCT

Time: 07:57
IN FROM GLENN CATANIA, ACE HARDWARE CORP, ADVISING THAT HIS DRIVER WAS STOPPED IN TRAFFIC SEVERAL HUNDRED FEET FROM THIS INCIDENT SCENE AND INHALED SMOKE FROM THE FIRE. THE DRIVER IS NOW EXPERIENCING A HEADACHE. CALLER IS SEEKING PDCT INFO FOR URANIUM OXIDE. PROVIDE INFO FROM CHEVRON MSDS. CALLER SAYS THAT THE FD ON HAND AT THE SCENE SAYS THAT THERE WAS NO RELEASE OF URANIUM OXIDE. INFORMED CALLER THAT DRIVER MIGHT HAVE BEEN EXPOSED TO DECOMPOSITION PRODUCTS OF OTHER MATERIALS INVOLVED IN THE FIRE AND THAT HE OUGHT TO SEEK MEDICAL ATTENTION ASAP AS A PRECAUTIONARY MEASURE.
^
JED

Time: 10:16
IN FROM STEVE UNGLESBEE, U.S. COUNCIL FOR ENERGY AWARENESS, PH# 202-293-0770. MR. UNGLESBEE ADVISES THAT APPARENTLY THERE WAS SOME CONFUSION REGARDING INFO PASSED TO THE ASSOCIATED PRESS REGARDING THIS INCIDENT. HE SAYS THAT THIS MATERIAL, WHICH HE IDENTIFIES AS FRESH NUCLEAR FUEL ALSO KNOWN AS ENRICHED URANIUM CONTAINED IN CERAMIC PELLETS HAS MINIMAL RADIOACTIVITY. HE FURTHER SAYS THAT PERSONNEL HANDLING MATERIAL ONLY NEED TO HAVE CLOTH GLOVES TO PROHIBIT CONTAMINATION OF THE MATERIAL. THERE IS NO NEED FOR PROTECTIVE CLOTHING/BREATHING APPARATUS TO PREVENT CONTAMINATION WITH THE RADIOACTIVE MATERIAL AS THE RADIATION HAZARDOUS ARE MINIMAL. CALLER BELIEVES THAT THE ASSOCIATED PRESS IS UNDER THE IMPRESSION THAT THIS MATERIAL IS SPENT NUCLEAR FUEL. ADVISED CALLER THAT THE CHEMTREC COMMUNICATOR ON DUTY AT THE TIME THIS RPT RECEIVED HAD PASSED INFO FROM THE CCD FOR URANIUM OXIDE TO THE ASSOCIATED PRESS. READ MR. UNGLESBEE INFO FROM THE CCD. MR. UNGLESBEE ADVISES THAT HE WILL FAX TO CHEMTREC A COPY OF THE ASSOCIATED PRESS STORY. HE WILL ALSO FAX A COPY OF INFO PERTAINING TO THE PDCT INVOLVED. JED

Time: 10:51
STEVE UNGLESBEE, U.S. COUNCIL FOR ENERGY AWARENESS, CALLING TO DISCUSS THIS REPORT AND NEWS COVERAGE INVOLVED (SEE ATTACHED NEWS RELEASE). CHEMTREC WILL CONTACT JEFF DONN. ALSO, CMA-PR AND G.E.-PR WILL BE NOTIFIED.
HEM

Time: 11:08
OUT TO JEFF DONN, BOSTON GLOBE, INFORMED HIM THIS IS NEW

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NUCLEAR FUEL AND WAS NOT THE HAZARD AS FIRST REPORTED. INFORMED HIM THAT I WOULD CONTACT BOTH CMA-RP AND G.E. - PR. MR. DONN WOULD APPRECIATE HEARING FROM GENERAL ELECTRIC.

HEM

PLACED A CALL TO MA-PR THEY WILL SEND SOMEONE DOWN.

Time:

11:17

OUT TO GENERAL ELECTRIC NUCLEAR DIV. PASSED DETAILS TO BRUCE ADLER, 203-373-2726, INCLUDING NEWS COVERAGE. GAVE HIM JEFF DONN'S NAME AND PHONE NR FOR CONTACT. G.E. WILL HAVE PROPER PERSON CALL HIM.

HEM

**** END OF TRANSMISSION**

Subject: 12/16

1 : 16 0633 Radioactive Fire

SPRINGFIELD, Mass. (AP) -- A tractor-trailer carrying radioactive material crashed and burned on an interstate early today, but authorities said none of the hazardous substance was released and there was no immediate danger.

No serious injuries were reported when the truck collided with a car and crashed into flames on Interstate 91 in downtown near two large hotels, the state police said.

A fire dispatcher said the truck was carrying about 11,000 pounds of uranium oxide from the General Electric plant in Wilmington, N.C., to the Vermont Yankee nuclear plant in Vernon, Vt.

"The radioactive material is in steel containers so the hazard for leak is most nil," said Bernie Wells, a fire department spokesman.

Witnesses said two huge drums on the truck's flatbed burned, along with three or four drums that fell on the roadway.

Neither driver appeared seriously hurt, but both were taken to a hospital for treatment, said police Sgt. Richard Catellier.

Members of the state and local police, the fire department and the hazardous waste team were at the scene.

A spokesman for Chemical Transport Emergency Center in Washington, who spoke on the condition of anonymity, said the material, if released, has a "high radiation risk." He said it is used in pellet form to pack fuel rods inside nuclear reactors.

Post-It™ brand fax transmittal memo 7671		# of pages » 9
To Meg Lussoli	From Frank Manning	
Co. NRC	Co. Chatham Co.	
Dept.	Phone #	
Fax #	Fax #	

URANIUM-238

1206

uranium-238. (U-238). The abundant isotope of uranium of which it comprises 99%. It is not fissionable, but will form plutonium-239 as a result of bombardment by neutrons in a reactor. Its half-life is 4.51×10^9 years. It will be used in breeder reactors, together with plutonium where its energy potential will be exploited by transmuting it to fissionable plutonium. See also breeder.

uranium carbide. See uranium dicarbide.

uranium compounds. Before the advent of nuclear energy, uranium had very limited uses. It had been suggested for filaments of lamps. A small tube of uranium dioxide, UO_2 , connected in series with the tungsten filaments of large incandescent lamps used for photography and motion pictures, tends to eliminate the sudden surge of current through the bulbs when the light is turned on, thereby extending their life. Compounds of uranium have been used in photography for toning and in the leather and wood industries uranium compounds have been used for stains and dyes. Uranium salts are mordants of silk or wool. In making special steels, a little ferrou uranium has been utilized, but its value is questionable in this connection. Such alloys have not proved commercially attractive. In the production of ceramics, sodium and ammonium diuranates have been used to produce colored glasses.

Uranium carbide has been suggested as a good catalyst for the production of synthetic ammonia. Uranium salts in small quantities are claimed to stimulate plant growth, but large quantities are clearly poisonous to plants.

By far the most important use of uranium lies in its application for nuclear (or atomic) energy. This use, in fact, has so increased the value of uranium as to eliminate its use for many of the purposes mentioned above (Glenn T. Seaborg, "Encyclopedia of Chemical Elements," ed. by C. A. Hampel).

uranium decay series. (uranium-radium series). The series of elements produced as successive intermediate products when the element uranium undergoes spontaneous natural radioactive disintegration into lead. Radium and radon are members of this series.

uranium, depleted. Uranium from which most of the uranium-235 isotope has been removed. See uranium-238.

uranium dicarbide. (uranium carbide). UC_2 . Properties: Gray crystals, d 11.28 (18C), mp 2330C, bp 4370C, decomposes in water, slightly soluble in alcohol.

Hazard: Highly toxic, radiation risk.

Use: As crystals, pellets, or microspheres for nuclear reactor fuel.

uranium dioxide. (uranium oxide; uranic oxide; urania; yellowcake). CAS: 1344-57-6. UO_2 .

Properties: Black crystals, insoluble in water, soluble in nitric acid and concentrated sulfuric acid, d 10.9, mp 3000C.

Derivation of pure oxide: Powdered uranium ore is digested with hot nitric-sulfuric acid mixture and filtered to remove the insoluble portion. Sulfate is precipitated from the solution with barium carbonate, and uranyl nitrate is extracted with ether. After re-extraction into water, it is heated to drive off nitric acid, leaving uranium trioxide. The latter is reduced with hydrogen to the dioxide. Can be prepared from uranium hexafluoride by treating with ammonia and subsequent heating of the ammonium diuranate. It is also recovered from phosphoric acid.

Hazard: High radiation risk. Ignites spontaneously in finely divided form.

Use: A crystalline (or pellet) form is used to pack nuclear fuel rods.

uranium, enriched. Natural uranium to which a few percent of the fissionable 235-isotope has been added.

See also enrichment.

uranium hexafluoride. CAS: 7783-81-5.

UF_6 .

Properties: Colorless, volatile crystals; sublimes; triple point 64.0C (1134mm); mp 64.5C (2 atmospheres); d 5.06 (25C); soluble in liquid bromine, chlorine, carbon tetrachloride, sym-tetrachloroethane, and fluorocarbons. Reacts vigorously with water, alcohol, ether, and most metals. Vapor behaves as nearly perfect gas.

Derivation: (1) Triuranium octoxide (U_3O_8) and nitric acid react to form a solution of uranyl nitrate; this is decomposed to UO_2 and reduced to the dioxide with hydrogen. The dioxide as a fluidized bed is reacted with hydrogen fluoride. The resulting tetrafluoride is fluorinated to the hexafluoride. (2) Triuranium octoxide is converted directly to the hexafluoride with hydrogen fluoride and fluorine, then purified by fractional distillation.

Hazard: Highly corrosive, radiation risk.

Use: Gaseous diffusion process for separating isotopes of uranium.

uranium hydride. UH_3 .

Properties: Brown gray to black powder, d 10.92, conductor of electricity.

Derivation: Action of hydrogen on hot uranium. **Hazard:** Highly toxic. Ignites spontaneously in air.

CHVN 137

CHEVRON

Emergency Number (800)457-2022 or (510)233-3737

Material Safety Data Sheet

CHEVRON

URANIUM OXIDE

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

PRODUCT DISCONTINUED. This Material Safety Data Sheet will no longer be updated.

1. PRODUCT IDENTIFICATION

URANIUM OXIDE

- DANGER! - HARMFUL IF SWALLOWED OR INHALED
 - OVEREXPOSURE MAY AFFECT THE KIDNEYS
 - CONTAINS RADIOACTIVE MATERIAL
 - PROLONGED OR REPEATED SKIN CONTACT OR INHALATION MAY CAUSE CANCER

SYNONYM: YELLOWCAKE

PRODUCT NUMBER(S): C1344576

PRODUCT INFORMATION: (510)842-5360

Revision Number: 4 Revision Date: 12/04/91 MSDS Number: 003372
 NDA - No Data Available NA - Not Applicable

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

CHVN

137

URANIUM OXIDE

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2. FIRST AID - EMERGENCY NUMBER (800)457-2022 OR (510)233-3737

EYE CONTACT:

Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. Remove contact lenses if worn. No additional first aid should be necessary. However, if irritation persists, see a doctor.

SKIN CONTACT:

Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.

INHALATION:

If there are signs or symptoms as described in this document due to breathing this material, move the person to fresh air. If breathing has stopped, apply artificial respiration. Call a doctor. **DO NOT ADMINISTER FIRST AID WITHOUT WEARING ADEQUATE RESPIRATORY PROTECTION.**

INGESTION:

If swallowed, give water or milk to drink and telephone for medical advice. **DO NOT** make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS - (ALSO SEE SECTIONS 11 & 12)

EYE CONTACT:

This substance may cause eye irritation due to the abrasive action of the dust. The degree of the injury will depend on the amount of material that gets into the eye and the speed and thoroughness of the first aid treatment. Signs and symptoms may include pain, tears, swelling, redness, and blurred vision.

SKIN IRRITATION:

This substance is not expected to cause prolonged or significant skin irritation.

DERMAL TOXICITY:

The dermal toxicity of this substance has not been determined. However, it may be slightly toxic to internal organs if absorbed through the skin. The degree of injury will depend on the amount absorbed. Read the Additional Health Data section (12) of this document for more information.

RESPIRATORY/INHALATION:

This substance is highly toxic to internal organs if inhaled. The degree of injury will depend on the airborne concentration and duration of exposure. This hazard evaluation is based on the known toxicity of the ingredients in this substance. The target organ(s) is the kidney. Read the Additional Health Data section (12) of this document for more information.

INGESTION:

This substance is highly toxic to internal organs if swallowed. The

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NA - Not Applicable

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URANIUM OXIDE

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degree of injury will depend on the amount absorbed. This hazard evaluation is based on the known toxicity of the ingredients in this substance. The target organ(s) is the kidney. Read the Additional Health Data section (12) of this document for more information.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:

Do not get this material in your eyes. Eye contact can be avoided by wearing chemical goggles.

SKIN PROTECTION:

Avoid contact with skin or clothing. Skin contact should be minimized by wearing protective clothing including gloves.

RESPIRATORY PROTECTION:

Wear approved respiratory protection when working with this material. An air-supplying respirator is recommended.

VENTILATION:

Ventilation must be demonstrated to be adequate to keep airborne concentrations of this material below the recommended exposure standards prior to using this material.

5. FIRE PROTECTION

FLASH POINT: NA**AUTOIGNITION:** NA**FLAMMABILITY LIMITS** (% by volume in air): Lower: NA Upper: NA**EXTINGUISHING MEDIA:**

CO2, Dry Chemical, Foam, Alcohol-type Foam, Water Fog.

NFPA RATINGS: Health 2; Flammability 1; Reactivity 0; Special NDA;**HMIS RATINGS:** Health 2; Flammability 1; Reactivity 0; Other NDA;

(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.

FIRE FIGHTING PROCEDURES:

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

COMBUSTION PRODUCTS:

Heating this material may produce RADIOACTIVE PRODUCTS

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA

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NA - Not Applicable

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STABILITY:

Stable. Avoid high temperatures.

HAZARDOUS POLYMERIZATION:

Polymerization will not occur.

INCOMPATIBILITY:

NDA

SPECIAL PRECAUTIONS:

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in HCl, H₂SO₄, HNO₃ and H₃PO₄; insoluble in water.**APPEARANCE:** Olive green-black powder.**BOILING POINT:** NA**MELTING POINT:** 1300C DECOMPOSES**EVAPORATION:** NA**SPECIFIC GRAVITY:** 8.30 @ 15.6/15.6C**VAPOR PRESSURE:** NA**PERCENT VOLATILE (VOLUME %):** NA**VAPOR DENSITY (AIR=1):** NA**VISCOSITY:** NA**MOLECULAR WEIGHT:** 842.09

8. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).**SPILL/LEAK PRECAUTIONS:**

Certain geographical areas have air pollution restrictions concerning the use of material in work situations which may release particulate contaminants to the atmosphere. Air pollution regulations should be studied to determine if this material is regulated in the area where it is to be used.

If this material is released into a work area, evacuate the area immediately. Persons entering the contaminated area to correct the problem or to determine whether it is safe to resume normal activities must comply with all instructions in the Protective Equipment section.

DISPOSAL METHODS:

Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:

All the components of this material are on the Toxic Substances Control

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Act Chemical Substances Inventory.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS# COMPONENT/REGULATORY LIMITS

100.0 % URANIUM OXIDE
CONTAINING

» 82.0 % URANIUM OXIDE
CAS1344576

» 1.0 % SULFUR
CAS7704349

< 1.0 % ZIRCONIUM
CAS7440677
5mg/m3 ACGIH TLV
10 mg/m3 ACGIH STEL
5mg/m3 OSHA TWA
10 mg/m3 OSHA STEL

< 1.0 % MOLYBDENUM
CAS7439987
5 mg/m3 ACGIH TLV
5mg/m3 OSHA TWA

< 1.0 % CALCIUM
CAS7440702

< 1.0 % SILICON
CAS7440213
10 mg/m3 ACGIH TLV
5mg/m3 OSHA TWA

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	CPS - CUSA Product Code
CC - Chevron Chemical Company	CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NDA
DOT HAZARD CLASS: NDA
DOT IDENTIFICATION NUMBER: NDA

SARA 311 CATEGORIES:

1. Immediate (Acute) Health Effects; YES
2. Delayed (Chronic) Health Effects; YES
3. Fire Hazard; NO
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

The following components of this material are found on the regulatory

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lists indicated by the number below the component name:

MOLYBDENUM

is found on lists: 02,10,11,13,14,17,28,

SILICON

is found on lists: 10,11,13,14,17,

ZIRCONIUM

is found on lists: 02,10,11,14,15,17,18,

CALCIUM

is found on lists: 02,10,11,

SULFUR

is found on lists: 02,10,11,

REGULATORY LISTS SEARCHED:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA TWA	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA Sect 4(e)
22=TSCA Sect 5(a)(e)(f)	23=TSCA Sect 6	24=TSCA Sect 12(b)
25=TSCA Sect 8(a)	26=TSCA Sect 8(d)	28=Canadian WHMIS
29=OSHA CEILING		

11. PRODUCT TOXICOLOGY DATA**EYE IRRITATION:**

No product toxicology data available. The hazard evaluation was based on data from similar materials.

SKIN IRRITATION:

No product toxicology data available. The hazard evaluation was based on data from similar materials.

DERMAL TOXICITY:

No product toxicology data available. The hazard evaluation was based on data from similar materials.

RESPIRATORY/INHALATION:

No product toxicology data available. The hazard evaluation was based on data on the components.

INGESTION:

No product toxicology data available. The hazard evaluation was based on data on the components.

12. ADDITIONAL HEALTH DATA**ADDITIONAL HEALTH DATA COMMENT:**

The primary hazard to personnel working with uranium oxide (U3O8) is absorption of U3O8 through inhalation or by contamination entering the mouth. Contamination can also enter the body through any breakage of the

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skin. If too much U308 is absorbed, uranium metal poisoning can occur causing damage to the kidney. This appears to be more of a hazard than the radiological hazard. The specific activity for U308 is 6.77×10^{-7} curies per gram of uranium.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

APPENDIX J

**NRC Response to Accidents Occurring During the
Transportation of Radioactive Material; General Statement
of Policy, 49 FR 12335, March 29, 1984**

NRC Response to Accidents Occurring During the Transportation of Radioactive Material; General Statement of Policy

AGENCY: Nuclear Regulatory Commission.

ACTION: General Statement of Policy.

SUMMARY: The Nuclear Regulatory Commission (NRC) has defined in a general policy statement its role in responding to accidents and incidents related to the transportation of nuclear materials. The purpose of the policy statement is to state clearly the extent of the NRC's participation and involvement in responding to such a transportation accident or incident.

EFFECTIVE DATE: March 29, 1984.

FOR FURTHER INFORMATION CONTACT: Dr. Justin T. Long, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone (301) 427-4135

SUPPLEMENTARY INFORMATION:

Background

The Nuclear Regulatory Commission (NRC), under the Atomic Energy Act of 1954, as amended (42 U.S.C. Chapter 23) and section 201 of the Energy Reorganization Act of 1974, as amended (42 U.S.C. 5841), is authorized to license and regulate the receipt, possession, use, and transfer of "byproduct material," "source material," and "special nuclear material" (as defined in 42 U.S.C. 2014). The NRC authority to license air shipment of plutonium is further governed by Pub. L. 94-79. Pertinent NRC regulations are contained in 10 CFR Parts 30, 40, 70, 71, and 73.

The U.S. Department of Transportation (DOT), under the Dangerous Cargo Act (R. S. 4472, as amended, 49 U.S.C. 170), Title VI and 902(h) of the Federal Aviation Act of 1958 (49 U.S.C. 1421-1430 and 1472(h)),

the Department of Transportation Act (49 U.S.C. 101, *et seq.*) and the Hazardous Materials Transportation Act (49 U.S.C. 1801-1812), is required to regulate safety in the transportation of hazardous materials, including radioactive materials. Pertinent DOT regulations are contained in 49 CFR Part 100 to 178.

The roles in regulatory responsibility of NRC and DOT have been delineated in a Memorandum of Understanding (MOU) between the two agencies dated June 8, 1979 (44 FR 38060). The MOU does not define the specific responsibilities of each agency in responding to transportation accidents or incidents. However, in all accidents, incidents, and instances of actual or suspended leakage involving packages of radioactive material regulated by the NRC, the MOU assigns to NRC the responsibility to act as lead agency for investigating the cause of the leakage and preparing a report of the investigation.

The Federal Emergency Management Agency (FEMA) is responsible for preparing a Federal Radiological Emergency Response Plan (FRERP). On December 23, 1980, FEMA published a "Master Plan" for commercial nuclear power plant accidents (45 FR 84910). Development of the FRERP, which is scheduled for completion in 1984, entails revision of the "Master Plan," including its expansion to incorporate provisions for responding to all types of peacetime radiological emergencies including transportation accidents. Availability of planning guidance for developing the FRERP was noticed in the Federal Register on April 28, 1983 (48 FR 19229). The FRERP will be based on the planning guidance and on the results of a Full Field Exercise conducted in the vicinity of the St. Lucie nuclear power plant in March 1984.

The response to transportation accidents is less structured than the radiological emergency response to accidents at licensed sites because of the uncertainties surrounding (1) the location where the accident occurs, (2) the diversity of authority of those who will be responding, and (3) the likely limited radiation knowledge of the first-on-scene responders (who are usually local officials). The states have the primary responsibility for protecting the health and safety of the citizens from public hazards. Recognition of the responsibilities for radiation hazards is reflected by the existence of an appropriately designated state agency chartered with the responsibility of responding to radiological emergencies.

The existing Memorandum of Understanding between the DOT and the NRC (mentioned above) assigns NRC the responsibility for the regulation and certification of shipping containers for fissile materials and for other radioactive materials (other than low specific activity materials) in quantities exceeding Type A limits as defined in 10 CFR Part 71. The MOU assigns DOT the responsibility for regulation of most other aspects of nuclear transportation activities. DOT operates a National Response Center which serves to relay information concerning transportation incidents involving hazardous materials. DOT regulations require a carrier, at the earliest practicable moment, to give notice to the National Response Center after an incident occurs during the course of transportation in which, among other things, fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive material. Each notification of a transportation incident of any kind is relayed by the National Response Center to the Regional Office of the Environmental Protection Agency (EPA) for incidents on land or to the U.S. Coast Guard Captain of the Port for incidents in navigable waters. When a reported incident is known to involve radioactive material, notification is also made to the Regional Coordinating Office for Radiological Assistance of the U.S. Department of Energy (DOE) and to the Regional Office of the Nuclear Regulatory Commission. NRC may also become aware of a transportation incident through other channels, such as the shipper, the carrier, or the police or highway patrol.

DOE has stated that DOE's involvement is the maintenance, at about 30 sites, of teams of technically trained nuclear and transportation specialists available to assist states, upon request, by providing desired advice and counsel in areas where states may need assistance. Such teams are highly professional and are equipped to provide analytical and diagnostic support, but not to become involved in cleanup activities. Such teams operate under the DOE Radiological Assistance Program or the Federal Radiological Monitoring and Assessment Plan (DOE coordinated).

The Commission invites all interested persons who desire to submit written comments or suggestions on this general statement of policy to send them to the Secretary of the Commission, United States Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch by July 27, 1984.

Consideration will be given to such submissions in connection with possible future revision of the stated policy. Copies of comments received may be examined at the Commission's Public Document Room, 1717 H Street N.W., Washington, D.C.

Statement of NRC Policy

In any accident or incident occurring in connection with the transportation of radioactive material in which a report is required to be sent to the National Response Center by DOT regulations in 49 CFR 171.15, NRC radiation safety assessment actions will consist of the following.

- Call the agency designated by the affected State to respond to transportation accidents involving radioactive materials as soon as practicable to ensure that agency has been informed of the incident. (The State government is responsible for assuming control of the accident scene to protect the health and safety of the public.)
- Offer NRC technical assistance in the form of information, advice, and evaluations to the State at the time the initial notification is made to the appropriate State agency.
- Assure awareness of the incident by the DOE and other affected agencies, including any agencies specifically designated by the Federal Emergency Management Agency.
- Maintain awareness of the situation until normal conditions are restored at the scene of the accident.
- Provide information on packaging characteristics in response to any query regarding NRC-approved packages.
- Respond to requests for information on NRC activities in connection with the event. Requests for specific information on an accident normally will be referred to the appropriate State agency, or to the DOE if the situation relates to DOE activities.
- If the shipper is an NRC licensee, ensure that the shipper provides complete and accurate information concerning the radioactive material and details of the shipment to emergency response personnel.
- In accordance with the NRC-DOT Memorandum of Understanding, act as lead agency for investigating all accidents, incidents, and instances of actual or suspected leakage involving packages of radioactive material regulated by the NRC. Any NRC personnel at the scene of a transportation accident will notify the on-scene coordinator of his or her presence and make clear that, unless

NRC assistance is requested by the on-scene coordinator, NRC activities will be primarily limited to information collection.

- Provide recommendations to emergency response personnel on radiological issues if NRC assistance should be requested by the on-scene coordinator or if a need is recognized by NRC personnel.

The policy here set forth relates solely to radiological concerns. Responding to any attempt to steal or sabotage a shipment of nuclear material is a responsibility of the Federal Bureau of Investigation (FBI) as delineated in the NRC/FBI Memorandum of Understanding dated April 27, 1979, and published December 20, 1979, at 44 FR 75535.

Dated at Washington, D.C., this 23rd day of March 1984.

For the Nuclear Regulatory Commission.

Samuel J. Chalk,

Secretary of the Commission.

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APPENDIX K

**Guide 63 from the 1990 *Emergency Response Guidebook*,
U.S. Department of Transportation; DOT P 5800.5**

POTENTIAL HAZARDS

HEALTH HAZARDS

External radiation hazard from unshielded radioactive material.
Internal radiation hazard from inhalation, ingestion or breaks in skin.
Radioactive material; degree of hazard will vary greatly, depending on type and quantity of radioactive material and type of packaging.
Materials in Special Form or in Type B packagings are not expected to cause contamination in accidents.
Some radioactive materials cannot be detected by commonly available instruments.
Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

Some of these materials may burn, but none of them ignites readily.
Radioactivity does not change flammability or other properties of the materials.

EMERGENCY ACTION

Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind, or if advised by Radiation Authority.
Isolate hazard area and deny entry.

Response actions may be performed prior to any measurement of radiation; limit entry to shortest possible time.

Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.

Notify Radiation Authority of accident conditions.

Detain uninjured persons, isolate equipment with suspected contamination, and delay cleanup until instruction of Radiation Authority.

CALL CHEMTREC AT 1-800-424-9300 FOR EMERGENCY ASSISTANCE.

If water pollution occurs, notify the appropriate authorities.

FIRE

Do not move damaged containers; move undamaged containers out of fire zone.

Small Fires: Dry chemical, CO₂, water spray or regular foam.

Large Fires: Water spray, fog (flooding amounts).

For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

SPILL OR LEAK

Do not touch damaged containers or spilled material.

Damage to outer container may not affect primary inner container.

Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.

Large Spills: Dike far ahead to collect runoff water.

FIRST AID

Use first aid treatment according to the nature of the injury.

If not affecting injury, remove and isolate suspected contaminated clothing and shoes; wrap victim in sheet or blanket before transporting.

If there is no injury, remove and isolate suspected contaminated clothing and shoes; assist person to shower with soap and water and notify Radiation Authority of action.

Advise medical personnel that victim may be contaminated with radioactive material.

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(See instructions on the reverse)

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11. ABSTRACT (200 words or less)

On December 16, 1991, a truck carrying unirradiated (fresh) nuclear fuel was involved in an accident on U.S. Interstate 91, in Springfield, Massachusetts. This report describes the emergency response measures undertaken by local, State, Federal and private parties. The report also discusses "lessons learned" from the response to the accident and suggests areas where improvements might be made.

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