

# **CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations**

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## ***Updates from the State Visits in 2019***

Prepared for  
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# EXECUTIVE SUMMARY

## INTRODUCTION – PURPOSE AND SCOPE

The purpose of the peer review of the Level VI Inspection Program is to identify and share best practices. Initially, it was also intended that recommendations would be made to prepare the Level VI Inspection Program for shipments of spent nuclear fuel to Yucca Mountain in Nevada. Thus, the first set of peer review site visits were conducted between March 2005 and August 2006. Peer review teams visited the following seven states:

- South Carolina
- Colorado
- Tennessee
- Washington
- Illinois
- New Mexico
- Michigan

The results of these site visits are documented in the January 2007 report “CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations.” Additional peer review site visits were made to New Mexico and Idaho in June and August 2011. The results of these site visits are documented in the October 2013 report “CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations – Updates from State Visits in 2011.” Subsequent peer review site visits were conducted in Colorado and Illinois in November and December 2014 and in New Mexico in July 2016. The results of these site visits are documented in the October 2015 report “CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations – Updates from State Visits in 2014” and in the June 2017 report “CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations – Updates from the State Visit in 2016.”

The latest peer review site visits were conducted in Texas in April 2019 and in Maryland in July 2019. This report is an update to the 2007, 2013, 2015 and 2017 reports based on these 2019 site visits. The additional findings are compared with the previous findings and presented using the same format as the previous reports.

Since 1999, each shipment of transuranic waste to the Waste Isolation Pilot Plant (WIPP) has been required to pass the Level VI Inspection. Since 2005, all motor carriers transporting a highway route-controlled quantity (HRCQ) of radioactive materials must pass a pre-trip Level VI Inspection. Although the status of Yucca Mountain and the transportation of spent nuclear fuel is currently uncertain, there is still the opportunity from the 2019 site visits to provide recommendations for improvements to the overall Level VI Inspection Program.

The same scope and methodology described in the 2007 report apply to the 2019 site visits and this report. Rather than repeat the same information in this report, the reader is directed to the 2007 report for these details. The four previous peer review reports may be obtained through CVSA’s website. Go to [www.cvsa.org/inspections/inspections](http://www.cvsa.org/inspections/inspections) then select “North American Standard Level VI Inspection Program.” Click on “News, Updates and Reports” then select

“CVSA/WIPP Updates and Reports.” On the resulting page, the link to the 2007 report is labeled “CVSA Level VI Inspection Program Peer Review – State Visits in 2005-2006,” the link to the 2013 report is labeled “CVSA Level VI Inspection Program Peer Review – Updates from State Visits in 2011,” the link to the 2015 report is labeled “CVSA Level VI Inspection Program Peer Review – Updates from State Visits in 2014” and the link to the 2017 report is labeled “CVSA Level VI Inspection Program Peer Review – Updates from the State Visit in 2016.”

As stated in the 2007 report, for each of the topic areas of interest, the peer review team members were looking for:

- Variations across states
- Lessons learned and best practices
- Future improvement needs

### **SUMMARY OF FINDINGS FROM THE 2019 STATE VISITS**

Notable differences across states include:

- Permit requirements
- Escort requirements
- Types of inspection equipment and personal protection equipment (PPE)
- Number of certified Level VI inspectors and the number of inspections conducted by each inspector
- Requirements for access to generator sites
- Inspection duration (varies across states from 30 minutes to 2 hours)
- Citation requirements and fines for violations and their disposition
- Mechanisms to capture and disseminate lessons learned

Key lessons learned and best practices include:

- Webinars, learning management systems (LMS) (including CVSA's LMS) and other online systems are effective methods for inspectors to receive training and updates.
- Prompt reporting to CVSA of inspectors' Level VI Inspection training assists CVSA in maintaining an accurate database of inspector training statuses for all states.
- Systems that track violations are useful in identifying trends that can be brought to the attention of state agencies, industry and the Level VI Inspection Program.
- Properly maintained survey equipment and PPE (including personal dosimetry) instills confidence in inspector safety and equipment effectiveness.
- PPE includes personal dosimetry for each certified Level VI inspector.
- Public outreach is a valuable activity to assure the public of the safety of radioactive material (RAM) shipments; how much public outreach is optimal depends on the frequency of RAM transportation activity and the public's knowledge of it
- Training and exercises are key to emergency preparedness; exercises are a part of the learning process and provide valuable takeaways

Suggestions for future improvements include both:

1. What states can do to improve their Level VI Inspection Programs
2. How CVSA, the U.S. Department of Energy (DOE) and other government entities can better assist states with their Level VI Inspection Programs

Suggestions regarding what states might do to improve their Level VI Inspection Programs include:

- If needed, clarify state policies and procedures regarding inspector actions when violations are detected.
- Ensure that online systems used for training and updates are accessible to all inspectors.
- Use tracked data to monitor the quality and completeness of inspection and violation reports and identify any trends that can be communicated to the Level VI Inspection Program community.
- Maintain a system to capture and disseminate lessons learned and best practices.
- Explore funding options to obtain and maintain adequate survey equipment and PPE.

Suggestions regarding how CVSA, DOE and other government entities could better assist states with their Level VI Inspection Programs include:

- CVSA should continue providing guidance and support for improving states' Level VI Inspection Programs. Suggestions by the states include:
  - Provide videos on procedures with in-depth steps.
  - Continue support for refresher training.
  - Continue use of CVSA Level VI Inspection LMS site for training items.
- DOE should continue to:
  - Support roadshows.
  - Fund training materials.
  - Provide assistance and public outreach for shipping campaigns.

## **RECOMMENDATIONS FROM THE 2019 STATE VISITS**

At the conclusion of the state visits, the peer review teams formulated general recommendations and additional recommendations were developed after analyzing the data.

Peer review team recommendations include:

- Program Management
  - The person who is the point of contact and has responsibility for the Level VI Inspection Program must be well trained in the Level I, hazardous materials (HM) and Level VI Inspections Programs in order to manage this important program and provide oversight for quality control of the inspection program and data.
  - The state WIPP coordinator must advocate for and take a proactive role in supporting and funding state agencies responsible for Level VI Inspections.
  - Agencies should establish/review/enhance written procedures for quality control and tracking of Level VI Inspections.
- Inspector Support
  - PPE should be available to all Level VI inspectors and should be maintained and kept up to date.
  - Personal dosimetry should be available and maintained for all Level VI inspectors.

Recommendations based on the data analysis include:

- States should utilize emergency preparedness training and exercises as valuable elements of a successful program.
- States should provide CVSA with timely inspector Level VI Inspection training status updates.

- If needed, states should investigate alternative funding options (such as WIPP) to obtain and maintain adequate survey equipment and PPE.
- All inspectors should have properly maintained PPE, including personal dosimetry.
- All inspectors should have access to any online systems used for training and updates.
- CVSA should assist states in formalizing lessons learned and best practices and developing a repository of lessons learned and best practices that would be accessible by all program participants.
- CVSA should continue development of new training items utilizing videos and the CVSA Level VI Inspection LMS site.
- DOE should continue support and funding for training and public outreach.

## **1 INTRODUCTION**

The Commercial Vehicle Safety Alliance (CVSA) developed the Level VI Inspection Program for commercial motor vehicles transporting select radioactive materials under a cooperative agreement with the U.S. DOE that began in 1986. The Level VI Inspection Program includes:

- Inspection procedures that are enhancements to the CVSA North American Standard Level I Inspection procedures for commercial motor vehicles
- A training and certification program for inspectors to conduct inspections on shipments of transuranic waste and HRCQ of radioactive material
- Inspection decals
- Out-of-service conditions and criteria
- Radiological surveys

CVSA conducted an initial set of seven state site visits from March 2005 through August 2006 to peer review the Level VI Inspection Program. The states visited were:

- South Carolina
- Colorado
- Tennessee
- Washington
- Illinois
- New Mexico
- Michigan

The results of these site visits are documented in the January 2007 report “CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations.” Additional peer review site visits were made to New Mexico and Idaho in June and August 2011. The results of these site visits are documented in the October 2013 report “CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations – Updates from State Visits in 2011.” Subsequent peer review site visits were conducted in Colorado and Illinois in November and December 2014 and in New Mexico in July 2016. The results of these site visits are documented in the October 2015 report “CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations – Updates from State Visits in 2014” and in the June 2017 report “CVSA Level VI Inspection Program Peer Review: State Differences, Lessons Learned, Best Practices and Recommendations – Updates from the State Visit in 2016.” The latest peer review site visits were conducted in Texas in April 2019 and in Maryland in July 2019.

### **PURPOSE AND OBJECTIVES OF REPORT**

This report is an update to the 2007, 2013, 2015 and 2017 reports based on the 2019 site visits. The additional findings are compared with the previous findings and presented using the same format as the 2007 report. The updated information supplements the previous reports.

The same scope and methodology described in the 2007 report apply to the 2019 site visits and this report. Rather than repeat the same information in this report, the reader is directed to the 2007 report for these details. The four previous peer review reports may be obtained through CVSA’s website. Visit [www.cvsa.org/inspections/inspections](http://www.cvsa.org/inspections/inspections) then select “North American

Standard Level VI Inspection Program.” Click on “News, Updates and Reports” then select “CVSA/WIPP Updates and Reports.” On the resulting page, the link to the 2007 report is labeled “CVSA Level VI Inspection Program Peer Review – State Visits in 2005-2006,” the link to the 2013 report is labeled “CVSA Level VI Inspection Program Peer Review – Updates from State Visits in 2011,” the link to the 2015 report is labeled “CVSA Level VI Inspection Program Peer Review – Updates from State Visits in 2014” and the link to the 2017 report is labeled “CVSA Level VI Inspection Program Peer Review – Updates from the State Visit in 2016.” The reader is encouraged to review the earlier reports as this report references them.

Since 1999, each shipment of transuranic waste to WIPP has been required to pass the Level VI Inspection. Since 2005, all motor carriers transporting HRCQ of radioactive materials must pass a pre-trip Level VI Inspection. The purpose of the peer review of the Level VI Inspection Program is to identify and share best practices. Initially, it was also intended that recommendations would be made to prepare the Level VI Inspection Program for shipments of spent nuclear fuel to Yucca Mountain. Although the status of Yucca Mountain is currently uncertain, there is still the opportunity from the 2019 site visits to provide recommendations for improvements to the overall Level VI Inspection Program.

As stated in the 2007 report, the peer review results identify and share:

1. Variations in the implementation of the Level VI Inspection Program across states
2. Lessons learned and best practices
3. Perceptions of needed improvements

This information provided the basis for additional recommendations and suggested next steps resulting from the 2019 site visits.

## **APPROACH AND SCOPE**

For the 2019 site visits, the CVSA Peer Review Committee members represent various organizations, including Colorado State Patrol, West Virginia Public Service Commission and CVSA. Appendix 1 lists the 2019 CVSA Peer Review Committee members and their organizational affiliations.

Maryland and Texas agreed to participate in the 2019 peer review visits. This was the first time each state participated in the peer review process. Texas was visited in April 2019 and Maryland in July 2019. A list of the peer review team members for each state visit and the specific dates of the visit are provided in Appendix 2.

The 2019 data collection effort covered all the same key areas of the Level VI Inspection Program as described in the 2007 report. The data collection process and selection of persons participating in the review used the same approach described in the 2007 report. The organization affiliations of the interviewees for each state are given in Appendix 3. The visit guidance and the peer review data collection instrument (peer review master interview guide) are both identical to those used for the earlier site visits and are found in Appendix 4 and Appendix 5, respectively.

The peer review teams often collect documents and other relevant materials during the visits. Any materials collected from each state are identified in Appendix 6. The correspondence of the



topic areas discussed in this report to the questions in the peer review data collection instrument (Appendix 5) is shown in Appendix 7 (this is the same as in the 2007 report).

The topic areas, the interviewee selection process and the analysis methodology described in the 2007 report apply to the 2013, 2015 and 2017 reports, as well as the 2019 site visits and this report. In addition, the five sets of site visit findings were compared in order to report if there have been any notable changes over the elapsed 13 years.

## **REPORT OVERVIEW**

The findings of the data analysis comprise the body of the report and are presented in sections 2 and 3. Section 2 reports findings that are integral to the Level VI Inspection Program by topic areas, including:

- State program policies and statutes
- Organizational implementation and relationships
- Inspector training and manpower
- Types, locations and number of inspections
- Permits, notification and scheduling
- Conduct of inspections – inspection procedures and duration
- Violations, enforcement and penalties
- Inspection equipment
- Tracking and managing information
- Public perceptions and program outreach
- Sharing lessons learned and best practices

Section 3 reports findings that may be relevant but are outside the purview of the Level VI Inspection Program, per se. These topics include:

- Transportation issues and restrictions
- Emergency preparedness

Section 4 selects the most potentially useful information across all the topic areas and condenses this information into a more succinct summary of the following:

- Variations across state programs
- Lessons learned and best practices
- Future improvement needs

Section 5 discusses recommendations that can be extracted from this exercise and next steps that may be necessary to develop and prioritize improvements to the Level VI Inspection Program. The peer review teams may offer recommendations at the close of a state visit. Additional recommendations were based on the analysis of the data.

## **2 LEVEL VI INSPECTION PROGRAM FINDINGS**

This section presents:

- A discussion of similarities or differences between the previous findings and the 2019 state visits, including variations across states
- Lessons learned, best practices and improvement needs from the 2019 state visits by topic area

### **STATE PROGRAM POLICIES AND STATUTES**

Respondents from both states confirmed that there are no state specific requirements for inspection of RAM shipments. Often cited requirements or recommendations for inspections include the FMCSA requirement for HRCQ of radioactive materials, WIPP protocol and the memorandum of understanding (MOU) with CVSA.

Both states mentioned that a concern for the infrastructure played a significant role when writing policies for RAM shipments. Also mentioned was population density. For both states, there appear to be no other jurisdictions with laws, policies or regulations that impact the transportation of RAM shipments, except possibly local entities that may have route restrictions and rules that the locals would enforce.

Nearly all respondents stated guidance is clear on actions to take when violations or inadequacies are detected and reporting requirements. They noted federal policies, Level VI Inspection procedures, CVSA operational policies, and the agency's protocol and procedures for required actions and reporting. However, one respondent felt there is no clear policy for an out-of-service or high survey reading situation.

### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

Respondents generally felt that their states have clear policies on inspector actions if violations are encountered and that there are clear reporting guidelines. However, since one interviewee expressed uncertainty, there may be a need to ensure that all inspectors know the policies and procedures.

### **ORGANIZATIONAL IMPLEMENTATION AND RELATIONSHIPS**

Both states have sites that receive, store or ship radioactive materials. One state oversees the activities of two licensed sites that do not involve vehicle inspections and has a limited relationship with a nuclear reactor facility due to no shipment activity. The other state reports good relationships with a low-level waste facility and a company that utilizes Cobalt-60 in its business.

### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

Respondents appear to consider the relationships they have with their generator and destination sites to be adequate. No details were provided regarding lessons learned, best practices or improvement needs.

## **INSPECTOR TRAINING AND MANPOWER**

The number of Level VI inspectors for the two states visited in 2019 ranged from three to 38. As noted in previous reports, the number of inspections performed by each inspector varies depending on the inspector's location and responsibilities. The average number of inspections conducted by an inspector per year ranged from one to 700. This included bulk HM, non-bulk general HM and Level II and Level VI Inspections.

Both states report that inspectors received Level VI Inspection refresher training regularly. One state has annual eight-hour Level VI Inspection refresher training in March. Most respondents from this state report that general HM refresher training is conducted annually in the fall. The other state conducts Level VI Inspection refresher training every two years and general HM training annually. One state trainer attends the eight-hour refresher training at the COHMED Conference each year and the Level VI Train the Trainer Course every two years. Refresher training is generally conducted in a classroom at a training facility. Other methods for training and regular updates (e.g., inspection bulletins and regulations) are webinars and online training, including the LMS. One state has two general HM instructors and three Level VI Inspection refresher instructors; while the other state, with fewer inspectors, has one Level VI Inspection refresher instructor.

Inspectors in both states obtain updated Federal Motor Carrier Safety Regulations (FMCSRs) and the Code of Federal Regulations (CFRs) annually, either in book form or online.

One state reported that RAM inspectors do not receive any other RAM regulation training beyond the Level VI Inspection inspector and refresher training. It was noted that in this state, not everyone has access to the CVSA member portal. Regulation information or training obtained from the CVSA website is distributed to staff via their own LMS. One interviewee expressed that it would be beneficial to have more RAM regulation training besides what is obtained from the Level VI Inspection refresher. Also noted is that there is no Modular Emergency Response Radiological Transportation Training (MERRTT) or Center for Radiological/Nuclear Training (CTOS) and that the health agency does not have access to the CVSA member portal.

The other state reports that Level VI inspectors have Transportation Emergency Preparedness Program (TEPP) training that includes MERRTT. They also have Class 7 training from CVSA's LMS via the CVSA member portal. Other training mentioned includes Hazardous Waste Operations and Emergency Response (HAZWOPER) (but no refresher) and HM technician training.

Respondents from both states listed the various training that they had received. For the most part, the training was similar for both states. This includes National Training Center (NTC) instruction, Department of Homeland Security (DHS) training, Level VI inspector training, the Level VI Train the Trainer Course, MERRTT, and North American Standard Part A and Part B, General HM, Cargo Tank, Bulk Package, Other Bulk Package and Passenger Carrier Inspections. Both states felt their training was good to very good. One interviewee believes the state's training is the best in the nation. Another interviewee stated that the Level VI Inspection training has vastly improved over the years by incorporating more hands-on learning and student support.

## **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

For both states, Level VI Inspection refresher training is conducted on a regular basis within the time requirements for Level VI inspector recertification. More recently, webinars, LMS and other online systems are being used to train and receive updates. In particular, CVSA's LMS is one resource for HM courses. States that have these online capabilities need to ensure that relevant personnel have access.

#### **TYPES, LOCATIONS AND NUMBER OF INSPECTIONS**

From the 2019 visits, there continues to be differences among states regarding inspections of RAM shipments. In one state, showing up in a marked vehicle and in uniform is all that is needed to access a facility for an inspection. For the other state, entry to the facility is controlled and an escort may be required, depending on the agency conducting the inspection.

For one state, the reported number of inspections over the past five years ranged from one to more than 50 inspections per year. The number of inspections varied depending on the inspectors' locations and the types of inspections (e.g. Level VI or general HM). For the other state, the number of inspections over the past five years ranged from 12-16 inspections per year.

#### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

Respondents provided no lessons learned, best practices or improvement needs for this topic area.

#### **PERMITS, NOTIFICATION AND SCHEDULING**

Both states require no additional permits for carriers transporting RAM, other than oversize/overweight permits. The cost of the additional permit is based on size or weight of the vehicle. One state noted that the monies collected from the additional permits go to the general highway fund. This is consistent with previous findings that there are many variations in state permit requirements for RAM shipments.

In one state, the generator site notifies local law enforcement of shipments. These shipments are on the Carlsbad (New Mexico) Field Office eight-week rolling schedule. For cobalt-60 shipments, the carrier notifies the agency. The agency uses email to notify the relevant offices and personnel of shipments requiring inspections. The inspections are scheduled as soon as possible once notification is received. Respondents from both states felt that adequate time is given in advance of RAM shipments in order to conduct inspections. Notification ranges from five days to more than a week prior to the shipment. Inspection schedules are developed as soon as notification is received or up to two weeks in advance of the shipment.

For one state, many respondents were unsure of how RAM shipments are tracked in their state but believed most shipments are tracked. It was noted that TRANSCOM is used for WIPP shipments. The other state monitors HRCQ shipments. Both states were not specific on number of RAM movements per year. Many respondents from one state were not sure of the number because not all RAM shipments are tracked. However, one interviewee from each state gave a range of 12-15 shipments per year.

#### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

Although the timing and sources of shipment notification differs for the two states, respondents from both states are satisfied with the advanced inspection notice provided them. No details were provided regarding lessons learned, best practices or improvement needs.

## **CONDUCT OF INSPECTIONS – INSPECTION PROCEDURES AND DURATION**

In this topic area, the findings of the 2019 visits were similar to the results discussed in the previous reports. In particular:

- Number of inspectors per inspection is generally one or two
- Inspection duration typically ranges from 30 minutes to two hours
- Factors impacting inspection duration include weather and number of violations

One state's procedure is to have two inspectors conduct the inspection. For this state, it was noted that an inspection at the seaport is subject to a shipment's release by various organizations (e.g., the port master, Customs and Border Protection, Department of Homeland Security (DHS), Coast Guard, etc.) which can account for a longer-than-usual inspection. For the other state, it is the policy to have two inspectors conduct an inspection at a specific facility. For other locations, it may be one or two inspectors, depending on staff scheduling. It was also noted that inspectors who conduct more inspections are more efficient and take less time than inspectors who conduct fewer inspections.

Respondents felt that inspection procedures and instructions for completing inspection reports are clear. Both states noted that they follow the CVSA policies, procedures and requirements for Level VI Inspections. One respondent mentioned a flow chart that is very helpful. Federal policies and CVSA operational policies are followed for completing inspection reports. CVSA policies were mentioned as detailed and easy to understand. As discussed earlier, nearly all respondents stated guidance is clear on actions to take when violations or inadequacies are detected. There was one inspector who did not think there is a clear policy on how to handle out-of-service violations.

The two states capture lessons learned by informal methods. Word of mouth, email and in-service training were mentioned as methods to disseminate lessons learned. In addition, both states use their Level VI Inspection refresher training to discuss lessons learned.

## **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

As noted in previous reports, capturing lessons learned from inspectors is important, not just for particular states but also the larger Level VI Inspection Program community. States should ensure that lessons learned reach each inspector and can be accessed, as needed, with a formal repository for lessons learned. CVSA can assist the states to disseminate relevant lessons learned to the broader community.

Based on one inspector's response that the policy is unclear, there may be a need to ensure that all inspectors know the actions to take when violations are detected.

## **VIOLATIONS, ENFORCEMENT AND PENALTIES**

Both states utilize software systems, such as Motor Carrier Management Information System (MCMIS) and SAFETYNET, as well as their own manual and automated systems, to track RAM transportation violations. Violations are rare. One state reports six to 12 violations in the past five years and the other state has had no violations in the past five years.

One state has the policy of no more than two citations per inspection and penalties depend on inspection location (point of origin or en route) and officer discretion (unless there's a weight or size issue). Fines are set by the county courts and are within the state's set minimum and maximum range. Fines range from \$0 to \$500. The county receives most of the monies for local general purposes and the state's general fund receives the remainder.

The other state citations are held in municipal courts where violations are written. There are no civil penalties and the county courts administer fines using the fine schedule that is set at the state level. Fines range from \$60 to \$1,050. As noted in previous reports, methods for assessing penalties for violations differ among states.

### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

Both states have systems to track violations. These systems can be useful to identify trends that could be brought to the attention of their agencies, the industry and the Level VI Inspection Program.

### **INSPECTION EQUIPMENT**

This topic area includes:

- Inspection survey equipment
- PPE

In one state, there are currently 12 Ludlum 2241-2 survey meters with probes for the officers to use. These are on loan from the state's health department. Not all Level VI inspectors have a meter assigned to them. However, there are 15 Ludlum 2241-2 survey meters on order using WIPP funds.

The equipment is issued to officers in each region to provide good coverage for the state and in districts on the state's WIPP route. The state's health department maintains the survey equipment, including annual calibration following American National Standards Institute (ANSI) and manufacturer's standards. Field instruments are brought to the annual training for recalibration. Respondents reported that the equipment is good and user friendly and that the equipment is well maintained.

The other state has Ludlum 2241-3 survey meters, as well as identifiers, dosimeters and other types of survey meters. The state police department has its own survey meters and they are assigned to individuals. The environmental department assigns its equipment to inspection vehicles. The equipment is maintained by the state's environmental department and is calibrated and recertified annually according to vendor specifications. Interviewees reported that the equipment is very good and easy to use.

For one state, there is no special PPE for Level VI inspectors. Every officer in the state, whether in commercial vehicle enforcement or not, is issued a weapon of mass destruction (WMD) kit that includes first aid; a full-face MSA respirator with nuclear, biological and chemical (NBC) capable canisters; and a Level B Tyvek suit with gloves. Updating or replacing PPE depends on funding and has been done once since 2003. Some respondents either did not know if the PPE had been maintained or they were certain the PPE had not been maintained. Upon review of the WMD kit, the peer review team discovered that the canisters for the MSA respirator were expired by 12 months, they had not been replaced and there appeared to be no plans to update them. It was also reported that personal dosimetry was not considered necessary for Level VI inspectors by a fellow agency that controls the state's inventory of personal dosimeters; therefore, personal dosimetry had not been issued to Level VI inspectors.

Individuals receive a two-day course on the use and care of the PPE. Some respondents felt the PPE was good and adequate for their needs, but it was also noted that the equipment was outdated, not maintained and possibly not trustworthy.

In contrast, the other state has personal radiation detectors (e.g., RadEye), personal thermoluminescent dosimeters (TLDs), Level B Tyvek suits, boots and full-face respirators. PPE is issued to individual inspectors and, additionally, the environmental department assigns PPE to each inspection vehicle. Officers receive training on the use of full-face respirators. The PPE inventory is reviewed semi-annually for condition of use. One respondent stated that the PPE is more than adequate and another respondent stated officers are happy with the equipment.

#### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

One state identified a mechanism to obtain WIPP funds for additional survey meters for inspectors. Both states have routine procedures in place to ensure their radiation survey equipment is properly maintained and calibrated. However, the states differ for PPE. One state has more than adequate PPE that is well maintained. The other state has PPE that is outdated and not maintained. This state should explore the same funding mechanism used for additional survey meters for purchasing adequate PPE and maintaining it.

Personal dosimetry is being used by one state (a best practice recommendation from the 2007 peer review report). The other state should issue personal dosimetry to its Level VI inspectors. WIPP funding could be used to maintain a personal dosimetry program.

#### **TRACKING AND MANAGING INFORMATION**

This topic area includes:

- Tracking shipments, inspections and violations
- Tracking inspector training
- Tracking program changes and managing/sharing updates

##### Tracking Shipments, Inspections and Violations

Each state has personnel trained in TRANSCOM for tracking WIPP shipments. Both states utilize software systems, such as MCMIS and SAFETYNET, as well as their own manual and automated systems to track certain types of RAM transportation inspections and violations. No information

was provided by the states regarding the use of tracked data to monitor the quality and completeness of inspection and violation reports.

#### Tracking Inspector Training

Currently, an inspector is required to complete refresher training every two years in order to remain Level VI certified. Thus, having a system to track Level VI initial and refresher training is essential. Both states have staff training record systems that include the inspectors' Level VI training records. CVSA has a database that tracks inspector training statuses for each state, but this system relies on prompt updates from the states.

#### Tracking Program Changes and Managing/Sharing Updates

As discussed in the "Inspector Training and Manpower" section of this report, inspectors receive updated FMCSRs/CFRs annually, either in book form or online. Also, webinars, LMS and other online systems are used to receive updates (e.g., inspection bulletins and regulations).

### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

The use of webinars, LMS and other online systems are effective ways for inspectors to receive program updates, as long as all inspectors have access to these systems.

States should consider using tracked data to monitor the quality and completeness of their inspection and violation reports.

The states should coordinate with CVSA to keep their inspectors' Level VI training data current in the CVSA database. Both states are very disciplined in providing CVSA updated training information.

### **PUBLIC PERCEPTION AND PROGRAM OUTREACH**

Both states report that executive management has no concerns regarding RAM transportation, as long as there are no issues and health and safety are protected. Management trusts its staff trained in RAM transportation to do their job.

One state reports management wants personnel to be fully prepared and equipped and supports the purchase of the necessary equipment for officer safety. Factors given that influence management perceptions include media, no major issues regarding shipments, an aggressive public outreach program, maintaining positive public awareness and politics.

Factors noted by interviewees that influence public perceptions of RAM transportation, either positively or negatively, include media, pop culture, incidents and public outreach. Respondents from both states felt that some members of the public may not have a negative perception of RAM transportation because there are no movements of RAM in their locations. Or some members of the public may have negative perceptions because of general fear of radioactive materials. And other members of the public may have positive perceptions because of radiopharmaceutical and nuclear medicine familiarity, no major RAM transportation issues and outreach programs, such as DOE roadshows.



One state has a radiation advisory board made up of industry, state regulatory, medical community, fire and law enforcement agencies. The board oversees a variety of activities related to RAM and may influence policy on RAM transportation in the state. The state also has some groups opposed to a potential spent nuclear storage facility in the state.

DOE roadshows have been a part of public outreach in both states. One state has had the DOE roadshow at the emergency management agency's annual conferences, as well as at other locations across the state. It was mentioned that concerns are eased when the public sees the shipping casks and the entire process is explained. The state expects to request the DOE roadshow as part of its future public outreach. It was suggested that public outreach could be increased to include high schools.

The other state did have the DOE roadshow some years ago; however, at this time, there are no plans to have future public outreach due to limited shipments.

### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

Consistent with previous findings, public outreach continues to be a valuable activity to assure the public of the safety of RAM shipments. How much public outreach is optimal depends on the frequency of RAM transportation activity and the public's knowledge of it.

### **SHARING LESSONS LEARNED AND BEST PRACTICES**

Neither state has an established formal procedure for capturing lessons learned and best practices. Both states use informal methods, such as word of mouth, email, and in-service and online training, to disseminate lessons learned. In addition, both states use their Level VI refresher training to discuss lessons learned. This is consistent with previous findings that states have informal mechanisms to share lessons learned and best practices. One state documents lessons learned and reports them to CVSA in case there are other agencies with the same experiences.

One state identified two lessons learned. They involve:

1. Improper marking of HRCQ versus regular Class 7 inspections
2. A disconnected ABS dash light

### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

Each state may wish to consider implementing a formal process to capture and disseminate lessons learned and best practices. As noted in previous reports, lessons learned and best practices identified by each state may be of interest and applicable to other jurisdictions. A formal mechanism to provide this information in the state and to other jurisdictions should be available. CVSA will assist the states to disseminate relevant lessons learned and best practices to the broader community with resources, such as in the "RAD Inspection News" section of CVSA's quarterly magazine and on the CVSA website.

### **3 ADDITIONAL FACTORS OF INTEREST (RELEVANT TO BUT BEYOND LEVEL VI INSPECTION PROGRAM)**

The interviews included questions that are relevant to RAM transportation but go beyond the Level VI Inspection Program, per se. These questions fall into two topical categories:

- Transportation issues and restrictions
- Emergency preparedness

#### **TRANSPORTATION ISSUES AND RESTRICTIONS**

This topic area includes the following issues:

- Route restrictions
- Weather restrictions
- Escort requirements
- Safe parking requirements

##### Route Restrictions

One state has preferred routes for HM shipments that are established by the state's transportation department. These routes include the interstate highway system for HRCQ and WIPP routes (involving designated state highways) for WIPP shipments. Major construction projects that may impact RAM shipments include a six- to eight-month project on one state highway and a possible (subject to legislation) 18- to 24-month project on another state highway.

The other state has designated truck routes that have been certified by the state's highway administration. There appear to be no general HM routes. It was noted that the most restrictive route could be a restricted lane on specific busy highways. RAM shipments may be impacted on two high-traffic highways that are always under constant repair and construction.

##### Weather Restrictions

For one state, severe weather conditions would cause a delay or rescheduling of inspections. In the case of WIPP shipments, the WIPP coordinator would work with the various state agencies and drivers. In the other state, each county on a specific route would handle any inclement weather situations.

##### Escorting Requirements

There are no escorts required for RAM shipments in one state, except for spent nuclear fuel in which escorts would be required per Nuclear Regulatory Commission (NRC) regulations. For the other state, only enriched uranium shipments require escorts. For both states, escorts could be state employees or third parties.

##### Safe Parking Requirements

Neither states have designated safe parking locations. But each has military bases that can be used. One state has new rest areas being built on interstate routes that are big enough to provide

safe parking. Neither state has established safe parking criteria. Each location is determined by state agencies on a case-by-case basis.

The WIPP shipments follow their own safe parking location protocols that include no parking near churches, hospitals and schools.

### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

No details were provided regarding lessons learned and best practices. One respondent did suggest that there be more communication between drivers and inspectors to avoid delays in inspections due to issues other than weather, such as a shipment held up by Customs and Border Protection.

### **EMERGENCY PREPAREDNESS**

This topic area includes:

- Exercises
- Availability of trained responders on routes

#### Exercises

One state has had full-scale emergency response exercises involving its nuclear and radiological facilities. There have been nine such exercises since 2000. In addition, there are emergency exercises held each year at the nuclear power plants. The other state has full-scale emergency response exercises every year involving a nuclear power plant facility. Some of the interviewees from each state participated in these exercises. They reported that the exercises have been good. Their comments are that there have been different scenarios each time, good participation by all jurisdictions with Class 7 safety and local governments involved, and always a positive takeaway from each event.

#### Trained Responders on Routes

Both states report that they have trained responders or personnel on RAM transportation routes in the following areas:

- First responders trained in RAM: In one state, 22 counties on the WIPP route have provided training to 21 cities with some participation by local law enforcement. Approximately 300-400 emergency medical services (EMS) personnel on the route are trained each year. For the other state, all response comes from the environmental department headquarters. Staff is trained to the technician level and inspectors near the routes are also trained.
- HM operations level responders trained in RAM: In one state, the fire, EMS and law enforcement agencies in route jurisdictions receive training. The other state has environmental department staff trained at the HM technician and HM specialist levels.
- HM technicians trained in RAM: The health and the emergency management departments in one state have HM technicians who are trained, while the other state has environmental department staff trained to the technician level.
- Personnel trained in critical incident command (CIC): For one state, lieutenants and above have been trained as district coordinators. In this state, district coordinators for emergency management have Incident Command Structure (ICS) 300 and 400 training,

which is part of the National Incident Management System (NIMS) Program. For the other state, personnel receive NIMS training at various levels, including NIMS 100, 200, 300, 400, 700 and 800.

- Personnel trained in HM critical incident command: For one state, environmental department management staff meet national professional qualifications in HM incident command or are HM safety officers.
- Personnel trained in radiological emergency operations: The health department for each state would respond to a radiological emergency. One state noted that their responders receive personal radiation detection device training and TEPP training.

The health department for each state has radiological response teams. Both states have hospitals along the WIPP route or in other locations where personnel have been trained in an EMS/HM course. One state reported that there are EMS or hospital personnel on RAM transportation routes that are trained in the handling of radiation incidents and radiological emergency management. Most of this training is TEPP MERRTT training included as part of the hospital training. The other state reports that local hospitals and fire departments are responsible for the training. The Federal Emergency Management Agency (FEMA) was mentioned as a source of training for the handling of radiation incidents. One state offers radiological emergency training to local responders, which includes TEPP MERRTT training, online classes and public-access LMS training. The other state reports that training has not been offered in recent years, although jurisdictions along an interstate corridor have had this training.

Respondents from both states felt that emergency preparedness in their state for events involving RAM transportation is good. It was stated that emergency preparedness depends on multiple state agencies and some agencies have more responsibilities than others. It was noted that all the agencies work together well during exercises and the exercises are a constant learning process.

#### **IDENTIFIED LESSONS LEARNED, BEST PRACTICES AND IMPROVEMENT NEEDS**

Training and exercises are key to emergency preparedness for events involving RAM transportation. In particular, exercises are a part of the learning process and provide valuable takeaways.

## **4 SUMMARY**

### **NOTABLE VARIATIONS ACROSS STATES**

A comparison of findings from the 2019 state visits and the previous state visits indicate the following notable differences across states:

- Permit requirements
- Escort requirements
- Types of inspection equipment and PPE
- Number of certified Level VI inspectors and the number of inspections conducted by each inspector
- Requirements for access to generator sites
- Inspection duration (varies across states from 30 minutes to two hours)
- Citation requirements and fines for violations and their disposition
- Mechanisms to capture and disseminate lessons learned

### **KEY LESSONS LEARNED AND BEST PRACTICES**

Key lessons learned and best practices included the following:

- Webinars, LMS (including CVSA's LMS) and other online systems are effective methods for inspectors to receive training and updates.
- Prompt reporting to CVSA of inspectors' Level VI training assists CVSA in maintaining an accurate database of inspector training statuses for all states.
- Systems that track violations are useful in identifying trends that can be brought to the attention of state agencies, industry and the Level VI Inspection Program.
- Properly maintained survey equipment and PPE (including personal dosimetry) instills confidence in inspector safety and equipment effectiveness.
- PPE includes personal dosimetry for each certified Level VI inspector.
- Public outreach is a valuable activity to assure the public of the safety of RAM shipments. How much public outreach is optimal depends on the frequency of RAM transportation activity and the public's knowledge of it.
- Training and exercises are key to emergency preparedness. Exercises are a part of the learning process and provide valuable takeaways.

### **FUTURE IMPROVEMENT NEEDS**

Suggestions for future improvements include both:

- What states can do to improve their Level VI Inspection Programs
- How CVSA, DOE and other government entities can better assist states with their Level VI Inspection Programs

### **WHAT STATES CAN DO TO IMPROVE THEIR LEVEL VI PROGRAMS**

- If needed, clarify state policies and procedures regarding inspector actions when violations are detected.
- Ensure that online systems used for training and updates are accessible to all inspectors.

- Use tracked data to monitor the quality and completeness of inspection and violation reports and to identify any trends that can be communicated to the Level VI Inspection Program community.
- Maintain a system to capture and disseminate lessons learned and best practices.
- Explore funding options to obtain and maintain adequate survey equipment and PPE.

#### **HOW CVSA, DOE AND OTHER GOVERNMENT ENTITIES CAN BETTER ASSIST STATES WITH THEIR LEVEL VI INSPECTION PROGRAMS**

There were a few identified needs pertaining to the CVSA Level VI Inspection Program. Identified future improvements include:

- CVSA should continue providing guidance and support for improving states' Level VI Inspection Programs. Suggestions by the states include:
  - Provide videos on procedures with in-depth steps.
  - Continue support for refresher training.
  - Continue use of CVSA Level VI LMS site for training items.
- DOE should continue to:
  - Support roadshows.
  - Fund training materials.
  - Provide assistance and public outreach for shipping campaigns.

## **5 RECOMMENDATIONS AND NEXT STEPS**

After the state visits, the peer review teams often make recommendations. Additional recommendations are developed after analyzing the data.

### **PEER REVIEW TEAM RECOMMENDATIONS**

At the conclusion of the 2019 state visits, the peer review teams formulated general recommendations. These recommendations are grouped according to the following topical areas:

#### **PROGRAM MANAGEMENT**

- The person who is the point of contact and has responsibility for the Level VI Inspection Program must be well trained in the Level I, HM and Level VI Inspection Programs in order to manage this important program and provide oversight for quality control of the inspection program and data.
- The state WIPP coordinator must advocate for and take a proactive role in supporting and funding state agencies responsible for Level VI Inspections.
- Agencies should establish/review/enhance written procedures for quality control and tracking Level VI Inspections.

#### **INSPECTOR SUPPORT**

- PPE should be available to all Level VI inspectors and maintained and kept up to date.
- Personal dosimetry should be available and maintained for all Level VI inspectors.

### **RECOMMENDATIONS BASED ON DATA ANALYSIS**

The following are recommendations derived from the findings, including lessons learned, best practices and future improvement needs.

- States should utilize emergency preparedness training and exercises as valuable elements of a successful program.
- States should provide CVSA with timely inspector Level VI Inspection training status updates.
- If needed, states should investigate alternative funding options (such as WIPP) to obtain and maintain adequate survey equipment and PPE.
- All inspectors should have properly maintained PPE, including personal dosimetry.
- All inspectors should have access to any online systems used for training and updates.
- CVSA should assist states in formalizing lessons learned and best practices and developing a repository of lessons learned and best practices that would be accessible by all program participants.
- CVSA should continue development of new training items, utilizing videos and the CVSA Level VI LMS site.
- DOE should continue support and funding for training and public outreach.

**APPENDIX 1: 2019 PEER REVIEW COMMITTEE**

<b>Peer Review Committee</b>	
<b>Member</b>	<b>Affiliations</b>
Reggie Bunner	West Virginia Public Service Commission
John Hahn	Colorado State Patrol
Carlisle Smith	Commercial Vehicle Safety Alliance



**APPENDIX 2: 2019 VISIT DATES AND PEER REVIEW TEAMS BY STATE**

<b>State</b>	<b>Visit Dates</b>	<b>Peer Review Team Members</b>
Texas	April 23-24, 2019	Reggie Bunner
		John Hahn
		Carlisle Smith
Maryland	July 16-17, 2019	John Hahn
		Carlisle Smith

**APPENDIX 3: 2019 STATE ORGANIZATIONS COVERED AND FIELD OBSERVATIONS**

<b>State</b>	<b>Organization Covered/Field Visits</b>
Texas	Texas Department of State Health Services
	Texas Department of Public Safety
Maryland	Maryland Department of the Environment
	Maryland State Police

## APPENDIX 4: CVSA LEVEL VI PEER REVIEW SITE VISIT GUIDANCE

### FOR CVSA LEVEL VI PROGRAM IMPLEMENTATION ORGANIZATIONS

- Initial overview by peer panel followed by initial program overview and site visit overview session by program lead/administrator with opportunity for questions and answers
- Review of inspection tools and checklists used by inspectors
- Interviews with inspectors
- Observation of one or more different inspectors conducting a mock inspection or an actual inspection, if available
- Review of training procedures and materials
- Interviews with trainers
- Site visit of equipment storage site and interview with equipment manager
- Interviews with key program sponsors (it may be useful to include relevant legal counsel to address specific jurisdiction regulations of pertinence)
- Interviews with key program stakeholders (customers, interest groups, key public/private stakeholders, etc.) as determined to be applicable (it may be useful to conduct interviews with more than one carrier)
- Interviews with relevant emergency management, CIC, ICS, HM personnel, if not determined to be outside scope of review
- Exit meeting with program lead/administrator to address ambiguities, need for clarification, etc.

#### THE FOLLOWING IS WHAT CVSA WILL NEED FROM YOUR STATE TO EFFECTIVELY CONDUCT THE PEER REVIEW

- Please have the following information available at the start of the site visit:
  - Average length of inspections
  - Number of inspections conducted each year for the past five years
  - Number of violations identified and cited each year for the past five years
  - Number and amount of fines levied each year over the past five years
  - Number of RAM movements through the jurisdiction each year for the past five years
  - Type and cost of RAM shipment permits (if applicable)
  - Number of jurisdiction HM refresher instructors
  - Number and type of inspection equipment and PPE
- Provide the names and years of experience of inspectors so a joint determination can be made about whom to interview. Set up interview times and mock inspection observation times with the selected inspectors in advance of the site visit.
- Set up the mock inspection venue for panel members to observe mock inspections by a few different inspectors.
- Identify the total number of trainers, including names and years of experience, so a joint determination can be made about whom to interview. Arrange interview times with the selected trainers in advance of the site visit.
- In advance of site visit, identify relevant equipment manager(s), set up interview times and arrange a visit to equipment site(s).

- Identify key program sponsors and set up interview times.
- Identify RAM generator sites and the key generator site personnel with whom the review team will interact. Set up interview times with the selected generator site personnel. These interviews will most likely be done via the phone.
- Identify relevant emergency management, CIC, ICS, HM personnel and set up interview times with the selected staff in these areas in advance of the site visit. These interviews may be done via the phone.
- Identify other key program stakeholders (e.g., interest groups, key public/private stakeholders) and set up interview times in advance of the site visit.
- Set up time at the start of the review site visit for an initial overview by the peer panel followed by initial program overview and site visit overview session by the program lead/program administrator.
- Designate time at the end of the review site visit for an exit meeting between the program lead/program administrator and the review team panel members.

**FOR PRIMARY CARRIERS (if applicable)**

- Initial meeting between peer review panel and carrier site point of contact (POC)
- Interviews with drivers
- Interviews with other relevant carrier staff
- Exit meeting between peer review panel and carrier POC

**THE FOLLOWING IS WHAT WE WILL NEED FROM YOU TO EFFECTIVELY CONDUCT THE PEER REVIEW**

- Designate a POC to work with panel team lead.
- Identify total number of drivers, including names and years of experience, so a joint determination can be made about whom to interview. Set up interview times with the selected drivers in advance of the site visit.
- Have POC determine which RAM generator sites should be visited.
- Set up time at the start of the site visit for an initial meeting between peer panel and carrier staff.
- Designate time at the end of the site visit for exit meeting between peer panel and carrier staff.

**FOR GENERATOR SITES (if applicable)**

- Designate a POC to work with panel team lead.
- Be prepared for an initial phone interview between select members of the peer review panel and the POC.
- Individual phone interviews with key generator staff (number depends on persons jointly identified as key staff of relevance) will be conducted.
- Identify relevant generator staff, including names and years of experience, so a joint determination can be made about whom to interview. Set up interview times with the selected staff in advance of the site visit.

**FOR DESTINATION SITES (if applicable)**

- Designate a POC to work with panel team lead.

- Be prepared for an initial phone interview between select members of the peer review panel and the POC.
- Phone interviews will be conducted with key destination staff (number depends on persons jointly identified as key staff of relevance).
- Identify relevant destination staff, including their names and years of experience, so a joint determination can be made about whom to interview. Set up interview times with the selected staff in advance of the site visit.

**APPENDIX 5: CVSA LEVEL VI PEER REVIEW MASTER INTERVIEW GUIDE**

CVSA Peer Review Interview Guide
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Data Collection Form: Jurisdiction Questionnaire Form – All Questions
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Jurisdiction	
Date/Start and Finish Times	
Interviewer(s): Lead Name Others	
Interviewee(s): Name/Title/Org/ Phone #/E-mail	

Q #	Jurisdiction Program Baseline Parameters	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
	<b>RAM Generator Sites</b>			
1.0	How many RAM waste generator sites exist in your jurisdiction? <b>(if not, skip to next section)</b>			
1.1	[If applicable] What kind of working relationship does the jurisdiction have with these generator site(s)? Poor/Fair/Good/Excellent		Site 1: Site 2: Site 3:	
1.1.1	[If applicable] What kind of working relationship do you have with the generator site(s)? Poor/Fair/Good/Excellent		Site 1: Site 2: Site 3:	
1.2	[If applicable] What requirements must an inspector undergo to access the generator site to perform a pre-trip inspection?			
1.3	[If applicable] Is a pre-trip inspection schedule and notification established in advance of the shipment to ensure inspectors are available as required to conduct the inspections?			

1.3.1	[If applicable] How far in advance of the shipment departure is the pre-trip inspection schedule and notice communicated?			
1.4	[If applicable] Is there a jurisdictional requirement pertaining to shipment notification?			
	<b>RAM Destination Sites</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
2.0	Does the jurisdiction have a RAM destination site? <b>(if not, skip to next section)</b>			
2.1	[If applicable] What kind of working relationship does the jurisdiction have with the destination site? Poor/Fair/Good/Excellent			
2.1.1	[If applicable] What kind of working relationship do you have with destination site? Poor/Fair/Good/Excellent			
2.2	[If applicable] What requirements must an inspector undergo to access the destination site to perform a post-trip inspection?			
2.3	[If applicable] Is a post-trip inspection schedule and notification established in advance of arrival to ensure inspectors are available as required to conduct the inspection?			
2.3.1	[If applicable] How far in advance of the shipment arrival is the post-trip inspection schedule and notice communicated?			
2.4	[If applicable] Is there a jurisdictional requirement pertaining to shipment notification?			
	<b>Other Jurisdictional Factors, such as Transportation</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments

	<b>Routes, Safe Parking, Inclement Weather and Delays</b>			
3.0	Has the jurisdiction established any preferred routes for RAM shipments?			
3.1	Does the jurisdiction have any major construction projects planned for any RAM routes that may impact the transportation of RAM shipments?			
3.1.1	What will be the duration of the construction (anticipated start/end dates)?			
4.0	Does the jurisdiction have any safe parking locations?			
4.1	If so, how many?			
4.2	What selection factors did the jurisdiction use to establish safe parking locations?			
5.0	Does the jurisdiction currently require or have plans to require the escort of any shipments of RAM through its jurisdiction?			
5.1	If so, will the RAM escort be armed or un-armed?			
5.2	Will the RAM escort be done by state employees or third party?			
6.0	How are inclement weather or other delays/issues handled to prevent the program from being overly burdensome?			
	<b>Tracking and Level of RAM Transportation Activity</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
7.0	Are RAM inspections tracked?			
7.1	If so, how are inspections tracked?			
8.0	How many inspections have been conducted each year for the past five years?			



9.0	Are RAM transportation violations tracked?			
9.1	How are violations tracked?			
10.0	How many violations have been identified each year for the past five years?			
10.1	How many violations have been cited each year for the past five years?			
11.0	Has there been a trend?			
12.0	Does the jurisdiction currently or is it planning to monitor/track shipments of RAM through its territory?			
13.0	How many RAM movements take place through the jurisdiction each year?			
14.0	Does the jurisdiction's program have personnel trained in satellite tracking systems (TRANSCOM)?			
	<b>Specific or Additional Jurisdictional Regulatory Requirements/Policies</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
15.0	Are jurisdictional penalties levied for violations/deficiencies?			
15.1	If so, how much are these penalties?			
15.2	How many penalties have been levied each year for the past five years?			
15.3	What is the money used for?			
16.0	Does the jurisdiction have a law/policy/regulation that requires inspection of RAM shipments that move through the jurisdictional area?			
16.1	Does this policy include all RAM shipments or is it specific to certain types?			
16.2	If the jurisdiction requires its own inspection of RAM shipments, is coordination with carriers and notification requirements in advance of			

	the shipment adequate to ensure inspectors are available to conduct the inspection?			
16.2.1	How far in advance of the shipment's arrival (en-route) will the inspection schedule be developed?			
16.3	Does the jurisdiction law/policy/regulation limit the transportation of RAM shipments during peak travel hours in any city within the jurisdiction?			
16.4	Does the jurisdiction require any additional permits for carriers transporting RAM?			
16.4.1	If so, what do the additional permits cost?			
16.4.2	What are the funds collected from the additional permits used for? What do they fund?			
16.5	What is the basis for these jurisdictional policies – risk, agency perception, public perception, other?			
16.6	What is the perception of executive management concerning RAM transportation through the jurisdiction?			
16.6.1	What do you think has influenced executive management perception?			
16.7	What is the perception of the general public concerning RAM transportation through the jurisdiction?			
16.7.1	What do you think has influenced public perception?			
16.8	Are there any special interest groups (or other factors) influencing policy on RAM transportation through the jurisdiction?			

16.9	Are there any other jurisdictions (e.g., tribal) that have laws, policies or regulations that impact the transportation of RAM shipments?			
	<b>Inspection Procedures</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
17.0	How many inspectors typically conduct an inspection?			
17.1	How long does an inspection typically take?			
17.2	Do most inspections tend to take the same amount of time?			
17.3	When the length of inspections varies, what generally accounts for a shorter or longer inspection?			
17.4	Are inspection protocols sufficiently clear and precise?			
17.4.1	Are instructions for how inspectors should fill out inspection forms clear and precise?			
17.5	Are there clear policies specifying what an inspector should do if any violations or inadequacies are detected?			
17.6	Do clear reporting guidelines exist and, if so, what are they?			
17.7	Have mechanisms been established to capture lessons learned from inspectors?			
17.7.1	How are lessons learned captured?			
17.7.2	What lessons learned have been identified?			
17.7.3	How have these lessons learned been communicated and acted on?			

	<b>Training/Experience</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
18.0	How many trained/certified Level VI inspectors does the jurisdiction have and how long has each inspector been performing this function?			
19.0	What is the number of inspections conducted per year by each of the inspectors?			
19.1	Approximately how many inspections do you conduct each month, each year?			
19.2	Is this basically the same number as performed by the other trainers; other inspectors?			
20.0	Do inspectors receive both general HM & Level VI refresher training on a regular basis?			
20.1	Is there a set schedule established for refresher training or is this training provided on an as needed basis?			
20.1.1	If scheduled, what is the refresher training schedule?			
20.1.2	How often do you receive refresher training?			
21.0	How is training tracked?			
22.0	How is refresher training accomplished?			
23.0	How many general HM refresher instructors does the jurisdiction have and what is the frequency and type of training they receive?			
24.0	How many Level VI refresher instructors does the jurisdiction have and what is the frequency and type of training they receive?			
25.0	How often do CMV inspectors receive updated FMCSRs/CFRs?			

26.0	Do RAM inspectors receive any additional training in RAM regulation beyond the CVSA Basic Level VI Course?			
27.0	What training do you have?			
28.0	In your opinion, how good is the training you receive?			
	<b>Inspection Survey Equipment</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
29.0	What type of radiation survey equipment is used by the jurisdiction to conduct inspections of RAM shipments (make/model)?			
30.0	What is the inventory of the equipment? How many of each type?			
31.0	Is the equipment issued to individual inspectors or to a division/squad/troop?			
32.0	Is the equipment certification/repair maintained by a central person or location?			
33.0	What is the jurisdiction standard to ensure that instruments in the field are calibrated?			
34.0	In your opinion, how good is the equipment and equipment maintenance? Please explain.			
	<b>Personal Protection Equipment</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
35.0	What type of PPE is used by the jurisdiction concerning RAM?			
36.0	What is the make and model of this PPE equipment?			
37.0	What is the inventory of PPE? How many are on hand?			
38.0	Is the PPE issued to individual inspectors or to a division/squad/troop?			
39.0	What is the jurisdiction standard to ensure PPE is			

	maintained in proper condition for use?			
40.0	What types of training courses are those persons issued PPE required to attend?			
41.0	In your opinion, how good is the PPE equipment and equipment maintenance? Please explain.			
	<b>Emergency Preparedness</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
42.0	Does the jurisdiction have first responders on RAM transportation routes that have been trained in RAM?			
43.0	Does the jurisdiction have HM operations level responders on RAM transportation routes that have been trained in RAM?			
44.0	Does the jurisdiction have HM technicians on RAM transportation routes that have been trained in RAM?			
45.0	Does the jurisdiction have personnel on RAM transportation routes that have been trained in critical incident command?			
46.0	Does the jurisdiction have personnel on RAM transportation routes that have been trained in HM critical incident command?			
47.0	Does the jurisdiction have personnel on RAM transportation routes that have been trained in radiological emergency operations?			
48.0	Does the jurisdiction have radiological response teams on RAM transportation routes?			
49.0	Does the jurisdiction have hospital personnel on RAM			

	transportation routes that have been trained in an EMS/HM course?			
50.0	Does the jurisdiction have EMS or hospital personnel on RAM transportation routes that have been trained in handling radiation incidents?			
51.0	Does the jurisdiction have EMS or hospital personnel on RAM transportation routes that have been trained in the radiological emergency management?			
52.0	Does the jurisdiction have any radiological emergency training available for local responders?			
53.0	Has the jurisdiction conducted any full-scale emergency response exercises involving RAM?			
53.1	If so, how many exercises have been conducted and when?			
53.2	Were you involved in these exercises?			
53.3	How good were the exercises and how well did those involved perform?			
53.4	How good is emergency preparedness for events involving RAM transportation?			
	<b>Public Awareness</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
54.0	Has the jurisdiction conducted any public outreach on the transportation of RAM?			
55.0	Does the jurisdiction have any plans to conduct any public outreach on the transportation of RAM?			
55.1	Is there a need for greater outreach and, if so, what is needed?			

	<b>Assistance</b>	N <sup>1</sup>	Y/N <sup>2</sup> P/F/G/E <sup>3</sup>	Open-Ended Responses/ Elaboration/ Comments
56.0	What can the CVSA do to better assist you to efficiently and effectively address the shipment of RAM through the jurisdiction?			
57.0	What can the DOE do to better assist you to efficiently and effectively address the shipment of RAM through the jurisdiction?			

<sup>1</sup>= number (type in numerical answer)

<sup>2</sup>=yes/no (type in yes or no response)

<sup>3</sup>= Poor/Fair/Good/Excellent (type in poor, fair, good or excellent)



## **APPENDIX 6: 2019 MATERIALS COLLECTED BY STATE**

### **MARYLAND MATERIALS COLLECTED**

- Equipment Inventory List from Maryland Department of the Environment
  - Survey meters
  - Field kits
  - Dosimeters

**APPENDIX 7: RELATION OF REPORT SECTION TOPICS TO QUESTIONS IN PEER REVIEW INTERVIEW GUIDE**

<b>Level VI Program Findings Topic</b>	<b>Relevant Interview Guide Questions</b>
State Program Policies and Statutes	16.0, 16.1, 16.5, 16.9, 17.5, 17.6
Organizational Implementation and Relationships	1.0, 1.1, 1.1.1, 2.0, 2.1, 2.1.1
Inspector Training and Manpower	18.0, 19.0, 19.1, 19.2, 20.0, 20.1, 20.1.1, 20.1.2, 21.0, 22.0, 23.0, 24.0, 25.0, 26.0, 27.0, 28.0
Types, Locations and Number of Inspections	1.2, 2.2, 8.0
Permits, Notification and Scheduling	1.3, 1.3.1, 1.4, 2.3, 2.3.1, 2.4, 12.0, 13.0, 16.2, 16.2.1, 16.4, 16.4.1, 16.4.2
Conduct of Inspections – Inspection Procedures and Duration	17.0, 17.1, 17.2, 17.3, 17.4, 17.4.1, 17.5, 17.6, 17.7
Violations, Enforcement and Penalties	9.0, 9.1, 10.0, 10.1, 11.0, 15.0, 15.1, 15.2, 15.3
Inspection Equipment	29.0, 30.0, 31.0, 32.0, 33.0, 34.0, 35.0, 36.0, 37.0, 38.0, 39.0, 40.0, 41.0
Tracking and Managing Information	7.0, 7.1, 8.0, 9.0, 9.1, 10.0, 10.1, 11.0, 12.0, 13.0, 14.0
Public Perception and Program Outreach	16.5, 16.6, 16.6.1, 16.7, 16.7.1, 16.8, 16.9, 54.0, 55.0, 55.1
Sharing Lessons Learned and Best Practices	17.7, 17.7.1, 17.7.2, 17.7.3
<b>Additional Factors of Interest Topic</b>	<b>Relevant Interview Guide Questions</b>
Transportation Issues and Restrictions	3.0, 3.1, 3.1.1, 4.0, 4.1, 4.2, 5.0, 5.1, 5.2, 6.0, 16.3
Emergency Preparedness	42.0, 43.0, 44.0, 45.0, 46.0, 47.0, 48.0, 49.0, 50.0, 51.0, 52.0, 53.0, 53.1, 53.2, 53.3, 53.4
<b>Summary Topic</b>	<b>Relevant Interview Guide Questions</b>
Notable Variations across States	All questions
Key Lessons Learned and Best Practices	All questions
Future Improvement Needs:	
What States Can Do to Improve Their Level VI Programs	56.0, 57.0 and other questions
How CVSA, DOE and other Government Entities Can Better Assist States with Their Level VI Programs	56.0, 57.0 and other questions