Western Interstate Energy Board

High-Level Radioactive Waste Committee Position Paper

Rail Shipment Inspection
Number 2017-5

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Statement of Policy

Trains transporting spent nuclear fuel and high-level radioactive waste (SNF/HLW) should be inspected by fully qualified inspectors, using a consistent approach which has been developed cooperatively with the help of Western states. The inspection protocol, to the extent practical, should be commensurate with the Commercial Vehicle Safety Alliance (CVSA) Level VI inspection program.

Background and Context

1. **The CVSA Level VI inspection for highway shipments.**
   The Level VI inspection for highway shipment of radioactive materials, developed in the 1990s by the CVSA in anticipation of spent nuclear fuel shipments, has been successful. Such inspections are conducted at the shipment origin, when the truck is loaded and ready to go, when the inspector creates a record of initial shipment conditions. Some states inspect shipments en route, and the shipment is inspected upon arrival at the destination. The Level VI inspection criteria require that equipment be "defect free." Any defects detected as a result of the inspection must be corrected before a shipment continues.

2. **Designing comparable inspections for rail shipments.**
   Several initiatives have been undertaken through the years to develop a comparable protocol for rail shipment of SNF/HLW. The initiatives suggest that, compared to truck shipments on public highways, rail inspection standards will be more complex, and the inspection process more time consuming. A current initiative in this vein is being undertaken by the National Transportation Stakeholder's Forum "Rail/Routing Ad Hoc Working Group."

Agenda Item VI-7 (HLRW)
Meeting Date: 04-27-18

3. Rail shipment inspection elements.

While the particulars and processes have not yet been worked through, it is generally agreed that the rail inspection should include:

- the "motive power" (i.e., the locomotive);
- the crew (i.e., training and experience regarding the special features of dedicated trains);
- the rail equipment (i.e., the rail cask, buffer, and escort cars)[1];
- the cargo (i.e., the casks, their radiation levels, their loading on cask cars).
- the consist (i.e., the entire train and its cargo as prepared for shipment).

4. En route inspection requirements.

The Federal Railroad Administration (FRA) requires an en route inspection of shipments that travel greater than 1,500 miles, and advises (for safety reasons, and to avoid impeding other rail traffic) that such inspections be conducted at crew change and/or refueling points, which are generally rail-yards. It is not yet clear how this requirement would be implemented. For example, should an en route inspection be conducted at a rail-yard near the middle or towards the end of a 1,700-mile rail route?

5. State inspection mandates.

While most states do not currently mandate en route inspections of rail shipments of radioactive materials, some states (e.g., Illinois) do mandate such inspections. It is not yet clear, however, how states requiring en route inspections would coordinate the implementation of these mandates with FRA requirements and advice.

6. Addressing departures from initial conditions.

An en route update of a detailed initial inspection is likely to identify departures from initial conditions. It has not yet been determined what degree of variation from which initial conditions should be "noted for observation" and which should require an en route fix, which would add to the time in transit.

7. Origin inspection locations.

At origin sites with rail access (e.g., San Onofre, Rancho Seco), the initial inspection would likely be conducted on-site, on utility property, after dedicated train "make-up."[2] At origin sites without rail access (e.g., Humboldt Bay), SNF would be transported by other modes to a mainline railhead for make-up of the dedicated train. The initial inspection would

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[1] DOE's "AAR S-2043" railcar is being designed to continuously monitor several conditions for each car in the consist (location, speed, truck hunting, rocking, wheel flats, bearing condition, ride quality, braking performance, and vertical, lateral, and longitudinal acceleration). The data is provided to the conductor, with indicators whether one or a combination of conditions require a check at the next scheduled stop (yellow), or that the train must be stopped as soon as possible (red). If made available to affected states, this data, which is more detailed than that obtained in a visual inspection, could reduce the need for en route inspections.

[2] Dedicated train "make-up" involves: delivery of the requisite casks, cask loading onto rail cars, assembly of loaded rail cars in a train with buffer and escort cars, and delivery of locomotive power and crew.

presumably occur at this railhead, on rail carrier property. The particulars of such arrangements have not yet been worked through.

Proposed Policy Recommendations

1. **Western states must be involved with the development of a SNF/HLW rail inspection protocol.**
   The protocol for rail shipment inspection and inspection reciprocity should be developed in a process that includes significant involvement of Western and other states, tribal governments, federal agencies such as DOE and FRA, and rail carriers, represented by organizations such as the American Association of Railroads.

2. **The SNF/HLW inspection protocol should be comprehensive.**
   In addition to the particulars of initial and en route inspections, the protocol should address:
   - Initial inspections for sites without rail access;
   - Arrangements to conduct en route inspections, desirably in conjunction with necessary crew changes and refueling;
   - Clarifications regarding which variations from the protocol require an en route correction before continuing;
   - That improvements in sensor and communications technology will be applied and adapted.