

## Tank Car Safety Initiatives Federal Railroad Administration

### Noteworthiness

In the United States Government's fiscal year that ended September 30, 2002, FRA collected approximately \$7.7 million civil penalties from railroads, shippers, and construction and maintenance organizations. FRA collected about \$6.2 million of the total from railroads. The whole purpose of the civil penalty process is to change behavior towards compliance with Federal law. In addition to penalties, FRA has other compliance tools that, while not reflected in the totals above, have a direct impact on a company's financial freedom. FRA can issue Emergency Orders, Compliance Orders, Railworthiness Directives, and verbal instructions to railroads, shippers, and construction and maintenance organizations that impart a call for action to solve an identified unsafe condition.

The civil penalty amounts above do not include the actual cost of derailments and equipment failures from inadequate or inappropriate maintenance procedures and processes. These costs include lost business traffic over a particular line, evacuations, employee injuries, legal costs, and environmental clean-up costs. Inadequate or inappropriate maintenance takes on several forms:

- ❑ The design of maintenance programs solely on "prior art" rather than on a sound engineering basis (e.g., DTA and RCM)
- ❑ The selection and use of an inspection method that is inappropriate for the type and size flaw under observation (remote visual verses dye penetrant for small-latent defects)
- ❑ The use of nondestructive evaluation capabilities that are not quantified
- ❑ The use of an inadequate inspection interval with respect to the failure mode and failure rate of a given component, and
- ❑ The adequacy and robustness of a facility's quality management system

While civil penalties, as noted above, are possible, FRA has taken action to recall tank cars from service for inspection when the agency finds that a car or a series of cars may either have a design flaw, a high-rate of failure, or improper work performed. Recalls *may* follow one or more of the following findings of fact:

- ❑ A series of tank cars of a particular design are found to exhibit similar failure patterns
- ❑ An owner's maintenance program does not contain the detail to ensure that the work on the car conforms to contract requirements
- ❑ An owner's maintenance program does not identify for inspection an area on the car that has a high-rate of failure, and FRA has evidence that this area is prone to failure
- ❑ An owner's maintenance program recommends the use of an inspection method or interval that is inappropriate for the failure mode and failure rate of a particular component
- ❑ A tank car facility uses personnel or procedures that do not meet the requirements of Appendix W and T
- ❑ A tank car facility does not use nondestructive evaluation processes that provide the sensitivity and reliability to find flaws (a quantified NDE process)
- ❑ A tank car facility does not have adequate documentation and test results to support its WPS, PQR, and records of qualification of welders and nondestructive evaluation personnel
- ❑ A tank car facility does not have a quality management system in place to ensure that the finished product conforms to contract requirements

- ❑ A tank car facility does not have a system in place to quantify the inspection intervals for measuring and test equipment and the equipment is found out-of-calibration
- ❑ A tank car facility uses subcontractors and the subcontractors do not have an adequate and robust quality management system
- ❑ The tank car facility does not have adequate parts control to ensure design control and traceability

In clear language, what does this mean to you? During a Federal audit, inspection, or investigation, if the agency finds evidence to support that a car or a series of cars may be in an unsafe operating condition, the agency can require recall for inspection of the effected fleet. A series of cars may include multiple owners where the cars received maintenance at a tank car facility that did not have an adequate and robust quality management system (e.g., the facility lacked documentation that its welding procedures conformed to Appendix W). FRA's evidence can occur either within a tank car facility or during over-the road service, including accident and incident investigations. Recall is in addition to any civil penalty demanded. In rare cases, the Department and other Federal agencies can seek criminal penalties—these cases vary with respect to knowledge and culpability depending on the statute.

### **Significant Investigations**

*Minot, North Dakota.* On January 18, 2002, a Canadian Pacific Railway freight train with 2 locomotives and 112 cars derailed 31 cars near Minot, North Dakota. Seven tank cars carrying anhydrous ammonia were breached, and a vapor plume covered the derailment site and the community. More than 220,000 gallons of product were released, one of the largest single releases of anhydrous ammonia in the United States. A local resident was fatally injured. The plume of anhydrous ammonia affected approximately 15,000 people, and between 60 and 65 residents of the neighborhood near the derailment site had to be evacuated and rescued. More than 300 people were injured, 11 seriously. The Safety Board's investigation focuses on tank car crashworthiness, specifically, the adequacy of non-normalized steels to resist fracture propagation below transition temperatures.

*Lowell, Massachusetts.* On May 31, 2002, tank car NATX 210023 began leaking from a lining and tank shell failure near Lowell, Massachusetts. As part of the failure analysis investigation, the owner performed a lining inspection. The investigation disclosed extensive failure of the tank car lining in the upper third of the car interior. An independent failure analysis of the lining suggests that the lining was not cured at the time of application. To determine if any additional cars had similar failure patterns, the owner began an extensive analysis of 34 additional cars constructed under the same built order as NATX 210023. As of October 9, 2002, 9 of 18 cars have required lining repairs.

*Shell Failures after maintenance and qualification.* FRA has an on-going investigation of shell failures that occurred shortly after a maintenance and qualification event. The focus of the investigations concern the appropriateness and design details of an owner's maintenance program, the written instructions given to shop-floor employees, and the adequacy and robustness of a facility's quality management system, especially as that system applies to special processes such as welding and nondestructive evaluation. FRA's audits focus on the ability of owner's and facilities to ensure railworthiness between inspection cycles.

### **Safety Advisories for Issuance**

*Riverview, Michigan.* The National Transportation Safety Board determined that the probable cause of the accident involving the release of methyl mercaptan from a tank car at the ATOFINA Chemicals, Inc., plant in Riverview, Michigan, was a fractured cargo transfer pipe that resulted from (1) the failure of ATOFINA to adequately inspect and maintain its cargo transfer equipment,

and (2) inadequate Federal oversight of unloading operations involving hazardous materials. Contributing to the accident were ATOFINA's reliance on a tank car excess flow valve to close in the event of a leak from cargo transfer equipment and the company's failure to require appropriate safety equipment for employees involved in tank car loading and unloading operations.

- ❑ *NTSB Recommendation to FRA:* Issue a hazardous materials bulletin to warn companies involved in tank car loading and unloading operations that tank car excess flow valves cannot be relied upon to stop leaks that occur during those operations. (R-02-16).

*Clymers, Indiana.* The National Transportation Safety Board determined that the probable cause of the accident at Essroc Cement Corporation and CP Recycling of Indiana was the failure of management to develop and implement safe procedures for offloading toluene diisocyanate matter wastes, resulting in the over pressurization of the tank car from chemical self-reaction and expansion of the toluene diisocyanate matter wastes.

- ❑ *NTSB Recommendations to FRA.* Issue an advisory bulletin reminding shippers of hazardous materials that any time a change is made in the chemical constituents of hazardous materials shipped, they should verify the compatibility of all tank car components, such as valves and gaskets, with all of the commodities to be transported. (R-01-01)
- ❑ Evaluate, with the assistance of the Research and Special Programs Administration, the Association of American Railroads, and the Railway Progress Institute, the deterioration of pressure relief devices through normal service and then develop inspection criteria to ensure that the pressure relief devices remain functional between regular inspection intervals. Incorporate these inspection criteria into the U.S. Department of Transportation *Hazardous Materials Regulations*. (R-01-02)

### **Scheduling of Modifications and Progress Reporting**

On September 21, 1995, the Department of Transportation issued a final rule that improved the crashworthiness of certain tank cars when involved in accidents (Docket HM-175A). Car owners that have tanks subject to the rule must schedule the cars for modification under a phased program. Car owners must submit a report to FRA by October 1 of each year. If you have not submitted your report this year, please forward them to Francisco Gonzalez III, Federal Railroad Administration, 1120 Vermont Avenue, Mail Stop 25, Washington, D.C., 20590. You may also fax the report to 202.493.6230, or e-mail the report to Francisco or myself.

### **Renewals**

E12095. The FRA has completed its final edits to DOT-E 12095. This exemption makes improvements to the Final Rule issued under Docket HM-201 on September 21, 1995. Our review included a comparison of the second draft of the exemption completed several years ago by a large industry/government task force, and with the last approved CGSB 43-147 Standard. FRA is preparing a document outlining the changes from the regulation and the current exemption for distribution to the exemption holders.