clothing, fabrics, speciality metals, and hand or measuring tools."

3. Section 225.7002–1 is amended by adding paragraph (c) as follows:

225.7002–1 Restrictions.

* * * * *

(c) Do not acquire hand or measuring tools that were not produced in the United States or its possessions.

4. Section 225.7002–2 is amended by revising paragraphs (a), (d), and (i) to read as follows:

225.7002–2 Exceptions.

* * * * *

(a) Any of the items in 225.7002–1 (a) or (b), if the Secretary concerned, or designee, determines that they cannot be acquired when needed in a satisfactory quality and sufficient quantity grown or produced in the United States or its possessions at U.S. market prices.

* * * * *

(d) Acquisitions of those supplies listed in FAR 25.108(d)(1), unless the supplies are hand or measuring tools.

* * * * *

(i) Purchases of specialty metals and chemical warfare protective clothing when the acquisition furthers an agreement with a qualifying country (see 225.872).

5. Section 225.7002–4 is amended by adding an introductory paragraph before paragraph (a), and by adding paragraph (d) to read as follows:

225.7002–4 Contract clauses.

Unless an exception is known to apply—

* * * * *

(d) Use the clause at 252.225–7015, Preference for Domestic Hand or Measuring Tools, in all solicitations and contracts over $25,000 calling for delivery of hand or measuring tools.

225.7003 [Removed and Reserved]

6. Section 225.7003 is removed and reserved.

225.7003–1 [Removed]

7. Section 225.7003–1 is removed.

225.7003–2 [Removed]

8. Section 225.7003–2 is removed.

PART 252—SOLICITATION PROVISIONS AND CONTRACT CLAUSES

9. Section 252.225–7012 is amended to revise paragraph (b)(1) to read as follows:

252.225–7012 Preference for certain domestic commodities.

* * * * *

(b) * * *

(1) To supplies listed in FAR 25.108(d)(1), or other supplies for which the Government has determined that a satisfactory quality and sufficient quantity cannot be acquired as and when needed at U.S. market prices;

* * * * *

10. Section 252.225–7015 is amended by revising the introductory paragraph to read as follows:

252.225–7015 Preference for domestic hand or measuring tools.

As prescribed in 225.7002–4(d), use the following clause:

* * * * *

[FR Doc. 93–22576 Filed 9–15–93; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

49 CFR Parts 173, 174 and 180

[Docket No. HM–201; Notice No. 93–15]

RIN 2137–AB40

Detection and Repair of Cracks, Pits, Corrosion, Lining Flaws, Thermal Protection Flaws and Other Defects of Tank Car Tanks

AGENCY: Research and Special Programs Administration (RSPA), DOT.

ACTION: Notice of Proposed Rulemaking (NPRM).

SUMMARY: RSPA is proposing revisions to the Hazardous Materials Regulations (HMR) that would require the development and implementation of Quality Assurance Programs (QAP) at facilities that build and repair tank cars; require the use of non-destructive testing (NDT) techniques in lieu of the current periodic hydrostatic pressure tests for fusion welded tank cars to more adequately detect critical cracks; require thickness measurements of tank cars; allow the continued use of tank cars with reduced shell thicknesses; revise the inspection and test intervals for tank cars; and clarify the inspection requirements relating to tank cars prior to and during transportation. These actions are necessary to increase the confidence that critical tank car defects will be detected. The intended effect of these actions is to enhance the safe transportation of hazardous materials in tank cars.

DATES: Comments must be received on or before March 16, 1994.

ADDRESSES: Address comments to the Dockets Unit, (DHM–30), Research and Special Programs Administration, Department of Transportation, Washington, DC 20590–0001. Commenters should submit five copies identifying the docket and NPRM number. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed stamped postcard. The location of the Dockets Unit is in Room 8421 of the Nassif Building, 400 Seventh Street SW., Washington, DC 20590. Public dockets may be reviewed between the hours of 8:30 a.m., and 5 p.m., Monday through Friday, except holidays.

FOR FURTHER INFORMATION CONTACT: Phil Olekszyk, (Telephone 202–366–0897), Deputy Associate Administrator for Safety, RRS–2, FRA, 400 Seventh Street SW., Washington DC 20590, Thomas A. Phemister, (Telephone 202–366–0635), Trial Attorney, Office of Chief Counsel, RCC–30, FRA, 400 Seventh Street SW., Washington, DC 20590 or James H. Rader, (Telephone 202–366–0510), Hazardous Materials Division, Federal Railroad Administration, RRS–12, Washington, DC 20590.

SUPPLEMENTARY INFORMATION:

I. Background

On December 8, 1987, the Research and Special Programs Administration (RSPA) issued an Advance Notice of Proposed Rulemaking (ANPRM) in the Federal Register under Docket HM–201 entitled "Detection and Repair of Cracks, Pits, Corrosion, Lining Flaws, Thermal Protection Flaws and Other Defects of Tank Cars" (52 FR 46510). The ANPRM solicited comments on the types of repairs that are likely to lead to non-detectable cracks and on non-destructive testing (NDT) techniques that are appropriate to find these and other cracks. The ANPRM also asked for comments on post-weld heat treatment and on techniques to repair cracks, pits, corrosion; lining flaws, thermal protection flaws and other defects without causing collateral damage. RSPA and the Federal Railroad Administration (FRA) hoped that the commenters would offer suggestions for rule changes to incorporate additional NDT techniques to qualify tank cars for further use.

In response to petitions for reconsideration under Docket HM–201B (55 FR 422, January 5, 1990 and 55 FR 39000, September 24, 1990), RSPA and FRA indicated that the issue of the minimum tank car shell thickness would be fully considered in this NPRM (*see* Shippers; Use of Tank Car Tanks With Localized Thin Spots; Corrections and Response to a Petition for

Reconsideration, 55 FR 39000 (September 11, 1990)). Commenters to that rule questioned RSPA and FRA's clarification that the part 179 requirement is the minimum tank car shell thickness. This NPRM addresses the comments received and proposes minimum service life shell thickness requirements and measures to ensure that those limits are observed. It also proposes to substitute NDT inspection procedures for existing hydrostatic testing requirements on all tank cars other than DOT Class 107 tank cars and on those few riveted tank cars remaining in service.

RSPA and FRA received 14 comments in response to the ANPRM from members of the various industries that own, lease, transport, or use tank cars. Following is a summary of the written comments:

1. What types of tank car repairs are likely to lead to undetected cracks (e.g., grinding, arc gouging, welding)?

Commenters stated that it is unlikely proper repairs would lead to undetected (or undetectable) cracks. The repair procedures most likely to lead to cracking are weld undercuts and jacking and pressing to restore the tank shell and head contour. Commenters suggested that in order to properly repair tank cars, companies must strictly adhere to stringent quality assurance programs, process control and personnel qualifications.

2. How effective is post weld heat treatment in reducing crack growth of existing cracks or the formation of new cracks?

Most commenters stated that post weld heat treatment is not effective in retarding growth in existing cracks, although it is effective in inhibiting the formation of new cracks by reducing residual stresses, increasing metal ductility and softening the heat affected zone near the weld.

3. What inspection techniques (e.g., ultrasonic, magnetic particle, acoustic emission and radioscopic) are appropriate to detect small cracks, pits, corrosion, lining flaws, thermal protection flaws and other defects?

Most commenters stated that all of the above techniques, alone or in combination, are reliable and each has its own inherent advantages and degree of sensitivity. The orientation and type of defect, as well as the characteristics of the material in which the defect exists, dictate the proper inspection procedure. Commenters suggested that adherence to good NDT techniques, procedures, and personnel qualifications are important to detect defects. Commenters supported the following NDT methods—

—Dye penetrant testing for surface flaws;
—Radiography testing for subsurface flaws;
—Magnetic particle testing for surface and some subsurface flaws;
—Ultrasonic testing for surface and subsurface flaws;
—Acoustic emission testing for targeting potential defective areas that will require further inspection;
—Enhanced visual imagery for surface flaws (e.g., fiberscopes and borescopes);
—Spark testing for lining flaws; and
—Infrared scanning for thermal protection flaws.

4. What techniques are appropriate to repair small cracks, pits, corrosion, lining flaws, thermal protection flaws, and other defects, without causing collateral damage?

Commenters stated that appropriate techniques for repairing small cracks, pits, and corrosion are contained in the Association of American Railroads (AAR) Manual of Standards and Recommended Practices, Specifications for Tank Cars, Specification M–1002. Repairs of lining and thermal protection flaws can be accomplished by following the manufacturer's instructions.

5. For small cracks, pits, corrosion, lining flaws, thermal protection flaws, and other defects, what alternatives to defect repair are appropriate (e.g., special handling, special train placement, and more frequent reinspection)?

Commenters stated that the only real alternative is more frequent inspection and tests.

A. Adequacy of the Hydrostatic Test

The history of the hydrostatic test predates the Department's regulations and its purpose was to find leaks associated with tank shell plates and loose rivets and to detect metal deformations (i.e., distress) in areas of reduced wall thickness. The early tank cars were of riveted or forge welded construction and the test was effective in finding imperfections associated with riveted joints, nozzles, tank anchors, and reinforcements. In the 1930s, tank car manufacturers started building fusion welded tank cars and hydrostatic tests were universally applied to these tank cars as well.

Practically all pressure vessels are given a final hydrostatic test at the time of construction. Such a test stresses the vessel with the goal of detecting flaws that can lead to crack initiation or shell deformation. If no imperfections are found, the integrity of the pressure vessel is verified. Hydrostatic testing is also required for highway cargo tanks, cylinders, portable tanks, pipelines, and stationary storage vessels. Normally, the test pressure for tank cars is the greater of 1.3 times or 133 percent of the maximum allowable working pressure (MAWP) of the tank; or, 133 percent of the maximum pressure used for loading and unloading product; or, the minimum pressure prescribed for the tank in the Federal specification (*see* 49 CFR 173.31(a)(14)).

Although widely accepted, a hydrostatic test does have notable limitations, particularly with respect to detecting fatigue cracks that are not yet extensive enough to fail at the pressures used in hydrostatic testing. For this reason, hydrostatic testing is most commonly paired with a 100 percent visual inspection of the tank shell to improve the probability of finding significant cracks.

On January 18, 1992, at Dragon, Mississippi a tank car loaded with liquefied petroleum gas split apart at a circumferential weld seam as the train began to pull out of a siding. The car was not overdue for any periodic tests or inspections. In an investigation following the Dragon incident, FRA and the National Transportation Safety Board (NTSB) subjected seven tank cars with known cracks to a hydrostatic test. (See Inspection and Testing of Railroad Tank Cars, Special Investigation Report NTSB/SIR–92–05, National Transportation Safety Board, 1992.) None of the tests showed any indication that a crack was present. In the same investigation, cracks in the circumferential welds were discovered in 39 other tank cars built to the same design. These tank cars had all passed a hydrostatic test within the last 10 years, thirteen of them within the last year, and yet radiographic and ultrasonic testing showed cracks ranging from 8.89 to 142.24 cm (3.5 to 56 inches) in length. The results of these findings parallel similar investigations where FRA found defects in tank cars that were not detected in the transportation system nor at the time of the hydrostatic test. In one recent accident, on March 25, 1992, at Kettle Falls, Washington, a tank car failed on its first post-test loaded move, one month after successfully passing the required visual inspection and the hydrostatic pressure test.

In a response to a letter from the NTSB, the Railway Progress Institute (RPI) estimated that, of the 121,000 tank cars owned or operated by RPI members, about 14,400 are hydrostatically tested each year. The RPI stated that, other than a small number of failures because of leaking seals and other components, they were

not aware of any tank cars that had failed a hydrostatic pressure test because of structural defects. Also in response to a similar letter from the NTSB, the AAR replied that tank cars appear to pass the required hydrostatic tests despite the presence of major flaws in the tanks.

Based on the ineffectiveness of the hydrostatic test in detecting significant fatigue cracking in tank cars resulting from severe loadings, stress risers, and welding defects, RSPA and FRA no longer consider the hydrostatic pressure test part of the optimum way to qualify fusion welded tank cars for continued service. This notice proposes non-destructive inspections and tests for the continued qualification of tank cars. The agencies believe that if such non-destructive tests were mandated, an incident like the one in Dragon, Mississippi might not have happened. This notice does not, however, propose to remove the requirement to perform a hydrostatic pressure test prior to certification of the tank car (e.g., *see* 179.100–18). This initial hydrostatic test substantiates the integrity of the new welded joints.

B. NDT Techniques

RSPA is proposing to require that the bottom shell of fusion welded tank cars be inspected periodically by appropriate NDT techniques, such as magnified visual imagery, ultrasonic, radiographic, magnetic particle, and dye penetrant testing methods, in lieu of hydrostatic pressure tests. In addition to the structural integrity test of all bottom shell welded attachments and of the circumferential and longitudinal welds in the bottom shell area using one of the NDT techniques, RSPA proposes to retain the requirement, now in § 173.31, for a complete visual inspection of the entire tank car, inside and out.

Such inspections may entail the removal of portions of the tank jacket when the cars are so equipped. The amount of jacket removal is dependent upon the inspection and test method employed. For example, an external inspection and test of the bottom shell may employ an industrial fiberscope that only requires inspection ports, whereas ultrasonic tests in the same areas could require complete removal of the tank jacket.

RSPA and FRA recognize that NDT techniques will be refined in the future to provide greater precision in measurement and improved ability to characterize defects. Even today, however, NDT techniques reveal considerably more about defects resulting from the severe loading conditions applied to tank cars than the current hydrostatic test. Like any testing, NDT depends on properly qualified inspectors and expert interpretation of test results. As a rule, tank car facilities using dye penetrant, magnetic particle, radiography, and enhanced visual imagery can expect about 90 per cent reliability in detecting flaws, with ultrasound somewhat lower due to the extra knowledge and skill required to interpret results. (See Reliability of Nondestructive Inspections, Final Report, San Antonio Air Logistics Center Report SA–ALC/MME 76–6–38–1, Lockheed-Georgia Company, Marietta, GA, December, 1978.) At this time, the reliability of acoustic emissions testing is not sufficient to include that NDT method in this rulemaking proposal. Even with a perfect system, some defects would remain hidden and, thus, FRA does not predict that the use of NDT techniques will always find every possible flaw in a tank car. Overall, FRA expects NDT to be 80–85 percent effective in finding significant defects. Based on the previous discussion, this is a considerable improvement over the current procedure.

With this in mind, and in keeping with the recommendations of the NTSB, RSPA and FRA will be working with the AAR Tank Car Committee to (1) conduct root cause analysis, such as defining the nature of cracking, typical loading spectra expected on the tank in actual service, crack initiation sites and mechanisms and a crack growth model; (2) determine the allowable flaw size using failure/acceptance criteria; (3) propose modifications to tank car design, such as multiple load paths and the use of materials that provide a reduced rate of crack propagation combined with high residual strength; and, (4) require the arrangement of design details, like bottom discontinuities, to reduce stress concentration points. The results of these efforts will be realized in the years ahead, but RSPA and FRA believe that NDT techniques are sufficiently advanced and dependable that the need for their use is demonstrated for tank cars.

C. Bottom Shell

Because defects are known to exist outside of the area currently defined as the "bottom shell," such as those in the attachment welds of bottom discontinuities, RSPA proposes to revise the current definition of the bottom shell by enlarging the area from 61 cm (two feet) to 122 cm (four feet) on each side of the longitudinal center line of the tank. RSPA and FRA consider this enlarged area more appropriate to qualify the tank for further use.

D. Inspection and Test Intervals

The existing periodic test requirements for tank cars list over 70 different DOT specifications (*see* the table in § 173.31(c)). Typically, tank cars have a 10-year periodic test interval, although most new tank cars used in Class 8 (corrosive) service are subject to a periodic test every 5 years up to age 10, then every 3 years up to age 22, and then every year. This is known as the 5–3–1 periodic test interval. Five DOT class tank cars (DOT–103ALW, DOT–104W, DOT–111A60W1, DOT–111AW1, and DOT–111A100W3) have a 20-year periodic test interval, based on relief granted under a petition submitted by the American Petroleum Institute in 1970 (35 FR 7120, May 5, 1970). These tank cars are in service 20 years before their first periodic test. After the 20 year inspection and test, the tank cars are inspected every 10 years (i.e., a 20–10 periodic test interval).

After reviewing the periodic test intervals and the commodities authorized in each tank, FRA found several inconsistencies:

(1) Prior to publication of a final rule under Docket HM–181 ("Performance-Oriented Packaging Standards; Changes to Classification, Hazard Communication, Packaging, and Handling Requirements Based on UN Standards and Agency Initiative," 55 FR 52402; December 21, 1990), the regulations authorized several different DOT Specification tank cars for the same material. For example, sodium hydroxide liquid or solution (Class 8) and carbolic acid (Division 6.1) are authorized in DOT 111A60W1 or 111A60W2 tank cars. If a shipper uses a new DOT 111A60W1 tank car, the tank car has a 20–10 periodic test interval; and, if the shipper uses a new DOT 111A60W2 tank car, the tank car has a 5–3–1 test interval.

(2) For some corrosive materials, the regulations specify a 5–3–1 interval based on the authorized tank specification, regardless of the rate at which the material corrodes the tank car shell.

(3) The DOT 105A500W tank car requires an inspection and test every 2 years when in chlorine service, but every 10 years when used in other hazardous materials service.

(4) The current periodic test intervals do not adequately consider the effects of fatigue on the car structure for the creation of cracks and other flaws or the proper inspection intervals to detect flaws before they reach a critical size.

These inconsistencies were compounded by certain revisions adopted under Docket HM–181 because shippers have more latitude to choose specification tank cars for specific hazardous materials, including Class 8 (corrosive) materials (*See* 55 FR 52402, 52443, December 21, 1990). In short, shippers may choose to use tank cars with a 20–10 periodic test interval even though the materials are corrosive to the tank. RSPA and FRA believe that the current approach, basing the periodic test interval on the tank specification, may lead to more frequent releases of hazardous materials through the tank shell from cracks and corrosion. As discussed below, there is a need to revise the existing periodic inspection and test intervals for tank cars and to base them on factors such as service environment, structural fatigue, crack propagation, and corrosion.

E. Inspection Intervals, Materials Not Corrosive to the Tank

Based on data collected thus far, FRA finds that cracks may reach a critical size adjacent to welds and welded attachments on the bottom shell within about 400,000 miles of railroad service (*see* "Owners of Railroad Tank Cars; Emergency Order Requiring Inspection and Repair of Stub Sill Tank Cars," 57 FR 41799 September 11, 1992). In meetings leading to the development of FRA's Emergency Order No. 17 (57 FR 41799, September 11, 1992), RPI noted that establishing the fatigue life of a structure such as a tank car required consideration of many factors, among them the commodity carried, the typical routing of the tank car, the length of the trip, accumulated mileage, and the design characteristics of the tank car, including the material used to construct it. RPI says, and AAR agrees, that the best single factor, by far, is accumulated mileage. RSPA and FRA agree that, given the current state of knowledge and the results of both research and the analysis of material gathered in this and similar proceedings, mileage is the most dependable general predictor of the onset of the effects of fatigue.

Common protocols for NDT (including Collins, J.A., Failure of Materials in Mechanical Design,©1981, John Wiley & Sons Inc., New York, p. 299) allow for two opportunities to inspect an item before predicted failure. This helps ensure against premature failure. Because tank cars travel an average of about 18,000 miles per year, an inspection and test interval of 10 years allows the recommended two inspections, with a safety factor. For the sake of efficiency, and to increase safety margins for most cars, FRA and RSPA propose to implement this 10-year inspection and test interval starting at what would otherwise be the next scheduled tank hydrostatic pressure test. This 10-year interval coincides with Rule 88 B.1. in the AAR's Field Manual of Interchange Rules. For 20–10 tank cars within the initial 20-year periodic hydrostatic test interval (i.e., Class DOT 103W, 104W, 111A60W1, 111A100W1, and 111A100W3 tank cars), it is proposed that the next inspection and test date be the date of publication of this rule, plus one-half of the remaining years to what would otherwise be the next scheduled tank hydrostatic test. After that the tank would be inspected at a 10-year interval. RSPA and FRA believe that the proposed uniform approach to tank car inspection and test is fair, safe, and enforceable.

FRA realizes, however, that some tank cars can travel in excess of the 18,000 mile annual average and, by doing so, the tank cars may reach 200,000 miles of railroad service before their first periodic inspection and 400,000 before their second. Because car owners can keep track of car miles traveled and FRA and RSPA, as a practical matter, cannot; because there are no distinguishing markings for high mileage tank cars; and because all tank cars have at least the potential to become high mileage tank cars, car owners are reminded that the proposals in this notice do not prohibit inspection and test intervals shorter than those mandated. Owners with high mileage cars should inspect their tank cars more frequently than the regulatory period proposed here and are encouraged to do so, by marking the tank car with the revised due date.

F. Inspection and Test Intervals, Materials Corrosive to the Tank

For corrosive materials in non-lined or non-coated tank cars, an inspection and test interval would be based on the lower of the corrosion rate of the tank shell or the fatigue life of the tank structure as discussed above. In this notice, FRA has developed an interval to ensure that the calculated thickness of the tank at the next inspection and test will not fall below the allowable minimum wall thickness. The inspection and test interval in this case is calculated by subtracting the actual thickness (measured at the time of construction or any subsequent inspection and test) from the allowable minimum thickness and then dividing that difference by the hazardous material's corrosion rate on the tank. As the shell thickness corrodes throughout the service-life of the tank, the inspection and test interval becomes more frequent. The test interval may not exceed ten years. Tank car operators may defer inspection and test costs by using tanks with thicker than minimum shells, by constructing tanks with a material that resists corrosion, or by using linings or coatings. If a lining or coating is used, there is no requirement in this notice for calculating the inspection and test interval based on corrosion, although inspection and testing of the lining or coating will be required as discussed below. Linings include glass and lead; coatings include organic, aluminum, and zinc materials. As a guide in determining the corrosion rate on the tank, owners of tank cars may refer to the National Association of Corrosion Engineers (NACE) Standard: "Test Method Laboratory Corrosion Testing of Metals For the Process Industries."

RSPA proposes to remove Table 1 and related footnotes from § 173.31 (c) and to move the inspection and test requirements to new subpart F of part 180.

G. Lining and Coating Inspections and Tests

RSPA proposes inspection and test requirements for tank cars with linings and coatings. This would ensure that the lining or coating is in proper condition for the transportation of hazardous materials. Since 1987, the Department's hazardous materials incident database shows that there have been 23 incidents involving lining or coating failures on tank cars that resulted in the release of hazardous material. As proposed, owners of lined or coated tank cars must determine the periodic inspection interval and inspection technique for the lining and coating, based on the owner's knowledge of the material used. The owner must also maintain all supporting documentation used to make such a determination, such as the lining or coating manufacturer's recommended inspection interval and inspection technique, at the owner's principle place of business. The supporting documentation used to make such inspection interval determinations and the inspection technique must be made available to FRA upon request.

H. Safety System Inspections

The HMR require tank cars used for transporting flammable gases and ethylene oxide to have thermal protection systems, consisting of either a thermal blanket or a thermal coating. In June 1991, General American Transportation Corporation (GATX) began an investigation into the thermal integrity of certain tank cars modified

with a "thermal blanket" to protect the tank car and the commodity within it from fire. The purpose of GATX's investigation was to determine if the thermal blanket on the top of the car remained in place after a period of several years. GATX found that the thermal blanket receded from the top of some tank cars, especially when the thermal blanket was not held in place with wire mesh or banding. Shortly after GATX's investigation, the AAR informed owners of tank cars about the findings reported by GATX. The AAR also began to investigate the extent of thermal integrity loss on tank cars by surveying several tank car owners. The results of the AAR's investigation are not complete, but preliminary data indicate that some owners have reported thermal integrity losses on some tank cars.

RSPA and FRA have stated on numerous occasions, including in a **Federal Register** publication, that if a tank car no longer meets the applicable specification, it may no longer be represented as meeting the specification, such as by marking the tank "DOT" (49 CFR 171.2(c)). For example, if there is a sufficient loss of thermal protection on a tank car, such that the tank car will no longer survive the pool and torch fire performance standard prescribed in § 179.105–4, the tank car may no longer be represented as a thermally protected tank car. Safety systems, that is, systems built into the car, may deteriorate after years of use. In addition to thermal protection, these systems include the manner in which a tank car was fabricated and maintained, the integrity of a tank head puncture resistance systems, and the coupler vertical restraint system, after years of use.

RSPA is proposing to add explicit requirements for the inspection of thermal protection systems, tank head puncture resistance systems, coupler vertical restraint systems, and devices used to protect discontinuities. If, after an inspection, one or more of these systems do not conform to the applicable specification requirements contained in part 179, renewal or repair of the system would be necessary to continue the qualification of the tank car. In this notice, RSPA is not proposing the use of any specific inspection method for thermal protection systems, although jacket removal, jacket inspection ports, infrared inspection techniques, and thermography are options to ensure their integrity. Nothing in the proposed regulation would preclude a tank car owner from marking a tank as meeting a less stringent specification, such as re-marking a Class DOT 112J tank car to a DOT 112S or 112A tank specification when the tank car no longer conforms to the Class DOT 112J standard, or when the tank car owner chooses not to inspect the thermal protection system when the product intended for transport in the tank car does not require such a system.

I. Minimum Shell Thickness

Under the current HMR, the only requirement for measuring tank car thickness is at the time of construction or after a repair involving the removal of metal. When a metal plate is first formed into a rolled "hoop" that will become part of the tank shell, it must be the thicker of the dimension specified in a chart summarizing specification requirements (e.g., § 179.101(a) or § 179.201–1(a)) or the result of a calculation that includes the required bursting pressure, the inside diameter of the tank and the tensile strength of the material from which the shell is formed (e.g., § 179.100–6(a)). If a repair involving the removal of metal is made, the regulations, stated broadly, permit the removal of 0.158 cm (1/16-inch) over a localized area. (See § 173.31(a)(11) for more detail.) The proposals in this notice recognize that tank car shell thickness tends to degrade over time. In addition, and enabled by enhanced inspection and test procedures, the proposals in this notice clarify both a standard for new construction and a definite service life shell thickness requirement for all areas of the tank shell and heads.

Commenters to an earlier rulemaking on localized thin spots under HM–201B submitted a table entitled "Allowable Thickness Reduction from Minimum Prescribed Thickness of Carbon Steel Tank Car Tanks," prepared by the AAR, allowing shell thickness below the part 179 construction standard in certain areas. In addition, the AAR subsequently submitted additional data in a report in support of its table. (*see* Johnson and Phillips, Study of Railroad Tank Car Thickness Minimums, Report # RA–12–3–56, AAR-RPI Railway Tank Car Safety Research and Test Project, 1989, Chicago, IL). Many commenters endorsed the AAR table and, except as noted below, RSPA and FRA also concur with the AAR table.

The major differences between the allowable tank car thickness reductions in the AAR table and the proposals contained in this NPRM are as follows:

(1) The AAR table applied only to carbon steel tank cars; this NPRM expands the concept to tank cars constructed of other materials. In a letter dated March 29, 1989 to the Administrator of RSPA, the AAR explained that limited research on carbon steel was the basis for their recommendation. Although the AAR research was on carbon steel, the physical properties of stainless steel and manganese-molybdenum steel support similar standards. RSPA and FRA propose to include aluminum and nickel tank cars as well because these cars are mounted on a car structure (i.e., a center sill); and therefore, the transmission of any load (e.g., inertia, buff, draft, and vertical coupler loads) is through the sill structure and not the tank. Tank anchors on aluminum and nickel cars transfer some stresses to the tank car shell through single ended impacts, although these shell stresses are less than those encountered on tanks that form part of the car structure (i.e., stub sill tank cars). This notice proposes a conservative limit on the amount of reduced shell thickness in these stressed areas to ensure an acceptable level of safety.

(2) The AAR table did not cover nickel clad tank cars. This notice proposes to include those tank cars because they conform to the part 179 standards for carbon steel cars, but with an added nickel clad [liner] in the interior of the tank car to inhibit corrosion.

(3) The table submitted by the AAR and this NPRM differ on the definition of a permissible "localized area of thickness reduction." The AAR table would have limited the localized area to a 60.96 cm (24 inches) perimeter. This notice proposes to allow localized areas of thickness reduction to have a total cumulative surface perimeter not exceeding 182.88 cm (72 inches), consistent with the current provisions in § 173.31(a)(11)(iv). In the HM–201 rulemaking on localized shell reductions, RSPA and FRA explained that the AAR requirement to limit the maximum reduction in shell thickness perimeter to 60.96 cm (24 inches) is unduly restrictive, and this proposal follows that explanation. (see "Shippers; Use of Tank Cars with Localized Reductions in Shell Thickness;" 54 FR 8336, 8337, February 28, 1989).

J. Damage-tolerance Fatigue Evaluations

The FRA has found that the tank shell and the attachment welds in the bottom shell, generally the area within four feet of the bottom centerline, are susceptible to fatigue cracking due to repeated loading conditions. Stress concentrations in the tank shell may cause the formation of small cracks that may not be detected, even at the next inspection and test. Long cracks stand a

greater chance of detection, but cracks are short during most of their existence and, unless the inspector knows where to search for such defects, they may never be found. RSPA and FRA consider that knowledge of inspection and test methods, the sensitivity of the inspection and test technique, the minimum detectable crack depth and length, and the locations on the tank car that are likely to receive high combined loadings are essential for reliable crack detection.

In an investigation of the structural integrity of certain dual-diameter tank cars, FRA found that the bottom shell of these tank cars was susceptible to fatigue cracking. In this investigation, FRA required the owners of dual-diameter cars to inspect a sample of each design for defects using NDT techniques (*see* Owners of Railroad Tank Cars, Railroads; Emergency Order Requiring Inspection and Repair of Dual Diameter Tank Cars, 57 FR 11900 April 7, 1992.

In its previously noted 1992 report on the inspection and testing of tank cars, NTSB disclosed that many defects are not routinely detected while tank cars are in service in the transportation system and that defects may suddenly grow to a critical size and lead to failure of the tank car. The NTSB recommended in this investigation that FRA and RSPA promulgate requirements for the periodic inspection and tests of tank cars to help ensure the detection of cracks before the cracks propagate to a critical length. Such requirements would establish inspection and test intervals based on the defect size detectable by the inspection and test method used and on the stress level and crack propagation characteristics of the structural component.

"Damage-tolerance" means the ability of a structure to maintain adequate residual strength in a damaged condition. Damage-tolerance assumes that flaws exist in the structure and that the design of the structure is such that these flaws will not grow to a critical size and cause catastrophic failure to the structure within a specified period of time. In simplified terms, damage-tolerance recognizes that there are some components of a structure that can be damaged without adversely affecting the structure's ability to perform, i.e., a mildly dented fender on a car; that there are some components that can be damaged without seriously hampering the ability of the structure to perform essential activities, e.g., a broken door window on an automobile, or a single burned-out head lamp; and that there are some components that continually wear and, at some point, are no longer capable of sustaining the ability of the structure to perform, e.g., the wearing-out of tires, or the wearing of engine bearings. RSPA and FRA concur with the thrust of the NTSB's recommendation relating to improved procedures for periodic inspection and testing of railroad tank cars. In fact, many NDT techniques are currently applied under other inspection and test programs mandated by RSPA and FRA.

RSPA also proposes to allow a person to use an alternative inspection and test procedure or interval based on a damage-tolerance fatigue evaluation, when the evaluation is examined by the AAR Tank Car Committee and approved by FRA's Associate Administrator for Safety.

FRA anticipates that some tank car owners will reduce inspection and test costs by proposing an inspection and test procedure or interval on a damage-tolerance approach that incorporates: (1) In-service inspection and test using techniques such as ultrasonic or acoustic emission; (2) sampling of individual designs with a 100 percent inspection and test of the design if a crack is found; (3) inspection and test intervals unique to each tank car component; and, (4) inspection and test intervals based on the degree of risk a material poses (i.e., high risk materials have shorter inspection and test intervals than those with low risks).

K. Quality Assurance Programs (QAP)

RSPA is proposing to require that each tank car facility establish Quality Assurance Programs (QAP) to help prevent and detect non-conformities during the manufacturing, repair, or inspection and test process. A tank car facility would be defined as a facility that requires certification under appendix B of the AAR Specifications for Tank Cars.

The NTSB recommended, in a report following their investigation of an incident involving a tank car of butadiene, on September 8, 1987, in New Orleans, Louisiana, that FRA establish quality control requirements for tank car manufacturers and tank car repair shops sufficient to ensure that actions taken by persons in those entities conform to Federal regulations and with conditions established in the AAR criteria for approval of a tank car facility to manufacture, repair, or modify rail tank cars. (see Butadiene release and fire from GATX 55996 at the CSX terminal junction interchange, New Orleans, LA, September 8, 1987, NTSB/HZM-88/01, National Transportation Safety Board, 1988.) The NTSB further recommended that FRA require tank car repair shops to develop and maintain current written procedures to guide their employees in performing work on tank cars and that the repair shops train their employees on those procedures. This proposal reflects the findings of the NTSB in their investigation.

The proposed QAP requirements would require each tank car manufacturing or repair facility to develop procedures that have the means to detect any nonconformity in the manufacturing, maintenance, or repair process and that have the means to prevent its recurrence. Furthermore, the proposed Quality Assurance Program must ensure that the finished product conforms to the requirements of the applicable specification and the regulations in the HMR. Interested persons may find useful information in developing their QAP in the 1991 edition of the AAR Specifications for Quality Assurance, M-1003.

At a minimum, QAPs must have the following elements—

(1) Authority and responsibility for those in charge of the quality assurance program;

(2) An organizational chart showing the interrelationship between managers, engineers, purchasing, construction, inspection, testing, and quality control departments;

(3) Procedures that ensure that the latest applicable drawings, design calculations, specifications, and instructions are used in manufacture, inspection, and testing;

(4) Procedures to ensure that the fabrication and construction materials received are properly identified and documented;

(5) A description of the manufacture, inspection, and testing program so that an inspector can determine the period of specific inspections and test;

(6) Monitoring and control of suitable processes and product characteristics during production;

(7) Procedures for the correction of imperfections found by the inspector;

(8) Provisions indicating that the requirements of the AAR Specifications for Tank Cars apply;

(9) Qualification of personnel performing ultrasonic, radiographic, dye penetrant, magnetic particle, or other non-destructive test inspections and tests according to Appendix W of the AAR Specifications for Tank Cars;

(10) Qualifications of personnel performing magnified visual imagery inspections (including fiber optic, borescope, and videoimagescope systems). Under these requirements, the examiner must have the capability to consistently and repetitively find flaws under test conditions. Furthermore, the

requirements must include visual acuity where detectability (minimum size of a flaw that an examiner can find); resolution (minimum distance at which two flaws may be seen separately); and contrast sensitivity (minimum detectable thickness change [convolutions] over a surface area) further define the qualifications of the visual examiner;

(11) Procedures for evaluating the inspection and test technique employed, including the accessibility of the area and the sensitivity of the inspection and test technique and minimum detectable crack length;

(12) Procedures for the periodic calibration and measurement of inspection and test equipment;

(13) A system for the maintenance of records, inspections, tests and the interpretation of inspection and test results;

(14) Procedures to ensure that only personnel qualified for each non-destructive inspection and test perform that particular operation; and

(15) Written procedures for their employees to ensure that the work performed on the tank car conforms to the applicable DOT or AAR specification and the AAR approval for the tank car. Persons interested in including tank cars built to Canadian or Mexican specifications are asked to discuss the issue in their comments to this docket.

RSPA and FRA do not consider the proposal for a mandatory QAP to create an undue burden because each tank car facility that performs welding on the tank during any fabrication, alteration, conversion, or repair must already have a QAP to obtain "certified" status as an AAR approved shop.

A one year transition period is proposed for the development of the QAP and the written procedures that guide employees performing work on tank cars. Commenters are asked to submit alternative implementation schedules, with supporting justification, in response to this NPRM.

II. Overview

The proposal in this NPRM potentially affects most of the Parts of the Hazardous Materials Regulations. To aid those persons reviewing this NPRM, this Overview is included along with the Review by Section; it is intended to make further review easier by sketching the relationships between the various parts of the HMR as they are potentially affected by the proposals contained in this notice. This Overview does not treat each proposed change in detail and, therefore, interested persons are advised to read this entire notice for a more complete understanding of the changes that would be made by adoption of the rule proposed here.

The definitions in part 171 would be augmented by defining the area included in the term "bottom shell."

Part 172 contains the hazardous materials table (HMT) with section references and special provisions. Amendments to sections directly affecting tank cars in this notice are mirrored in the special provisions to the hazardous materials table.

Part 173 contains requirements for shippers; the primary impact of this NPRM would be on the standards for qualifying, maintaining, and using tank cars now found in § 173.31. The guidelines for selecting the right tank car for the commodity to be transported would stay in proposed part 173; the requirements for the pre-trip inspection that makes certain that a tank car is in proper condition for transportation would be moved to part 174; and the periodic testing requirements now in § 173.31(c) would be moved to part 180.

Requirements specific to the railroad transportation of hazardous materials are found in part 174. The proposals in this docket would move the current § 173.31(b), containing requirements for "examination before shipping" to a new § 174.68.

Essentially all of the Federal requirements for building and repairing tank cars are now in part 179. Regulations pertaining to new construction would remain in part 179 and regulations for on-going repairs, inspections, and tests would be moved to a newly created subpart F of part 180 Such a move is patterned on and indeed parallels efforts by other agencies within DOT to separate the rules for building a container for hazardous materials from the rules on keeping it safe during its useful life.

The following table lists the proposed paragraphs or sections and, where applicable, the corresponding paragraph or section contained in the current HMR. In some cases, the cross references are to provisions which are similar to, but not identical with current provisions.

New section	Old section
173.31(a)(1)	173.31(a).
173.31(a)(2)	173.31(a)(4) [except 4th and 5th sentence].
173.31(b)(1)(i)..	173.31(a)(5) [except 2d sentence].
173.31(b)(1)(ii)..	173.31(a)(6) [except "Effective November 15, 1990" beginning of 1st sentence].
173.31(b)(2)(i)..	173.31(a)(12).
173.31(b)(2)(ii)..	173.31(a)(15).
173.31(c)	173.31(a)(7) [except "Effective July 1, 1991" beginning of 1st sentence].
173.31(d)	173.31(a)(14).
173.31(e)	173.31(a)(17).
173.31(f)	173.31(a)(3).
173.319(e)	173.31(c)(13).
174.68(a)	173.31(b)(1), (2), and (3).
174.68(b)	173.24b(b).
179.7	
180.501	
180.503	
180.505	
180.507	
180.507(a)	173.31(a)(1).
180.507(b)(1), (2), (3), and (4)	173.31(a)(2), (8), (9), and (10).
180.509	
180.509(a)(2)..	173.31(c)(10).
180.509(a)(3)..	173.31(c)(8).
180.509(b)(3)..	173.31(a)(16).
180.509(b)(4)..	173.31(c)(9).
180.509(b)(5)..	173.31(e).

New section	Old section
180.509(d)(6)..	173.31(c)(14).
180.509(f)	173.31(a)(11).
180.509(g)	173.31(a)(11) and (f).
180.509(h)(2)..	173.31(c)(6).
180.511	
180.511(a)	173.31(c)(3).
180.513	173.21(f) and 179.6.
180.515	173.31(c)(7).
180.517	173.31(c)(8).
180.517(b)	173.31(c)(8).
180.519	173.31(d).

III. Review by Section

Part 171

Section 171.8. As currently defined, "bottom shell" means

that portion of a tank car tank surface, excluding the head ends of the tank car tank, that lies within two feet, measured circumferentially, of the bottom longitudinal center line of the tank car tank.

FRA learned from its experience with Emergency Order No. 16 and other field investigations that welding flaws may exist outside of the currently defined area. Experience with finite element analysis and the mapping of stress concentrations in the tank structure under various loading conditions also shows that concentrated stresses appear outside the currently defined area. If the proposals in this notice become final regulations, the definition of the "bottom shell" would be revised to include an additional 61 cm (2 feet) on each side of the center line. The FRA believes that by thus increasing the width, inspections of the bottom shell will more completely encompass the high-stressed areas of the tank.

Part 172

Section 172.101. In the HMT, special provision "B41," appearing in column (7) of the entries for "benzyl chloride," "fluorosulfonic acid," and "titanium tetrachloride" would be removed. Also, HMT special provision "B43," appearing in column (7) of the entries for "carbon dioxide, refrigerated liquid," "hydrogen chloride, refrigerated liquid," and "vinyl fluoride, inhibited" would be removed.

Section 172.102. Special provisions "B41" and "B43" would be removed because they are unnecessary. The inspection and test intervals (i.e., 5–3–1) specified in special provision "B41" and the non-destructive tests requirements specified in special provision "B43" would be incorporated into the proposed Subpart F of Part 180.

Part 173

Section 173.31. This section would be completely revised and entitled "Use of Tank Cars," and reorganized for clarity. The provisions would not be substantially changed. Current paragraph (a) would remain in this section. In paragraph (b) pre-trip inspection and securement requirements would be moved to part 174 and referenced in this section. Paragraph (c) containing certain periodic test and inspection requirements would be moved to subpart F of part 180.

Proposed paragraph (a)(1) is current § 173.31(a) revised to correspond to the language in the HMR for cargo tanks and portable tanks (see §§ 173.32c(a) and 173.33(a)). The section would also include "AAR" specifications since the use of these tank cars for hazardous materials service is authorized in the HMR (see §§ 173.241 and 173.242). When these tank cars are used for the transportation of hazardous materials, the tank cars must meet the minimum specification for new construction as required by the AAR.

Proposed paragraph (a)(2) is current § 173.31(a)(4). The fourth sentence in current § 173.31(a)(4) would be removed since it is essentially the same as the second sentence in the same paragraph. The fifth sentence would be removed since it is essentially the same as the prohibited marking requirements in § 172.303(a).

Proposed paragraph (a)(3) would provide that no person may fill a tank car with a hazardous material when the car is overdue for periodic inspection and test. This provision will allow the movement of tank cars containing the residue of a hazardous material to a tank car facility for inspection and test. This paragraph was proposed in Docket HM–166X as § 173.31(b)(4) (56 FR 37505, August 7, 1991). It is consistent with provisions allowing similar movements for cargo tanks, portable tanks, and multi-unit tank car tanks (see §§ 173.31(d)(10), 173.32c(c), and 173.33(a)(3) respectively).

Proposed paragraph (a)(4) is added to reinforce the inspection requirements that must be fulfilled before a tank car of hazardous materials is offered for transportation. In this notice, RSPA proposes to move the requirements in the current § 173.31(b)(1)(2) and (3) to a new section 174.68.

Proposed paragraph (b)(1)(i) is current § 173.31(a)(5). The proposed paragraph would be revised by removing the reference to the compliance date, now past, for equipping DOT-specification tank cars not transporting hazardous materials with shelf couplers.

Proposed paragraph (b)(1)(ii) is current § 173.31(a)(6). The proposed paragraph would be revised by removing the reference to the compliance date, now past, for equipping non-DOT specification tank cars transporting hazardous materials with shelf couplers.

Proposed paragraph (b)(2)(i) is current § 173.31(a)(12). Proposed paragraph (b)(2)(ii) is current § 173.31(a)(15). The latter provisions would be simplified by using the term "poisonous by inhalation" (see § 171.8) in place of the defining criteria.

Proposed paragraph (c) is current § 173.31(a)(7). The requirements would be revised by removing the reference to the compliance date, now past, for welding air brake equipment support attachments to pads instead of directly to the tank shell.

Proposed paragraph (d) is current § 173.31(a)(14). The proposed paragraph would be revised by changing the term "uninsulated" to "non-insulated." Proposed paragraph (e) is current § 173.31(a)(17). The provision would be simplified by using the current definition of "poisonous by inhalation" (see § 171.8) in place of the defining criteria.

Proposed paragraph (f) is current § 173.31(a)(3). The paragraph would be simplified by removing the specific "DOT" Class references and by explaining that any tank of the same class with a higher tank test pressure than the tank authorized in the HMR may be used. The paragraph would also be simplified by specifying the hierarchy of the letters in the specification marking that describe

special protective systems (e.g., "J" for thermally protected, jacketed cars, "T" for thermally protected, non-jacketed cars; "S" for cars with head shields but without thermal protection; and "A" for cars without protective systems).

Section 173.319. Paragraph (a)(4)(iii) is revised by removing the parenthetical reference. Current paragraph 173.31(c)(13) is redesignated as proposed paragraph § 173.319 (e). Proposed paragraph (e) would be revise for clarity and units of measurements would conform to current SI nomenclature. Furthermore, this notice proposes to change the term "stencilling" to "marking" for consistency with the terminology used throughout the HMR.

Part 174

Section 174.68. Proposed paragraph (a) is current § 173.31 (b) (1), (2), and (3). To determine if a "tank and safety appurtenances and fittings are in proper condition for the safe transportation of the lading" this section would be expanded to clarify and define the areas on the tank, safety appurtenances, and fittings needing pre-trip shipper inspection.

Proposed paragraph (b) refers to the requirement in §§ 173.24(b) and (f) that package (including tank car) closures be so designed and closed that there is no identifiable release of hazardous materials into the environment and would establish the rebuttable presumption of an improper inspection under § 174.68(a)(4) if closures are found in less than a tool-tight condition during transportation. Current § 173.31(b)(1) requires that "the shipper (offeror) must determine to the extent practicable, that * * * fittings are in proper condition * * *" FRA's experience in enforcing § 173.31(b)(1) is that, when a tank car is discovered during transportation with a loose closure, the offeror will argue that the car was inspected and that all "practicable" steps were taken to tighten the fittings. This argument ignores the clear requirement in § 173.24 that packages and fittings be designed and closed to prevent releases under conditions normally incident to transportation. As proposed in this notice, the inspection requirement in § 174.68 would be directly related to the design and operation requirements in § 173.24. RSPA and FRA believe that this alignment of the regulations will clarify requirements and that, by fostering compliance with safety standards, the proposal will improve hazardous materials transportation safety.

Part 179

Section 179.2. This section would be amended by adding a definition for "Tank car facility." A tank car facility means an entity that manufactures, repairs, inspects, or tests tank cars to ensure that the tank cars conform to Parts 179 and 180 of the regulations; it is an entity that effects the certificate of construction of the tank car or verifies that the tank car conforms to the specification.

Section 179.7. This section would be added to require tank car facilities to have a Quality Assurance Program.

Paragraph (a) would state the performance standard for the program. Paragraph (b) would require that the QAP have certain minimum requirements, as discussed in more detail earlier in this preamble under the subject heading "K. Quality Assurance Programs." Paragraph (c) would require tank car facilities to ensure that only personnel qualified for a particular non-destructive inspection and test perform that operation. Paragraph (d) would require each tank car facility to have written procedures, covering inspection, fabrication, and repair operations as appropriate, for their employees. Paragraph (e) would cross-reference the training requirements in subpart H of part 172. Section 172.702 requires that a hazmat employer, shall train each of its hazmat employees. A hazmat employer includes a person who represents, sells, offers, reconditions, tests, repairs, or modifies a packaging as qualified for the use in the transportation of hazardous materials (e.g., marking the tank car with the letters "DOT"). See definitions in § 171.8. Proposed paragraph (f) would specify the compliance date by which tank car facilities must have a quality assurance program and written procedures in effect.

Part 180

Subpart F of part 180. This subpart would contain the qualification and maintenance requirements for tank cars. The section headings, sections, and many paragraphs are similar to those for cargo tanks, currently found in Subpart E of Part 180.

Section 180.501. Paragraph (a) would specify the applicability of the proposed Subpart. Paragraph (b) would specify that any person who performs a function required by Subpart F of Part 180 must perform that function according to the regulations.

Section 180.503. This section proposes to define certain terms used throughout the subpart. For simplicity, the section makes applicable the terms currently used in Parts 171 and 179 for the construction of tank cars.

Section 180.505. This section proposes to require each tank car facility performing repair work to have a quality assurance program based on that proposed in § 179.7 for new car construction.

Section 180.507. This section would contain continuing qualifications for existing tank cars that are no longer authorized for new construction, such as a DOT 113A175W tank car. Proposed paragraph (a) is essentially current § 173.31(a)(1) except that it would be revised to include non-specification tank cars that are currently authorized for the transportation of hazardous materials. Proposed paragraphs (b) (1), (2), (3), and (4) are current § 173.31(a) (2), (8), (9), and (10).

Section 180.509. This section would specify the requirements for the periodic inspection and test of tank cars. Proposed paragraph (a)(1) would require each tank car facility to evaluate the tank according to the "Acceptable results of inspections and tests" as prescribed in proposed § 180.511. Paragraph (a)(2) would require marking each tank car passing a periodic inspection and test to indicate the date of inspection and test and the inspection and test due dates according to new § 180.515. This paragraph is similar to current § 173.31(c)(10). Proposed paragraph (a)(3) would require a written report for each tank car after it successfully passes an inspection and test. The report would contain with details of the inspections and tests conducted, the defects found, and the methods employed to repair them. The report must conform to the details specified in new § 180.517. This report is similar to current § 173.31(c)(8).

Proposed paragraph (b) would specify unusual conditions that may require an inspection and tests of tank cars, similar to § 173.32b(e) for portable tanks and § 180.407(b) for cargo tanks. Proposed paragraph (b)(1) would require an inspection and test if the tank shows evidence of abrasion, corrosion, cracks, dents, distortions, defects in welds, or any other condition unsafe for transportation. Proposed paragraph (b)(2) would require an inspection and test if the tank was in an accident and "damaged to the extent that may adversely affect its lading retention capability" (e.g., large dent or gouge in the tank shell). Proposed paragraph (b)(3) would be added to require an inspection and test if transferring the tank into or out of service that was corrosive to the tank. This paragraph is similar to the current requirements in §§ 173.31(a)(16), 173.32(i), and 180.407(b)(2) for tank car tanks, portable

tanks, and cargo tanks. Proposed paragraph (b)(4) would require an inspection and test if work was done on the tank that required welding, riveting, hot or cold forming, etc. This paragraph is similar to current § 173.31(c)(9). Proposed paragraph (b)(5) would require an inspection and test if the tank was involved in a fire. This paragraph is similar to current § 173.31(e) except that this proposal reflects that the fire repair requirements are now in § 180.513. Proposed paragraph (b)(6) would require an inspection and test, of either a single tank car or a design of tank cars, if required by FRA, based on probable cause. This paragraph is analogous to § 173.32(j) and § 180.407(b)(5) for portable tanks and cargo tanks, respectively. Probable cause may include an inspection and test where FRA discovers a crack in a welded area, a wheel burn, or a large dent or bulge in the tank shell; it may also include a group of cars of a given design if FRA discovers problems apparently related to cars of that design.

Proposed paragraph (c) would specify the frequency with which inspections and tests must be performed on tank cars. Proposed paragraph (c)(1) would specify the requirements for the inspection and hydrostatic test of DOT Class 107 tank cars and riveted tank cars. As noted above, the hydrostatic test is still effective for these tanks since it will detect loose rivets and areas of metal distress. Proposed paragraph (c)(2) would require an inspection for thermal integrity of DOT Class 113 tank cars in place of the inspection and testing requirements in subpart F of part 180. This paragraph cross-references the requirements in § 173.319(e). Proposed paragraph (c)(3) would specify the inspection and test requirements for fusion welded tank cars. The intervals would vary depending upon whether or not the tank was lined or coated and upon whether or not the car was transporting materials corrosive to the tank. This will ensure that the tank shell thickness does not degrade below the minimum shell thickness proposed in the NPRM before the next inspection and test cycle. For linings and coatings, this proposal would require a tank car facility to inspect the lining or coating based on the inspection and test intervals and techniques established by the owner. The owner must establish an inspection interval and test technique based on the manufacturer's recommendations or the owner's knowledge of the life-expectancy of the lining or coating.

Proposed paragraph (d) would specify the manner for conducting visual inspection required for each tank car. This section is similar to § 180.407 (d) and (e) for cargo tanks. Proposed paragraph (d)(1) would require an inspection of the tank internally and externally for abrasion, corrosion, cracks, dents, distortions, defects in welds, or any other conditions unsafe for transportation. Proposed paragraph (d)(2) would require the inspection of all piping, valves, fittings, and gaskets for corrosion and any other condition unsafe for transportation. Proposed paragraph (d)(3) would require an inspection for missing or loose bolts, nuts, or other elements. Proposed paragraph (d)(4) would require an inspection for all closures on the tank for proper securement and to prevent leaks in transportation. The tank car facility would also inspect the protective housings for proper securement. Proposed paragraph (d)(5) would require an inspection of the markings on the tank car for legibility. Proposed paragraph (d)(6) would require an inspection of the seats on excess flow valves. This paragraph is current § 173.31(c)(14).

Proposed paragraph (e) would require a structural integrity inspection and test on all circumferential and longitudinal welds and welded attachments on the bottom of the tank (122 cm [4 feet] on each side of the bottom tank centerline) using one or more non-destructive test methods.

Proposed paragraph (f) would require thickness measurements to determine that the tank is not below the minimum shell thickness proposed in the NPRM. This section is similar to current § 173.31(a)(11), but would expand the requirement beyond localized areas of reduced thickness to the full tank shell.

Proposed paragraph (g) would specify the minimum shell thickness reductions based on FRA research and comments received. This paragraph is a combination of current §§ 173.31(a)(11) and 173.31(f). Proposed paragraph (g)(i) would allow thickness reductions on carbon steel, stainless steel, aluminum, nickel, and manganese-molybdenum steels. Proposed paragraph (g)(ii) would specify the minimum shell and head thickness reductions for uniform and localized areas, provided:

(a) The cumulative surface perimeter of a localized area does not exceed 182.88 cm (72 inches);

(b) Any reduction in the shell thickness does not effect the structural strength of the tank;

(c) The tank car is not an "inner" tank for Class DOT 115;

(d) The tank car is not a Class DOT 103 or 104 tank car having an inside diameter greater than 243.84 cm (96 inches); and

(e) The tank car is not a Class DOT 111 in ethylene oxide service.

Proposed paragraph (h)(1) would require the inspection of the safety systems on the tank, such as thermal protection systems, tank head puncture resistance systems, and coupler vertical restraint systems, to ensure their integrity. Proposed paragraph (h)(2) would require the inspection and test of re-closing pressure relief devices (safety valves). This paragraph is current § 173.31(c)(6).

Proposed paragraph (i) would require an inspection and test of the lining and coating on the tank according to the owner's determinations.

Proposed paragraph (j) would require a leakage pressure test of the tank and appurtenances. This paragraph is similar to § 180.407(h).

Proposed paragraph (k) would allow an alternative inspection and test procedure, based on a damage-tolerance fatigue evaluation, if examined by the AAR Tank Car Committee and approved by the Associate Administrator for Safety FRA.

Proposed paragraph (l) would specify the compliance date for the new inspection and test requirements.

Section 180.511. This section would specify the acceptable results of inspections and tests. Proposed paragraph (a) would establish an acceptable visual inspection as one that shows no structural defect that may cause the tank to fail (including leak) before the next inspection and test interval. This paragraph is similar to current § 173.31(c)(3).

Proposed paragraph (b) would establish an acceptable structural integrity inspection and test as one that shows no structural defect that may initiate crack growth and cause the tank to fail before the next inspection and test interval, such as a propagating crack in a circumferential weld or welded attachment.

Proposed paragraph (c) would establish an acceptable service life shell thickness. An acceptable test is one that shows no areas of the tank below the minimum shell or head thickness allowable.

Proposed paragraph (d) would establish an acceptable safety system inspection, (e.g., thermal protection) as one that shows the systems conform to part 179. For example, the thermal protection system must be inspected to determine that the tank car has sufficient thermal integrity and the tank head puncture resistance system and support brackets must be inspected to ensure that they are secure and conform to the specification.

Paragraph (e) would establish an acceptable inspection and test for lining and coatings as one that shows no holes or degraded areas.

Paragraph (f) would establish an acceptable inspection and test for a leakage pressure test as one that shows no indications of leakage in any product piping, fitting, or closure.

Paragraph (g) would establish an acceptable hydrostatic test (for DOT Class 107 tank cars and riveted tank cars) as one that shows no leakage in the tank. Since there are very few Class DOT 107 tank cars and riveted tanks subject to this hydrostatic test requirement (approximately 137 Class DOT 107s and 120 riveted tank cars), this NPRM proposes that owners follow the hydrostatic test requirements that were in effect on [insert date final rule is published in the **Federal Register**].

Section 180.513. This section would specify that tank repairs must conform to the requirements of Appendix R of the AAR Specifications for Tank Cars. This paragraph is current §§ 173.31(f) and 179.6. Based on the comments received to the ANPRM, RSPA and FRA believe that the requirements for repair in the AAR Specifications for Tank Cars are acceptable for the detection and repair of cracks, pits and corrosion.

Section 180.515. This section would specify the marking requirements for tank cars after a successful tank inspection and test. This paragraph is similar to current §§ 173.31(c) (7) and (10), 179.100–21, and 179.200–25.

Section 180.517. This section would specify the reporting and record retention requirements after a tank has successfully completed its required inspection and test. This section is similar to current § 173.31(c)(8). Proposed paragraph (a) would require the tank owner retain the certificate of construction of the tank car (AAR form 4–2) and related documentation certifying that the tank conforms to the specification. The owner shall retain the documents for the period of ownership. Upon a change in ownership, Section 1.3.15 of the AAR Specifications for Tank Cars requires the transfer of these documents to the new owner. Proposed paragraph (b) would specify the inspection and test reporting requirements. This paragraph is current § 173.31(c)(8) revised to conform with § 180.417(b) for cargo tanks.

Section 180.519. This is current § 173.31(d). The paragraph is revised by changing the title "TABLE II," to read "TABLE I." The references to the table in the section would also be changed to reflect the new title.

IV. Regulatory Analysis and Notices

A. Executive Order 12291 and DOT Regulatory Policies and Procedures

This proposed rule does not meet the criteria specified in section 1(b) of Executive Order 12291 and, therefore, is not a major rule. The rule is not considered significant under the regulatory policies and procedures of the Department of Transportation (44 FR 11034). A regulatory evaluation is available for review in the Docket.

B. Executive Order 12612

This proposed rule has been analyzed in accordance with the principles and criteria contained in Executive Order 12612 ("Federalism"). The Hazardous Materials Transportation Act (HMTA) contains an express preemption provision (49 App. U.S.C. 1804(a)4)) that preempts State, local, and Indian tribe requirements on certain covered subjects. Covered subjects are:

(i) The designation, description, and classification of hazard materials;

(ii) The packing, repacking, handling, labeling, marking, and placarding of hazardous materials;

(iii) The preparation, execution, and use of shipping documents pertaining to hazardous materials and requirements respecting the number, content, and placement of such documents;

(iv) The written notification, recording, and reporting of unintentional release in transportation of hazardous materials; or

(v) The design, manufacturing, fabrication, marking, maintenance, reconditioning, repairing, or testing of a package or container which is represented, marked, certified, or sold as qualified for use in the transportation of hazardous materials.

This proposed rule concerns design, manufacturing, repairing, and other requirements for packages represented as qualified for use in the transportation of hazardous materials.

If adopted as final, this rule would preempt any State, local, or Indian tribe requirements concerning these subjects unless the non-Federal requirements are "substantively the same" (*see* 49 CFR 107.202(d)) as the Federal requirements.

The HMTA (49 App. U.S.C. 1804(a)5)) provides that if DOT issues a regulation concerning any of the covered subjects after November 16, 1990, DOT must determine and publish in the **Federal Register** the effective date of Federal preemption. That effective date may not be earlier than the 90th day following the date of issuance. RSPA requests comments on what the effective date of Federal preemption should be for the requirements in this proposed rule that concern covered subjects. Thus, RSPA lacks discretion in this area, and preparation of a federalism assessment is not warranted.

C. Regulatory Flexibility Act

Based on limited information concerning the size and nature of the entities likely to be affected by this proposed rule, I certify that this proposed rule would not have a significant economic impact on a substantial number of small entities. This certification is subject to modification as a result of a review of comments received in response to this proposal.

D. Paperwork Reduction Act

The information collection requirements contained in proposed §§ 179.7, 180.507, 180.509, and 180.517 are being submitted to the Office of Management and Budget for review under the provisions of the Paperwork Reduction Act of 1980 (44 U.S.C. 3504(h)). Comments on the collection of information should be sent to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC, Attention: Desk Officer for the Department of Transportation. Comments must reference the title of this notice, "Detection and Repair of Cracks, Pits, Corrosion, Lining Flaws, Thermal Protection Flaws and other Defects of Tank Car Tanks."

E. Regulatory Identifier Number (RIN)

A regulation identifier number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN number contained in the heading of this document can be used to cross-reference this action with the Unified Agenda.

V. List of Subjects

49 CFR Part 171

Exports, Hazardous materials transportation, Hazardous waste, Imports, Incorporation by reference, Oil, Reporting and recording requirements.

49 CFR Part 172

Hazardous materials transportation, Hazardous waste, Labels, Markings, Oil, Packaging and containers, Reporting and recordkeeping requirements.

49 CFR Part 173

Hazardous materials transportation, Packaging and containers, Radioactive materials, Reporting and recordkeeping requirements, Uranium.

49 CFR Part 174

Hazardous materials transportation, Radioactive materials, Railroad safety.

49 CFR Part 179

Hazardous materials transportation, Railroad safety, Reporting and recordkeeping requirements.

49 CFR Part 180

Hazardous materials transportation, Motor carriers, Motor vehicle safety, Packaging and containers, Railroad safety, and Reporting and recordkeeping.

In consideration of the foregoing, title 49, Chapter I of the Code of Federal Regulations, would be amended as set forth below:

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

1. The authority citation for part 171 would continue to read as follows:

Authority: 49 App. U.S.C. 1802, 1803, 1804, 1805, and 1818; 33 U.S.C. 1321; 49 CFR part 1.

2. In § 171.8, the definition of "Bottom shell" would be revised to read as follows:

§ 171.8 Definitions and abbreviations.

* * * * *

Bottom shell means the portion of the tank car surface, excluding the tank heads, that lies within 122 cm (four feet) measured circumferentially from the bottom longitudinal center line of the tank.

* * * * *

PART 172—HAZARDOUS MATERIALS TABLE, SPECIAL PROVISIONS, HAZARDOUS MATERIALS COMMUNICATIONS, EMERGENCY RESPONSE INFORMATION, AND TRAINING REQUIREMENTS

3. The authority citation for part 172 would continue to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, 1805, and 1808; 33 U.S.C. 1321; 49 CFR part 1, unless otherwise noted.

§ 172.101 [Amended]

4. In § 172.101, in the Hazardous Materials Table, the following changes would be made:

a. For the entries "Benzyl chloride", "Fluorosulfonic acid", and "Titanium tetrachloride", in Column (7), Special Provision "B41," would be removed.

b. For the entries "Carbon dioxide, refrigerated liquid", "Hydrogen chloride, refrigerated liquid", and "Vinyl fluoride inhibited", in Column (7), Special Provision "B43" would be removed.

§ 172.102 [Amended]

5. In § 172.102, in paragraph (c)(3), Special Provisions "B41" and "B43" would be removed.

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

6. The authority citation for part 173 would continue to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, 1805, 1806, 1807, 1808, and 1817; 49 CFR part 1, unless otherwise noted.

7. Section 173.31 would be revised to read as follows:

§ 173.31 Use of Tank Cars.

(a) *General.* (1) No person may offer a hazardous material for transportation in a tank car unless the tank car meets the applicable specification and packaging requirements of this subchapter or, when this subchapter authorizes the use of an "AAR" specification tank car, the applicable specification of the AAR Specifications for Tank Cars.

(2) Tank cars and appurtenances may be used for the transportation of any commodity for which they are authorized. Tank cars proposed for a commodity service other than authorized, must be approved for such service by the Association of American Railroads' Committee on Tank Cars. Transfer of a tank car from one authorized service to another may be made only by the owner or with the owner's authorization.

(3) No person may fill a tank car overdue for a periodic inspection or test with a hazardous material. Any tank car marked as meeting a DOT specification and any non-specification tank car transporting a hazardous material must have a periodic inspection and test conforming to § 180.509 of this subchapter.

(4) No person may offer a hazardous material for transportation in a tank car unless the tank car passes the inspection requirements of § 174.68 of this subchapter.

(b) *Safety Systems*—(1) *Coupler vertical restraint.* Each tank car used for transportation of hazardous material must be equipped with a coupler vertical restraint system that meets the requirements of § 179.14 of this subchapter.

(2) *Pressure relief devices.* (i) Pressure relief devices on tank cars must be of a type and design approved by the AAR Committee on Tank Cars and be constructed of metal not subject to deterioration by the lading.

(ii) Except for shipments of chloroprene, inhibited, in Class DOT 115 tank cars, tank cars used for materials meeting the definition for Division 6.1 liquids, Packing Group I or II, Class 2 gases, or Class 3 or 4 liquids, must have self-closing pressure relief devices. However, a tank car built before January 1, 1991, and equipped with a non-closing pressure relief device may be used to transport a Division 6.1 or Class 4 liquid if the liquid is not poisonous by inhalation. Unless otherwise specifically provided in this subchapter, frangible discs may not have breather holes.

(c) *Attachments.* No railroad tank car, regardless of its construction date, may be used for the transportation in commerce of any hazardous material unless the air brake equipment support attachments of such tank car conform to the standards for attachments set forth in §§ 179.100–16 and 179.200–19, as in effect on November 16, 1990.

(d) *Tank car test pressure.* A tank car used for the transportation of a hazardous material must have a tank test pressure equal to or greater than the greatest of the following:

(1) Except for shipments of carbon dioxide, anhydrous hydrogen chloride, vinyl fluoride, ethylene, or hydrogen, 133 percent of the sum of lading vapor pressure at the reference temperature of 46 °C (115 °F) for non-insulated tank cars or 41 °C (105 °F) for insulated tank cars plus static head, plus gas padding pressure in the vacant space of a tank car;

(2) 133 percent of the maximum loading or unloading pressure, whichever is greater;

(3) The minimum pressure prescribed by the specification in part 179 of this subchapter; or

(4) The minimum test pressure prescribed for the specific hazardous material in the applicable packaging section in subpart F or G of this part.

(e) *Interior heater coils.* Tank cars used for materials poisonous by inhalation may not have interior heater coils.

(f) *Tank car alternatives.* Unless otherwise specifically provided in this part:

(1) When this subchapter designates a specific specification tank car, the same class tank car with a higher marked test pressure also may be used.

(2) When the tank car specification delimiter is an "A," offerors may also use tank cars with a delimiter "S," "J" or "T."

(3) When the tank car specification delimiter is an "S," offerors may also use tank cars with a delimiter "J" or "T."

(4) When a tank car specification delimiter is a "T" offerors may also use tank cars with a delimiter of "J."

(5) When a tank car specification delimiter is a "J," offerors may not use any other specification delimiter.

8. A new paragraph (e) would be added to § 173.319 to read as follows:

§ 173.319 Cryogenic liquids in tank cars.

* * * * *

(e) *Special requirements for Class DOT–113 tank cars.* (1) A class DOT–113 tank car need not be periodically pressure tested; however, each shipment must be monitored to determine the average daily pressure rise in the tank car. If the average daily pressure rise during any shipment exceeds 20.68 Kpa (3 psi) per day, the tank must be tested for thermal integrity prior to any subsequent shipment.

(2) *Thermal integrity test.* When required by paragraph (e)(1) of this section, either of the following thermal integrity tests may be used:

(i) *Pressure rise test.* The pressure rise in the tank may not exceed 34.47 kPa (5 psi) in 24 hours. When the pressure rise test is performed, the absolute pressure in the annular space of the loaded tank car may not exceed 75 microns of mercury at the beginning of the test and may not increase more than 25 microns during the 24-hour period; or

(ii) *Calculated heat transfer rate test.* The insulation system must be performance tested as prescribed in 179.400–4 of this subchapter. When the calculated heat transfer rate test is performed, the absolute pressure in the annular space of the loaded tank car may not exceed 75 microns of mercury at the beginning of the test and may not increase more than 25 microns during the 24-hour period. The calculated heat transfer rate in 24 hours may not exceed:

(A) 120 percent of the appropriate standard heat transfer rate specified in § 179.401–1 of this subchapter, for DOT–113A60W and DOT–113C120W tank cars;

(B) 122.808 joules (0.1164 Btu/day/lb.) of inner tank car water capacity, for DOT–113A175W tank cars;

(C) 345.215 joules (0.3272 Btu/day/lb.) of inner tank car water capacity, for DOT–113C60W and 113D60W tank cars; or

(D) 500.09 joules (0.4740 Btu/day/lb.) of inner tank car water capacity, for DOT–113D120W tank cars.

(3) A tank car that fails a test prescribed in paragraph (e)(2) of this section must be removed from hazardous materials service. A tank car that was removed from hazardous materials service because it failed a test prescribed in paragraph (e)(2) of this section may not be used to transport a hazardous material until it conforms with all applicable requirements of this subchapter.

(4) Each frangible disc must be replaced every 12 months, and the replacement date must be marked on the car near the pressure relief valve information.

(5) Pressure relief valves and alternate pressure relief valve must be tested every five years. The start-to-discharge pressure and vapor tight pressure requirements for the pressure relief valves must be as specified in § 179.401–1 of this subchapter. The alternate pressure relief device values specified in § 179.401–1 of this subchapter for the DOT–113C120W tank car apply to the DOT–113D120W tank car.

PART 174—CARRIAGE BY RAIL

9. The authority citation for part 174 would continue to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, and 1808; 49 CFR 1.53(e), 1.53, App. A to part 1.

10. Section 174.68 would be added to read as follows:

§ 174.68 Inspection requirements prior to transportation.

(a) No person may offer a tank car containing a hazardous material or a residue of a hazardous material for transportation unless that person determines that the tank car is in proper condition and safe for transportation. As a minimum, each person offering a tank car for transportation must inspect:

(1) The tank shell and heads for abrasion, corrosion, cracks, dents, distortions, defects in welds, or any other condition that makes the tank car unsafe for transportation;

(2) The piping, valves, fittings, and gaskets for corrosion and other conditions that make the tank car unsafe for transportation;

(3) For missing or loose bolts, nuts, or elements that make the tank car unsafe for transportation;

(4) All closures on tank cars and determine that the closures and all fastenings securing them are properly tightened in place by the use of a bar, wrench, or other suitable tool;

(5) Protective housings for proper securement;

(6) The pressure relief device, including a careful inspection of the frangible disc in non-closing pressure relief devices, for corrosion or damage that may alter the intended operation of the device;

(7) Each tell-tale indicator after filling and prior to transportation to ensure the integrity of the frangible disc;

(8) The external thermal protection system, tank head puncture resistance system, coupler vertical restraint system, and other safety systems for conditions that make the tank car unsafe for transportation;

(9) The required markings on the tank car for legibility; and

(10) The periodic inspection date markings to ensure that the inspection and test intervals are within the prescribed intervals.

(b) Closures on tank cars are required, under this subchapter, to be designed and closed so that, under conditions normally incident to transportation, there will be no identifiable release of a hazardous material to the environment. Accordingly, in any action brought to enforce this section, the lack of securement of any closure to a tool-tight condition, detected at any point, will establish a rebuttable presumption that a proper inspection was not performed by the offeror of the car as required by § 174.68(a)(4). That presumption may be rebutted only by evidence establishing that the car was subjected to abnormal treatment, e.g., a derailment or vandalism.

PART 179—SPECIFICATIONS FOR TANK CARS

11. The authority citation for part 179 would continue to read as follows:

Authority: 49 App. U.S.C. 1803, 1804, 1805, 1806, and 1808; 49 CFR part 1, unless otherwise noted.

§ 179.1 [Amended]

12. In § 179.1, in paragraph (c), the section reference "§ 173.31" would be revised to read "§ 180.507".

13. In § 179.2, the following definition would be added, in the appropriate alphabetical order, to read as follows:

§ 179.2 Definitions and abbreviations.

* * * * *

Tank car facility means an entity that manufactures, repairs, inspects, or tests tank cars to ensure that the tank cars conform to this part and part 180 of this subchapter, that alters the certificate of construction of the tank car, or that verifies that the tank car conforms to the specification.

14. Section 179.7 would be added to read as follows:

§ 179.7 Quality assurance program.

(a) At a minimum, each tank car facility shall have a Quality Assurance Program, approved by the AAR, that—

(1) Ensures the finished product conforms to the requirements of the applicable specification and regulations of this subchapter;

(2) Has the means to detect any nonconformity in the manufacturing, repair, or testing of the tank car; and,

(3) Prevents non-conformities from recurring.

(b) At a minimum, the quality assurance program must have the following elements—

(1) Statement of authority and responsibility for those persons in charge of the quality assurance program.

(2) An organizational chart showing the interrelationship between managers, engineers, purchasing, construction, inspection, testing, and quality control departments.

(3) Procedures that ensure that the latest applicable drawings, design calculations, specifications, and instructions are used in manufacture, inspection, testing, and repair.

(4) Procedures to ensure that the fabrication and construction materials received are properly identified and documented.

(5) A description of the manufacturing, inspection, and testing program so that an inspector can determine specific inspection and test intervals.

(6) Monitoring and control of suitable processes and product characteristics during production.

(7) Procedures for the correction of imperfections.

(8) Provisions indicating that the requirements the AAR Specifications for Tank Cars, M–1002, apply.

(9) Qualification requirements of personnel performing ultrasonic, radiographic, acoustic emission, dye penetrant, magnetic particle, or other non-destructive inspections and tests.

(10) Qualification requirements of personnel performing magnified visual imagery inspections (including fiber optic, borescope, and videoimagescope systems). Under these requirements, the examiner must have the capability to consistently and repetitively find flaws under test conditions. Furthermore, the requirements must include visual acuity criteria where detectability (minimum size of a flaw that an examiner can find); resolution (minimum distance at which two flaws may be seen separately); and contrast sensitivity (minimum detectable thickness change [convolutions] over a surface area) further define the qualifications of the examiner.

(11) Procedures for evaluating the inspection and test technique employed, including the accessibility of the area and the sensitivity of the inspection and test technique and minimum detectable crack length.

(12) Procedures for the periodic calibration and measurement of inspection and test equipment.

(13) A system for the maintenance of records, inspections, tests, and the interpretation of inspection and test results.

(c) Each tank car facility shall ensure that only personnel qualified for each non-destructive inspection and test perform that particular operation.

(d) Each tank car facility shall establish written procedures for their employees to ensure that the work performed on the tank car conforms to the specification and the AAR approval for the tank car.

(e) Each tank car facility shall train its employees in accordance with subpart H of part 172 of this subchapter on the program and procedures specified in paragraph (b) of this section to ensure quality.

(f) *Date of conformance.* After January 1, 1995, no tank car facility may manufacture, repair, inspect, or test tank cars subject to requirements of this subchapter, unless it is operating in conformance with a Quality Assurance Program and written procedures required by paragraphs (a) and (b) of this section.

PART 180—CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS

15. The authority citation for part 180 would continue to read as follows:

Authority: 49 U.S.C. 1803; 49 CFR part 1.

16. A new subpart F would be added to part 180 to read as follows:

Subpart F—Qualification and Maintenance of Tank Cars

Sec.

180.501 Applicability.
180.503 Definitions.
180.505 Quality assurance program.
180.507 Qualification of tank cars.
180.509 Requirements for inspection and test of specification tank cars.
180.511 Acceptable results of inspections and tests.
180.513 Repairs, alterations, conversions, and modifications.
180.515 Markings.
180.517 Reporting and record retention requirements.
180.519 Periodic retest and reinspection of tank cars other than single-unit tank car tanks.

Subpart F—Qualification and Maintenance of Tank Cars

§ 180.501 Applicability.

(a) This subpart prescribes requirements, in addition to those contained in parts 107, 171, 172, 173, and 179 of this subchapter, applicable to any person who manufactures, fabricates, marks, maintains, repairs, inspects, or services tank cars to ensure that the tank cars are in proper condition for transportation.

(b) Any person who performs a function prescribed in this part shall perform that function in accordance with this part.

§ 180.503 Definitions.

The definitions contained in §§ 171.8 and 179.2 apply to this subchapter.

§ 180.505 Quality assurance program.

The quality assurance program requirements of § 179.7 of this subchapter apply.

§ 180.507 Qualification of tank cars.

(a) Each tank car marked as meeting a "DOT" specification or any other tank car used for the transportation of a hazardous material must meet the requirements of this subchapter or the applicable specification to which the tank was constructed.

(b) *Tank car specifications no longer authorized for construction.* (1) Tanks prescribed in the following table are authorized for service provided they conform to all applicable safety requirements of this subchapter:

Specification prescribed in the current regulations	Other specifications permitted	Notes
105A200W	105A100W	1
105A200ALW	105A100ALW	1
105A300W	ICC–105, 105A300	.....
105A400W	105A400	.....
105A500W	105A500	.....
105A600W	105A600	.....
106A500X	ICC–27, BE–27, 106A500	.....
106A800X	106A800	.....
107A * * *		2

Note 1: Tanks built as Specification DOT 105A100W or DOT 105A100ALW may be altered and converted to DOT 105A200W and DOT 105A200ALW.

Note 2: The test pressures of tanks built in the United States prior to January 1, 1956, may be increased to conform to Specification 107A, except that tanks built before 1941 are not authorized. Original and revised test pressures must be indicated and may be shown on a plate attached to the bulkhead of the car.

(2) For each tank car conforming to and used under an exemption issued before October 1, 1984, which authorized the transportation of a cryogenic liquid in a tank car, the owner or operator, if not the owner, shall remove the exemption number stenciled on the tank car and stamp the tank car with the appropriate Class DOT–113

specification followed by the applicable exemption number. For example: DOT-113D60W-E * * * * (asterisks to be replaced by the exemption number). The owner or operator marking a tank car in this manner shall retain on file a copy of the last exemption in effect during the period the tank car is in service. No person may modify a tank car marked under this paragraph unless the modification is in compliance with an applicable requirement or provision of this subchapter.

(3) Specification DOT-113A175W, DOT-113C60W, DOT-113D60W, and DOT-113D120W tank cars may continue in use, but new construction is not authorized.

(4) Class DOT 105A and 105S tank cars, constructed of ASTM A212B steel to ASTM A300 low temperature requirements, authorized under DOT E-3992 may continue in service, but new construction is not authorized.

§ 180.509 Requirements for inspection and test of specification tank cars.

(a) *General.* (1) Each tank car facility shall evaluate the tank car according to the requirements specified in § 180.511.

(2) Each tank car that successfully passes a periodic inspection and test must be marked as prescribed in § 180.515.

(3) A written report as specified in § 180.517(b) must be prepared in English for each tank car that is inspected and tested under this section.

(b) *Conditions requiring inspection and test of tank cars.* Without regard to any other periodic inspection and test requirement, tank cars must have an inspection and test according to this section if:

(1) The tank car shows evidence of abrasion, corrosion, cracks, dents, distortions, defects in welds, or any other condition that makes the tank car unsafe for transportation.

(2) The tank car was in an accident and damaged to an extent that may adversely affect its lading retention capability.

(3) The tank car is transferred into or out of a service that is corrosive to the tank.

(4) Repair(s), modification(s), or conversion of the tank car is performed requiring welding, riveting, caulking of rivets or hot or cold forming to restore tank car contour.

(5) The tank bears evidence of damage caused by fire.

(6) The Associate Administrator for Safety, FRA, so requires it based on the existence of probable cause that a tank car or a class or design of tank cars may be in an unsafe operating condition.

(c) *Frequency of inspection and tests.* Each tank car shall have an inspection and test according to the requirements of this paragraph.

(1) For Class 107 tank cars and tank cars of riveted construction, the tank car must have a hydrostatic pressure test and visual inspection conforming to the requirements in effect on [insert date final rule is published in the **Federal Register**] for the tank specification.

(2) For Class DOT 113 tank cars, see § 173.319(e) of this subchapter.

(3) For fusion welded tank cars, each tank car must have an inspection and test conforming to paragraphs (d) through (k) of this section—

(i) For cars transporting materials not corrosive to the tank, every 10 years for the tank and service equipment (i.e., filling and discharge, venting, safety, heating, and measuring devices).

(ii) For non-lined or non-coated tank cars transporting materials corrosive to the tank, an interval based on the following formula, but in no case shall the interval exceed 10 years for the tank and 5 years for service equipment.

$$i = \frac{t_1 - t_2}{r}$$

where:

i means the inspection and test interval

t_1 means the actual thickness

t_2 means the allowable minimum thickness under paragraph (g) of this section

r means the corrosion rate per year

(iii) For lined or coated tank cars transporting materials corrosive to the tank, every 10 years for the tank, 5 years for the service equipment, and an interval based on the owner's determination for the lining or coating, but not greater than every 10 years.

(A) Each owner of a tank car equipped with a lining or coating shall determine the periodic inspection interval and test technique for the lining or coating. The owner must maintain all supporting documentation used to make such a determination, such as the lining or coating manufacturer's recommended inspection interval and test technique, at the owner's principal place of business.

(B) The supporting documentation used to make such inspection and test interval determinations and technique must be made available to FRA upon request.

(d) *Visual inspection.* At a minimum, each tank car facility must visually inspect the tank externally and internally as follows:

(1) An internal inspection of the tank shell and heads for abrasion, corrosion, cracks, dents, distortions, defects in welds, or any other condition that makes the tank car unsafe for transportation, and except in the areas where insulation or a thermal protection system precludes it, an external inspection of the tank shell and heads for abrasion, corrosion, cracks, dents, distortions, defects in welds, or any other condition that makes the tank car unsafe for transportation;

(2) An inspection of the piping, valves, fittings, and gaskets for indications of corrosion and other conditions that make the tank car unsafe for transportation;

(3) An inspection for missing or loose bolts, nuts, or elements that make the tank car unsafe for transportation, and replacing or tightening those found missing or loose;

(4) An inspection of all closures on the tank car for proper securement in a tool tight condition and an inspection of the protective housings for proper securement;

(5) An inspection of excess flow valves having threaded seats for tightness; and

(6) An inspection of the required markings on the tank car for legibility.

(e) *Structural integrity inspections and tests.* At a minimum, each tank car facility shall inspect the tank car for structural integrity as specified in this section. The structural integrity inspection and test shall include all circumferential and longitudinal welds within the area of the bottom shell and all attachments welded to the bottom shell by one of the following inspection and test methods to determine that the welds are in proper condition:

(1) Dye penetrant test

(2) Radiography test

(3) Magnetic particle test

(4) Ultrasonic test

(5) Enhanced visual imagery (e.g., fiberscopes and borescopes)

(f) *Thickness tests.* (1) Each tank car facility shall measure the thickness of the tank car shell, heads, sumps, domes, and nozzles on each tank car by using a device capable of accurately measuring the thickness to within ±0.051 mm (±0.002 inch).

(2) After repairs, alterations, conversions or modifications of a tank car that results in a reduction to the tank car shell thickness, the tank car facility shall measure the thickness of the tank car shell in the area of reduced shell thickness.

(g) *Service life shell thickness allowance.* (1) A tank car found with a thickness below the required minimum thickness after forming for its specification, as stated in Part 179 of this subchapter, may continue in service if:

(i) Construction of the tank car shell and heads is from carbon steel, stainless steel, aluminum, nickel; or manganese-molybdenum steel; and

(ii) Any reduction in thickness of the tank shell or head is no more than that provided in the following tables:

UNIFORM SHELL THICKNESS REDUCTIONS

Location	Class DOT 103, 104, 111, and 115 tank cars (see notes)	Class DOT 105, 109, 112, and 114 tank cars (see notes)
Top of the tank car.	3.17 mm (1/8 inch).	0.79 mm (1/32 inch).
Bottom shell .	1.58 mm (1/16 inch).	0.79 mm (1/32 inch).

LOCALIZED SHELL THICKNESS REDUCTIONS

Location	Class DOT 103, 104, 111, and 115 tank cars (see notes)	Class DOT 105, 109, 112, and 114 tank cars (see notes)
Top of the tank car.	4.76 mm (3/16 inch).	1.58 mm (1/16 inch).
Bottom shell .	1.58 mm (1/16 inch).	1.58 mm (1/16-inch).

Notes:

[1] The cumulative perimeter for localized reductions may not exceed a 182.88 cm (72 inches) perimeter.

[2] Any reduction in the tank car shell does not affect the structural strength of the tank car so that the tank car shell no longer conforms to Section 6.2 of the Association of American Railroads Specifications for Tank Cars.

[3] 3Applies only to the outer shell for DOT Class 115 tank cars.

[4] For DOT Class 103 and 104 tank cars, the inside diameter may not exceed 243.84 cm (96 inches).

[5] No Class DOT 111A tank car with a reduced shell thickness may be used for the transportation of ethylene oxide.

(h) *Safety system inspections.* At a minimum, each tank car facility must inspect:

(1) Tank car thermal protection systems, tank head puncture resistance systems, coupler vertical restraint systems and systems used to protect discontinuities (i.e., skid protection and protective housings) to ensure their integrity.

(2) Reclosing pressure relief devices by:

(i) Removing the safety relief device from the tank car for inspection; and,

(ii) Testing the safety relief device with air or gas to ensure that it conforms to the start-to-discharge pressure for the specification or commodity in this subchapter.

(i) *Lining and coating inspections and tests.* At a minimum, each tank car facility must inspect the lining or coating installed on the tank car according to the inspection interval and test technique established by the owner (as required by paragraph (c)(3)(iii) of this section).

(j) *Leakage pressure test.* (1) At a minimum, each tank car facility shall perform a leakage pressure test on the tank fittings and appurtenances. The leakage pressure test must include product piping with all valves and accessories in place and operative, except that during the pressure test the tank car facility shall remove or render inoperative any venting devices set to discharge at less than the test pressure. Test pressure must be maintained for at least 5 minutes. Leakage test pressure must not be less than 50% of the tank test pressure.

(2) Interior heater systems must be tested hydrostatically at 200 psi (1379 kPa) and must show no signs of leakage.

(k) *Alternative inspection and test procedures.* (1) In lieu of the other requirements of this section, a person may use an alternative inspection and test procedure or interval based on a damage-tolerance fatigue evaluation, when the evaluation is examined by the Association of American Railroads Tank Car Committee and approved by the Associate Administrator for Safety, Federal Railroad Administration.

(2) *Compliance date.* Each tank car shall have an inspection and test conforming to this section no later than the date the tank car requires a periodic hydrostatic pressure test (i.e., the marked due date on the tank car for the hydrostatic test). For tank cars on a 20-year periodic hydrostatic pressure test interval (i.e., Class DOT 103W, 104W, 111A60W1, 111A100W1, and 111A100W3 tank cars), the next inspection and test date is the midpoint between [insert date of publication of this rule] and the remaining years until the tank would have had a hydrostatic pressure test. After that, the tank car must be inspected and tested at 10-year intervals.

§ 180.511 Acceptable results of inspections and tests.

Provided it conforms with other applicable requirements of this subchapter, a tank car is qualified for use if it successfully passes the following the inspections and tests conducted in compliance with this subpart:

(a) *Visual inspection.* A tank car successfully passes the visual inspection when the inspection shows no structural defect that may cause leakage from or failure of the tank before the next inspection and test interval.

(b) *Structural integrity inspection and tests.* A tank car successfully passes the structural integrity inspection and test when it shows no structural defect that may initiate crack growth and cause failure of the tank before the next inspection and test interval.

(c) *Service life shell thickness.* A tank car successfully passes the service life shell thickness inspection when the tank shell and heads show no thickness reduction below that allowed in § 180.509(g) of this part.

(d) *Safety system inspection.* A tank car successfully passes the safety system inspection when each thermal protection system, tank head puncture resistance system, coupler vertical restraint system, and system used to protect discontinuities (e.g., breakage grooves on bottom outlets and protective housings) on the tank car conform to this subchapter.

(e) *Lining and coating inspections and tests.* A tank car successfully passes the lining and coating inspection and test when the lining or coating shows no evidence of holes or degraded areas.

(f) *Leakage pressure test.* A tank car successfully passes the leakage pressure test when all product piping, fittings and closures show no indication of leakage.

(g) *Hydrostatic test.* A Class 107 tank car or a riveted tank car successfully passes the hydrostatic test when it shows no leakage, distortion, excessive permanent expansion, or other evidence of weakness that might render the tank car unsafe for transportation service.

§ 180.513 Repairs, alterations, conversions, and modifications.

In order to repair tank cars, the tank car facility must comply with the requirements of appendix R of the AAR Specifications for Tank Cars.

§ 180.515 Markings.

(a) Each tank car facility shall mark the inspection and test date and the due date for the next inspection and test on the tank near the DOT specification number. A tank car facility may consolidate the dates for each visual inspection, safety system inspection, lining and coating inspection or test, leakage inspection and test, and structural integrity inspection and test on the tank when the inspection and test and the inspection and test due dates are the same.

(b) The tank car facility must comply with the marking requirements of appendix C of the AAR Specifications for Tank Cars.

(c) Converted tank cars must have the new specification and conversion date permanently marked in letters and

figures at least 0.952 cm (3/8-inch) high on the outside of the manway nozzle or the edge of the manway nozzle flange on the left side of the car. The marking may have the last numeral of the specification number omitted (e.g., "DOT 111A100W" instead of "DOT 111A100W1").

(d) When pressure tested within six months of installation and protected from deterioration, the test date marking of a safety relief device is the installation date on the tank car.

§ 180.517 Reporting and record retention requirements.

(a) *Certification and representation.* Each owner of a specification tank car shall retain the certificate of construction (AAR Form 4–2) and related papers certifying that the manufacture of the specification tank car identified in the documents in accordance with the applicable specification. The owner shall retain the documents throughout the period of ownership of the specification tank car and for one year thereafter. Upon a change of ownership, the requirements of Section 1.3.15 of the AAR Specifications for Tank Cars apply.

(b) *Inspection and test reporting.* Each tank car that is inspected as specified in § 180.509 must have a written report, in English, prepared according to this paragraph. The owner must retain a copy of the inspection and test reports until successfully completing the next inspection and test of the same type. The inspection and test report must include the following:

(1) Type of inspection and test performed (a checklist is acceptable);

(2) The results of each inspection and test performed;

(3) Owner's reporting mark;

(4) DOT Specification;

(5) Inspection and test date (month and year);

(6) Location of defects found and method used to repair each defect;

(7) The name and address of the tank car facility and the signature of inspector.

§ 180.519 Periodic retest and inspection of tank cars other than single-unit tank car tanks.

(a) *General.* Unless otherwise provided in this subpart, tanks designed to be removed from cars for filling and emptying and tanks built to specification DOT 107A**** and their safety relief devices must be retested periodically as specified in Retest Table 1 of paragraph (b) of this section. Retests may be made at any time during the calendar year the retest falls due.

(b) *Pressure test.* (1) Each tank, except as provided in paragraph (b)(8) of this section, must be subjected to the specified hydrostatic pressure and its permanent expansion determined. Pressure must be maintained for 30 seconds and as much longer as may be necessary to secure complete expansion of the tank. The pressure gauge must permit reading to an accuracy of 1 percent. The expansion gauge must permit reading of total expansion to an accuracy of 1 percent. Expansion must be recorded in cubic centimeters. Permanent volumetric expansion must not exceed 10 percent of total volumetric expansion at test pressure and tank must not leak or show evidence of distress.

(2) Each tank, except tanks to specification DOT 107A, must also be subjected to interior air pressure test of at least 100 psi under conditions favorable to detection of any leakage. No leaks may appear.

(3) Safety relief valves must be retested by air or gas, must start to discharge at or below the prescribed pressure and must be vapor tight at or above the prescribed pressure.

(4) Frangible discs or fusible plugs must be removed from the tank and visually inspected.

(5) Tanks must be retested as specified in Retest Table 1 of this paragraph before return to service after repairs involving welding or heat treatment.

RETEST TABLE 1

Specification	Retest interval—years		Retest pressure—p.s.i.		Safety relief valve pressure—p.s.i.	
	Tanks	Safety relief devices[4]	Tank hydrostatic expansion[3]	Tank air test	Start-to-discharge	Vapor tight
DOT 27	5	2	500	100	375	300
106A500	5	2	500	100	375	300
106A500X	5	2	500	100	375	300
106A800	5	2	800	100	600	480
106A800X	5	2	800	100	600	480
106A800NCI	5	2	800	100	600	480
107A****	5[1]	2[1]	[2]	None	None	None
110A500–W	5	2	500	100	375	300
110A600–W	5	2	600	100	500	360
110A800–W	5	2	800	100	600	480
110A1000–W	5	2	1,000	100	750	600
BE–27	5	2	500	100	375	300

[1] If DOT 107A**** tanks are used for transportation of flammable gases, one frangible disc from each car must be burst at the interval prescribed. The sample disc must burst at a pressure not exceeding the marked test pressure of the tank and not less than 7/10 of the marked test pressure. If the sample disc does not burst within the prescribed limits, all discs on the car must be replaced.

[2] The hydrostatic expansion test pressure must at least equal the marked test pressure.

[3] See § 180.519(d)(8).

[4] Safety relief valves of the spring-loaded type on tanks used exclusively for fluorinated hydrocarbons and mixtures thereof which are free from corroding components may be retested every 5 years.

(6) The month and year of test, followed by a "V" if visually inspected as described in paragraph (d)(8) of this section, must be plainly and permanently stamped into the metal of one head or chime of each tank passing test; for example, 1–60 for January 1960. On DOT 107A**** tanks, the date must be stamped into the metal of the marked end, except that if all tanks mounted on a car have been tested, the date may be stamped into the metal of a plate permanently applied to the bulkhead on the "A" end of the car. Dates of previous