

NOTICE OF SAFETY ADVISORY 2001-02 - Structural integrity of cast steel draft sills, manufactured by American Steel Foundries, and installed in certain covered hopper cars. When in normal condition and used under normal train operations, these cast draft sills appear not to pose a safety hazard to railroad employees or the general public.

On March 12, 2001, FRA published Notice of Safety Advisory 2001-02 in the Federal Register (Volume 66, No. 48, page 14432), addressing the structural integrity of cast steel draft sills, manufactured by American Steel Foundries, and installed in certain covered hopper cars.

Background: Recently, FRA discovered that several Type C-114 covered hopper cars, manufactured by Trinity Industries, have experienced failures of their cast steel draft sills. A cast draft sill that apparently contained a pre-existing crack caused one train separation on main line track on the Montana Rail Link. Also, several of these cast draft sills failed in torsion as a result of a number of minor, low speed yard derailments. To date, all of the cars involved in such failures are owned and principally operated by The Burlington Northern and Santa Fe Railway Company (BNSF). At this time, there have been no reported failures of this type of cast draft sill on any other railroad; however, FRA and the industry are still in the process of investigating this matter. There have been no reported injuries or fatalities due to the failure of these draft sills.

On January 18, 2001 at Winston, Montana, approximately 20 miles east of Helena, Montana, a westbound BNSF loaded unit grain train, G-CVNKAL9-16, experienced a broken draft sill on the B-end of covered hopper BNSF 472398. The draft sill broke forward of the inboard draft lugs and separated from the car, allowing the draft gear, coupler, and a portion of the draft sill to fall to the rails. When the separation took place, the train's air brake train line pipe also separated, causing an emergency air brake application on the train. At this time, it appears as though there was an approximately 30 - percent old break in the walls of the involved draft sill (a break that existed before the train separation occurred), with the remaining sill breaking with rapid brittle fracture at the time of the incident. The old crack appears to have started in the area of the side wall of the draft sill where an inspection port was cast in, and directly in front of, the rear draft lugs. No derailment occurred in this instance.

On January 30, 2001, at the West Havre yard in Havre, Montana, the same series of Type C-114 covered hoppers were involved in the derailment of BNSF train GSPLTAC 9-26. A total of 19 cars derailed as the train was leaving the yard, traveling approximately 8 miles per hour. Five (5) of the cars overturned onto their sides and experienced failures of the cast steel draft sills. Furthermore, an attempt was made to re-rail one of the derailed loaded cars using a mobile crane with a sling passing under the draft sill. The car had no damage other than having one pair of wheels derailed. The draft sill on the car was inspected prior to lifting the car, and it was found to be free of any cracks or damage from the derailment. While the car was being lifted with the sling, the draft sill failed catastrophically, which caused the car to fall to the ground. The draft sill fractured on both sides just outboard of the rear draft lugs, but remained attached by a severely bent section on the top portion of the sill. No injuries or fatalities resulted from this incident, nor were the broken draft sills the cause of the derailment.

On January 31, 2001, BNSF transferred two of the broken draft sills involved in the above incident to its testing facility at Topeka, Kansas for a metallurgical analysis. The draft sills were then forwarded to the manufacturer for further inspection. The initial report from BNSF and the manufacturer stated that the material used in the draft sills met the Association of American Railroads' (AAR) requirement for a Grade "B" steel casting. A subsequent design review between BNSF, the car builder, and the draft sill

manufacturer found the design acceptable, and at this time did not recommend any subsequent changes. However, fatigue and impact testing of the fractured draft sills is still being conducted by both BNSF and the manufacturer. The AAR is also investigating nationwide if any of the cast draft sills of this same design have been installed on car owners equipment other than BNSF.

The cars currently in question are Type C -114 covered hopper cars, with a capacity of 5,161 cubic-feet, series BNSF 471500 through 477012 and series BNSF 450000 through 450649, a total of 5,999 cars. The cars were built by Trinity Industries from 1998 through 2000, and the draft sills were manufactured by American Steel Foundries (ASF). Examples of the casting nomenclature on the draft sills that have failed are: ASF 6/98 3952 A-2 and ASF 6/99 3952 B-2. BNSF has initiated a systemwide inspection of the draft sills on these two car series, looking especially for cracks in the area of the inspection ports ahead of the rear draft lugs. BNSF is inspecting both sides and both ends of each of these cars. The inspection instructions issued by the BNSF to their inspectors regarding these cars, loaded or empty, provides for the following:

Initial terminal, 1000-mile, terminating inspection points, and all repair tracks:

1. Inspect cars paying particular attention to the cast draft sill. Inspect for cracks propagating from the bottom flange or the side inspection holes of the cast draft sill, see attached photographs.
2. Determine if car is defective per 49 CFR § 215.121(b)(2), if crack is 6" or less and car is safe to move to destination, if loaded forward for unloading. If empty "BH" car home for repair.
3. If crack is greater than 6" and car is safe to move, then car must be "BH" home and moved under 49 CFR § 215.9.
4. Report defect code "DS" when bad ordering these cars.
5. Place a white dot, using spray paint, on both sides of the draft sill on both ends of the car once inspection is completed.

A cast draft sill is considered a component of a car's center sill structure. FRA's Freight Car Safety Standards prescribe that a car may not be placed or remain in service if the car center sill is broken; cracked more than 6 inches; or permanently bent or buckled more than 2 ½ inches in any six foot length. Car inspections required by FRA safety regulations will normally detect this type of defect.

Recommendation: When in normal condition and used in normal train operations, these cast draft sills appear not to pose a safety hazard to railroad employees or the general public. However, if any of the cars listed above is involved in a derailment, regardless of how minor, it should be considered to be a significant safety risk to all personnel and the following steps taken:

- ! Exercise caution if the car is positioned such that it applies a torsional load to the draft sill;
- ! Avoid lifting the car by the draft sill with a crane to re-rail; or
- ! If the car's draft sill has a crack of 6 inches or more, request home shop disposition, complying with 49 C.F.R. § 215.9.

For additional information concerning car series BNSF 471500 through BNSF 477012 and BNSF 450000 through BNSF 450649, and to obtain a copy of System Mechanical Alert BNSF MA-01/01, FRA

recommends that the railroad contact Mr. Rick Stauffer, System Mechanical Department, Burlington Northern and Santa Fe Railway Company, P.O. Box 961056, Fort Worth, TX 76131-2830, telephone (817) 352-1465,.

FRA may modify Safety Advisory 01-01, issue additional safety advisories, or take other appropriate action to ensure the highest level of safety on the Nation's railroads.

Issued in Washington, D.C. on March 12, 2001. George Gavalla, Associate Administrator for Safety.