

The D/t ratios that could lead to fatigue cracking during transportation were changed in the 1990 edition of API RP 5L1. The ratio was reduced from 70:1 to 50:1 because fatigue cracking had been reported in pipe with D/t ratios lower than 70:1. The latest edition of API RP 5L1, issued in July 2002, also states that pipe with D/t ratios well below 50:1 may suffer fatigue in transit under some circumstances.

No statistics on transportation damage were specifically tracked before RSPA instituted a change in 2002 to gather more detailed accident statistics. However, RSPA is now gathering information on whether an accident is caused by pipe damage sustained during transportation and whether the failure is a longitudinal tear or crack.

Railroad Transportation of Accident Pipe

The section of pipeline where the rupture occurred was constructed in 1967. The Enbridge 1966 purchase specification for the pipe included a requirement that pipe loading details be provided subject to its approval. In its quotation, U.S. Steel provided a diagram for railroad car loading (see figure 9), which Enbridge subsequently approved. The railcar loading instructions consisted of a drawing with notes specifying the blocking supports and banding to be used under and around the pipe and the required positioning of the longitudinal weld. U.S. Steel also noted in its specifications that the purchaser would spot-check railcar loadings at the mill before transportation. U.S. Steel transported the pipe by railcar to its storage facility near the mill, where it was unloaded and stored. Later, U.S. Steel loaded the pipe for transportation by rail. Finally, the pipe was loaded on trucks for transportation to the construction sites.¹⁷ Enbridge had arranged with Moody Engineering Company (Moody) to inspect the manufacturing of the pipe. The handling and loading of the pipe for transportation from the mill to storage was a part of that inspection. These activities were summarized in Moody's final report. The Moody report indicates that the pipe was periodically inspected at a nearby storage facility to ensure that the pipe was being handled and unloaded with care. The report indicates that the pipe was accepted for shipment subject to the operator's shipping instructions. U.S. Steel did not document inspections of pipe loading. No records were found to indicate that the engineering company or the pipeline operator inspected the loading of the pipe on railroad cars for transportation from the U.S. Steel storage facility.

¹⁷ Records related to the production activities at U.S. Steel's McKeesport pipe mill were destroyed several years ago after the mill was closed for a period of time.