

Safety Advisory: Possible Catastrophic Failure of Nurse Tanks and Recommendation for Periodic Testing February 2024

The **Federal Motor Carrier Safety Administration (FMCSA)** and the **Pipeline and Hazardous Materials Safety Administration (PHMSA)** issue this safety advisory to provide notice of the possibility of catastrophic failure of certain hazardous materials packages commonly known as “nurse tanks.” See Title 49, Code of Federal Regulations ([49 CFR §173.315\(m\)](#)).

Background

This notice focuses on nurse tanks manufactured from January 1, 2007, through December 31, 2011, by American Welding and Tank (AWT) at its Fremont, Ohio plant. Nurse tanks manufactured by AWT from 2009 to 2010 were the subject of a prior FMCSA investigation and enforcement action in response to improper manufacturing procedures.

On August 23, 2023, a 2009 AWT nurse tank containing anhydrous ammonia experienced a catastrophic failure in a farm co-op lot, resulting in the release of all product. The failure caused the tank shell to “rocket” over 300 feet from its original location. While no injuries were reported, this event is an indicator of potential continuing problems with AWT nurse tanks that have now been in service for over a decade.

As a result of this incident, the owner of the nurse tank involved contracted with a third-party testing company to examine their AWT nurse tanks that were manufactured between 2008 and 2012. Radiographic testing showed that 7 of 8 the nurse tanks tested had extreme stress corrosion cracking, porosity, and inclusions/voids in the welds where the heads and shells of the nurse tanks were joined. Only the 2012 tank passed. The nurse tank owner submitted these results to engineering experts who were involved in previous research funded by FMCSA into similar issues with this series of AWT nurse tanks.¹ Based on the test results and the review by the experts, the owner voluntarily placed the nurse tanks out-of-service. The parent company of the farm co-op subsequently conducted similar radiographic testing on 142 AWT nurse tanks manufactured between 2007 and 2012, and 100 failed the test. All 2012 tanks passed.

Recommendation

The current Hazardous Materials Regulations (49 CFR Parts 171-180) do not require periodic inspection and testing of nurse tanks that have attached and legible American Society of Mechanical Engineers (ASME) identification plates and that meet the other requirements in [49 CFR §173.315\(m\)\(1\)](#). Requirements for periodic inspection and testing of nurse tanks apply only when the ASME plate is missing or illegible. See [49 CFR §173.315\(m\)\(2\)](#).

The FMCSA and PHMSA nevertheless *strongly* recommend that owners of AWT nurse tanks manufactured between January 1, 2007, and December 31, 2011 that are exempted from periodic inspection and testing requirements as described above, conduct voluntary periodic visual inspection in accordance with [49 CFR §173.315\(m\)\(2\)\(i\)](#); thickness testing in accordance with [49](#)

¹ FMCSA published four research studies on nurse tank safety available at the following links: [Testing and Recommended Practices to Improve Nurse Tank Safety, Phase I](#) (<https://rosap.ntl.bts.gov/view/dot/146>); [Testing and Recommended Practices to Improve Nurse Tank Safety, Phase II](#) (<https://rosap.ntl.bts.gov/view/dot/163>); [Testing and Recommended Practices to Improve Nurse Tank Safety, Phase III](#) (<https://rosap.ntl.bts.gov/view/dot/36238>); and [Testing and Recommended Practices to Improve Nurse Tank Safety, Phase IV](#) (<https://rosap.ntl.bts.gov/view/dot/62475>).

[CFR §173.315\(m\)\(2\)\(ii\)](#), and pressure testing in accordance with [49 CFR §173.315\(m\)\(2\)\(iii\)](#). Note these dates reflect the years of manufacture that failed testing.

For owners of affected AWT nurse tanks unable to conduct voluntary pressure testing, FMCSA and PHMSA recommend that either radiographic or ultrasonic testing be conducted. While the period of voluntary inspection and testing is at the discretion of the nurse tank owner, FMCSA and PHMSA recommend conducting the inspection and testing at least once every five years consistent with [49 CFR §173.315\(m\)\(2\)\(iv\)](#).

Additional Information

FMCSA and PHMSA are committed to the safety of the farming community and the public. The agencies will be engaged with stakeholders through a variety of outreach activities intended to emphasize the importance of this recommendation and its implications for the owners of these nurse tanks.

For more information, or if you have a question concerning this Safety Advisory, please contact Paul Bomgardner, Chief, FMCSA Hazardous Materials Division, at (202) 493-0027, or by email at paul.bomgardner@dot.gov.