



PS-4—2020 THIRD EDITION

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POSITION STATEMENT

PERIODIC PROOF TESTING OF STATIONARY, VACUUM-JACKETED TANKS FOR CRYOGENIC AND REFRIGERATED LIQUIDS

Question

Should stationary, vacuum-jacketed storage tanks for cryogenic and refrigerated liquids in service be subjected to periodic proof tests above the maximum allowable working pressure (MAWP)?

Answer

The Compressed Gas Association (CGA) *does not* recommend that stationary, vacuum-jacketed storage tanks for cryogenic and refrigerated liquids in service be periodically proof tested for the following reasons.

Reasons

1. These tanks are designed, fabricated, tested, inspected, and stamped in accordance with Section VIII, Division 1 of the *ASME Boiler & Pressure Vessel Code* [1].
2. The materials used in the construction of this type of vessel have excellent fracture toughness at low temperatures. This material property provides a large flaw tolerance capability to the vessel.

The cryogenic liquids stored (liquid nitrogen, liquid oxygen, liquid argon, liquid helium, liquid hydrogen, and liquefied natural gas) and refrigerated liquids (carbon dioxide, nitrous oxide) are noncorrosive. Thermal and pressure cycling are minimal. Thus, any undetected existing fabrication flaw will not grow to a critical size by stress corrosion cracking and/or a fatigue crack growth mechanism.

3. Minute leakage from either the inner vessel or outer shell of vacuum-jacketed storage tanks causes vacuum decay and loss of thermal performance. Routine periodic checking of the vacuum and checking for frost spots during each fill of the tank identifies defects; they are the best indicators of a container's performance and suitability for continuous service.
4. The vacuum jacket provides structural protection to the container from external damage such as dents, gouges, scratches, atmospheric corrosion, etc.
5. Many stationary, vacuum-jacketed storage tanks for cryogenic and refrigerated liquids have been used successfully for 30 or more years using the integrity checks described in reason 3 to verify their safe operating condition. Additional proof testing above the MAWP has not been warranted.

NOTE—CGA takes the position that testing of stationary, vacuum-jacketed storage tanks for cryogenic and refrigerated liquids should be conducted any time there is indication that tank integrity might have been compromised. The specifics of such testing are dependent upon existing regulatory requirements and industry practices and are not in the scope of this statement.

Reference

Unless otherwise specified, the latest edition shall apply.

[1] *ASME Boiler & Pressure Vessel Code*, American Society of Mechanical Engineers. www.asme.org

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Work Item 20-013
Bulk Distribution and Equipment Committee

NOTE—Technical changes from the previous edition are underlined.

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