

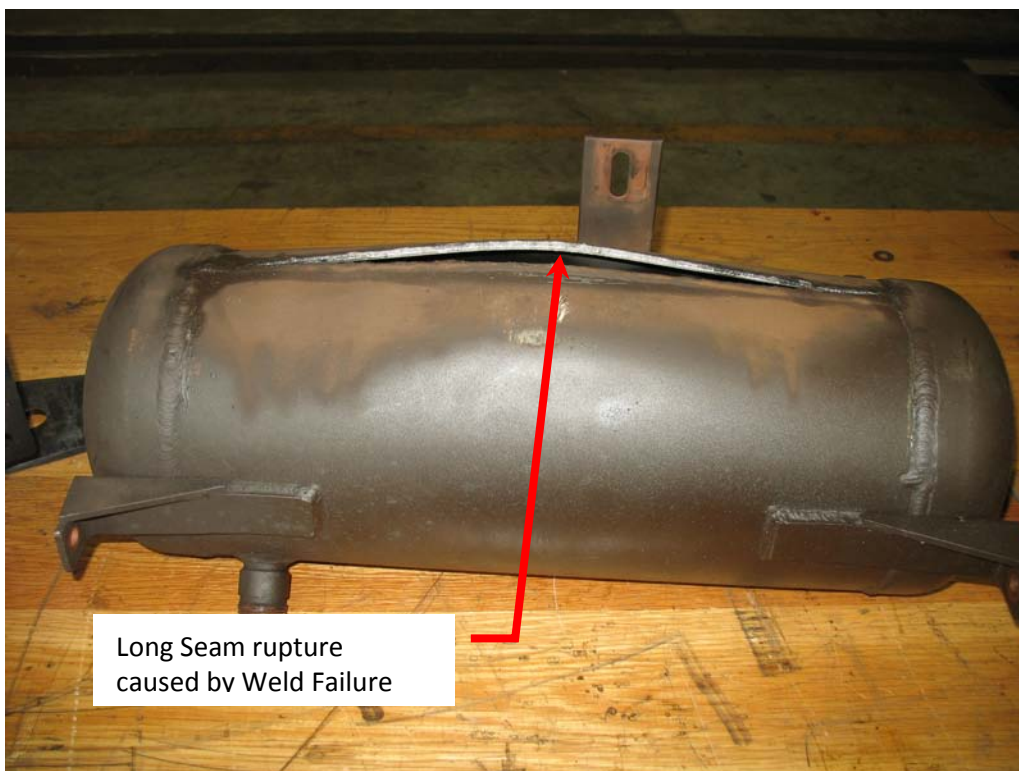


## Pressure Vessel Life Study/Condition Assessment Brief Description

Unfired Pressure Vessels are subject to many of the same design stresses as those seen in boilers with some additional issues related to the products they contain. The addition of the design factors, along with cyclic fatigue and product induced corrosion often lead to sudden and catastrophic failure. Fortunately on smaller vessels the impact is low on property and personnel. In some cases the larger vessels failures result in more dramatic damage and personnel injury. Some vessels used in lethal service require concern for both public safety and environmental impact. [Photo: East Ohio Liquid Natural Gas Vessel-1944/122 People Killed/ 600 Left Homeless]

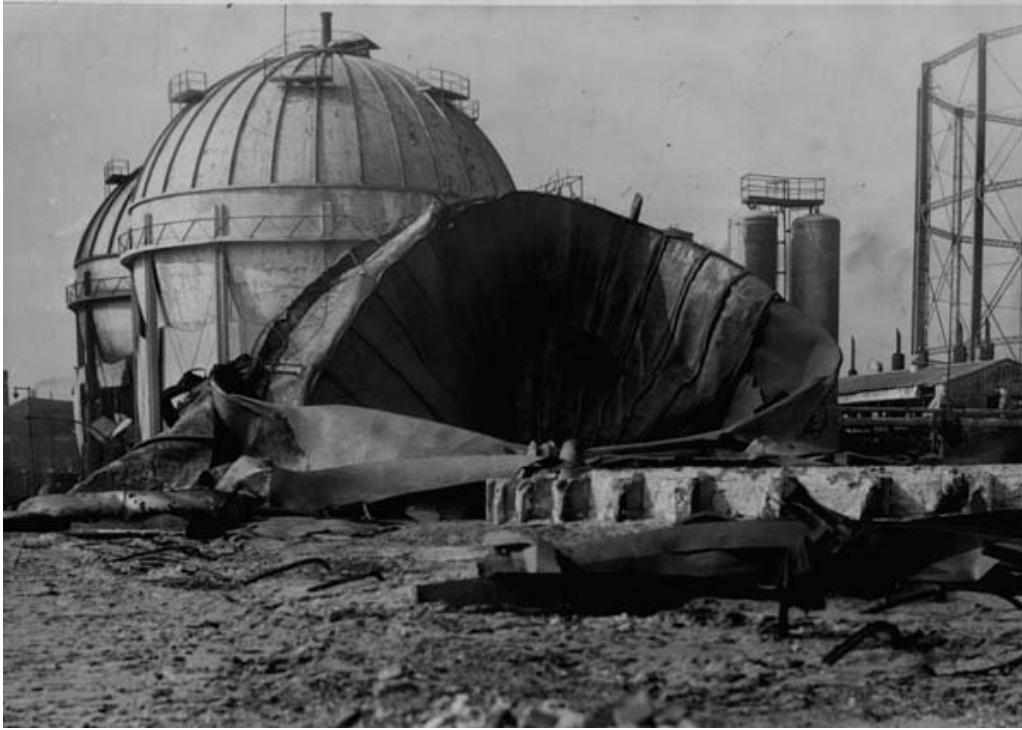
The approach to each pressure vessel life assessment involves a risk assessment of all of these critical factors and an integrated entry plan covering both “where to look” and “how to look”. Some pressure vessels cannot be safely entered to perform a close visual inspection of the internal surfaces. All Coastal Inspection Services inspection personnel are trained extensively in confined space entry and lock/out tag out of Pressure Vessels. When a safe entry cannot be accomplished, remote visual equipment can often be utilized to locate suspect areas. These suspect areas on the pressure vessel are selected for supplemental external examination using a method that can confirm the information gained by remote visual examination.

In a pressure vessel life study or condition assessment some discontinuities revealed do not threaten the continued safe operation of the vessel. The central focus of the pressure vessel life assessment is most often on the vessels “fit for service” criteria. It is often determined that inspection data found in previous inspections does not reduce a vessels continued safe operation. Again as in all inspections, experience in evaluation of suspect discontinuities or weld flaws should be performed by experienced inspectors.



Small pressure vessels similar to this 12” X 36” failed air tank may not cause significant damage.

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The failure of large pressure vessel seams can cause significant damage. [East Ohio Gas 1944]



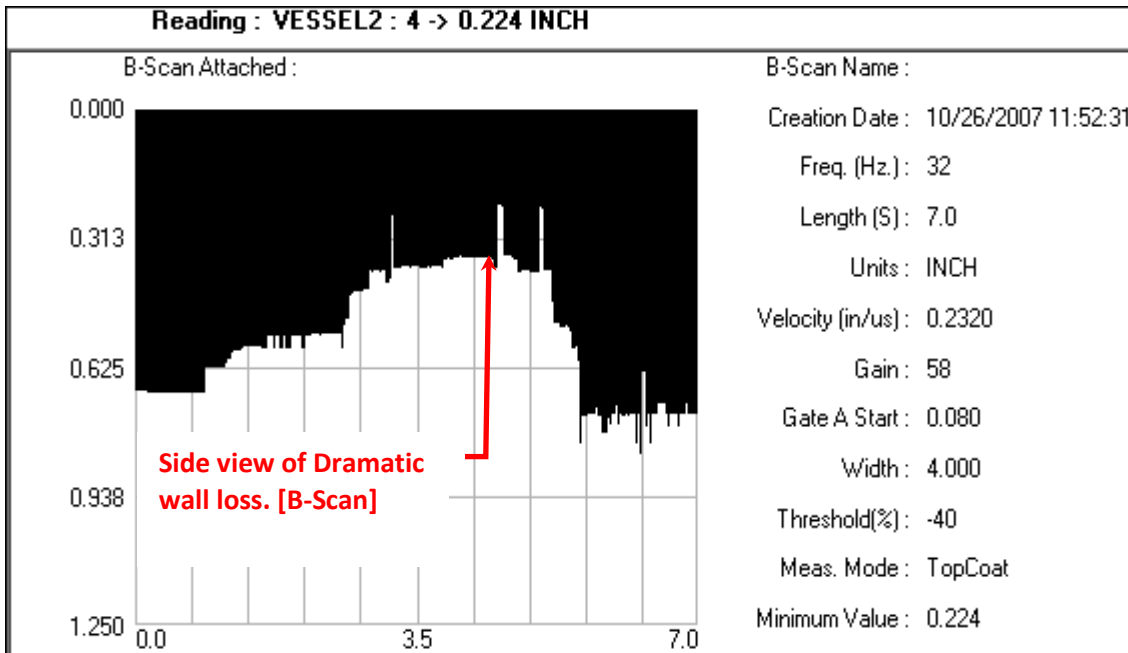
Detection and proper evaluation of internal corrosion is critical in pressure vessel inspection.



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Internal Corrosion observed remotely inside a pressure vessel & verified with external B-Scan UT.



The view above reflects severe wall loss revealed with external B-Scan Ultrasonics of the suspect area observed using a remote video camera on a pressure vessel life study. ASME calculations revealed that this vessel was not safe for continued safe operation. Coastal Inspection Services recommended a repair technique that followed the National Board Inspection Code [NBIC].