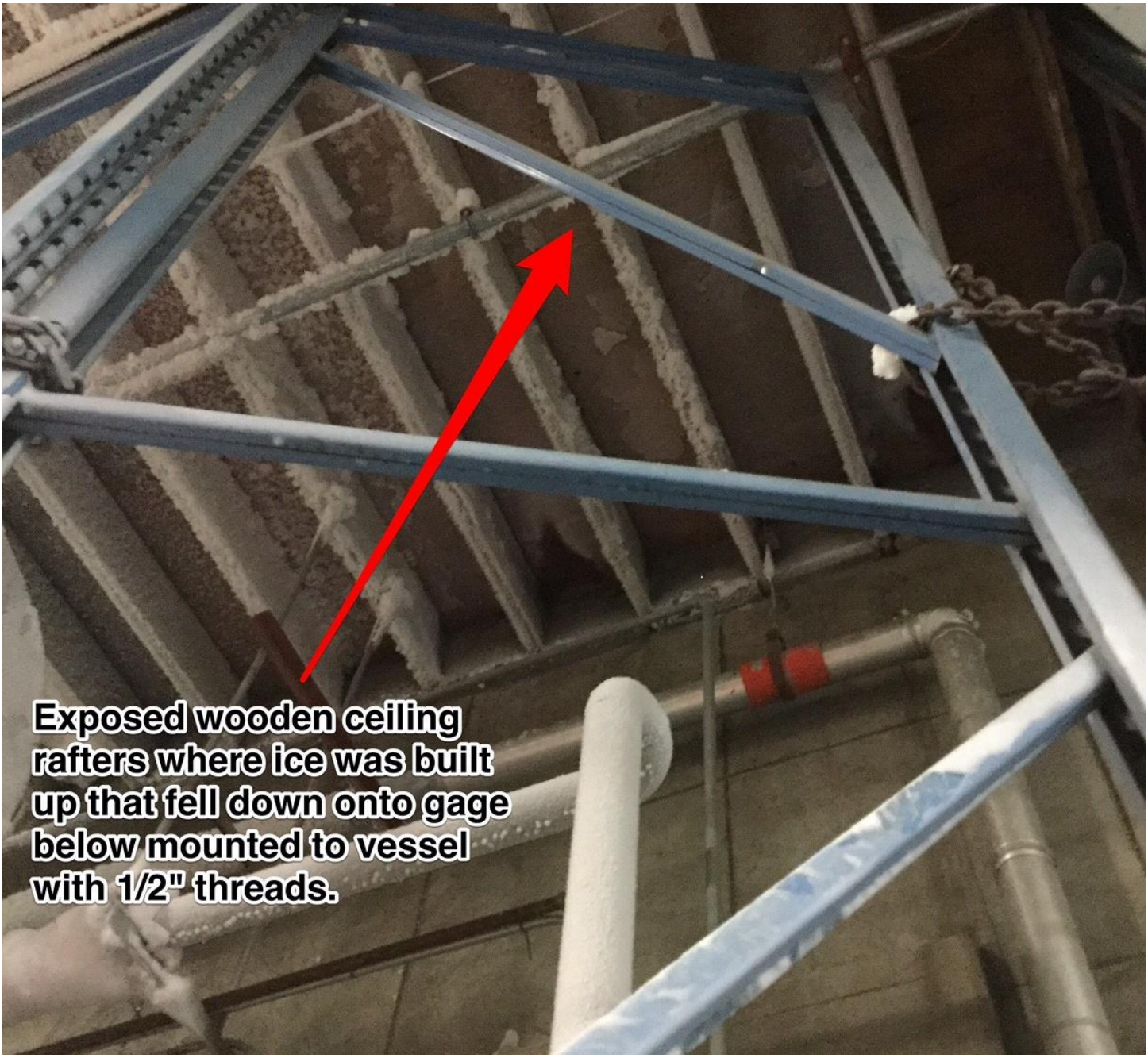
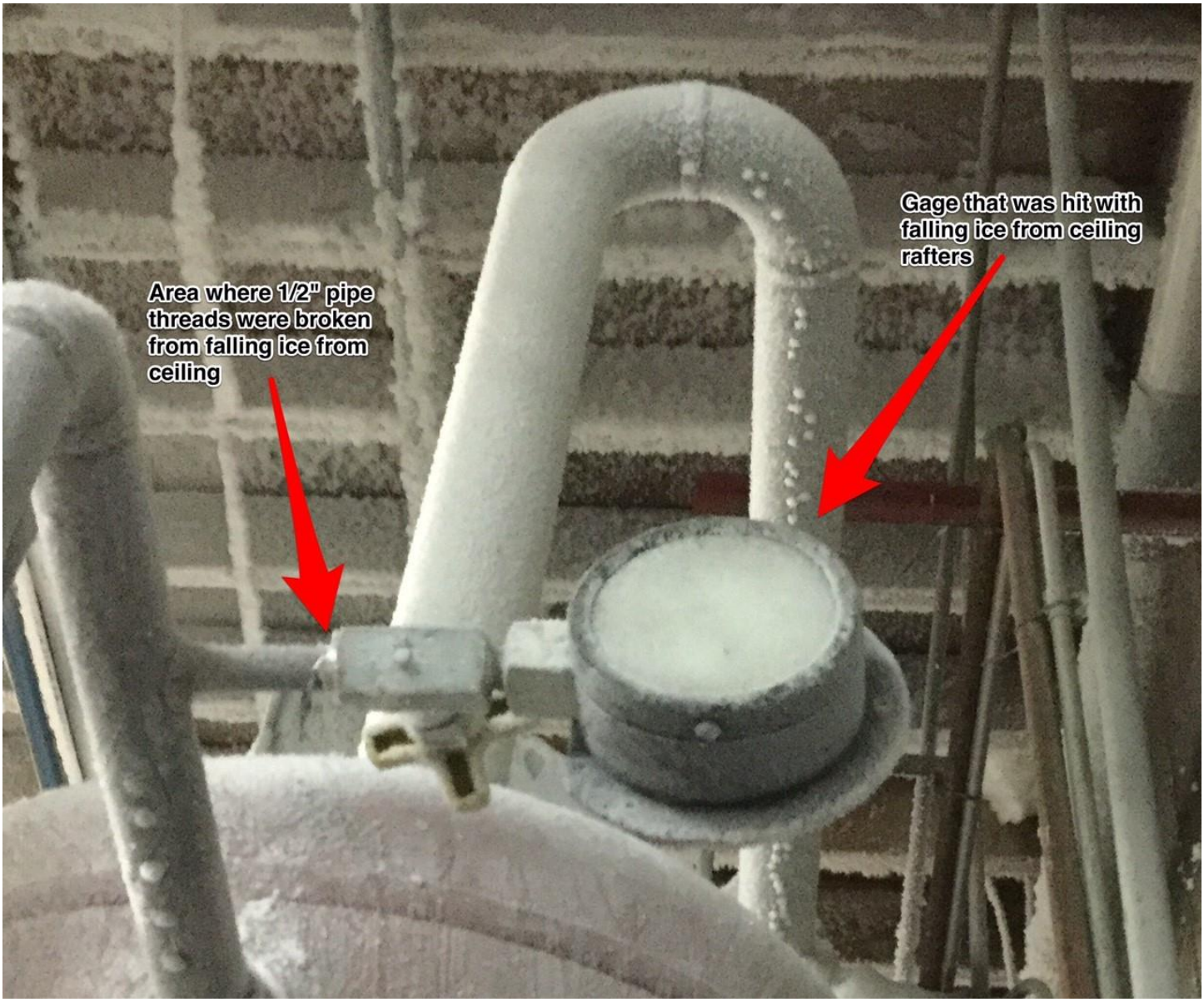
Incident Summary (Posse File#5620261)

SUPPORTING INFORMATION	Incident Date			June 2, 2017
	Location			Abbotsford BC
	Regulated industry sector			Boilers, PV & Refrigeration – Refrigeration system.
	Impact	Injury	Qty injuries	None
			Injury description	None
			Injury rating	None
		Damage	Damage description	Broken threaded connection, connecting a pressure gauge to the pressurized vessel on the ammonia refrigeration system.
			Damage rating	Minor
	Incident rating			Minor
	Incident overview			Falling Ice from exposed wooden ceiling rafters in older section of large commercial freezer, broke a threaded connection of a pressure gauge mounted to a pressurized vessel on the ammonia refrigeration system. This caused a leak of pressurized ammonia that sprayed directly on to the ammonia leak detection system sensor.
INVESTIGATION CONCLUSIONS	Site, system and components			The system circulates ammonia via large compressors, through pressurized piping, and pressure vessels that are used in the refrigeration system. Gauges are mounted throughout the system to monitor system pressure at various locations. The area that the affected pressure gauge was mounted on was the interior of a large scale commercial freezer, where ice tends to build up.
	Failure scenario(s)			Exposed wooden ceiling rafters located in the older area of the large scale commercial freezer, developed ice build-up on the surface directly above the pressure gauge that was mounted on the ammonia pressurized vessel. A piece of ice fell from the ceiling and hit the pressure gauge below, breaking its threaded connection causing ammonia to leak out.
	Facts and evidence			-Ice Build-up on exposed rafters of ceiling in commercial freezer area. -Pressure Gauge directly below the rafters, installed on the pressurized ammonia vessel. -Evidence based on observations during investigation, and witness account from Chief Operating Engineer. -Licensed contractor was onsite at the time and contained the leak immediately, then made the necessary repairs. -Protective barriers were mounted above pressure gage to prevent a future occurrence.
	Causes and contributing factors			It is Highly probable that the build-up of ice on exposed ceiling rafters was the cause of the ammonia leak from the system. This is based on observations during the investigation, plus witnessed accounts by the Chief Engineer and Licensed Contractor onsite at the time of leakage.


Exposed wooden ceiling rafters where ice was built up that fell down onto gage below mounted to vessel with 1/2" threads.


Gage that was hit with falling ice from ceiling rafters
Area where 1/2" pipe threads were broken from falling ice from ceiling


NH3
Gas Detector
Ammonia detector mounted to wall
directly across and in line with gage
that was broken off of 1/2" pipe threads