

Incident Summary (#5624551)

SUPPORTING INFORMATION	Incident Date	<i>September 26, 2017</i>	
	Location	<i>Burnaby</i>	
	Regulated industry sector	<i>Refrigeration System</i>	
	Impact	Qty injuries	<i>0</i>
		Injury description	<i>None</i>
		Injury rating	<i>None</i>
	Damage	Damage description	<i>A liquid ammonia transfer pump developed a leak on one of its seals.</i>
		Damage rating	<i>Insignificant</i>
Incident rating	<i>Insignificant</i>		
Incident overview	<i>The liquid ammonia transfer pump gear shaft O-ring failed thus allowing the liquid ammonia to leak in to the ammonia compressor room. The compressor room ammonia refrigerant leak detection system activated.</i>		
INVESTIGATION CONCLUSIONS	Site, system and components	<i>The site is a dairy product processing plant that utilizes an ammonia refrigeration system. The refrigeration system is monitored and operated by a power engineer on a continuous basis. The liquid ammonia positive displacement transfer pump is used to pump the liquid refrigerant from a surplus refrigerant storage vessel to the main ammonia refrigerant receiver. The transfer pump operation is intermittent and the run time is approximately 5 hours a month.</i>	
	Failure scenario(s)	<i>The O-rings are 17 years old and the pump receives only a minor amount of preventive maintenance such as greasing the sleeve bearings. Over time the O-rings lose their sealing capability as they become less pliable.</i>	
	Facts and evidence	<i>The liquid ammonia transfer pump is located in the refrigeration compressor room. The pump is a positive displacement rotary gear pump that is capable of generating significant discharge pressures and is driven by an electric motor. The operation of the pump is intermittent and is used to transfer liquid ammonia from a surplus refrigerant storage vessel to the main refrigerant receiver. The pump averages 5 hours of run time per month. The plant shift engineer noticed the ammonia leak detector visual low alarm indicator had been activated and went in to the compressor room to investigate. He found liquid ammonia was spraying out of the back of the pump body. He left the compressor room and proceeded to don his respirator and gather the necessary tools to isolate the leak. The pump was fully isolated by closing the necessary valves and the leak stopped. By this time the ammonia leak detection system had switched to high level alarm and this resulted in a full plant/building evacuation. The fire department and hazmat team arrived onsite and checked the ammonia residual reading in the compressor room and they were satisfied with the results and gave permission for plant staff to return to work. The plant shift engineer called the maintenance contractor and informed them of the situation with the leaking pump. Pump seals were replaced and pump was restored to service next day.</i>	

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	<i>The loss of ammonia is estimated at 1lb.</i>
Causes and contributing factors	<ul style="list-style-type: none">- O-rings were 17 years old and have become less pliable and lost their sealing capability.- Parts availability for the pump is difficult to find so there was a reluctance to service it.- O-ring showed signs of fretting when it was removed from pump.

Photos or diagrams (if necessary)





