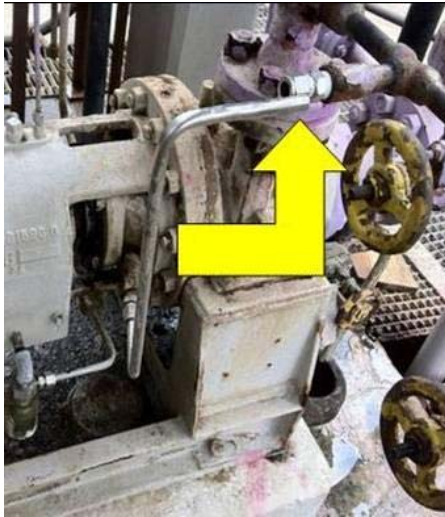


## Mechanical Integrity of Tubing

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Proper installation, maintenance, and inspection of metal tubing is important in preventing fires and toxic material releases in process plants. Don't forget about tubing just because it is usually small. Even a small leak can cause a fire which can grow much larger, and small releases of toxic materials can be dangerous. Here are some reported incidents.

- A ½-inch stainless steel tube between a glycol pump and a process vessel failed at a fitting near the process vessel. The resulting leak sprayed onto a reboiler and ignited causing significant equipment damage. The tubing failure was concluded to be the result of vibration caused by the glycol pump.
- A 1-inch stainless steel supply tube to a gas scrubber failed at a nut and ferrule compression fitting. The resulting gas leak ignited but self-extinguished without major damage. The exact cause of the tubing failure was not determined, but pressure charts indicated that there had been an over-pressure excursion before the incident. Also, the tubing could have been damaged or weakened during storms in the previous hurricane season.



- During startup of an LNG plant, a gas leak from ½-inch tubing for a pump seal was detected. Repairs were done by a technician who had not been properly trained. When the plant was re-started, the tubing failed completely causing an LNG leak and fire.

Note: The pictures are examples of tubing failures and are not from the incidents described.

### What can you do?

- ➔ Review your plant procedures for installation, inspection, and maintenance of tubing.
- ➔ Remember that tubing may not be as durable as pipe and may be more easily damaged. Avoid impacts to tubing and tubing connections.
- ➔ Report any damaged or leaking tubing which you observe in your plant and follow up to ensure it is repaired.
- ➔ Be aware that the installation and repair of tubing must be done by a qualified and properly trained technician.
- ➔ Use the proper tools and procedures, including for bending and crimping, for installation and maintenance of tubing.
- ➔ Use the correct components – tubing, ferrules, nuts, and fittings. Do not mix components from different manufacturers.
- ➔ Ask the supplier of your tubing and tubing fittings to provide information on proper installation and maintenance of their product.

**Don't forget tubing in your mechanical integrity programs!**