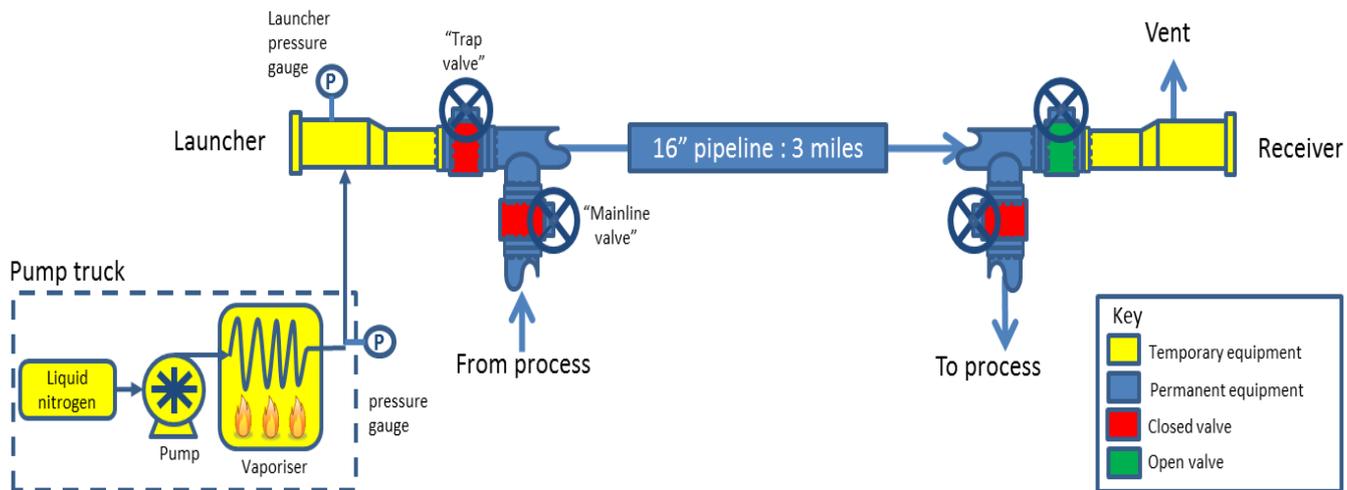


**Background:** On June 25<sup>th</sup>, 2012, an incident occurred at a BP America Production Company (BPAPC) facility. The incident resulted in one fatality and caused the hospitalization of two individuals. The purpose of this alert is to share lessons learned in an effort to protect workers and to prevent similar incidents in the future. Note: this alert is based upon our internal investigation and observations from OSHA's investigation.

**Incident description:** While preparing for a pipeline inspection using an in-line inspection tool (known as a pig), a temporary pig launcher that was attached to a pipeline was over-pressured and failed. Nitrogen pumping equipment was being used to purge the pipeline prior to beginning the in-line inspection. The job was planned, a procedure was in place for the operation, and safety measures were identified and used. However, the valve between the launcher and the pipeline was closed.

**What went wrong:** At the beginning of the pipeline purging operation, the experienced in-line inspection team believed that the pipeline valves were in the proper position and began pumping from the nitrogen truck to purge the line. The team did not realize that the "trap valve" between the pig launcher and the pipeline had inadvertently been left closed. The plan called for an initial purge up to 15 psi followed by 350 psi to push the pig through the pipeline. The pig launcher, which had a maximum allowable working pressure (MAWP) of 660 psi, was not equipped with a pressure relief valve. The nitrogen truck included a pressure trip set at 6000 psi without consideration of using it to protect the launcher or pipeline. When pressure was applied, it is believed that the 100 psi gauge used during the purge phase on the pig launcher swung around to the zero stop almost instantaneously. The team at the pig launcher mistakenly read the gauge at zero and called for more pressure. Within approximately 2 minutes, the temporary pig launcher was pressured beyond its burst pressure resulting in a pressure release, killing one team member and causing the hospitalization of two others.



#### What we learned:

1. During design, consider avoiding the use of temporary equipment (such as pumping equipment) capable of exceeding the plant safe operating limits (such as the 660 psi MAWP of the launcher). Where this is not practical, techniques such as a hazard and operability study ("HAZOP") may be used to identify mechanical and instrumented systems to reliably prevent design limits from being exceeded.
2. If temporary equipment has the capacity to exceed safe operating limits, the temporary equipment should have the same layers of protection which would be considered for permanent plant installations (e.g., a pressure trip or relief valve). When this is not possible, a rigorous risk assessment should be completed by an engineer to identify engineering controls or systems which reliably prevent those limits from being exceeded.
3. An appropriately designed method for monitoring system pressure should be established during the design phase of the operation appropriate for the potential range of pressures (such as a remote digital monitoring system).
4. When communication is required in a noisy environment, common communication methods between key team members should be established, documented and practiced prior to commencing work.
5. Where an activity relies on human intervention (e.g., ensuring correct valve positions) to meet safety requirements, written procedures should clearly identify all critical steps and valve positions, and identify potential errors in each step through a method of verification such as a checklist.

6. **Conclusion:** Recent industry data shows that a significant percentage of incidents in the Oil and Gas Exploration and Production industry are related to equipment over-pressure or unplanned pressure releases. Even recurring or routine tasks which involve pressure can have serious consequences if the hazards are not fully identified, evaluated and properly mitigated. Although this incident occurred during pipeline inspection operations, please consider how this scenario might apply to your work and share this information accordingly. Together we can make a difference.<sup>1</sup>

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<sup>1</sup> BPAPC makes no express or implied representations or warranties with respect to the information provided in this alert and reserves the right to present additional or contrary information in light of new evidence. Those who intend to apply the learnings from this document need to consult appropriate technical experts in applying these learnings to their specific situations.