Lessons (Not) Learned Programs

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Alyeska Pipeline Service Company

Trans-Alaska Pipeline System (TAPS)

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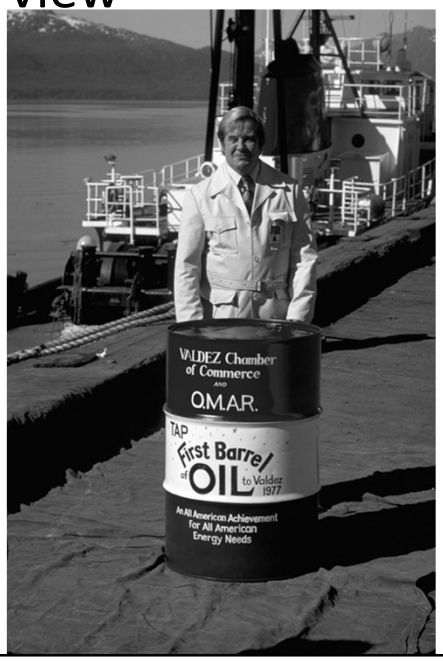
Company Overview

- TAPS is a crude oil pipeline
- TAPS began operations in 1977
- 2018 throughput average was 509 thousand bpd
- Peak throughput in 1988 was 2.1 million bpd in 1988
- Almost 18 billion barrels moved by TAPS since 1977



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Company Overview

- **48-inch diameter pipe**
- **800-miles long**
  - ✓ **420 miles above-ground**
  - ✓ **380 miles below-ground**
- **178 mainline valves**
- **800 Alyeska employees**
  - ✓ **95% live in Alaska**
  - ✓ **20% are Alaska Native**
- **1,000-2,000 TAPS contractors (Seasonal)**
  - ✓ **70 percent of TAPS contractor companies are based in Alaska**

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What are Lessons Learned?

What are your thoughts?

"A Lesson Learned is knowledge or understanding gained by experience. The experience may be positive, as in a successful test or mission, or negative, as in a mishap or failure. A Lesson Learned provides recommendations for avoiding a repetition of failure (or obtaining a repeat of success)."

NASA's IV&V Quality Manual (Independent Verification and Validation), Version Q (August 28, 2014)

"The learning gained from the process of performing the project...the purpose of documenting lessons learned is to share and use knowledge derived from experience to:

- **Promote the recurrence of desirable outcomes**
- **Preclude the recurrence of undesirable outcomes**

As a practice, lessons learned includes the processes necessary for identification, documentation, validation, and dissemination of lessons learned."

Project Management Institute (PMI) Project Management Body of Knowledge (PMBOK), 5th Edition

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Why are Lessons Learned Important to Compliance?

What are your thoughts?

Here are a few of mine:

- Identify and fix process/procedural gaps
- Prevent the recurrence of problems
- Prevent the escalation of consequences
- Continuous improvement leads to improved performance
- Improved communication (micro and macro)
- Supports a learning organization

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Why Lesson Learned Programs Fail?

In a study of lessons learned and personal development for enhancing employee knowledge, researchers found eight barriers to capturing and using lessons learned:

1. Lack of time – *No time to stop and reflect, we have more work to do*
2. Lack of management support – *The "kiss of death" to any program*
3. Employee resistance to sharing – *Fear of admitting failures (cultural)*
4. Poor IT infrastructure
5. "Stove-piping" – *aka, "Silos"*
6. Accessibility of knowledge – *Now where did I file that?*
7. Not invented here syndrome – *We know better than others*
8. Lack of real-time integrated database – *The right information, being in the right hands, at the right time*

➢ **Result = Repeat Failures**

Carrillo, P., & Chinowsky, P. (2006, January). Exploiting knowledge management: The engineering and construction perspective. Journal of Management in Engineering, 22(1), 2 - 10.

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When Has a Lesson Been Learned?

A **lesson identified** becomes a **lessons learned** only after the lesson has been implemented into a business control or business activity.

1. When Identified:
   - Proactively built into process/procedure/checklist
   - Proactively built into training/orientation
2. When Retrieved:
   - Built into planning of a future business activity

➢ Remember that the primary **objective** of a Lessons Learned program is the **learning**!

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What Some Experts Say

"Organizational learning means the process of improving actions through better knowledge and understanding."

C. Marlene Fiol and Marjorie A. Lyles, "Organizational Learning," Academy of Management Review, October 1985.

"An entity learns if, through its processing of information, the range of its potential behaviors is changed."

George P. Huber, "Organizational Learning: The Contributing Processes and the Literatures," Organization Science, February 1991.

"Organizations are seen as learning by encoding inferences from history into routines that guide behavior."

Barbara Levitt and James G. March, "Organizational Learning," American Review of Sociology, Vol. 14, 1988.

"Organizational learning occurs through shared insights, knowledge, and mental models…[and] builds on past knowledge and experience"

Ray Stata, "Organizational Learning—The Key to Management Innovation," Sloan Management Review, Spring 1989.

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Keys to a Successful Lessons Learned Program

1. **Standardize and simplify the methodology**
   - Formalize and Secure Management Support
   - Implement Companywide Process/Procedure
2. **Identification of lessons should be routine**
   - Build it in as a Routine Step to Existing Processes and Activities
   - Capture Clear and Actionable Lessons
3. **Take action on lessons identified**
   - Implement Solutions to Improve Processes/Procedures/Checklists/Training
     - **Becomes a lesson learned**
4. **Automate the retrievability**
   - Utilize Technology to Store and Share Past Lessons
   - Utilize Technology to Quickly Find and Use Past Lessons (User Focused)
5. **Plan future work with lessons identified**
     - **Becomes a lesson learned**

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What our Solution Looks Like

1. **Companywide process and expectations**
   - **Management system expectations**
   - **Business process for lessons learned**
2. **Technology tools (portal and search)**
   - **For capturing and storing lessons (now)**
   - **For searching and finding lessons (future)**
3. **HLVEs (internal major learnings)**
4. **External major learnings**

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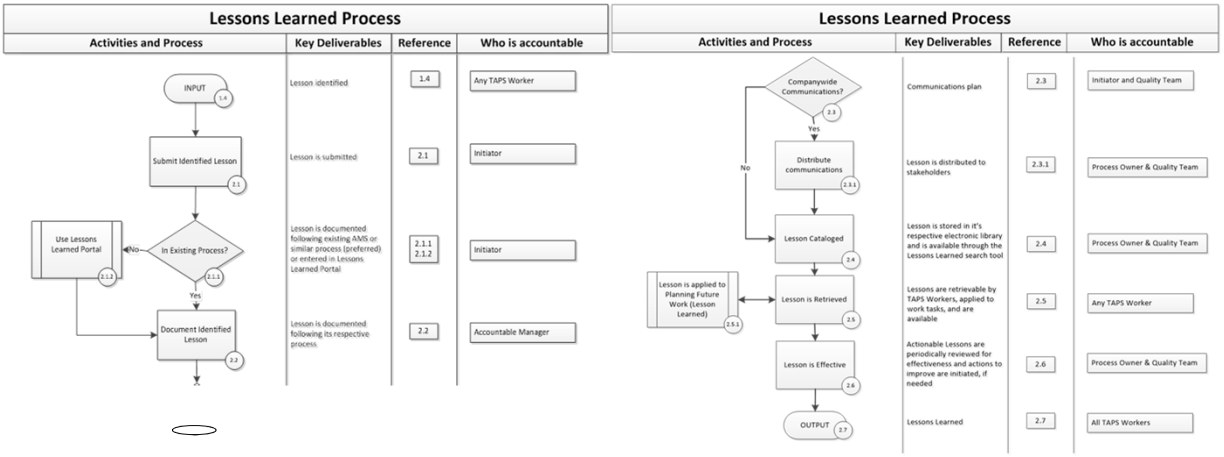
What our Solution Looks Like

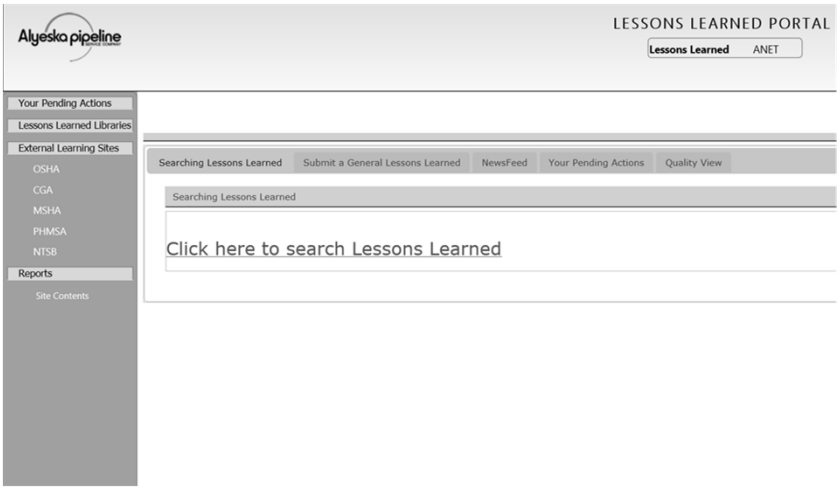
Companywide Process/Standard



- **All other business processes capture lessons learned**

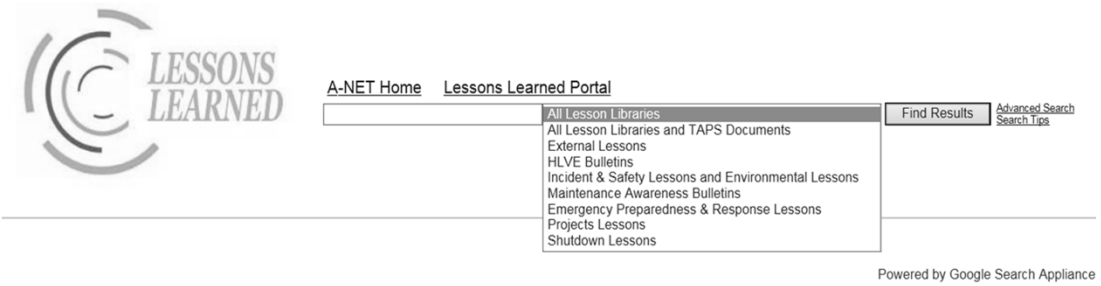
What our Solution Looks Like

Lessons Learned Portal



What our Solution Looks Like

Lessons Learned Search



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What our Solution Looks Like

High Value Learning Events

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HLVE

HLVE BULLETIN 2018-10

NLI #: 29347 – West Fire Water IWWS Vapor Intrusion

INCIDENT SUMMARY:

On July 18th, 2017 while on routine rounds, the Alyeska Fire Team encountered high levels of hydrocarbon vapors in, and around, the West Fire Water Pump Building (WFW) at the Valdez Marine Terminal. The WFW Building is a non-classified area and has multiple possible ignition sources, such as pumps and electrical panels, as well as a power distribution center (PDC) in the immediate vicinity. Mitigation measures ensued, including ventilating the building, electrically isolating WFW and the West Tank Farm, and identifying the source of the hydrocarbon vapors. Later in the evening the atmospheric conditions in WFW had returned to normal.

Potential Losses:

- Serious injury and/or death, as well as extensive property damage could have occurred if the vapors ignited from one of the ignition sources.
- The Valdez Marine Terminal could have been without the resources of the WFW pump building for an extended period of time limiting the ability to move oil.
- Environmental impacts could have occurred as a result of this incident.

The investigation team determined the vapor had travelled through an IWWS Vault during the refill of a Ballast line due to inadvertently bypassing two existing engineered controls to prevent vapor migration. If either one of these safeguards had been left in place this incident would not have occurred.

Green arrow is 16" V108
Red arrow is WFW building (470 feet away)

LESSONS IDENTIFIED:

System View: The crews focused on getting tasks done safely with no environmental or scheduling impact; however, they failed to understand the overall risks and lost focus on the system as a whole. The work was not stopped when the system did not react as expected. Additionally, the return-to-service portion of the procedure did not identify risks, hold points, or other controls to prevent incidents. The return-to-service of most processes on TAPS inherently hold high risk and must be identified and mitigated.

Act with Discipline: The investigation team determined a loss of "Operational Discipline" resulted in this incident, as well as a loss of "Situational Awareness" by all parties involved in the execution of the procedure.

1. Had the isolation valve between the WFW IWWS piping and the Berth 5 Ballast Header not been opened prematurely, vapors would not have made it to the WFW building. The technician working on this system performed the steps out of sequence because the procedure did not state otherwise.
2. Had the water seal for manhole 55-MH-12 not been removed, the vapors would most likely have percolated through the headervent rather than enter the building in the quantity they did. The contractor was directed to do this by two other personnel that "knew what they were doing;" however, by doing so removed the engineered protection to prevent vapor migration.

Reference Incident Investigation Information Center web-site for additional information

FOR FURTHER INFORMATION CONTACT THE ALYESKA QUALITY PROGRAMS TEAM

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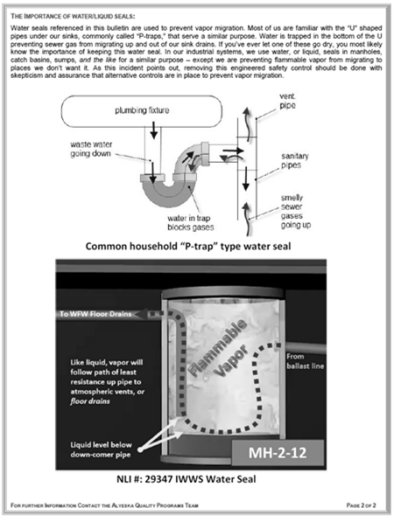

THE IMPORTANCE OF WATER/LIQUID SEALS:

Water seals referenced in this bulletin are used to prevent vapor migration. Most of us are familiar with the "U" shaped pipes under our sinks, commonly called "P-traps," that serve a similar purpose. Water is trapped in the bottom of the U preventing sewer gas from migrating up and out of our sink drains. If you've ever let one of these go dry, you most likely know the importance of keeping this water seal. In our industrial systems, we use water, or liquid, seals in manholes, catch basins, sumps, *and the like* for a similar purpose – except we are preventing flammable vapor from migrating to places we don't want it. As this incident points out, removing this engineered safety control should be done with skepticism and assurance that alternative controls are in place to prevent vapor migration.

Common household "P-trap" type water seal

NLI #: 29347 IWWS Water Seal

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Questions?

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