CAL FIRE - OFFICE OF THE STATE FIRE MARSHAL PIPELINE SAFETY DIVISION

TRB Study on Automatic/Remote Shutoff Valves
September 08, 2020

Chief Jim Hosler
Assistant Deputy Director
Pipeline Safety

Pipeline Safety Division
TRB Study

Overview

- Defining moments for the State Fire Marshal
- Who is CAL FIRE – Office of the State Fire Marshal
- PHMSA Inspections
- Elder Pipeline Safety Act of 1981
- How Does AB864 Affect Pipelines
- AB 864
- BEST Available Technology (B.A.T.)
- Release History and Trends
- B.A.T. pipeline changes
- Urban Area Challenges
- Overlap of EESA and HCAs
- Evaluation of B.A.T.- ASV, RSV

Pipeline Safety Division
TRB Study

Defining Moments

- 1980 - Gale Ave fire - Long Beach – spawned legislation creating our program
- 1989 – Runaway Train derailment & subsequent Calnev pipeline fire – San Bernardino - NTSB investigation - 4 fatalities
- 1994 -Northridge earthquake - Fire and failure of oxyacetylene pipeline
- 1995 Department of Forestry and Fire Protection (CAL FIRE) and Office of the State Fire Marshal Merge
- 2004 -Walnut Creek fire - 5 fatalities – largest civil penalty - $325,000
- 2015 – Refugio Oil release - Pipeline failure that released 2,934 barrels into the ocean near Santa Barbara

Pipeline Safety Division
TRB Study

Who is CAL FIRE OSFM Pipeline Safety Division?

- The State Fire Marshal is directly responsible for regulating the safety of approximately 5200+ miles of hazardous liquid transportation pipelines within California.

- The Division is mandated by State law to exercise exclusive safety regulatory and enforcement authority over intrastate hazardous liquid pipelines and also acts as an agent of the Pipeline and Hazardous Materials Safety Administration PHMSA.

Pipeline Safety Division
TRB Study

Pipeline Safety Staff

- 1 Assistant Deputy Director
- 1 Staff Services Manager
- 5 Supervising Engineers
- 1 Staff Attorney
- 8 Administrative Staff
- 21 Pipeline Safety Engineers
- Total current projected staff 49 persons

Pipeline Safety Division
TRB Study

PHMSA Field inspection activity

- Operator Qualification
- Public Awareness
- Construction & Design
- Emergency Response Plans
- Operation & Maintenance Records
- Drug & Alcohol
- Integrity Management

Pipeline Safety Division
TRB Study

Elder Pipeline Safety Act of 1981

- Regulations change and adapt to the needs of the State, Public Safety and protection of the environment.
- Under existing law, the Elder California Pipeline Safety Act of 1981, the State Fire Marshal exercises safety regulatory jurisdiction over intrastate pipelines and, to the extent authorized by federal law, interstate pipelines used for the transportation of hazardous or highly volatile liquid substances. Existing law provides that a violation, as determined by the State Fire Marshal, of the act, or any regulation adopted pursuant to the act, subjects a person to a civil penalty.
- What are the most recent changes
  - SB295 – Annual inspection of every pipeline and operator
  - AB864- Coastal Best Available Technology (CBAT)
  - Statue rule revisions- 20% Specified Minimum Yield Strength (SMYS) exemption for crude oil pipelines

Pipeline Safety Division
TRB Study

Remote-controlled sectionalized block valves and automatic shutoff systems are two of the best available technologies that California requires the operators to consider in reducing the amount of petroleum product released in an oil spill.

This regulation was created because of the May 2015 pipeline accident at Refugio Beach in Santa Barbara County. This incident released over 100,000 gallons of crude oil into the Pacific Ocean and impacted over 25 miles of coastline.

To prevent similar incidents from occurring on intrastate hazardous liquid pipelines, former Governor Jerry Brown signed Assembly Bill 864 into law that year. This is known as the CBAT Regulations.

Pipeline Safety Division
TRB Study

Assembly Bill 864 enacted Government Code Section 51013.1 which required that any new or replacement pipeline near environmentally and ecologically sensitive areas use the best available technologies to reduce the worst-case discharge.

Best Available Technologies include:

- Leak detection technology
- Automatic shutoff systems
- Remote-controlled sectionalized block valves
- Emergency flow restriction devices
- Combination of technologies.
- Off the shelf Technologies

Pipeline Safety Division
TRB Study

51013.1. (Elder Pipeline Act of 1981) Key Language for CBAT

(a) By January 1, 2020, any new or replacement pipeline near environmentally and ecologically sensitive areas in the coastal zone shall use best available technology, including, but not limited to, the installation of leak detection technology, automatic shutoff systems, or remote controlled sectionalized block valves, or any combination of these technologies, based on a risk analysis conducted by the operator, to reduce the amount of oil released in an oil spill to protect state waters and wildlife.

(b) (1) By July 1, 2020, an operator of an existing pipeline near environmentally and ecologically sensitive areas in the coastal zone shall submit a plan to retrofit, by January 1, 2022, existing pipelines near environmentally and ecologically sensitive areas in the coastal zone with the best available technology, including, but not limited to, installation of leak detection technologies, automatic shutoff systems, or remote controlled sectionalized block valves, or any combination of these technologies, based on a risk analysis conducted by the operator to reduce the amount of oil released in an oil spill to protect state waters and wildlife.

Pipeline Safety Division
TRB Study

Goals of B.A.T.
(Public Comment Response)

- Protection of:
  - Environmentally and Ecologically Sensitive Areas
  - State waters and wildlife
  - Coastal Zone
- By using:
  - Risk Analyses
  - Best Available Technology
    - That provides the greatest degree of protection
    - Considering effectiveness and engineering feasibility
    - Off the shelf technology

Pipeline Safety Division
TRB Study

AB 864 Resources

- AB 864 is codified in section 51013.1 of Title 5, Chapter 5.5 of the Government Code
- https://osfm.fire.ca.gov/divisions/code-development-and-analysis/title-19-development/

Pipeline Safety Division
TRB Study

The CBAT regulation, however, does not consider the cost of the retrofit. It focused on the safety aspects with the intention of protecting the coastal zone and state waters. The spill analysis focused on the worst-case discharge and the technologies to limit any potential spill from the pipeline.

- By October 2022, the OSFM reviewed the spill analysis on **395** regulated pipelines in California. Out of the 395 regulated pipelines, the operators reported that they can reduce the worst possible dispersion on **130** pipelines when they install the proposed best available technology on the subject pipelines.

- OSFM reviewed 395 spill analyses in the past years. The results confirm that both remote-controlled sectionalized block valves and automatic shutoff systems significantly reduce the time to shut down the pipeline.

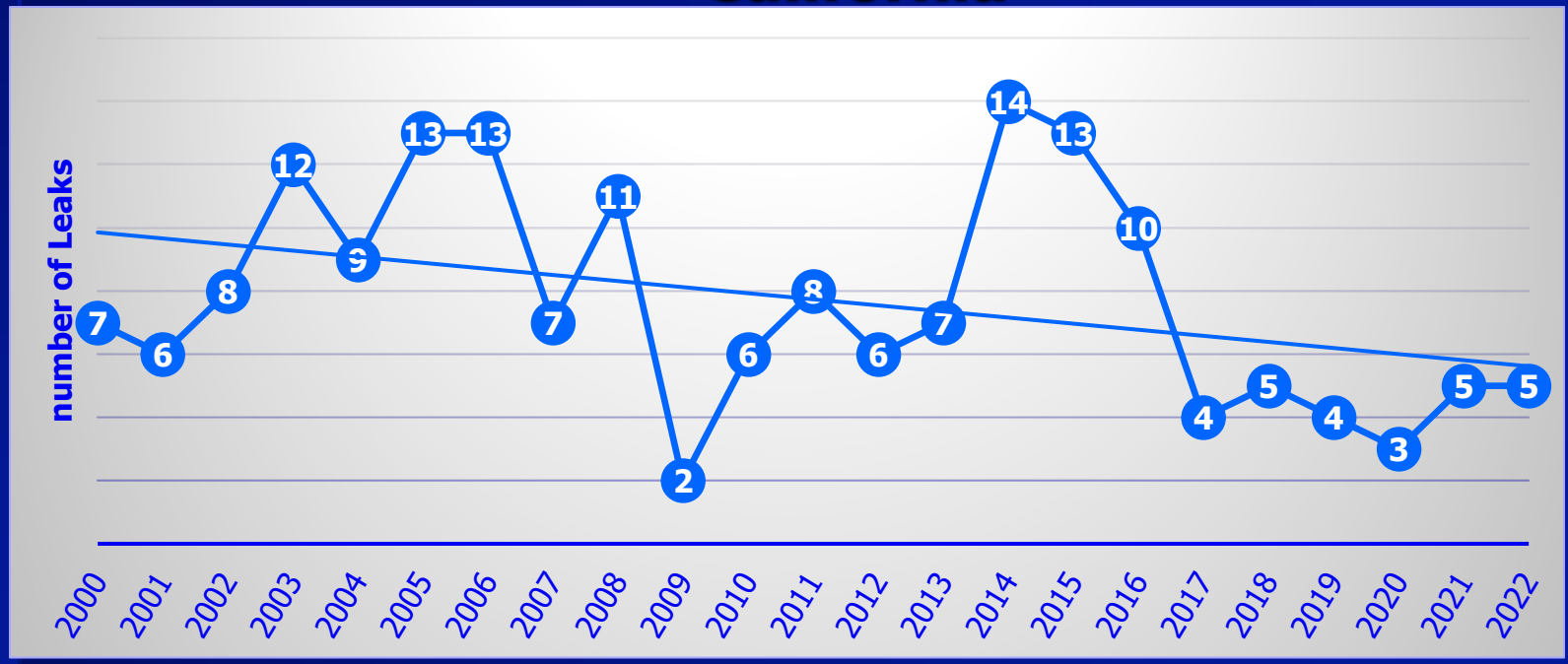
Pipeline Safety Division
TRB Study

What is the most typically proposed B.A.T.

Most operators proposed upgrading the leak detection system on the regulated pipeline because it greatly reduces the leak detection time. Typical upgrades include the fiber optics cable, leak detection software, additional transmitters/sensors, etc. A few operators proposed installing the remote-controlled sectionalized block valve or automatic shutoff system. This system reduces the time to shut down the pipeline and consequently reduces the worst-case dispersion of oil from a pipeline.

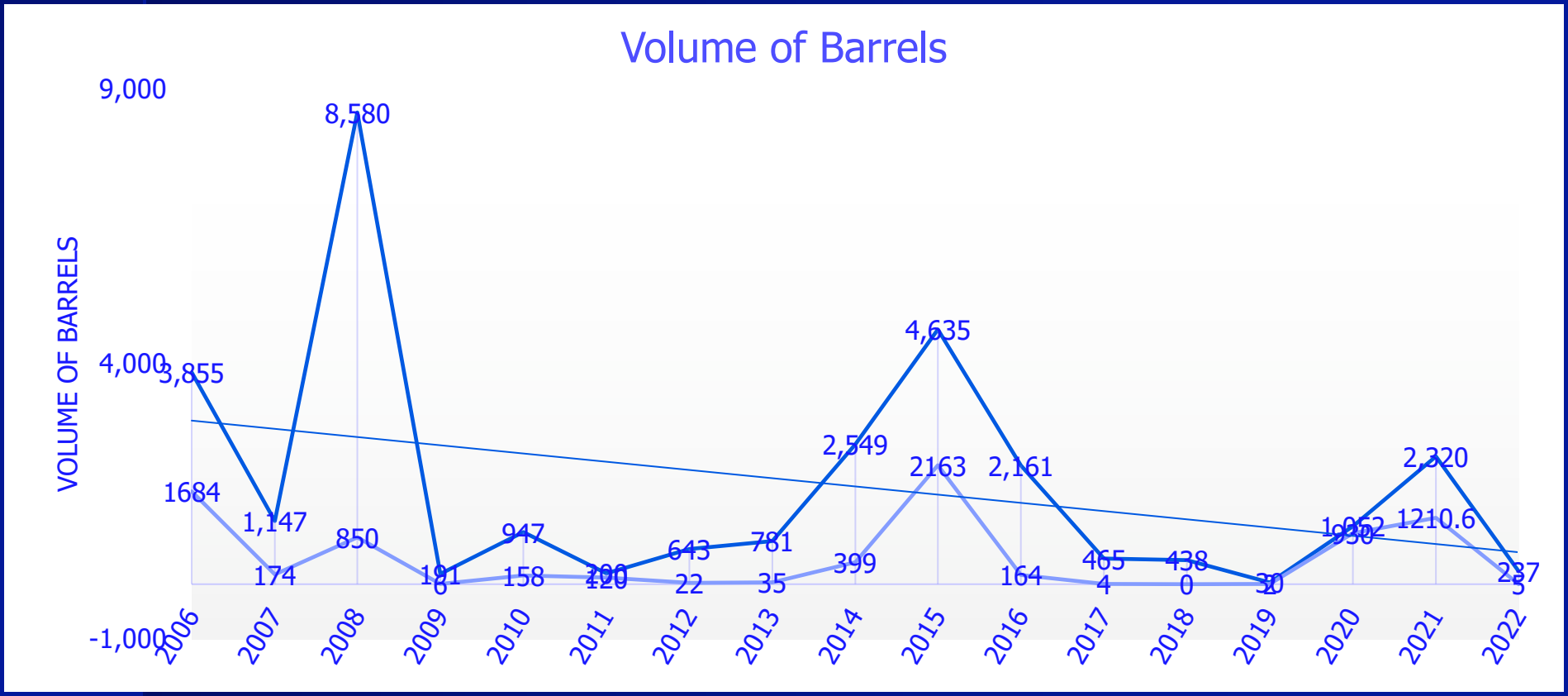
Pipeline Safety Division
TRB Study

Significant Incidents on Intrastate Lines in California



Pipeline Safety Division
TRB Study

Barrels Spilled in Jurisdictional Pipeline



Pipeline Safety Division
TRB Study

OSFM Fully Supports the Addition or Automation of Existing ASV/RCV's for Safety

- How many pipelines are affected by the rule: **395**
- How many must make changes: **130**
- How many miles are subject to the CBAT regulation: **3,540**
- How many pipelines plan to add Remote actuated block valves: 4
- How many plan to add leak detection only: 11

Pipeline Safety Division
TRB Study

OSFM Fully Supports the Addition or Automation of Existing ASV/RCV's for Safety (CONT.)

- How many pipelines plan to add emergency flow restriction devices only: 52
- How many pipelines plan to add both remote actuated block valves and leak detection: 63
- Estimated reduced average worst case discharge for the pipelines: 288.264 barrels
- Estimated average reduced response or closure time for the isolation of pipelines: 0.36 hours. (Reduced from 0.71 hours or 21.6 minutes from 84.5 min – about a 50% reduction in closure time

Pipeline Safety Division
TRB Study

Leak detection is still a key factor for this equipment to add value to the systems.

- The results confirm that both remote-controlled sectionalized block valves and automatic shutoff systems significantly reduce the time to shut down the pipeline. If an operator can detect any potential release earlier and shut down the pipeline earlier, they are able to reduce the volume of oil spilled from a pipeline.

Mathematically speaking,

- Volume = [Leak detection time + shut down time] x flow rate + residual fluids
- If we reduce either leak detection time or shutdown time, we can reduce the spilled volume

Pipeline Safety Division
TRB Study

Urban Areas Challenges

Permits and environmentally sensitive areas are two ongoing challenges we are facing to retrofit a pipeline in urban areas. (Forest, National, State Parks)

- For example, when an operator analyzes the optimal location to install a valve, they analyze the elevation profile to select the optimal location. The County representative or public, may object to installing the valves at the location proposed by the operator because the county map shows some protected species living at that location. In this situation, the operator conducted the analysis again and selects an alternative location that still reduces the spilled volume from the base case.

Secondly, permits are required when an operator retrofits a pipeline in most cities. The local government requested additional supporting documents from the operators.

Because of that, the operator reported that they might have to delay the construction until they receive the permits from the local governments.

Pipeline Safety Division
TRB Study

Overlap of Environmentally and Ecologically Sensitive Areas (EESA) and HCA's

EESA

Environmentally and Ecologically sensitive areas (EESAs) are **landscape elements or places which are vital to the long-term maintenance of biological diversity protected by the government, soil, water or other natural resources both on the site and in a regional context**.

- They include wildlife, wildlife habitat areas, steep slopes, wetlands, and prime agricultural lands.
- Plants and animals' endemic to the region

Pipeline Safety Division
TRB Study

Overlap of Environmentally and Ecologically Sensitive Areas (EESA) and HCA's (CONT.)

HCA 49 CFR §195.450 Definitions

High consequence area means:

- **(1)** A ***commercially navigable waterway,*** which means a waterway where a substantial likelihood of commercial navigation exists;
- **(2)** A ***high population area,*** which means an urbanized area, as defined and delineated by the Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 people per square mile;

Pipeline Safety Division
TRB Study

HCA 49 CFR §195.450 Definitions (Continued)

- **(3)** An ***other populated area,*** which means a place, as defined and delineated by the Census Bureau, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area;
- **(4)** An ***unusually sensitive area,*** as defined in § 195.6

Unusually Sensitive Area (USAs) 49 CFR § 195.6

- **USA Drinking Water**
- **Community Water System**
- **Ecological Resource**
- **Coastal Beach**
- **Certain Coastal Waters**

Pipeline Safety Division
TRB Study

Evaluation of Best Available Technology B.A.T.

- OSFM requires operators to submit spill analysis on each regulated pipeline
- OSFM reviews the justifications for why the B.A.T. was chosen
- Evaluate the adequacy of the B.A.T. selected per section 2110
- Minimum standard the B.A.T. shall reduce the quantity in the event of a spill
- OSFM reviews and monitors the pipelines and offers recommendations to the operators for usage of B.A.T.
- If B.A.T. is not considered for pipelines that do not fall under the rule, OSFM questions the operator on the risk review process and how are threats addressed or mitigated

Pipeline Safety Division
TRB Study

Evaluation of B.A.T ASV and RSV

- What is the estimated volume currently
- What is the estimated volume reduced
- What is the applied B.A.T.
- What type of valves
  - Automatic
  - Remote
  - EFRD
  - Driver?
  - Close time?
- Valve spacing and how many on the system
  - Do they communicate on status to the system
- What is the amount of reduction and impact to the enviroment

Pipeline Safety Division
TRB Study

CONTACT

Chief Jim Hosler
Assistant Deputy Director
jim.hosler@fire.ca.gov
Office number: (562) 497-0350

Pipeline Safety Division
Agency Training

QUESTIONS?