National Transportation Safety Board
Office of Railroad, Pipeline and Hazardous Materials Investigations
Washington, DC 20594

DCA22FM001

PIPELINE OPERATIONS

Group Chair's Factual Report - Supplemental

Report Date: October 27, 2023

TABLE OF CONTENTS

A. ACCIDENT

Location:	San Pedro Bay, California
Date:	October 1, 2021
Time:	1610 (PST) 2310 (UTC)
Operator:	Amplify Energy Inc / Beta Offshore
System Type:	Hazardous liquids
Commodity:	Crude oil

B. PIPELINE OPERATIONS GROUP

Group Chair	Kim West National Transportation Safety Board Washington, DC
Group Member	[redacted] United States Coast Guard San Pedro, California
Group Member	Brian Pierzina Pipeline and Hazardous Materials Safety Administration Oklahoma City, Oklahoma
Group Member	Junaid Ashfaq Bureau of Safety and Environmental Enforcement Camarillo, California
Group Member	Jeff Ortloff Amplify Energy Corp. Houston, Texas

C. SUMMARY

For a summary of the accident, refer to the *Pipeline Operations Group Chair's Factual Report* and *Nautical Operations Group Chair's Factual Report* within the docket.

D. FACTUAL INFORMATION

This addendum intends to report on additional factual information, supplemental to the *Pipeline Operations Group Chairman's Factual Report*, dated August 28, 2023.

1.0 Pipeline Control Center

The following additional information supplements the Pipeline Control Center discussion in Sections 12.0, 13.0, and 14.0 of the original factual report.

1.1 Abnormal Operations

Beta's procedure titled "SPBPL 16 [inch] Emergency Shutdown, Isolation and Drawdown" directed in bold red letters that if a pipeline leak is suspected and/or indicated by the leak detection system, "shut down [the] 16 [inch] pipeline." Specifically, the pipeline was to be isolated by closing shutdown valves at three locations. After initial isolation, according to Beta's procedure, additional valves were to be closed and an evaluation was to be performed to determine if drawdown of the pipeline was needed.[1]

1.2 Leak Detection

According to Beta's Oil Spill Prevention and Response Plan, which PHMSA approved on March 22, 2021, "as a general rule … *the location error decreases exponentially as the leak size increases. Leak location estimation depends on the quality of the measurements. For large leaks (greater than 20% of flow), an accuracy of [plus or minus] 5% of the distance from nearest two pressure meters is achievable." The San Pedro Bay Pipeline had two pressure meters, one on each end of the pipeline*, that were roughly 17 miles apart.[2]

The nighttime controller and the pipeline superintendent conducted the manual leak detection test in 30-minute increments from approximately 0020 to 0220 on October 2, 2021. Comparing the results of the flow meter readings at approximately 0020 to 0120, the manual leak detection revealed a difference of about 8-10 barrels per half-hour between what was shipped from Platform Elly and what was received at Beta Pump Station.[3]

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[1] SPBPL 009.11 PL EMERGENCY SD PROCEDURE
[2] (a) 1185-200812 - LOA - 03.22.21
(b) Beta Offshore Oil Spill Response Plan – Section 6.a
[3] Amplify Energy - Controller (Before failure discovered), 9 Oct 21

1.3 Alarms

Alarms indicate an equipment malfunction, process deviation, or other condition that requires a controller's response. Some alarms are designated "safety-related" because they relate to an operational factor that is necessary to maintain pipeline integrity or could lead to the recognition of a condition that could impact the integrity of the pipeline, or a developing abnormal or emergency situation. Amplify designated alarms designed to protect the public, property, or the environment as safety related.

Beta's control room management procedure required review of safety-related alarm operations using a process that ensured alarms were accurate and supported safe pipeline operations. This procedure required monthly identification, recording, review, and analysis of false alarms.[4]

According to Beta's control room management procedure, controllers were required to be trained on responding to abnormal operating conditions likely to occur simultaneously or in sequence.[5]

According to the ATMOS Inc.'s Operations and Maintenance Manual, the "sleep" control is intended for use during instrument maintenance or other cases where the system is liable to see large changes for no operational reason. It causes leak detection to be disabled and inhibits the alarms. The "sleep" command will disable ATMOS leak detection capability and should only be used if maintenance work is being carried out on the instrumentation system and false leak alarms may be generated.[6]

According to Amplify, placing the system in "sleep" mode does not "stop" the system or equate to "ignoring" it. Rather, the crew still receives and acknowledges the alarms, but the loud ringing is paused. Amplify further stated that "by using sleep mode, the operators—who continue to acknowledge and respond to the alarms—can more easily discuss the alarms and their troubleshooting efforts without the distraction of loud ringing."

The ATMOS Inc.'s Operations and Maintenance Manual also explains what actions to take when ATMOS reports a leak alarm. The manual explains that ATMOS

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[4] (a) A *false alarm* is any alarm that was presented to the controller that did not accurately reflect the actual parameter or condition, or an alarm that misled a controller to believe a condition existed that did not exist.
(b) SPBPL 009.11 PL EMERGENCY SD PROCEDURE

[5] NTSB_PHMSA_00000637_PSOM Sec 19.00, v2015-1.doc

[6] NTSB_PHMSA_00004285_Atmos LD 2001 Operation Manual V1.0

displays “LEAK DETECTED” in bold red letters on the overview display if a leak is detected for 5 scans (if the “Leak Warning” status is present for 5 scans). The actions to be taken by the operators when such an event arises should be defined in the client’s own plant and pipeline operations manual.” The manual also states that, when ATMOS PIPE™ “detects a leak condition, it will start to estimate the leak size and location. Leak locations estimation is based on the pressure profile changes after a leak occurs in a pipeline. After a leak, the pressure measurement values nearest to the leak location will drop the most. The rate of convergence depends on the size of the leak and the operating conditions along the pipeline when the leak occurs. Large leaks occurring during steady state operating conditions generally produce the most rapidly converging estimates.”

1.4 Communication Between Platform Elly and the Beta Pump Station

In 2020, Beta invested in a series of replacements and upgrades to the communications systems, to reduce the frequency of periodic alarms indicating lost communications between Platform Elly and Beta Pump Station. Beta’s Oil Spill Response Plan explained that “adverse weather will not affect detection or shut down times.”

Beta had a manual leak detection procedure that was available for use in the event of a communications breakdown between Platform Elly and the Beta Pump Station as a backup to the ATMOS LDS. The manual leak detection criterion was to be based upon a 5% variance in the net accumulated metered barrels between Elly and the Beta Pump Station over a 1-hour period, or a 1.5% variance over 24 hours.[7]

On October 1, 2021, controllers received multiple communication-loss alarms, indicating lost communication between Platform Elly and Beta Pump Station for at least 10 seconds. As an example, controllers received communication-loss alarms at 1525, 1526, 1535, 1617, 1632, and 1729.[8] The pipeline had a history of experiencing communication-loss alarms.

2.0 Damage Prevention Program

The San Pedro Bay Pipeline Operations and Maintenance Manual procedure on damage prevention establishes Beta’s damage prevention program to minimize damage to its pipeline facilities by excavation activities.[9] The damage prevention procedure references the procedure on internal and external examination of buried pipeline, a procedure that establishes Beta’s program of examination of buried

[7] SPBPL 001.00 Manual Leak Detection Procedure
[8] Alarms_OCT 1-3
[9] NTSB_PHMSA_00000729_O&M Sec 3.01, Damage Prevention, v2020.docx

pipelines for evidence of internal or external corrosion.[10] The internal and external examination of buried pipeline procedure references the pipeline repair procedure.[11]The pipeline repair procedure is intended to define pipeline defects and specify acceptable disposition methods. The pipeline repair procedure includes the following guidance:

Whenever the Company discovers any condition that could adversely affect the safe operation of its pipeline system, it must correct the condition within a reasonable time (as soon as possible). However, if the condition is of such a nature that it presents an immediate hazard to persons or property, the Company may not operate the affected part of the system until it has corrected the unsafe condition.

3.0 Operator Qualification

According to Amplify' s Operator Qualification (OQ) Program, it required its controllers to be qualified for the following tasks:

- Field Operations of a Pipeline, Including Startup/Shutdown (OQ43A)
- Control Center Operations of a Pipeline, Including Startup/Shutdown (OQ43B)
- Computational Pipeline Monitoring (CPM) Leak Detection
- Pig Launcher Pressure Relieving Equipment (OQ45)[12]

Amplify' s OQ Program required a written test and performance evaluation for qualification and a reevaluation period of 3 years for each of these tasks. At the time of the accident, the controllers and Pipeline Superintendent were qualified for Field Operations of a Pipeline, Including Startup/Shutdown and Control Center Operations of a Pipeline, Including Startup/Shutdown. They were not qualified for CPM Leak Detection, nor was the daytime controller qualified for Pig Launcher Pressure Relieving Equipment.

Amplify explained that Beta employees do not specifically train on CPM Leak Detection because they determined the training was not relevant to controllers who operated the leak detection system in the control room. Amplify indicated that CPM Leak Detection was a training program for maintaining the underlying software that powers the leak detection system. Amplify stated that Beta's former leak detection vendor, Atmos, was responsible for maintenance of the leak detection software.[13]

[10] NTSB_PHMSA_00000819_O&M Sec 6.04, Int & Ext Examination of Buried Pipe, v2020.doc
[11] NTSB_PHMSA_00000871_O&M Sec 9.01, Repairs, v2020.doc
[12] NTSB_PHMSA_00004576_Appendix B-1, OQ task list v2017-1
[13] Email from Amplify Director of Facilities Engineering to NTSB Group Chair, dated October 16, 2023.

According to Amplify, Beta maintained contracts with Atmos to maintain the leak detection software and conduct maintenance of the software.

Amplify also requires its controllers to complete the following OQ modules:

- Abnormal Operating Conditions (AOC)
- Pig Launcher and Receiver (OQ29)
- Safety Related Conditions (OM01)
- Incident Reporting (OM02)
- Control Room Management (CRM01)
- Fatigue (CRM02)

	Daytime controller	Nighttime controller
Field Operations of a Pipeline, Including Startup/Shutdown (OQ43A)	✓	✓
Control Center Operations of a Pipeline, Including Startup/Shutdown (OQ43B)	✓	✓
Computational Pipeline Monitoring (CPM) Leak Detection	Not completed	Not completed
Pig Launcher Pressure Relieving Equipment (OQ45)	Not current (Required renewal date 4/3/21)	✓
Abnormal Operating Conditions (AOC)	✓	✓
Pig Launcher and Receiver (OQ29)	Not current (Required renewal date 4/3/21)	✓
Safety Related Conditions (OM01)	✓	✓
Incident Reporting (OM02)	Not current (Required renewal date 4/13/21)	✓
Control Room Management (CRM01)	Not current (Required renewal date 4/25/20)	Not current (Required renewal date 1/10/21)
Fatigue (CRM02)	Not current (Required renewal date 8/25/20)	Not current (Required renewal date 1/10/21)

Beta's OQ trainings were administered by Compliance Service, Inc. The training materials for OQ43B identify AOCs, including a leak; piping, valve, or component failure; ignition of release fluids; exceedance of MAOP/MOP plus buildup exceeded; and unexplained pressure deviation. The training materials indicate a "Reaction to AOCs" begins with "scope and assessment," before step 2, "protection

of the public, emergency responders, company personnel, and the environment are 1st priority," and step 3, "mitigation."[14]

The AOC training materials cover regulation overviews for 49 CFR 195.503 (liquids) and 192.803 (gas), define AOCs, describe how to recognize and react to an AOC, and demonstrate the difference between an AOC and abnormal operations. The information on how to identify AOCs included:

- Not all AOCs look alike
- Some AOCs are general and may occur on many different covered tasks, such as:
    - blowing gas
    - leaking fluid
    - fires
    - inoperable valve
- Some AOCs are task specific.
- Task specific AOCs require more knowledge of the task at hand.
- Details of the task specific AOCs are covered in the qualification for each individual covered task.

The AOC training materials also warned not to confuse AOCs with abnormal operations. Examples of abnormal operations provided in the training materials included: unintended closure of a valve, loss of communication, and any foreseeable malfunction of a component, deviation from normal operation, or personnel error, which may result in a hazard to persons or property. The qualification criteria include passing a written test with a minimum score of 100% on critical questions and 80% overall.[15] There was no Job Performance Evaluation (JPR) for the AOC covered task.

4.0 PHMSA Post-accident Actions

On October 4, 2021, PHMSA issued a Corrective Action Order (CAO) to Beta Offshore. The CAO required 15 specific correction actions, including that the San Pedro Bay Pipeline remain shut down until corrective measures were undertaken. The CAO also required testing of the failed pipe, inspection of the integrity of the pipeline, an operating pressure restriction, and PHMSA approval prior to the pipeline returning to service.

[14] CSInc017009
[15] CSInc017017

After the accident, PHMSA conducted a compliance review related to the pipeline operations leading up to the accident which resulted in a Notice of Probable Violation (NOPV), a Proposed Civil Penalty in the amount $3,389,734, and Proposed Compliance Order issued to Amplify on April 6, 2023.

The NOPV identified ten probable violations of the Pipeline Safety Regulations PHMSA identified (see Attachment A pages 4 through 16).

The Proposed Compliance Order, if implemented, would require Beta to amend its procedures; train all facilities operators, control room operators, PICs, supervisors, superintendents, and safety personnel on the amended procedures; and provide training to all controllers and supervisors on fatigue risk management.

As of October 5, 2023, Amplify contested PHMSA's findings, asserting that there were no underlying violations, and that the proposed civil penalty should be withdrawn or substantially reduced. However, Beta agreed to the proposed compliance conditions (see Attachment B pages 45 through 48).

Submitted by:

Kim West
Pipeline Accident Investigator

NOTICE OF PROBABLE VIOLATION
PROPOSED CIVIL PENALTY
and
PROPOSED COMPLIANCE ORDER

VIA ELECTRONIC MAIL TO : [redacted]@amplifyenergy.com

April 6, 2023

Mr. Martyn Willsher
President and Chief Executive Officer
Amplify Energy Corp.
111 Ocean Boulevard, Suite 1240
Long Beach, CA 90802

CPF 5-2023-011-NOPV

Dear Mr. Willsher:

On October 1, 2021, the San Pedro Bay Pipeline, operated by Beta Offshore, a subsidiary of Amplify Energy Corp., failed off the coast of California, spilling approximately 588 barrels of crude oil into the San Pedro Bay, an inlet of the Pacific Ocean (Failure). On October 3 through 22, 2021, pursuant to 49 U.S.C. § 60117, representatives of the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), responded to the failure site to conduct an accident investigation. Various other federal and state agencies also responded to the scene, including the United States Coast Guard (USCG), the Bureau of Safety and Environmental Enforcement (BSEE), the National Transportation Safety Board (NTSB), the California Department of Fish and Wildlife (CDFW), and local law enforcement. Private oil spill response organizations (OSROs) under contract with Beta Offshore also responded to the spill to assist in clean-up efforts.

The San Pedro Bay Pipeline is a 16-inch diameter transmission pipeline. It is approximately 17.79 miles in length, beginning offshore at Platform Elly, located off the coast of California in

KIRKLAND & ELLIS LLP
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May 12, 2023

Mr. Dustin Hubbard
Director, Western Region
Office of Pipeline Safety
Pipeline and Hazardous Materials Safety Administration
Department of Transportation
12300 W. Dakota Ave., Suite 110
Lakewood, CO 80228

Re: CPF 5-2023-011-NOPV (April 6, 2023)
Beta Response to Notice of Probable Violations

Dear Director Hubbard:

We write on behalf of Beta Operating Company, LLC ("Beta") to respond to the above-referenced Notice of Probable Violations regarding the October 2021 spill event.

Beta shares PHMSA's commitment to ensuring public safety and enhancing pipeline integrity. The record before and after the October 2021 spill shows that Beta takes its regulatory, compliance, and safety obligations seriously. Over many years, Beta operated the San Pedro Bay Pipeline ("Pipeline") safely and consistent with applicable laws and regulations. Beta properly invested in its infrastructure, conducted regular inspections, and kept state and federal regulators up to date. External and in-line inspections of the Pipeline repeatedly showed that Beta maintained the Pipeline in excellent condition.

Unfortunately, on January 25, 2021, two massive container ships dragged their anchors in a "no-anchor" zone across the Pipeline. The anchors damaged and displaced the Pipeline. Yet despite the ships repeatedly crossing the Pipeline's well-known location, nobody informed Beta of these anchor drags. Had the ships, the Coast Guard, or the Marine Exchange (which monitors vessel traffic) notified Beta of the anchor drags, Beta would have inspected the Pipeline via a ROV and made any necessary repairs. No disclosures were made, and months later, on October 1 and October 2, 2021, approximately 588 barrels of oil were released at the point of one of the anchor strikes.