

# ACCIDENT INVESTIGATION REPORT

1. OCCURRED

DATE: **16-JAN-2024** TIME: **0252** HOURS

STRUCTURAL DAMAGE

CRANE

OTHER LIFTING

2. OPERATOR: **Arena Offshore, LP**

DAMAGED/DISABLED SAFETY SYS. **Comp. vibration switch**

REPRESENTATIVE:

TELEPHONE:

INCIDENT >\$25K **C1 Compressor Damages**

CONTRACTOR:

H2S/15MIN./20PPM

REPRESENTATIVE:

REQUIRED MUSTER

TELEPHONE:

SHUTDOWN FROM GAS RELEASE

OTHER

3. OPERATOR/CONTRACTOR REPRESENTATIVE/SUPERVISOR ON SITE AT TIME OF INCIDENT:

8. OPERATION:

4. LEASE: **G02587**

PRODUCTION

DRILLING

WORKOVER

COMPLETION

HELICOPTER

MOTOR VESSEL

PIPELINE SEGMENT NO.

DECOMMISSIONING

PA

PIPELINE

SITE CLEARANCE

TA

PLATFORM

OTHER

AREA: **SM** LATITUDE:

BLOCK: **128** LONGITUDE:

5. PLATFORM: **B**

RIG NAME:

6. ACTIVITY:  EXPLORATION(POE)

DEVELOPMENT/PRODUCTION (DOCD/POD)

9. CAUSE:

7. TYPE:

EQUIPMENT FAILURE

HUMAN ERROR

EXTERNAL DAMAGE

SLIP/TRIP/FALL

WEATHER RELATED

LEAK

UPSET H2O TREATING

OVERBOARD DRILLING FLUID

OTHER \_\_\_\_\_

INJURIES:

HISTORIC INJURY

OPERATOR

CONTRACTOR

REQUIRED EVACUATION

LTA (1-3 days)

LTA (>3 days)

RW/JT (1-3 days)

RW/JT (>3 days)

FATALITY

Other Injury

10. WATER DEPTH: **225** FT.

11. DISTANCE FROM SHORE: **75** MI.

12. WIND DIRECTION:

SPEED: M.P.H.

13. CURRENT DIRECTION:

SPEED: M.P.H.

14. SEA STATE: FT.

15. PICTURES TAKEN:

16. STATEMENT TAKEN:

POLLUTION

FIRE

EXPLOSION

LWC  HISTORIC BLOWOUT

UNDERGROUND

SURFACE

DEVERTER

SURFACE EQUIPMENT FAILURE OR PROCEDURES

COLLISION  HISTORIC  >\$25K  <=\$25K

## 17. INVESTIGATION FINDINGS:

On January 16, 2024, at approximately 0252 hours, the C1 compressor experienced a piston failure that caused damage to the housing and ignited a fire at Arena Offshore, (Arena) LP OCS-G02587, South Marsh Island (SM) 128 B Facility. While making a round, the night operator (NO) discovered a fire on the C1 compressor. The NO activated the fire alarm and the emergency shut down system (ESD). Shortly after the NO alerted personnel of the fire, the operators were able to extinguish the fire without any injuries.

**Sequence of Events:**

On January 16, 2024, the NO was near the C1 compressor when a piston failure occurred causing the piston rod to penetrate the housing and ignite a fire. The C1 compressor was compressing approximately 3.5 million cubic feet (MMcf) a day at the time of the failure. The NO activated the fire alarm and the emergency shut down system (ESD). Shortly after the activation of the ESD, the NO went door-to-door alerting all personnel of the fire. The operators were able to extinguish the fire using a firewater hose and 2 (30 lb.) dry chemical fire extinguishers. The Rotating Equipment Specialist arrived on the SM-128B facility January 17, 2024, to investigate the incident. There were no injuries to personnel due to this incident.

**BSEE INVESTIGATION:**

On January 16, 2024, the Bureau of Safety & Environmental Enforcement (BSEE) Lafayette District (LD) Accident Investigator (AI) received a phone call notification of a compressor failure that occurred on Arena's SM-128B Facility. The AI requested additional information pertaining to the incident such as the compressor inspections, statements, and other relevant documents from Arena. The BSEE LD AI conducted an onsite investigation at SM-128B on January 29, 2024. BSEE conducted interviews with the personnel involved in extinguishing the fire, compressor mechanics and reviewed all pertinent documentation.

During an interview with a compressor mechanic, it was stated that scarring was found on the piston. As per the compressor mechanic, the scarring that was discovered is generally a sign of poor maintenance.

As per the Rotating Equipment Specialist, it was suspected that the piston detached from the piston rod due to the nut on the end of the rod loosening as a component fault or from wear that caused the nut to become loose. This event caused the two bottom connecting rod bolts to break which led to the piston rod nut contacting the head end of the cylinder and separating from the frame. As the housing broke, the gas blowing down through the vent system ignited. The operators utilized 2 (30 lb.) dry chemical fire extinguishers and a firewater hose to extinguish the fire. It was also determined that the C1 compressor vibration switch tripped but failed to initiate a shut down at the panel. On January 18, 2024, an Instrumentation and Electrical Contractor tested the vibration switches on the C1 compressor. The switches tripped and relayed the signal to shut in the compressor panel. The contractor found moisture in the output line of the vibration switch. Due to the freezing temperature at the time of the incident (17 °), it is suspected that the fluid froze which would have allowed the switch to trip but not allow the signal to the panel. The C1 compressor is scheduled to be rebuilt.

**CONCLUSION:**

The C1 compressor piston failure led to a sequence of events that resulted in the piston rod nut contacting the head end of the cylinder and separating from the frame. As the housing broke, the gas blowing down through the vent system ignited. It was also determined that the vibration switch tripped but failed to initiate a shut down

at the panel. Due to the freezing temperature at the time of the incident (17F), it is suspected that the fluid froze which would have allowed the switch to trip but not allow the signal to the panel. According to statements, the vibration change from the compressor was enough to trip the vibration switch prior to the fire. If the signal could have initiated the shut down to the panel, the incident may have been prevented.

As a result of the SM-128B incident, Arena has implemented the following action:

- An in-line desiccant dryer to the pneumatic supply inlets of the compressor control panel were ordered and will to be installed.

18. LIST THE PROBABLE CAUSE(S) OF ACCIDENT:

**Equipment Failure:** The C1 compressor piston failure led to a sequence of events that resulted in the piston rod nut contacting the head end of the cylinder and separating from the frame. As the housing broke, the gas blowing down through the vent system ignited.

19. LIST THE CONTRIBUTING CAUSE(S) OF ACCIDENT:

**Work Environment:** It was also determined that the vibration switch tripped but failed to initiate a shut down at the panel. Due to the freezing temperature at the time of the incident (17F), it is suspected that the condensation froze in the tubing between the switch and the panel which would have allowed the switch to trip but not allow the signal to the panel. Desiccant dryers were ordered to prevent the condensation from forming in the tubing.

20. LIST THE ADDITIONAL INFORMATION:

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

**Compressor**

**Fire and Piston Rod**

ESTIMATED AMOUNT (TOTAL):

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: **NO**

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

**NA**

25. DATE OF ONSITE INVESTIGATION:

28. ACCIDENT CLASSIFICATION:

29-JAN-2024

26. Investigation Team Members/Panel Members:

29. ACCIDENT INVESTIGATION PANEL FORMED:

NO

27. OPERATOR REPORT ON FILE:

OCS REPORT:

30. DISTRICT SUPERVISOR:

Mark Malbrue

APPROVED

DATE:

08-AUG-2024