



SPILL# 457247
Doc# 2303094
Date: 10/03/2018

Date: October 3, 2018
To: Colorado Oil & Gas Conservation Commission
From: SandRidge Energy
Subject: Gregory Pad Incident Investigation and Preventative Action Plan

The SandRidge Energy Operations Team has concluded a thorough investigation and analysis of the fire that occurred on the Gregory Pad on 9/1/2018. Please see our executive summary below and the attachments included in this submission. A list of attachments is directly below, followed by the executive summary on the next page. Key contact information is provided at the end of this document. Please do not hesitate to reach out at any time with questions.

List of Attachments

1. 3rd Party Investigation conducted by Contek Solutions, LLC
2. SandRidge Standard Operating Procedures for Jet Pump Operations
3. SandRidge Standard Jet Pump Operating Procedures Appendix
4. Power Fluid Vessel Emergency Shut Down Valve



Executive Summary

1. Incident Summary
2. Investigation
3. Findings
4. Preventative Actions
5. Additional Controls
6. Key Contacts

1. Incident Summary:

- Witness Account
 - At approximately 4:25 AM Mountain Time, flow hands working on the south end of the pad noticed a small fire inside the Castle 7 (C7) pump house.
 - The flow hands immediately started toward the fire with fire extinguishers but the fire quickly expanded so they immediately evacuated the site.
- Response
 - Jackson County Fire Department responded to the fire and was able to extinguish the fire.
- Damage Assessment
 - *from Contek Investigation Report sec. 6.3*

“Area Extent: C7 Pump House skid building and the C7 horizontal separator received the most significant damage. There was a fire-soot fallout line outside the dike in front of Pump House C5. Wiring, instrumentation and insulation damage was extensive up to and including the Allocation horizontal vessels SW of Pump House C5.”
 - 5 BBLs of power fluid was released and contained in secondary containment
 - 100 BBLs of fluid was used to extinguish the fire



2. Investigation:

- Investigative Team on site by 9/5/2018:

Name	Title	Company
Braden Hail	Facilities Engineering Supervisor	SandRidge Energy (OKC)
Nathan Harbin	Project Manager	SandRidge Energy (OKC)
Grant Hewins	Field Operations Manager	SandRidge Energy (Field)
Grady Camper	Production Superintendent	SandRidge Energy (Field)
Andrew Bormann	Field Engineer	SandRidge Energy (Field)
Shon Crabtree	Instrument & Electrical Technician	SandRidge Energy (Field)
Hadley Bedbury, C.S.P.	Technical Consultant	Contek Solutions
Garrett Giddens	Pump Skid Technician	Weatherford
Mark Scott	Field Safety Representative	Total Safety

- Inspection
 - The investigative team thoroughly inspected the following:
 - interior and exterior of the C7 pump house
 - the C7 power fluid vessel and all piping
 - all electrical components on the site
 - all equipment within the damage extent

3. Findings:

- Based on the investigation, the initial fire was likely caused by an electrical arc flash event during Castle 7 jet pump operation.
- The fire escalated from a small fire within the pump house to a larger fire spreading damage across the site due to the pump suction hose melting, releasing pressurized hydrocarbon fluid and gas into the fire.



4. Preventative Actions:

- Contek has recommended the following actions prior to future jet pump operation. The right-hand column contains the actions that will be taken by SandRidge going forward to address the risk factors.

Contek Recommendations	SandRidge Actions
1. "Require a pre-delivery quality assessment of Triplex Pump House Skids by the provider prior to delivery with a copy provided. Review the findings for proper corrections."	SandRidge will require a pre-delivery quality assessment of each jet pump and will internally review the documentation.
2. "Consider implementing your own pre-acceptance inspection checklist or process prior to accepting delivery of additional Triplex pump skids in addition to the suppliers' process."	Sandridge will have a licensed electrician and a pump technician thoroughly inspect each unit before initial operation. We will also institute annual preventative maintenance checks on jet pump electrical components going forward.
3. "Develop a standard practice or assessment document for assessing electrical process and other safety hazards for new skids and as needed for preventative findings and corrections. This should include wiring, grounding, and other potential hazards."	Sandridge worked with experienced jet pump professionals at Powder River Hydraulics to create Standard Operating Procedures to be implemented prior to jet pump operations. Please refer to the "SandRidge Jet Pump Unit Standard Operating Procedures" and the corresponding appendix attached in this submission.
4. "Implement Arc Flash assessment, training, marking/labeling and other requirements as appropriate."	SandRidge will only conduct arc flash related work through contracted arc flash trained electricians who will be required to wear proper arc flash PPE.
5. "Track all identified repairs to timely completion."	SandRidge will continue tracking all repairs and inspections performed pre-delivery, pre-startup and during ongoing maintenance.



5. Additional Controls:

- Along with the preventative actions listed above, SandRidge will also be implementing an additional automated emergency shut down valve on the fluid outlet of each power fluid vessel. This redundant shut down device will ensure that, in the event of a fire, pressurized fluid will not escape the power fluid vessel and continue to provide fuel to the fire. This measure will ensure that the fire will be limited to only the pump house.

Please refer to the "Power Fluid Vessel ESD" documentation provided as an attachment in this submission.

6. Key Contacts

Environmental & Safety Related Topics:

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Topics Regarding the SandRidge Investigation & Action Plan:

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