

Short Procedure: Gray B24X - ESP Failure

Background: Well is down due to ESP failure with a HIC. Plan to pull equipment, repair casing, cleanout and treat as needed. RTP as a flowing well. Upgrade tubing head to TM-40 due to current WH height.

It is up to the WSR, Workover Engineer and Production Engineer to make the decisions necessary to safely do what is best for the well.

Contacts: Jon Bacon Workover Engineer 713-201-8239
Travis Garza Workover Superintendent 432-687-7953
Katrina Schilling Production Engineer 970-620-3399

WellSafe Procedure Required: No, requires < 10ppg KWF
MASP: < 500 psi

Short Procedure: For procedure specifics, WSR's will need to refer to the Well Intervention Standard Procedure or Rangely WPT.

NOTE: Sustained surface casing pressure noted during 2017 TAR (all gas) with communication to the production casing.

520 SISCP noted in 8/28/19 & bled off (all gas), observed constant/slow pressure build up on both production & surface casing.

1.	MIRU workover rig and equipment. Check pressure on all casing strings (including bradenhead). <u>Record tubing and casing pressures every day on the WellView report. Bleed off SISCP & monitor throughout job.</u>
2.	Bleed off pressure. Kill well with river water if possible. If unable to kill with water, pump 10 ppg or less KMW if necessary. Due to well being converted to FL, do not want to pump higher than necessary KWF. NOTE: Unless there is a well control event do not pump heavier than 10 ppg KWF. Confirm with workover engineer and superintendent that well is WellSafe certified prior to CaCl ₂ .
3.	Test BPV to 2,100 psi for 15 minutes. Set BPV in hanger, noting BPV SN and test date (confirm within 21 days) (WSEA 10A), if possible. N/D tree. N/U 7-1/16" 5K BOP with Washington head, 5K annular and 2-7/8" pipe rams on top of blind rams (WSEA 8A). Pull BPV. Test BOPE to 5 minute 250 psi low/10 minute 2100 psi high (WSEA 9). NOTE: If BPV cannot be set, the well must be monitored for flow for 15 minutes or longer before installing BOP. Note reasoning for not setting BPV in WellView timelog and in WSEA 10.
4.	Caliper elevators and document in WellView. TOOH with the 2-7/8" tubing. While spooling out ESP cable, visually inspect tubing. Based on observed condition of equipment, a decision will be made on whether to perform a treatment. NOTE: New TK-15 tubing ran in 2009. Corrosion noted during 2009 job. NOTE: Will not tag for fill. Plan to cleanout with full-gauge bit to scrape casing for future casing repair work.
5.	P/U 6-1/8" bit and cleanout BHA on 2-7/8" workstring (7" Shoe: 6,326'). Cleanout to PBTD at 6,546', if possible. Keep workover engineer notified of cleanout progress. Cleanout may be called short if not making progress NOTE: OH from 6,326'-6,546'. Last clean out in 2009 to PBTD 6,546'

Phase Table				
Well Phase	Phase 1	Phase 2	Steps	Equipment
LOCN	MOB	RU	1	
WO	PROD	PRODTBG 1	2-4	
WO	PROD	CSGCLNOUT	5	Cleanout BHA
WO	PROD	ACID	6	Acid BHA rental / personnel
WO	PRODCSG	CSGREPAIR	7-9	Casing & patch Cement
WO	PRODCSG	WHREPAIR	10-11	Wellhead

6. If Xylene or Acid treatment is needed, communicate with workover engineer on forward plan. Max pressure for any treatment will be 1700 psi. Refer to Rangely Regulatory/Permitting document for rules on subsequent reporting requirements. **NOTE: May defer treatment until after production tubing is run if well is taking fluid.**

NOTE: Solvent volume will be determined by calculating the volume from PBTD to the packer setting depth. The amount of excess will be determined on location by the WSM, tool pusher, and tool hand. Light asphaltenes can most likely be treated with 10% excess, but heavy deposits may require up to 100% excess. Discuss with WOE as well.

7. P/U and TIH with WL entry guide, 7" Lok-Set packer, pup joint, and on/off tool with 1.875" 'F' profile. Set packer at ~6,250' (packer must be within 100' of OH). Set 1.875" F tubing plug. If necessary, displace well to freshwater. **Attempt to test Lok-Set packer to 500 psi for 15 minutes with FW EMW (WSEA 10B, if it tests).** TOH

8. P/U 7" TST packer and TIH on 2-7/8" workstring. If necessary, set above Lok-Set packer and **test Lok-set Packer/Plug to 500 psi for 15 minutes with FW EMW (WSEA 10B).** Attempt to test casing to 350 psi for 15 minutes. Begin moving TST packer to isolate casing leak. If necessary, P/U 7" full-bore packer and test casing from ~1,000' to surface (surface casing shoe: 1,011'). **Notify WOE of test results.**

NOTE: Will not run CBL, CBL performed during 2009 workover. Weak bond/free pipe from surface casing shoe to surface.

NOTE: CBL available in Rangely file room.

9. If leak is above 1,000' and in free pipe, continue to step 9a. Otherwise, Once nature of the leak is determined and CBL reviewed, communicate with workover engineer and superintendent to determine plan forward for repairing the leak. If it is necessary, a written procedure will be developed to cover the steps for repairing the HIC

NOTE: ENSURE ALL STEPS ARE BEING TAKEN TO FOLLOW ALL REGULATORY AND RULES AND REGULATIONS. REFER TO RANGELY REGULATORY/PERMITTING DOCUMENT FOR REQUIREMENTS. IF UNSURE CONSULT WITH WORKOVER ENGINEER OR DIANE PETERSON FOR GUIDANCE.

10. If necessary, set RBP at +/- 2,000' and **test to 500 psi for 15 minutes (WSEA 10C).** Spot 300 lbs sand on top of RBP. N/D BOPs and tubing head. Upgrade tubing head to TM-40 per GE's recommendations. **Test void to 3,000 psi for 15 min (WSEA 10D).**

11. N/U 7-1/16" 5K BOP with Washington head, 5K annular and 2-7/8" pipe rams on top of blind rams **(WSEA 8A).** Test break to 5 minute 250 psi low/10 minute 2100 psi high. **(WSEA 9).** TIH with retrieval tool on 2-7/8" workstring. Pull RBP(s) and TOH.

12. TIH with slick skirt on visually inspected TK-15 tubing, replacing bad joints as needed. Space out, circulate packer fluid, and land. **Test 7" casing / Lok-Set packer / Hanger seals to 350 psi for 30 minutes (WSEA 6A and 10E).**

13. Set BPV, documenting BPV SN and test date (confirm within 21 days) **(WSEA 10F).** N/D BOP. N/U tree with second master valve. Pull BPV. **Test void to 5,000 psi for 15 minutes (WSEA 10G).** Test tubing against plug to 500 psi for 15 minutes **(WSEA 6B).**

NOTE: If BPV cannot be set, the well must be monitored for flow for 15 minutes or longer before installing production tree. Note reasoning for not setting BPV in WellView timelog and in WSEA 10.

14. MIRU PLS. Test lubricator to 500 psi for 5 min. RIH and pull tubing plug. POOH R/D PLS.

WO	PROD	PRODTBG 2	12-14	Tubing
LOCN	MOB	RD	15	

Casing patch procedure

NOTE: Cement was circulated to surface during primary cement job in 2003 but CBL shows TOC ~2,470'. Review CBL closely for any stringers and consult with WOE and Superintendent prior to continuing with patch. Depending on leak depth & confidence of free pipe, may elect to squeeze cement.

9a. RIH with 7" Kline RBP / 7" TST packer on 2-7/8" workstring to +/- 2,000', or below TOC. Set 7" RBP. Set 7" TST packer and **test RBP to 500 psi for 15 minutes (WSEA 10C).** Spot 300 lbs sand on top of RBP. TOH.

NOTE: Ensure Surface Casing Pressure is 0 psi & not flowing.

9b. P/U 7" internal casing cutter on 2-7/8" workstring to desired cut depth. Cut 7" casing. TOH.

NOTE: Consult with WOE and Superintendent on planned cut depth. Coorelate with 2009 CBL to ensure collar is not within 6' of planned cut.

9c. N/D 7-1/16" BOP & tubing head. P/U 7" casing spear and engage 7" casing. L/D 7" casing.

NOTE: Ensure GE is onsite to inspect 7" hanger. If necessary, send in to be redressed.

9d. RIH with 8-1/8" polish mill on 2-7/8" work string on top of 7" casing. Dress off 7" casing. TOH

9e. RIH with 7" casing patch on new 7" 23# L-80 casing. Engage 7" stub, set and pack-off patch. Test casing patch to 500 psi for 15 minutes.

9f. Set 7" mechanical casing slips, engage slips with a minimum of 50klbs. Cut 7" casing & dress stump. **N/U new TM-40 tubing head. Test void to 3000 psi for 15 minutes (WSEA 10D).**

15. Notify production personnel in field office and notify lease operator that well is ready to flow. Complete Ownership Transfer Document from D&C to Operations. RDMO workover rig and equipment. **ENSURE LOCATION IS CLEAN.**

9g. N/U 7-1/16" 5K BOP with 3K Washington head, 5K annular and 2-7/8" pipe rams on top of blind rams (WSEA 8A). Test break to 5 minute 250 psi low/10 minute 2100 psi high. (WSEA 9)

9h. RIH with on/off skirt on 2 7/8" work string. Wash sand off 7" Kline RBP at +/- 2,000'. POOH with RBP. Test 7" casing / Lok-Set Packer to 350 psi for 15 minutes (operational).

9i. Continue to step 12.