**PROCEDURE:** CENTRIFUGE TEST FOR OIL BS&W CUT

**RISK RANKING:** LOW

**HAZARD ASSESSMENT:**

<table>
<thead>
<tr>
<th>HAZARD</th>
<th>POTENTIAL EFFECTS</th>
<th>CONTROL</th>
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<tbody>
<tr>
<td>1. Flammable vapors / LEL.</td>
<td>1. Vapors may ignite causing flash fire.</td>
<td>1. Monitor to be used to detect LEL. Fixed fire and LEL detection may be in place to initiate ESD. SABA/SCBA may have to be used.</td>
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<td>2. Exposure above OEL may cause serious personal injury, at higher concentrations; exposure will cause breathing to stop.</td>
<td>2. Monitor to be used to detect H2S. Fixed H2S detection may be in place to initiate ESD.</td>
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<td>2. H2S.</td>
<td>3. Swallowing, skin contact and eye contact.</td>
<td>3. Proper PPE is to be worn as per MSDS for chemicals used to perform BS&amp;W cut thus preventing worker exposure.</td>
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<tr>
<td>3. Worker exposure.</td>
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**SAFETY EQUIPMENT:**

Safety Glasses with side shields, hard hat, steel toe boots, FR Clothing, rubber gloves and personal gas monitor.

**NOTE:** This must be done on a regular basis. Inaccuracy and non-conformance have serious repercussions. This procedure determines the Basic Sediment and Water in a sample and sets the percentages of hydrocarbon liquids to water and other impurities. This procedure is based on API Standards & conforms to ASTM D 96-88.

**PROCEDURE:**

1. Determine the schedule for testing wells and follow the established, including well stabilization periods required.

2. Put sampler in operation. Adjust tension on the spring to get correct timing, representative of the oil produced throughout the period.
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3. For conventional production:
   • Take liquid sample from test separator.

4. For heavy oil production:
   • Take liquid sample from wellhead. Heat sample in a bath to enable it to be put in a test tube.
   • A minimum of 1000ml sample is required.

5. Shake sample well to make an emulsion to be sure you are getting a sample that is representative of all the fluid collected during test.

6. Fill two 100 ml centrifuge tubes with the sample taken to the 100% level on tubes calibrated from 0% to 200% and to the 50% level on tubes calibrated from 0% to 100%. Add a small amount of demulsifier (knock out drops) to assist separation and shake again. If escaping gas has left the level below the 50% or 100% level, top it off again.

7. Take warm solvent, preferably Varsol, from the centrifuge tube heater and fill the centrifuge tubes to 100% on tubes calibrated from 0% to 100% and to 200% on tubes calibrated from 0% to 200%.

8. Put the tubes back into the heater and let the samples heat for a period of time. Do not let tubes boil over. If there was a line heater in service before the test separator or if the production is warm enough more heating of the sample may not be required. Ensure applied heat does not exceed the vapor temperature of the oil and water.

9. Place sample tubes on opposite sides of the centrifuge to maintain balance. Spin the centrifuge for 10 minutes (tests at each field will be required to determine if 10 minutes is sufficient to drop out all BS&W.

10. Obtain readings of combined basic sediment and water directly in percentages from the tube to the nearest 0.05 ml (from 0.1 to the 1ml graduation) and to the nearest 0.1ml (above the 1ml graduation).

11. Read the BS&W measurement directly from the 0% to 200% calibrated tubes. Double the readings (to account for the solvent) to determine the BS&W content of the oil from the 0% to 100% calibrated tubes (i.e. reading of .25ml is to be recorded as .5ml). Oil must be below 0.5% BS&W to meet pipeline specifications. If no solvent was used, read the % of BS&W directly from the 0% to 100% tubes.
I2. Average the results from the two different tubes. Record the percentage of water and sediment, the solvent used, the type and amount of demulsifier if used and the bath temperature.

13. Calculate the total volume of oil produced in one day by multiplying the total fluid produced reading (on the Floco) by the percentage of BS&W contained in the centrifuge.

14. If you have any reason to doubt the results take another test, if it comes back in the same range and is high or low look for reasons for the change and contact your foreman.