**Hydrocarbon - Water Stripper Scenario Expert Rationale ONLY**

**Decision Point 1:** Select the top 4 variables that you would monitor to ensure stable Stripper Tower operation. Please explain your rationale for your selections.

|  |  |
| --- | --- |
| **Selection** | **Option** |
| X | Vessel 1 level |
|  | Water flow into tower |
| X | Level of stripper tower |
| X | Flow through tower vent |
| X | Steam flow to tower |
|  | Water flow out of tower |
|  | Delta pressure of tower |

**Expert Rationale:**

Vessel 1 level – Provides a liquid seal for V101 and a stable level should provide a stable flow to T201.

Water flow into tower – indication of how much load will be on the tower and determine if mass balance of tower is equal.

Level of Stripper tower – Tower trays will flood if too high and the pump will lose suction and stop flowing if too low.

Flow through tower vent – Indication of proper stripping of hydrocarbons from water. Temperature of vent – secondary. Could be used to confirm tower vent flow indication is working. Should only change if there is no vent flow or pressure on vent changes.

Steam flow to tower – Ensures hydrocarbons are stripped from water.

Water flow out of tower - Helps to determine mass balance and an indication of pump performance.

Delta pressure of tower – indicates tower problems or tray fouling.

**Decision Point 2:** What do you think is going on here? Rank the following items from 1 = most likely (top) to 5 = least likely (bottom). Please explain your rationale for your selections.

|  |  |
| --- | --- |
| **Rank** | **Option** |
| 2 | FV202 malfunctioning |
| 1 | LC201 failing |
| 3 | FV205 cycling |
| 5 | Stripper tower tray damage |
| 4 | FC202 transmitter failing |

**Expert Rationale:**

1) LC201 is correct. Feed into the tower is the same as before and flow out is higher. Level should be dropping. This is verified when the low-level alarm comes in.

2) The steam flow and tower DP should cycle with it the valve.

3) Flow is increasing with output which should happen. Then mass balance reasoning applies. The tower DP would increase, or decrease depending on the failure and should not affect the level to this degree. If trays fell to the bottom of the tower – decrease.

**Decision Point 3:** What are the 3 most important actions to take at this moment? Select only the three most important actions you would take and rank them from 1 = most important (top) to 3 = least important (bottom). Please explain your rationale for your selections.

|  |  |
| --- | --- |
| **Rank** | **Option** |
| 1 | Place FV202 in manual |
|  | Increase feed to the Stripper tower |
|  | Stop steam flow to Stripper tower |
| 2 | Have outside operator check the local level indicator |
| 3 | Reduce FV202 output to recover level in T20 |

**Expert Rationale:**

First move as it is open too far and draining the tower. The pump will eventually cavitate and stop flowing when the tower is empty. Next, have your outside operator check the local level - this could happen at the same time as placing the FV202 in manual or reducing its output. Then reduce Fv202 output - this should happen right after the FV202 is put in manual to recover the level in T201.