#### Inventory the HFP Tank

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| General | Fill the HFP feed tank from the Monomer HFP storage tank |

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| Procedure Outline | **NOTE\*-** If HFP flow transmitter has been deinventoried for maintenance or E&I, flow transmitter to be inventoried before startup. Follow procedure 33P4.H.5.   1. Notify Monomer panelboard operator of intentions to load the HFP feed tank 2. Prepare HFP feed tank for loading 3. Ready to begin loading HFP feed tank 4. Communicate to Monomer operator that loading is complete 5. Restore HFP feed tank to standard operating conditions |

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| Safety | * HFP is toxic and a gas at room temperature. If a leak should develop, breathing air must be worn * The HFP tank loading block valve, 1006HS, is interlocked closed by any of the following conditions: * **Hi level of HFP tank**: This value now changes as a function of campaign size, with a maximum campaign size of 45 batches. Operators need only to enter the number of batches required and the hi-level trip point is automatically calculated. * **HH level of HFP tank**: This value is set at 1600 lbs based on level (80% of the level transmitter range, which is far greater than needed for the longest campaign). * **HH pressure of HFP tank**: This value is set at 25 psig. * **HFP tank vent valve:**  1004HS is closed * **HFP to AC BV open:** 1033HS, 1021HS, 1022HS, and 1030HS (any open) * **HFP software E-STOP:** activated * The HFP vent valve is interlocked closed by any of the following conditions: * **Mixed gasholder pressure hi**: 990PG greater than 15 psig * **Mixed gasholder level high**: 387LG greater than 70 % * **HH level of HFP tank**: greater than 1600 lbs   **HFP software E-STOP**: activated  **Mixed gas holder frag chamber pressure above 10 psig or less than 2 psig.** |

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#### Inventory the HFP Tank, Continued

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| Safety **(Continued)** | * The HFP emergency block valve 1035HS that is located on the bottom of the tank is interlocked by any of the following conditions: * **HFP software E-STOP**: activated * The nitrogen valve used to pad the HFP tank is interlocked closed if: * **HFP tank vent valve 1004HS open** * **HFP tank pressure exceeds 70 psig**: 1008PG greater than 70 psig * **HFP software E-STOP**: activated  The HFP software E-Stop is available on the Common HFP DCS graphic and when activated by the operator, will close all valves on the HFP system (1004HS, 1005HS, 1006HS and 1035HS). HFP E-Stop can also be automatically activated by logic intended to detect a Loss of Containment. Activation of the HFP E-Stop, either manually or automatically, will require a ‘HFP Estop Reset’ located below the ‘HFP E-Stop’. |
|  | The process is always monitored by the DCS, however, 100% operator attention is still required to monitor the transfer that takes 10-20 minutes. |

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| Initial Equipment Status | * The HFP tank has been evacuated and purged to remove oxygen or at a low level * HFP feed tank has 2 - 4 lbs of HFP vapors. See “Prepare HFP Tank for Maintenance |

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#### Inventory the HFP Tank, Continued

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| Procedure Steps | Notify Monomer operator of intention to load the HFP feed tank   1. Monomer operator will open HFP manual supply valve (Monomer’s makeup valve)   **Prepare the HFP feed tank for loading**   * Close nitrogen supply automatic valve to the HFP tank. Leave the manual nitrogen valves open. Leave the automatic block valve in MAN mode. Note: there is no need to close the field N2 valve * Vent the HFP tank to 3 psig by opening the manual valve (at the North side of the tank) to the atmosphere after connect vent/vacuum connection. Large quantities of nitrogen can upset Monomer. DO NOT PULL VACUUM ON THE TANK (Title V) * When HFP tank has been depressurized to 3 psig, close the manual valve to the atmosphere. Disconnect vacuum/vent line. * Open the manual valves which isolate the automatic block valves for venting and loading the HFP tank. * Manual vent valves (2) on mixed gasholder line   **NOTE: Valve is located on top of No. 8 autoclave cell roof**   * HFP tank manual valves around the vent automatic valve * Manual orbit valve in cell, maximum of 5 turns   Enter the number of batches for which HFP is needed in the DCS. Per a PHA recommendation, the HFP inventory should be no more than 600 lbs. The number of batches allowed is limited to 45.  **Ready to start loading HFP feed tank**   * The DCS automatically opens the vent valve, followed by the loading valve. A new high-level trip point is calculated and displayed on the interlock help screen for 1006HS. * When the calculated refill level based upon the desired number of batches is reached, the loading valve and vent valve close automatically and the nitrogen valve is opened. * The refill level trip point is calculated as follows:   (Number of batches required \* 12 lb/batch \* 1.1 allowance for aborted batches)   * Example: For 45 batches, the trip point is (45\*12\*1.1) = 594 lb. * Note: When filling the HFP tank from empty, the HFP entering the tank flashes and becomes a vapor. After filling is complete, the nitrogen valve opens, and pressurizes the tank, the HFP that flashed when entering the tank, condenses back into a liquid. At that point, the HFP weight should increase. Experience has been the level nearly doubles. |

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#### Inventory the HFP Tank, Continued

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| Procedure Steps (Continued) | **Ready to start loading HFP feed tank, (*Continued)***   * The high level trip point is calculated as follows: * (Number of batches required \* 12 lb/batch \* 1.1 allowance for aborted batches) + 10 lbs * Example: For 45 batches, the trip point is (45\*12\*1.1) + 10 = 604 lb. * Rather than entering an exact campaign size, it is more likely that an estimated number of batches to be made on all autoclaves for the next month will be entered. * If the number of batches requested is less than the current inventory, the valves remain closed. * If a mistake is made in the batch entry field, enter a 0 (zero) to reset, wait for the field to read –1, then enter the new value. * If an interlock condition for the loading valve occurs while filling, the valve closes and the batch entry remains. When the interlock condition clears, open the valves to resume loading the tank. Too fast loading of the HFP tank (orbit valve in cell too open, the pressure in the HFP tank will increase and will shut-off the HFP feed loading automatic. When pressure in the tank drops by 5 psig, re-open the valve and continue with loading. To avoid repeat interruptions to HFP feed transfers reduce orbit valve opening. * If the operator selects the software HFP E-Stop, the transfer is aborted and all valves are interlocked closed. HFP E-Stop can also be automatically activated by logic intended to detect a Loss of Containment. If E-Stop is activated by a Loss of Containment, a red ‘Loss of Containment’ alarm box will appear above the activated red ‘HFP E-Stop’ button. Activation of the HFP E-Stop, either manually or automatically, will require a ‘HFP Estop Reset’ located below the ‘HFP E-Stop’. |

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#### Inventory the HFP Tank, Continued

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| Procedure Steps (Continued) | **Ready to start loading HFP feed tank, (*Continued)***   * At end of the transfer N2 will be added to the HFP tank by the DCS to about 50-60 psig through DCS * Communicate to Monomer operator that loading is complete * Restore HFP feed tank to standard operating conditions * **Close** all manual valves in HFP feed system from monomers and HFP tank Vent line around automatic * HFP feed tank is now back to normal operating conditions * Run an “HFP Dummy Batch” on any autoclave running an HFP modified product (6C X) before resuming normal operation of that autoclave. If the HFP tank is loaded prior to a 6C X campaign, then this is part of the normal start up procedure, but if it is loaded mid campaign, then an “HFP Dummy Batch” is still needed to make sure the line is liquid full to the autoclave.   **Follow Up Items**   1. Record HFP amount transfer   **Affected Process Variables to Monitor**  1. Monitor the HFP feed tank level through DCS   1. Monitor the Monomer storage tank level through DCS   3. Record transfer in Daily log (Title V requirement)  **References**  TEFLON™ Catalog of Chemicals |

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#### Inventory the HFP Tank, Continued

**HFP FEED TANK INVENTORY**

The amount of HFP in the feed tan is shown in the table below

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| --- | --- | --- | --- | --- | --- |
|  | % LEVEL | LBS HFP |  | % LEVEL | LBS HFP |
| LOW LEVEL 🡪 | 0 | 0 |  | 52 | 1037 |
|  | 2 | 38 |  | 54 | 1077 |
|  | 4 | 76 |  | 56 | 117 |
|  | 6 | 114 |  | 58 | 1157 |
|  | 8 | 154 |  | 60 | 1198 |
|  | 10 | 194 |  | 62 | 1238 |
|  | 12 | 234 |  | 64 | 1278 |
|  | 14 | 274.5 |  | 66 | 1318 |
|  | 16 | 315 |  | 68 | 1358 |
|  | 18 | 355 |  | 70 | 1398 |
|  | 20 | 395 |  | 72 | 1438 |
|  | 22 | 435 |  | 74 | 1478 |
|  | 24 | 475 |  | 76 | 1519 |
|  | 26 | 515 |  | 78 | 1559 |
|  | 28 | 555 | DCS cut off (HiHi = 1600) | 80 | 1599 |
|  | 30 | 596 |  | 82 | 1639 |
|  | 32 | 636 |  | 84 | 1679 |
|  | 34 | 676 |  | 86 | 1719 |
|  | 36 | 716 |  | 88 | 1759 |
|  | 38 | 756 |  | 90 | 1799 |
|  | 40 | 796 |  | 92 | 1840 |
|  | 42 | 836 |  | 94 | 1880 |
|  | 44 | 876 |  | 96 | 1920 |
|  | 46 | 917 |  | 98 | 1960 |
|  | 48 | 957 |  | 100 | 2000 |

End of topic