#### Prepare Autoclave TFE Feedline for Maintenance and Restore to Service

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| Purpose | Allow maintenance on the TFE feed and block valves, delta P instrument, TFE flow transmitter, and on the TFE feedline, back to first manual valve from the autoclave. Restore this system to service. This OD is also referenced by other autoclave-maintenance operating directions. |

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| Safety and Environ- mental | * Fill out P-Form 107 for Deinventory and Reinventory of TFE Systems * Initiate FG Form 78 – TFE Inventory Permit * Opening the autoclave or TFE line requires a Hazardous Line Break permit. This includes adding/removing line blanks. The permit should be filled out immediately before the physical line break by the operator supervising the line break. * Autoclave contains low pressure nitrogen pad. Vent pressure before proceeding with lockout. * Do not trap TFE between manual valves for any longer than necessary * Do not trap cold brine between manual valves without draining * Verify vacuum system knockout pot is free of liquid before using the system * Electric power to the autoclave TFE feed/block valves is only locked out if and when the valves are removed or replaced in order to facilitate use of other automatic devices in lockout/maintenance task. Therefore, initial lockout may not include this power source. Always verify electric power is locked out before removing these valves. * For roof access to change the MWT discharge rupture disk, sensor, or boot; it is necessary to lockout both the steam supply valve to the vacuum jet and either the autoclave vent line or the entire autoclave per 33P4R2. |

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| Initial Equipment Status | * Monomer Weigh Tank in standby condition at less than 95 psig, and with balance or liquid load line open to RMST. * Monomer Weigh Tank fail-safe automatic valve to autoclave TFE feedline is open * Autoclave deinventoried of all process and dispersion through standard venting and batch drop DCS automated steps * Autoclave may contain a water charge for packing maintenance procedures * Autoclave padded with low pressure nitrogen * Maintenance should have all parts ready to install before opening the TFE feedline. Leaving the feedline open for extended periods draws moisture in, and will require drying. |

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#### Prepare Autoclave TFE Feedline for Maintenance and Restore to Service, Continued

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| Procedure Outline | 1. Lockout Autoclave 2. Lock, Open Emergency Vent 3. Lockout, Evacuate, and Purge TFE from Feedline 4. Pressure Test and Helium Leak Check TFE Feedline 5. Evacuate, and Purge Air from TFE Feedline and Reinventory 6. Restore Autoclave to Service 7. Vacuum Test Autoclave-side of TFE Feedline |

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| References | * P-Form 107 Deinventory and Reinventory Checklist * FG Form 78 Inventory Permit * WW-539 Interlock Bypass Permit * WW-574 Hazardous Equipment Line Break * WW-508 Lock, Tag, and Try |

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| **Lockout Autoclave** | Close, lock, tag, and try the following autoclave manual valves and equipment:   1. Shutoff the autoclave nitrogen valve and vent nitrogen pressure out ATM vent valves in DCS. 2. Gas Holder Manual – 3rd level 3. Ingredients Header Manual Valve – 3rd level 4. 75# Steam Back Manual – 3rd level 5. Inboard / Outboard Injection Manual Valves – 3rd level 6. Pin closed the cleaning ram ball valve – 3rd level 7. LTT Motorized Drop Valve in closed position, ECR hand switch and pin – 3rd level 8. LTT Agitator field disconnect, hand switch, and ECR – 3rd level 9. LTT electric to TFE block valve and feed control valve switches, ECR, if and when TFE feed and block valve are removed or replaced. |

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#### Prepare Autoclave TFE Feedline for Maintenance and Restore to Service, Continued

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| **Lockout, Evacuate, and Purge TFE from Feedline** | 1. Initiate Evacuation and Purging Checklist (P-107) 2. Close and lock the TFE feedline manual valve closest to the autoclave on the 3rd level. Note: Do not complete this step until E&I is ready to bypass open the TFE feed/block valve, and monomer weight tank fail-safe valve. 3. After completing the permit, have E&I bypass open the TFE feedline automatic control valve closest to the monomer weigh tank. The TFE automatic block valve closest to the autoclave remains closed. 4. After completing the permit, have E&I bypass open the monomer weigh tank fail-safe valve to the TFE feedline. 5. Verify vacuum system knockout pot is free of liquid before using the system. 6. Purge the N2/vacuum hose with N2 prior to connecting to remove any water from the vacuum hose. 7. Using the purge tap located near the TFE manual valve, evacuate the purge tap to at least -20" Hg vacuum 8. With the vacuum hose connected and valved into the purge tap, slowly open the TFE purge manual valve and evacuate the TFE feedline to at least -20” Hg vacuum. 9. Break vacuum with nitrogen and pressure the line up to 60 psig. 10. Repeat the vacuum and pressure steps for a total of 3 or more times each. 11. After the last pressure up to 60 psig, vent the line down to 3 to 5 psig. 12. Monitor TFE feedline pressure for 30 minutes using either the field gauge or the feedline dP transmitter to verify the manual valve is not leaking through (less than 1 psig pressure increase). 13. Turn off brine supply valve to TFE feedline tracing if TFE feedline is to be opened for more than 30 minutes, the line is to be cleaned with water, or the autoclave will be high-pressure tested. 14. Turn equipment over to maintenance:  * Complete the hazardous line break permit with maintenance at this time for the line break * Immediately before maintenance breaks flanges vent down the system to zero psig. * Maintenance will be making line break (physical disconnect). * Note if this procedure is used for autoclave maintenance not requiring the TFE feed line to be opened, leave 3 to 5 psig N2 in line. |

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#### Prepare Autoclave TFE Feedline for Maintenance and Restore to Service, Continued

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| **Lockout, Evacuate, and Purge TFE from Feedline, (Continued)** | 1. As part of the above autoclave TFE feedline preparation, E&I bypasses the TFE automatic valve closest to the monomer weigh tank open to allow complete clearing of the line. If needed, disconnect the air supply jumper to close the automatic valve, and thereby allow use of autoclave valves. Leave the bypass permit in place as it will be needed to put the TFE feedline back in service, and will be removed at that time. 2. If autoclave feed/block is removed or replaced; lock, tag, and try electric to TFE block valve and feed control valve switches, ECR 3A 3. If autoclave feed/block is removed or changed, blow any TFE skins out of the line with N2 while the valves are removed. Note this is a short burst of nitrogen, not continuous purging. |

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| **Dry TFE Feedline** | This step (drying) only needs to be completed if water was introduced to the TFE feedline, or if the line was left open for an extended period of time. Otherwise, skip forward to next section.     1. Verify brine tracing is still turned off by looking at tracing and looking at TFE feed line temperature on DCS. If brine tracing was not properly turned off, and pipe was allowed to pull in moisture, turn off tracing and allow pipe to warm up to room temperature. 2. Verify autoclave feed closest to MWT valve is open. 3. Using the purge tap near the TFE manual valve, evacuate the TFE feed line to at least -20" Hg. Note this should remove all free water. 4. Break the vacuum with nitrogen and pressure the system up to 60 psig 5. Repeat the above two steps two more times, and measure dew cup per procedure 33P4F08. If the system is not dry per 33P4F08, then evacuate and purge the piping three more times per (2.) and (3.) above. Repeat until dry. |

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#### Prepare Autoclave TFE Feedline for Maintenance and Restore to Service, Continued

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| **Pressure Test and Helium Leak Check TFE Feedline** | 1. TFE feed manual valve closest to the autoclave should be closed 2. If closed, restore bypass/open the autoclave TFE feedline automatic valve closest to monomer weigh tank. 3. Verify that the line is no longer open to the atmosphere, and restore brine cooling to the TFE feedline. Allow 30 minutes to cool the line if brine was turned off. 4. Locate small helium cylinder and place near pressure / purge tap for TFE feedline. 5. Purge the nitrogen / vacuum hose with nitrogen prior to connecting to the pressure / purge tap to remove residual moisture in the hose. 6. Using the purge tap near the TFE manual valve, evacuate the TFE feedline to at least -20” Hg. 7. Vacuum leak check; should be less than 1” Hg in 1 minute. 8. Break the vacuum with nitrogen, and return the TFE feedline pressure to 0 psig. 9. Using a helium cylinder, pressure up the TFE feedline to 8-10 psig via the TFE feedline pressure / purge tap. 10. Using the purge tap near the TFE manual valve, pressure up the TFE feedline with nitrogen from 8-10 psig to 90 psig. 11. Impacted flanges from maintenance activity should be taped. Allow the helium/nitrogen mixture to mix for at least 30 minutes. Allowable pressure drop in the TFE feedline while waiting on the mixing of helium and nitrogen is 0.5 psig over 30 minutes. 12. After 30 minutes of allowing the helium/nitrogen mixture to mix with tape on the flanges, but not exceeding two hours, the flanges should be helium leak checked using the Accumulation method on the highest sensitivity. Reference: 32.2.2 – Using Portable Analyzers. 13. Any leaks failing the helium leak check should be addressed and helium leak checked again before proceeding. 14. Remove tape from flanges to prevent corrosion. 15. Using the purge tap near the TFE manual valve, evacuate the TFE feedline to at least -20” Hg. 16. Break the vacuum with nitrogen and pressure the system up to 3-5 psig. |

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#### Prepare Autoclave TFE Feedline for Maintenance and Restore to Service, Continued

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| **Evacuate, and Purge Air from TFE Feedline and Reinventory** | 1. TFE feed automatic valve closest to the autoclave should be closed. TFE feed automatic valve closest to the monomer weigh tank should be bypassed open. 2. Purge the nitrogen / vacuum hose with nitrogen prior to connecting to the pressure / purge tap to remove residual moisture in the hose. 3. Using the purge tap near the TFE manual valve evacuate the TFE feedline to at least -20" Hg vacuum 4. Break the vacuum with nitrogen and pressure the system up to 60 psig 5. Repeat the evacuation and pressure steps for a total of 5 or more times 6. Evacuate the line to at least -20" Hg vacuum (do not complete this step until ready to inventory process with TFE, otherwise leave 3-5 psig nitrogen pressure in line) 7. Verify vacuum and pressure the line up to 15 psig with TFE by slowly opening the TFE manual valve on the 3rd level. Check for TFE leaks with an approved leak detector 8. Evacuate the section of line to 3 - 5 psig 9. Pressure the line up to 30 psig with TFE by slowly opening the TFE manual valve. 10. Evacuate to 3 to 5 psig 11. To prevent the trapping of TFE between manual valve and purge tap, evacuate and purge stub ends on purge taps. Leave a 5 psig nitrogen blanket on the purge tap downstream of the manual valve. 12. Slowly open TFE manual valve. Bring line to MWT pressure. 13. Have E&I remove the autoclave TFE feed valve and monomer weigh tank fail-safe valve bypasses. |

End of topic

#### Prepare Autoclave TFE Feedline for Maintenance and Restore to Service, Continued

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| **Restore Autoclave to Normal Service** | Open or restore power to the following valves and equipment:     1. Gas Holder Manual – 3rd level 2. Ingredients Header Manual Valve – 3rd level 3. 75# Steam Back Manual – 3rd level 4. Inboard / Outboard Injection Manual Valves – 3rd level 5. Remove pin from the cleaning ram ball valve – 3rd level 6. Motorized Drop Valve in closed position, ECR hand switch and pin – 2nd level 7. Agitator field disconnect, hand switch, and ECR – 3rd level 8. Electric to TFE block valve and feed control valve switches, ECR 3A |

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| **Autoclave Low Pressure Test** | Complete this section only if the TFE feed valves were replaced, any flange on the autoclave was dissembled, or packing follower was removed.     1. For pressure test after adding packing, verify autoclave has 200 gallons of water. 2. Set autoclave jacket temperature to 50 oC in automatic. 3. Close motorized drop valve, vent valves, and knockout pot valves. 4. Start the autoclave agitator. 5. Open Ingredients Header automatic block valve (FREDDY), and open low pressure N2 valve until autoclave pressure reaches 30 psig. Close N2 valve. 6. Allowable pressure drop is no more than 0.5 psig in 30 minutes with stable autoclave temperature. If packing was added, tighten packing until dripping stops. 7. Vent the autoclave to 2-3 psig with the vent valves. Drain any water in the autoclave to the RWDC or HUT. Close the motorized drop valve. 8. Set Autoclave jacket temperature to 50°C in Auto. 9. Using the vent valves and steam jet, evacuate the autoclave to at least -22” Hg (less than -10.5 psig). Close vent valves. 10. Allowable pressure increase is no more than 0.2 psig in 30 minutes with stable autoclave temperature. |

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