TSE Industries, Inc.

O&M Instructions for N_2 controls and dryer solvent condenser. Permit No. 1030207-012-AC, 1030207-013-AF, I.D. #003

Purpose: is to describe means for assuring compliance with the above air permit sections related to maintaining a nitrogen blanket on all tanks with a conservation vent and used for production of TDI dimmer (T9) (1)and maintenance of the T9 dryer solvent vapor condenser (2).

1. **N_2 Blanket:** Nitrogen is obtained from a 20,000-pound liquid nitrogen tank situated outside the building. The tank level is monitored electronically by the nitrogen supplier, assuring that a sufficient supply is maintained at all times. Each T9 process tank equipped with a conservation vent is supplied with a nitrogen pad in the headspace of each tank to suppress solvent vapor and prevent escape through the vent to the atmosphere.
   Elements of the plan:
   - All shut-off valves between the N_2 tank and process tanks that can be reached without the use of an equipment have been locked in the open position with a lock that has to be cut-off to actuate the valve.
   - **Control Device:** N_2 flow to the tanks is set with commercially available acrylic flow meter for gases, which has direct reading the adjusting knob. Additional unit **(18.d)** is available in maintenance when flow meter is found to be inoperative.
   - **Operating Parameter:** Adjusting knob is secured in the proper flow (0.5-1.0 SCFM **(18.a)**) position by a sealing device like those used to secure the valves. The sealing devices are controlled item within the EHS department.
   - **Timetable and Records:** Once per month **(18.b,c)** the flow at each of the flow meters is observed and compliance to operating parameter is recorded on the Monthly Fugitive Log**(18.e)** by EHS department. The seals will be checked for security and signs of tampering at the same time. Any discrepancies and further action will be noted in the comment section of the Monthly Fugitive Log.

2. **Solvent Condenser:** The solvent condenser is located between the T9 dryer and vacuum pump and it consists of a commercially available shell and tube heat exchanger. Its purpose is to condense and recover the solvent that is driven out of the wet T9 material in the drying process. This is a batch process where typically less than 250 pounds of T9 are placed in the dryer under heat and vacuum until dry.
   Elements of the plan:
   - The condenser has no moving parts of periodically replaceable supplies. Its efficiency relies upon a constant supply of chilled water to condense the toluene vapor. Since there are no impurities circulating in the solvent or heat exchanger medium, scaling or corrosion is not a maintenance consideration.
   - **Control Device:** Digital thermometer is used to monitor the chilled water temperature. There is no additional unit **(18.d)** available in maintenance when thermometer is found to be inoperative and production process will shut down. An alarm will sound when temperature is outside the set operating limits.
   - **Operating Parametar:** The temperature of chilled water must be 30°F or lower **(18.a)** before beginning of the each dryer load.
   - **Timetable and Records:** Production operator is required to monitor the chilled water temperature prior to beginning of each dryer load **(18.b,c)** and record it on the batch sheet **(18.e)**. If the chilled water temperature is above 30°F, the operator is not permitted to start the batch. Maintenance must diagnose the problem and effect repair before the operator may continue. The temperature reading of the chilled water circulating through the condenser will be additionally verified by EHS department and recorded on the Monthly Fugitive Log **(18.e)**.