HTRI
Heat Transfer Research, Inc.

Vapor infusion implementation questionnaire/checklist for heat exchangers and process equipment

Application and process conditions

- ☐ Operating flow rate of heat exchanger water stream to be treated _____ (kg/s or lbs/hr)
- ☐ Salt water ☐ or Fresh water ☐ Other_____
- ☐ Maximum design temperature of the heat exchanger _____(°F) and actual operating temperature of the stream to be treated at the proposed injection site prior to entering the heat exchanger _____(°F)
- ☐ Actual operating exit (outlet) temperature of the treated stream of the heat exchanger _____(°F)
- ☐ Ambient temperature around heat exchanger(s) _____(°F)
- ☐ Maximum design pressure of the heat exchanger _____ (psig) and actual operating pressure of the inlet pipe of the treated stream at the proposed injection site prior to entering the heat exchanger _____(psig)
- ☐ Pressure drop through heat exchanger of the treated stream (from inlet to outlet) _____ (psig)
- ☐ Volume/dimensions of heat exchanger header (shell and tube) _____ (cu.ft.) Dimensions_____
- ☐ Coolant flow enters from the ☐ top or ☐ bottom of heat exchanger
- ☐ Orientation of water flow Vertical☐ Horizontal☐
- ☐ Heat exchanger inlet pipe size _____(inch)
- ☐ Any vacuum service before or after the heat exchanger? _____
- ☐ Existing treatment? (If any) _____

Utilities - air and electric source

- ☐ Regulated air source? (☐ Yes / ☐ No)
- ☐ Pipe/tube inside diameter (ID) from air source to service air hook up at the vapor infusion control device? _____(inch)
- ☐ Distance from the air source to service air hook up at the vapor infusion control device? _____(feet)
- ☐ Air source maximum pressure _____ (psig)
- ☐ Air source maximum air flow _____ (cfm)
- ☐ Air source temperature _____ (°F)
- ☐ Air source quality? _____
- ☐ Oil free? (☐ Yes / ☐ No) Notes: _____
- ☐ Dry? (Entrained water removed) (☐ Yes / ☐ No) Notes: _____
- ☐ Electric source _____V (AC, DC?) _____A, (12-, 24-, 110-, or 220-volt options depending on application)

Vapor infusion system and injection site location logistics

- ☐ Electric source within 10 feet of the vapor infusion system control device? (☐ Yes / ☐ No)
- ☐ A potential vapor infusion injection site within 4 feet of heat exchanger inlet that can accommodate a female NPT to connection? (☐ Yes/ ☐ No)
- ☐ A vapor infusion injection site within 25 feet of vapor infusion control device? (☐ Yes / ☐ No)
- ☐ Distance from female NPT and all fittings (reducers, tees, flanges…) at the proposed injection site of the inlet water pipe to the interior center line of inlet water pipe? _____ (inch) Picture of the proposed injection site are helpful to understand infusion location and length of infusion wand needed).

Drawings and specifications, please provide the following if available:

- ☐ Specification sheet for each heat exchanger
- ☐ Heat exchanger drawing for each heat exchanger
- ☐ Process flow diagram and operating conditions containing the heat exchanger(s)
- ☐ Process instrumentation diagram that contains the heat exchanger(s) (flow, pressure, temperature in and out of the heat exchanger(s))
- ☐ Blueprint of exchanger locations (if more than one to be treated) showing the distance between each exchanger.
- ☐ Pictures of fouling, heat exchangers, injection site pipe and immediate surroundings
- ☐ Foulant analysis describing the type of fouling
- ☐ Cooling water analysis or source quality assessment

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