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## What are the most common issues that can delay a final field approval?

1. For the main and pilot fuel trains, the manual shut-off valve at the inlet to the fuel train and the burner test firing valve located as close to the burner as practical all need to be certified to CSA 3.16 (ball valve) or CSA 3.11 (lubricated plug valve). If these valves are not properly certified, or are located too far away from the burner, or are not easily accessible, then they will need to be replaced or moved.  
Please refer to the FAQ documents related to Manual Valves for additional details.
2. All main and pilot automated safety shut-off valves (SSV) must be certified to CSA 6.5 as per the CSA B149.3 code. All main valve configurations and most pilot valve configurations also need to be classified as commercial/industrial (C/I). For pneumatic valve assemblies, the valve body, pneumatic actuator, and 3-way solenoid valve need to be purchased as a complete certified assembly and the components within this assembly cannot be modified. Purchasing separate components and assembling them yourself will not produce a certified assembly. The "CSA 6.5 C/I" marking must appear on the valve assembly.
3. All required documentation must match the as-built configuration.  
Please refer to the FAQ related to Required Documentation for additional details.  
Required documentation includes at a minimum:
  - a. P&ID showing all fuel train components and shutdown devices interlocked with the BMS.
  - b. P&ID showing the fuel supply line pressure control device and overpressure protection device.
  - c. Bill of Materials showing all fuel train components and shutdown devices.
  - d. BMS electrical wiring diagram showing fuel train components and shutdown devices.
  - e. Appliance operation control narrative.
  - f. Specification of electrical hazardous area classification.
  - g. Commissioning report showing the setpoints of all components and including the stack emissions readings with the appliance operating at the maximum fuel flow rate.  
If the burner has an adjustment needle installed, the stack readings must be taken with the needle all the way out.

4. All fuel train components are adequately protected from overpressure if any pressure control device were to fail open.  
Please refer to the FAQ related to Overpressure Protection for additional details.
5. The fuel gas low pressure switch (PSLL) must be set at 50% of the normal operating pressure at that location. The fuel gas high pressure switch (PSHH) must be set at 125% of the normal operating pressure at that location.  
Please refer to the CSA B149.3 code for additional details (clauses 9.5.1 and 9.5.2).
6. All fuel venting must be properly installed as per the CSA B149.3 code (eg. regulator casing vents, relief valves, safety vent valves, etc).  
Please refer to the FAQ related to Guidelines for Venting for additional details.  
Some common issues are:
  - a. All vents must be terminated outside of a building.
  - b. Vents larger than 1/2" size must have screens installed to prevent entry of bugs.
  - c. Combined vents must have the header increased in size as per the CSA B149.3 code. Overpressure relief valves should be vented separately.
  - d. Vent terminations must be pointing down to prevent water entry.
  - e. Vent lines must be the same size or larger than the vent port they are connected to. Tubing must be a minimum of 3/8" size when connected to a 1/4" port.
  - f. Vent terminations are located at least 3ft from any building opening, 10ft from any mechanical air intake, and 3ft from any source of ignition (10ft for propane).
  - g. Vent terminations should not be located beneath a building or enclosure.
  - h. A safety vent valve and vent line must be properly sized as per Table 5.1 of the CSA B149.3 code.
7. Isolation valves installed on any type of pressure/level switch/transmitter used as a shutdown device (eg. PSLL, PSHH, FSLL, LSL, etc.) must be locked open and tagged to indicate it cannot be closed during normal operation. This is to ensure the function of a critical safety device is not bypassed.  
Please refer to the FAQ related to Isolation Valves.
8. Make sure the electrical hazardous area classification is documented and ensure the equipment is installed as per the classification. This is especially important inside enclosures with gas equipment. Please refer to the FAQ related to Hazardous Area Seals and Hazardous Area Classification Inside an Enclosure.

9. The main and pilot fuel train flexible hose are properly certified as per clause 7.10 of the CSA B149.3 code: CSA 8.1 (elastomeric), CSA 8.3 (thermoplastic), CGA CR96-001 (metallic).
10. Pressure test points or gauges installed downstream of each pressure control device.  
Please refer to the FAQ related to Pressure Test Points.
11. All critical safety shutdown devices must be hardwired to the BMS.  
Some typical shutdown devices are:
  - a. Fuel Gas PSSL & PSHH
  - b. Bath Fluid LSLL
  - c. Process Fluid FSLL
  - d. Process Fluid TSHH
  - e. Combustion Air FSLL/PSSL
  - f. Stack / Furnace TSHH
  - g. Furnace Low Draft / PSHH
12. Make sure the low level switch is rated for the bath fluid TSHH setpoint. Most level switches are rated for less than 150°C, which can be a problem for high temperature bath fluid.
13. The safety shut-off valve (SSV) configuration must match the CSA B149.3 code requirements based on the maximum fuel input rating to the burner. Different configurations are required at 1.0 MMBtuh, 5.0 MMBtuh, and 12.5 MMBtuh.  
Please refer to section 5 and Appendix B of the CSA B149.3 code.
14. An electric control panel must be CSA or ULc certified by the manufacturer or receive a CSA SPE-1000 special inspection from an authorized inspection agency. Look for the appropriate markings.
15. Make sure all equipment installed in an unheated space is rated for -40°C or less. It is very common for equipment to be rated for -29°C, which means this equipment will need to have some kind of special approval to be accepted such as:
  - a. Letter from the manufacturer indicating safe operation at lower temperatures.
  - b. Heat tracing and insulation installed to protect the equipment.Anything with a minimum temperature rating higher than -29°C should never be installed in an unheated space in Alberta or Northern BC.
16. All piping must be well supported.