Solicitation: COMBO-AFRL-PZLEQ-2026-0007
AH1 Gas Fired Air Heater
Q&A
15 June 2026

Question 1:

Though the solicitation clearly details requirements for a combustion heat source, would an electric-heater solution be considered?

Answer:

No, we would not consider an electric heater. We do not have the electrical infrastructure to make the switch from natural gas to electric.

Question 2:

If an electric-heater solution is acceptable, what is the maximum hot-side air heating rate (MW)?

Answer:

Not Applicable

Question 3:

Is a process and instrumentation drawing (P&ID) available?

Answer:

No, there is no P&ID at this time.

Question 4:

Is there an allowable / expected time requirement from ambient startup to reach any particular set point condition of air outlet temperature / pressure?

Answer:

Starting from the heater at ambient conditions and providing 300 psig air at 34 lbm/sec (the highest velocity of process air) we would expect 1250 F process air after 60 minutes or less.

Question 5:

Will operation remain constant at a given set point condition of air temperature / pressure once reached within a given cycle? Or will it change from a "first" set point to a "second" (new / different) set point condition within a given operating cycle? If changing, is there an allowable / expected time requirement from completion of operation at one set point to reaching the new set point?

Answer:

The typical operation of the heater will NOT be a constant temperature output but will vary maybe 10 times during the run. Most of those variations are within +/- 200 F. We expect new output temperatures to stabilize within 15 minutes of a setpoint change. As for flow and pressure, it may change also and just as often. In all cases, we expect the heater to stabilize temperature within 15 minutes.

Question 6:

Is there an allowable / expected time requirement from completion of operation at a given set point condition to return to ambient conditions?

Answer:

After the heater is no longer needed for the run, we would shut down the burner and continue to route process air through the system to cool it down. We typically set a process air temperature of 250 F as the point at which we stop process air flow. The cool down of the heater to get to 250 F output must be done in less than 60 minutes.

Question 7:

What is the expected cycling of the equipment? How often will the equipment run through a full cycle of A) ambient conditions, to B) set point conditions, and C) back to ambient conditions? Will there be an "idle" operating condition between any given set point operating cycle?

Answer:

Potentially every day a full cycle from ambient to varying set points of temperature, pressure, and flow, back to ambient conditions. No idle stages. That is, we shut the machine down overnight and fire back up the next day.

Question 8:

Is there a maximum allowable pressure loss for compressed air at any given condition?

- At 750 PSIG inlet? At varying compressed air exit temperatures?
- At 300 PSIG inlet? At varying compressed air exit temperatures?
- At intervals of 50 PSI inlet pressures?

Answer:

Maximum allowable pressure drop across the heater from inlet flange to discharge flange would be 15 psi at 750 psig inlet and 34 lbm/sec and 100 F inlet and 1250 F discharge. All other conditions are based upon satisfying this condition.

Question 9:

Should we assume a "Design Condition" for the fired heater to be 34.0 lb/sec of compressed air entering at 100F & ??? PSIG (to be determined from above), and exiting at 1250F & ??? PSIG (to be determined from above). Is this acceptable?

Answer:

There are several "Design Conditions". There will be corners to this envelope that will establish "Design Conditions". The maximum is 750 psig at 1250 F at 34 lbm/sec for leaving air pressure, temperature, and flow. The other "corners" could be 300 psig at 1250 F, or 300 psig at 300 F, or 750 psig at 300 F for example. Flow rates from 2.5 lbm/sec all the way up to 34 lbm/sec with all the same "corners". Bottom line: The heater must perform within an operational envelope as specified, with varying pressures, temperatures and flows.

Question 10:

Is there a minimum allowable thermal efficiency for the fired heater at the Design Condition, including "Economizer" as needed?

Answer:

Not a specific efficiency number. But we do want to get the most out of the natural gas we will be consuming, thus the use of an "economizer" is expected.

Question 11:

We assume that the compressed air is entering from a receiving / storage tank, since it enters the fired heater at 100F maximum (no heat of compression from direct compressor outlet), is this correct?

Answer:

The compressed air will enter the heater directly from the compressors which have aftercoolers to drop the temperature. There will be a few hundred feet of uninsulated outdoor pipe between the compressor and the heater. Therefore, the temperature of the inlet may be close to the ambient conditions of the day. On a hot summer day, the temperature may be above 100 F.

Question 12:

What is the minimum inlet temperature of the compressed air? Does a compressed air inlet temperature of less than 100F need to be considered in the "Design Condition" thermal duty?

Answer:

The inlet temperature of the compressed air may be below 100 F but that is outside of the designed operating envelope of the heater. Again, there will be a few hundred feet of uninsulated outdoor pipe between the compressor and the heater. Therefore, the temperature of the inlet may be close to the ambient conditions of the day. On a cold winter day, the temperature may be below 100 F.

Question 13:

The specification seems to imply that a radiant + convective design is required, but can a design with convective-only heat transfer be provided instead?

Answer:

We are interested in a design that allows the heater to both heat up and cool down within the timeframes we are stating above. We understand that the limited use of "heat soaking" materials,

like castable refractory, allows for faster heat up and cool down times. But in some cases, it is needed. We also want to reduce coil damage with excessive heat in case of a power outage.

Question 14:

The specification seems to imply that there is concern with a potential acid dew point on the flue gas side; does the flue gas side consist of SOMETHING OTHER than products of combustion of commercial grade natural gas? Normally this would have a moisture dew point of approx. 120F, and essentially no acid dew point.

Answer:

The flue gas would be only ambient air (not expected to be contaminated) and natural gas combustion products. If your design does not produce acid condensate, there isn't a concern.

Question 15:

The specifications seem to show some discrepancy on maximum / design / operating pressures.

- One location reads "Design Pressure: 500 PSIG".
- One location reads "Maximum Operating Pressure: 750 PSIG".
- One location reads "Heater shall be designed for working pressure of 750 psig and operating pressure of 825 psig."

What is the maximum expected pressure of compressed air ENTERING the fired heater equipment? What is the maximum required pressure of compressed air EXITING the fired heater equipment, directed to downstream users?

Answer:

Sorry for the confusion. There is a little bit of "copy paste" errors since we reused a similar spec from a smaller unit. Max working pressure is 750 psig with design pressure being 825 psig.

Question 16:

We assume that the compressed air will have a dew point of no higher than -40F, is this correct?

Answer:

There are no dryers in this system. The compressors discharge air at up to 750 psig and cool it to 100 F with an aftercooler. That means the dew point will be 100 F at the process air output of the compressors at the highest pressure of 750 psig. Expect the air from the aftercooler to be saturated air at 100 F or thereabouts.

Question 17:

What is the reason for specifying a minimum of 4" pipe for compressed air? If this is unsuitable for the design we are offering, can this requirement be eliminated?

Answer:

This 4" is referring to the minimum coil tube size. Our intent is to reduce the process air pressure drop across the heater to 15 psi or less. We understand that the highest velocity through the heater will occur at the 1250 F at 34 lbm/sec point. You will need to provide documentation to show that smaller tube sizes in your design will satisfy the pressure drop limit at the worst-case velocities.

Question 18:

If the entire pressure part of the fired heater can be designed / manufactured / tested / stamped to ASME Sec. VIII, Div. 1 ("U" stamp), can the API RP 530 and API 560 requirements be eliminated?

Answer:

The API standards cover much more than an ASME stamp. If there are issues with API standards, we are willing to address those issues and provide clarification or a waiver.

Question 19:

Is castable refractory required or expected for inside insulation? Or can a soft ceramic fiber internal insulation be considered instead? Can some sections be one type / other sections another type?

Answer:

As stated earlier, we are interested in a design that allows the heater to both heat up and cool down within the timeframes we are stating above. We understand that the limited use of "heat soaking" materials, like castable refractory, allows for faster heat up and cool down times. But in some cases, it is needed. We also want to reduce coil damage with excessive heat in case of a power outage.

Question 20:

The specification seems to imply a much more complicated shell than we would normally expect for such a fired heater; we would typically consider a very low operating pressure (no significant pressure vessel consideration), ambient / atmospheric discharge of flue gas, simple carbon steel "cold shell" structural components with refractory / internal insulation, no "external casing / internal casing" considerations, etc. Is there something we do not understand about the intention of this shell, or operation on the flue gas side?

Answer:

The specification is intended to cover different design types. A type as you describe could be proposed if you can show that the air heater can satisfy all the other specifications including the space limitation.

Question 21:

The specification references an "Economizer" to preheat combustion air prior to entry into the burner(s); the specification seems to imply that this would be operated like a pressure vessel. However, with "cold" compressed air entering the fired heater (100F maximum), is a separate combustion air preheater really required to act as an "economizer" downstream of the fired heater pressure parts? And even if an "air preheater economizer" (last heat absorbing equipment prior to atmospheric discharge of flue gas) is used, such an air preheater would typically be a low-pressure heat exchanger design, with no significant pressure vessel consideration. Can you clarify if this is fully necessary?

Answer:

The shell of the economizer or pre-heater is not intended to be a pressure vessel. The process air coil inside is the pressure vessel. Our intent is to extract as much heat from the flue gas into the inlet air flow as we reasonably can before it is discharged to the atmosphere.

Question 22:

Is there a maximum allowable flue gas discharge temperature, either at Design Condition or any other operating condition?

Answer:

No

Question 23:

Will the location for installation of this replacement equipment be a greenfield plot site within the plant, with no existing equipment? Or are there existing process / structural components which must be accounted for in the design & layout?

Answer:

We provided a layout diagram to our contracting office and we assume this went out with the solicitation. If it has not, please ask the contracting office for the diagram. The heater shall fit into this space as defined. As for attachment to our existing piping system, we will modify accordingly to meet the layout of the heater that fits into the area shown in the diagram.

Question 24:

Can the equipment be delivered as multiple shop-fabricated components and/or multiple ship-loose item, with field erection & assembly instructions? If so, is field erection & assembly to be performed by others, or to be included in the supplier's scope?

Answer:

We expect this heater to be delivered in sections. Field erection, assembly, and commissioning will be accomplished by the heater manufacturer in conjunction with the general contractor who wins the contract to modify the piping system.

Question 25:

Can field assembly of instruments & controls be considered?

Answer:

Field erection, assembly, and commissioning will be accomplished by the heater manufacturer in conjunction with the general contractor who wins the contract to modify the piping system.

Question 26:

Did John Zink, COEN, or Peabody (John Zink now owns COEN and Peabody, who also previously supplied air heaters) supply the existing air heater burner and system? if so, can you please provide a reference number and/or drawings so that we can locate within our files?

Answer:

No

Question 27

If no to the above, are you able to share any drawings or documentation of the existing unit?

Answer:

No

Question 28:

Will there be a need to have the desired outlet temperature of 250 deg F to 1250 deg F correspond to the entire flow rate of air range? or, do you only need an intermediate temperature for the max desired flow rate of 34.0 lbm/s? essentially, I'd like to clarify the operating cases

Answer:

There will be a case of needing the full range of flow rates at a full range of temperatures. That is, 2.5 lbm/s at 250 F and also at 1250F as well as 34 lbm/s at 250 F and at 1250 F. All flows at all temperatures.

Question 29:

Will you intend to fully shut down the air heater after the operational period/testing or will you keep at a standby, low fire mode?

Answer:

Yes, a complete shutdown at end of testing. A standby mode while testing is occurring could also be the case, but the machine is fired up and shut down daily.

Question 30:

Are you open to a direct-fired air heater? this will have the advantage of being simpler to operate, less expensive to operate, reduced plot space, and reduced initial investment? the main tradeoff is that a small portion of the heated outlet air stream will contain the combustion products from the burner; these direct-fired air heater burners are very common in many applications for various drying process, FCC charging in refineries, and many others; in reviewing the needs of the heated stream for the AFRL, it seems suitable; would you be open to this style of air heater?

Answer:

No. Heated air intended for research must be combustion free.

Question 31:

Will there be FARs or DFARs applicable?

Answer:

The FAR has been replaced with Revolutionary FAR Overhaul (RFO). All applicable RFO provisions and clauses, as well as DFARS provisions and clauses are listed in solicitation attachment COMBO-AFRL-PZLEQ-2026-0007.

Question 32:

A factory test of the air heater at max flow will likely not be possible as the expected high amount of required fuel gas is not available at the JZ test stand nor would JZ have an air permit currently to conduct such a large test; we will confirm, but are you open to options to reduced scale tests, on-site testing or 3rd party locations, if still required?

Answer:

Full scale testing and commissioning is required. Commissioning of the system will take place at WPAFB after complete installation. Any deficiencies must be corrected by the vendor is the system fails the commissioning process at WPAFB.