RSI-G-466 HT Transformer Furnace

Startup, Shutdown and Malfunction Plan

Startup

1. Record the gas meter reading before starting the furnace.
2. Visually inspect furnace for any broken equipment or items in need of repair.
3. Turn furnace primary and afterburners on.
4. Allow for afterburner termperature to reach 2200° F.
5. Begin loading scrap in the primary chamber, not exceeding permit limits.

Shutdown

1. After processing material for the day, turn off primary and afterburner burners.
2. Record the gas meter reading after turning off furnace.
3. After primary chamber has cooled, remove debris.
4. Weigh, number and record all batch loads.

Complete Operating Instructions (SOP)

Turn power and main gas valves on and record the gas meter reading.
Raise all doors and inspect all chambers.

1. Start combustion blowers. Open primary door slightly. Start "Primary" and "Afterburner burners" by turning the selector switches to the on position, opening slide gate, and pushing start button. "Silence Low Temperature Alarm". There is a 2 minute built in purge prior to ignition. Observe that each burner did in fact ignite by observing burner on lights and physically observing the flame by sight.
2. Close all doors.
3. Prepare work area for production day.
4. Calibrate CEMS with "zero" gas.
5. Select material to be charged and prepare loading trays. Note: Refer to "Items not to be charged into the chamber" as described by the permit.
6. When the afterburner and primary chamber is at the desired temperature, the furnace may be loaded. Start drawing sample gas through the CEMS unit.
7. Push slide gate to the closed position taking note that flame is extinguished prior to closing all the way. Raise the primary charge door and load material into the chamber. Pull the primary burner slide gate to start primary burner.
8. Close the door and observe the temperature controls. Close primary slide gate to turn burner off when needed. Observe CEMS unit. Adjust primary and secondary draft doors as needed.
9. Record the charge time, material type, and the size of the load in the "Daily Operators Log".

Note: This unit is equipped with an interlock system that prevents the primary charge door from being opened should the afterburner temperature drop below the required minimum temperature. There is however, a manual override switch which will allow the door to operate under any temperature condition. This mode is primarily used for maintenance only. A red light on the control panel indicates that the interlock is in the manual mode. Do not charge material into the chamber if the red interlock light is illuminated.

10. Observe temperature controls and CEMS unit throughout the operating day to assure proper operation of all chambers.
11. Observe the exit of the stack for emissions after each charge and make the proper adjustments to the draft controls if necessary.
12. Observe all alarm functions throughout the operating day.
13. Repeat process as needed throughout the day closing primary burner slide gate prior to opening the door for removal of material. Product may not be removed if flame is still present on said product.
14. When process day is complete, turn off all burners. Leave blowers on until the temperature is less than 300 deg. F
15. Turn off the main gas valve.
16. Record the total weight of material processed on the daily log sheet.
17. Observe all "Lock-out/Tag-Out procedures before cleaning all chambers thoroughly.

Possible Malfunctions and Corrective Actions

For all malfunctions:

- Record the date and time the malfunction began and ended in the Malfunction Log.
- Record the corrective actions taken including the date and time the corrective action(s) began and when it was completed.

1. Burner will not light or stay lit and or chamber will not reach set-point temperature:
   a) Check that combustion blower is on and the airflow switch has closed to allow line voltage to the flame safety device. If blower is not operating check fuses or circuit breakers. If voltage is supplied to the motor and still does not work, replace the motor.
   b) Check flame safety relays for proper operation and replace if necessary.
   c) Check flame rod or UV scanner for proper operation and clean or replace if necessary.
   d) Check ignition electrode for proper operation and clean or replace if necessary.
   e) Check reset button on flame safety device for proper operation.
   f) Check that the proper gas supply is present and all valves are open.

2. Control does not display the temperature:
   a) Check fuse and power to the control.

b) If there is power at the control and still no temperature readout, perform the following test: Remove "positive" and "negative" thermocouple leads from the back of the control. Install a jumper wire between the terminals that the wire was removed from. Observe the digital display for an ambient temperature display. If the display is present refer to item c.
c) Remove temperature probe and remove the element from the probe housing. Inspect the element for signs of damage or breaks. Check housing for pitting or burnout. Replace damaged items if necessary.
d) If there is still no temperature display after following items a, b, & c instructions, replace and program a new temperature control.
e) Do not operate the furnace if the CEMS unit recording device not is operational.

3. CEMS unit did not record temperatures properly or no readings whatsoever.
   a) Observe the afterburner control temperature readout. If no digital display is present, follow the instruction for problem number 2. Note that the afterburner temperature probe has a double element, one for the control and one for the data logging.
   b) Check all T/C connections from the probe to the CEMS.
   c) Refer to the "Daily Operations Log" to see that furnace was operating during the temperature recording period.
   d) Check that the data logger (in CEMS) was "Started" .
   e) Check logging while monitoring the computer input for proper temperature range and type (as in C or F).
   f) Check backup battery power.

4. Visible emissions are present out of the stack.
   a) Turn primary burner switch to the off position.
   b) Close primary draft doors.
   c) Open the retention draft door to a 2" opening. Note: Close the afterburner draft door when combustible material is not present to prevent over cooling of the afterburner.
   d) Check material to find the source of excessive emissions and remove from all future charges.
   e) Record the time and duration of excessive emissions in the "Daily Operators Log".
   f) Note and record the afterburner temperature in said log.

5. Temperature or gasses records values less than 2200°F.
   a) Noticed by the operator reading the digital temperature and gasses at the computer readout.
   b) Could occur due to a blown fuse in the burner or low air flow in the burner.
   c) Follow the corrective actions under item 1 above.
   d) Record the corrective action taken to bring the temperature back up to 2200°F.
   e) Record the date and time the corrective action began and the time it was completed on the Malfunction Log.

6. If the malfunction is not identified here, modify this report within 45 days of the malfunction to include it and the corrective actions.
   a) If emissions standard was exceeded, report the malfunction within the required time to your local air quality control department.
   b) Submit a letter within the allowable working days explaining the circumstances of the event, the reasons for not following this plan and whether or not any excess emissions and/or parameter monitoring exceedances have occurred.

Emergency Shutdown (in the event of interrupted gas supply, gas leak, or power outage)

1. Turn off main electrical supply and gas supply and close draft door.
2. Contact supervisor.
3. Supervisor is to contact the appropriate utility for leak checks or explanation of interrupted service.
4. Keep records of service interruptions and make notes on data logger spreadsheets should the afterburner temperature drop prior to the batch process completion

MALFUNCTION LOG

Type of Malfunction and Cause	Date and Time of Malfunction	Date and Time Corrective Action Began	Date and Time Corrective Action Ended	Corrective Action Taken