The contractor shall furnish and install a UL approved Power Flame model Sync-Matic HMI programmable controller based lead-lag system. The lead-lag function shall be by the programmable controller and shall service __ (2 – 6) boiler/burner units. A 5.7" (minimum) HMI operator touch screen shall be standard equipment. The HMI shall allow the operator to input system operating parameters as well as provide visual indication of each burner's operation status, firing rate, operating setpoint, as well as the pressure/temperature of the common header. MODBUS communications shall be standard.

1. The lead-lag control panel shall include the following features:

    1.1 Direct entry of system setpoint through the HMI.

    1.2 PID controlled automatic modulation with baseload or parallel modulation response (specify 135 ohm, 4-20 mA, or 0-10 VDC signal).

    1.3 Manual modulation input for system testing and adjustments.

    1.4 Indicating lamps to indicate burner online or burner failed.

    1.5 Lead Lag/ Backup selector switch to allow control function to be switched to 1) the programmable controller; 2) the individual boiler-mounted operating and modulation controllers.

    1.6 Adjustable lead and lag burner on and off delay timers, accessible through the HMI.

    1.7 Boiler cycle and boiler hour counters.

    1.8 Multiple lead selection modes: Manual, Time Alternate, Time Equalize, Cycle Alternate, Cycle Equalize, and Day of Week.

    1.9 Night and/or Weekend setback settings allow for reduced setpoints at non-peak times to reduce fuel usage.

    1.10 Failure transfer automatically transfers failed burner's settings to the next available burner.

2. The Sequence of Operation Shall be as Follows:

    2.1 Upon start up, burners shall always start in the low fire position. Upon release of the combustion control system, the burners shall modulate via the programmable controller.

    2.2 As the pressure/temperature increases, the header mounted transducer will signal the programmable controller. In turn, the controller shall sequence the

PID firing rate circuits of each active modulating burner in an appropriate lead-lag sequence.

2.3 Upon still further increase in pressure/temperature, the programmable controller will de-energize the lag burner(s) then the lead burner in the appropriate sequence. This function will either take place immediately or after a time delay based on the variance from setpoint. The burners will be in the low fire position before de-energizing.

2.4 With a drop in pressure/temperature, the programmable controller will reverse the sequence to call the burners to fire and to modulate the burners in an appropriate lead-lag sequence.

2.5 In the event that any burner fails to operate, the programmable controller shall automatically transfer control to the next available burner.

2.6 An appropriate pressure/temperature transducer shall be supplied with each system. The transducer shall be installed in the main steam/water header.

3. Options:

3.1 Outdoor Reset: Raises the water temperature setpoint as outside temperature decreases.

3.2 10” Color HMI: Allows the settings to be displayed in a larger, easier to read format.