

DATE
10/12/10

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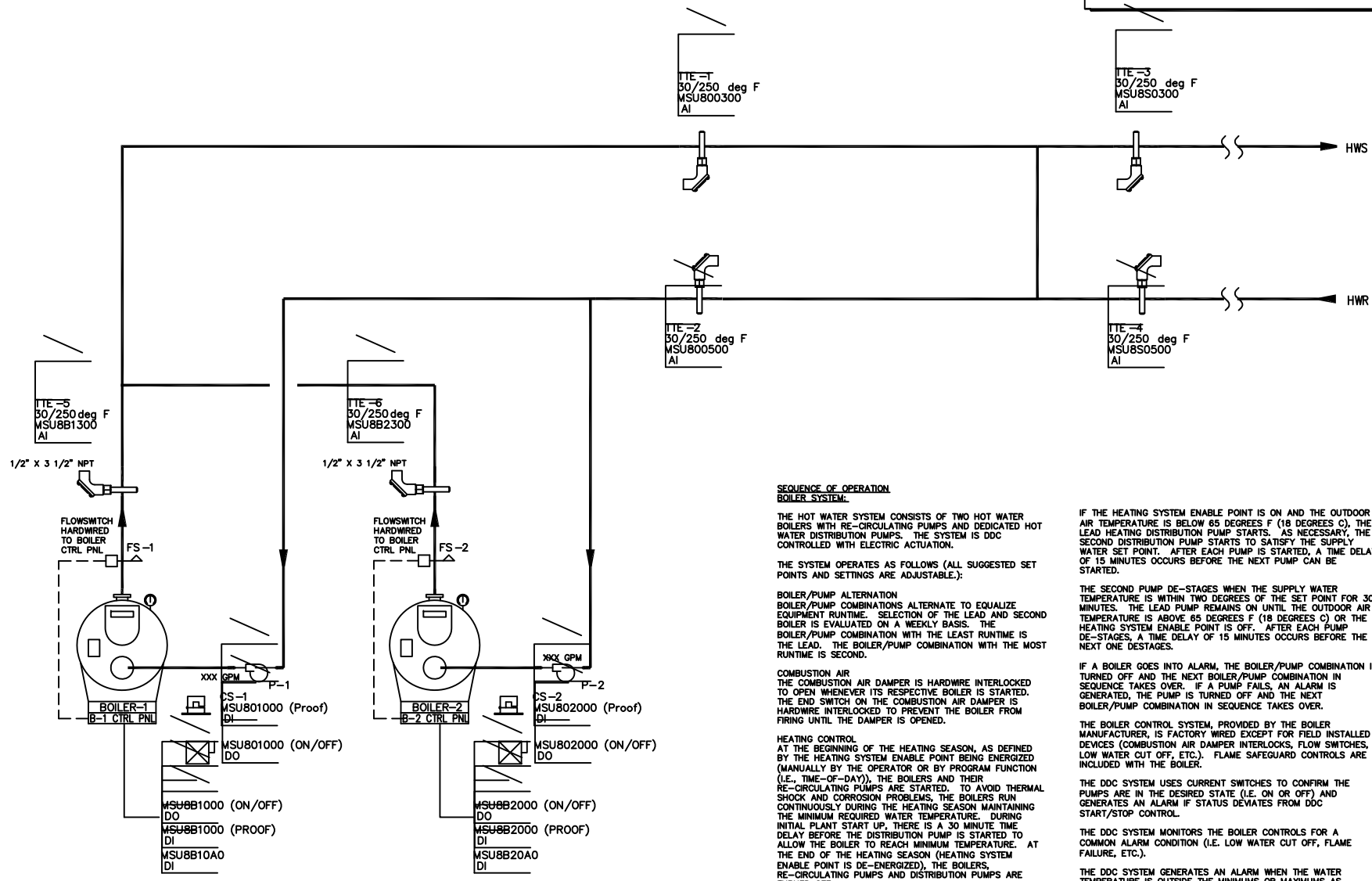
REVISION
7/11/16
RLANDRUM

DETAIL NO.
XXXXXX-XX

SHEET



INSTALLATION NOTES:
1 A/E TO DETERMINE EQUIPMENT ID#



**SEQUENCE OF OPERATION
BOILER SYSTEM:**

THE HOT WATER SYSTEM CONSISTS OF TWO HOT WATER BOILERS WITH RE-CIRCULATING PUMPS AND DEDICATED HOT WATER DISTRIBUTION PUMPS. THE SYSTEM IS DDC CONTROLLED WITH ELECTRIC ACTUATION.

THE SYSTEM OPERATES AS FOLLOWS (ALL SUGGESTED SET POINTS AND SETTINGS ARE ADJUSTABLE):

BOILER/PUMP ALTERNATION
BOILER/PUMP COMBINATIONS ALTERNATE TO EQUALIZE EQUIPMENT RUNTIME. SELECTION OF THE LEAD AND SECOND BOILER IS EVALUATED ON A WEEKLY BASIS. THE BOILER/PUMP COMBINATION WITH THE LEAST RUNTIME IS THE LEAD. THE BOILER/PUMP COMBINATION WITH THE MOST RUNTIME IS SECOND.

COMBUSTION AIR
THE COMBUSTION AIR DAMPER IS HARDWIRE INTERLOCKED TO OPEN WHENEVER ITS RESPECTIVE BOILER IS STARTED. THE END SWITCH ON THE COMBUSTION AIR DAMPER IS HARDWIRE INTERLOCKED TO PREVENT THE BOILER FROM FIRING UNTIL THE DAMPER IS OPENED.

HEATING CONTROL
AT THE BEGINNING OF THE HEATING SEASON, AS DEFINED BY THE HEATING SYSTEM ENABLE POINT BEING ENERGIZED (MANUALLY BY THE OPERATOR OR BY PROGRAM FUNCTION (I.E. TIME-OF-DAY)), THE BOILERS AND THEIR RE-CIRCULATING PUMPS ARE STARTED. TO AVOID THERMAL SHOCK AND CORROSION PROBLEMS, THE BOILERS RUN CONTINUOUSLY DURING THE HEATING SEASON MAINTAINING THE MINIMUM REQUIRED WATER TEMPERATURE. DURING INITIAL PLANT START UP, THERE IS A 30 MINUTE TIME DELAY BEFORE THE DISTRIBUTION PUMP IS STARTED TO ALLOW THE BOILER TO REACH MINIMUM TEMPERATURE. AT THE END OF THE HEATING SEASON (HEATING SYSTEM ENABLE POINT IS DE-ENERGIZED), THE BOILERS, RE-CIRCULATING PUMPS AND DISTRIBUTION PUMPS ARE TURNED OFF.

IF THE HEATING SYSTEM ENABLE POINT IS ON AND THE OUTDOOR AIR TEMPERATURE IS BELOW 65 DEGREES F (18 DEGREES C), THE LEAD HEATING DISTRIBUTION PUMP STARTS. AS NECESSARY, THE SECOND DISTRIBUTION PUMP STARTS TO SATISFY THE SUPPLY WATER SET POINT. AFTER EACH PUMP IS STARTED, A TIME DELAY OF 15 MINUTES OCCURS BEFORE THE NEXT PUMP CAN BE STARTED.

THE SECOND PUMP DE-STAGES WHEN THE SUPPLY WATER TEMPERATURE IS WITHIN TWO DEGREES OF THE SET POINT FOR 30 MINUTES. THE LEAD PUMP REMAINS ON UNTIL THE OUTDOOR AIR TEMPERATURE IS ABOVE 65 DEGREES F (18 DEGREES C) OR THE HEATING SYSTEM ENABLE POINT IS OFF. AFTER EACH PUMP DE-STAGES, A TIME DELAY OF 15 MINUTES OCCURS BEFORE THE NEXT ONE DESTAGES.

IF A BOILER GOES INTO ALARM, THE BOILER/PUMP COMBINATION IS TURNED OFF AND THE NEXT BOILER/PUMP COMBINATION IN SEQUENCE TAKES OVER. IF A PUMP FAILS, AN ALARM IS GENERATED, THE PUMP IS TURNED OFF AND THE NEXT BOILER/PUMP COMBINATION IN SEQUENCE TAKES OVER.

THE BOILER CONTROL SYSTEM, PROVIDED BY THE BOILER MANUFACTURER, IS FACTORY WIRED EXCEPT FOR FIELD INSTALLED DEVICES (COMBUSTION AIR DAMPER INTERLOCKS, FLOW SWITCHES, LOW WATER CUT OFF, ETC.). FLAME SAFEGUARD CONTROLS ARE INCLUDED WITH THE BOILER.

THE DDC SYSTEM USES CURRENT SWITCHES TO CONFIRM THE PUMPS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL.

THE DDC SYSTEM MONITORS THE BOILER CONTROLS FOR A COMMON ALARM CONDITION (I.E. LOW WATER CUT OFF, FLAME FAILURE, ETC.).

THE DDC SYSTEM GENERATES AN ALARM WHEN THE WATER TEMPERATURE IS OUTSIDE THE MINIMUMS OR MAXIMUMS AS REQUIRED BY THE BOILER MANUFACTURER (I.E. DIFFERENTIAL TEMPERATURE TOO LARGE OR TOO SMALL, RETURN OR SUPPLY TEMPERATURE TOO LOW, ETC.).

ALARMING

- NORMAL
- BOILER SUPPLY WATER TEMPERATURE

ENHANCED 24/7

- PUMP FAILURE
- BOILER FAILURE
- COMMON SUPPLY WATER TEMPERATURE

BOILER SYSTEM CONTROL DIAGRAM