

# CENTRAL UTILITY PLANT MEETING ALL SEISMIC AND EMISSION REQUIREMENTS

## FULTON THERMAL FLUID CASE STUDY

### Kaiser Permanente Anaheim

Anaheim, California

New Central Utility Plant (CUP)

### CUSTOMER APPLICATION AND KEY CHALLENGES

Kaiser Permanente was planning a large expansion to their Orange County health service network that would meet a number of strategic needs: provide updated facilities, meet the expanding demands of an aging population and comply with the new seismic and emission regulations within Southern California. They determined the best option was to build a new facility to replace a nearby existing facility. The new construction was established as a three phase process including: an initial medical office building, a second office building and central utility plant and the main hospital opening in September 2012.

Another key concern for Kaiser Permanente was the need to contain human resource costs for the completed facility. As a result R.F. MacDonald Co. worked in conjunction with the engineering firm overseeing the project to design and deliver Thermal Fluid Skids, for a system that would deliver steam for humidification, sterilization and hot water heating.



An architectural rendering of the Kaiser Permanente Complex in Anaheim, CA

### R.F. MACDONALD CO. ANALYSIS & SOLUTION

To meet the needs of the complete new medical complex R.F. MacDonald Co. and Fulton Boiler designed and commissioned a thermal fluid system that produces 5,175 Lbs/hr 125 psig steam using heaters, unfired steam generators, and other accessory equipment. The system has full redundancy of the thermal fluid heaters, steam generators, thermal fluid pumps, surge tank pumps, and feedwater deaerator pumps. All equipment was factory piped and wired into a single system consisting of several adjoining skids. Field installation was simplified since only single point utility connections for power, natural gas, water, drains, vents, and flues were required.

### Project Challenges

A number of challenges were presented during this project. The space for the entire complex was more than adequate, but in order to optimize space for the central utility plant the building was designed as a three story structure – with the boiler and heater room located on the third floor. Consequently, all the loaded Fulton skids had to be delivered through a 10'x12' louver



Fully loaded skids delivered through the 10'x12' third floor louver openings

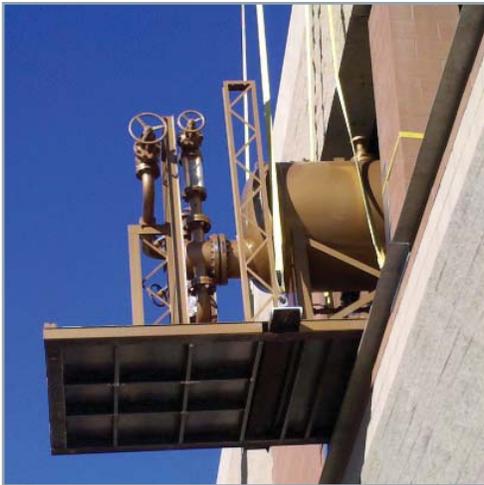
BOILERS

PUMPS

SYSTEMS

SERVICE

PARTS



**The third story 10'x12' louver window was used for delivery of all equipment and skids that were manufactured to exacting height and width restrictions**

General Contractor:  
Hensel Phelps Construction Co.  
Architect: Cannon Design  
Engineering: M+NLB  
HVAC Contractor:  
Control Air Conditioning Corp.



Final installation of Fulton Thermal Fluid Systems

opening. Working with Fulton all of the skids were designed to either be broken down into smaller sections or assembled in a way to meet the restrictions on width and height.

One highly unique part of the equipment delivery challenge was the heaters, which normally ship vertically welded to the skid. In this case the heaters were shipped horizontally on a special frame. The frames helped protect the heaters during shipping and were also used to pick, hoist and vertically reposition the heaters once they were inside the central utility plant.

#### **OSHPD Seismic Testing Requirements**

Another challenge was the OSHPD requirements for California hospitals, which are regulations that specify industrial equipment requiring special seismic testing and certification. In this case all equipment on the skids was built according to ASME code, allowing the equipment to qualify for OSHPD certification based on supplying equipment calculations - not extensive and costly "shaker table" testing.

#### **Thermal Fluid Not Subject to Title 8 Operator Requirements**

One advantage of the Thermal Fluid Systems is that they are not subject to the same California Title 8 regulations as high pressure steam boilers and fired pressure vessels that require a full time boiler operator. And although the system still requires operators to monitor the processes, check parameters and maintain the equipment, in this case the operators could also be responsible for other equipment within the Central Utility Plant.

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### Reduced Water Treatment Requirements

An inherent advantage of thermal fluid systems compared to fired steam boilers relates to water treatment. While water treatment is still necessary for the unfired steam generators, it is far less critical. Heat transfer surfaces in the unfired steam generator operate at reduced temperatures compared to a boiler. This greatly reduces the tendency for scale formation. The generator heat exchanger can also be readily opened for inspection and cleaning should the need arise.

### Challenges Accomplished with On-Time Delivery

R.F. MacDonald Co. was presented with a very aggressive schedule for installation and start up especially given all the challenges on this project. Still the delivery schedules were met, the engineering firm was well supported and the facility opened on time.

**As Central Utility Plants for hospitals are impacted by Seismic Regulations, Emission Requirements, Safety Codes and tightening budgets it is critical to evaluate multiple options. R.F. MacDonald Co. would be pleased to offer our assistance**



Final installation