FOSDICK & HILMER'S
Engineering Quarterly
January 2014

Congratulations

Service Recognition

30 Years Bob Taeuber
10 Years Ketan Amin

Retirees

Dave Hudson
Jim Cooper

Received Professional Engineer License

Stephen Byers, Electrical P.E.

Conferences Attended:

Jim Pretz & Joel Grubbs attended the Midwest Health care Conference in Indianapolis, IN in November.

PSMJ PM Bootcamp at F&H

Keith Strunk, Plumbing Dept. Manager

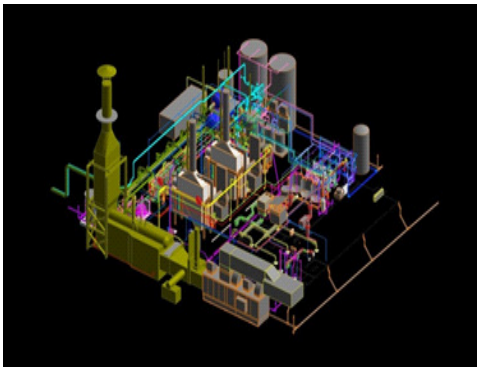
2013 saw the first ever Project Management Bootcamp, hosted by PSMJ Resource Inc., at F&H. A collection of 20 Project Managers gathered to take part in the two day training course. The course covered several PM topics including Action Plans, Financial Plans, Project Management Plans, Scheduling and Project Leadership. We have seen the use of several of the management tools by our PM's since this course took place. Plans are in place to implement the tools learned in the training as a standard practice on all future F & H projects.

Combined Heat and Power Plants on the Rise

Joel Grubbs, Vice President

Fosdick & Hilmer has provided engineering and design for Combined Heat and Power Plants (CHPP) since the early 1900's. We have accomplished this by using steam turbine generators and high pressure boilers in central energy plants. Our CHPP experience over the past decade includes: design of natural gas and fuel oil fired combustion turbine generators with steam-producing heat recovery equipment in the turbine high temperature exhaust stream. The configuration of a combustion turbine coupled to an electric power producing generator and steam producing heat recovery unit is referred to as advanced cogeneration technology. With low natural gas prices, increasing electric costs, and imminent coal regulations becoming law, many facility owners are now exploring their options. They are discovering the economic and environmental benefits of advanced central heat and power technology.

A relevant application example of this is for a CHPP currently under construction. The new facility located at a chemical processing complex in southeastern Ohio, is owned, operated and maintained by DTE Energy Services (DTEES). F&H was contracted by DTEES to provide: engineering and design, construction documents, automation engineering and construction phase services for replacement of the complexes' existing central steam plant. Key features of the new plant include:



Left: Revit rendering of the DTEES CHPP plant in Southeast OH.

The new CHPP is scheduled to begin commercial operation in September of 2014.

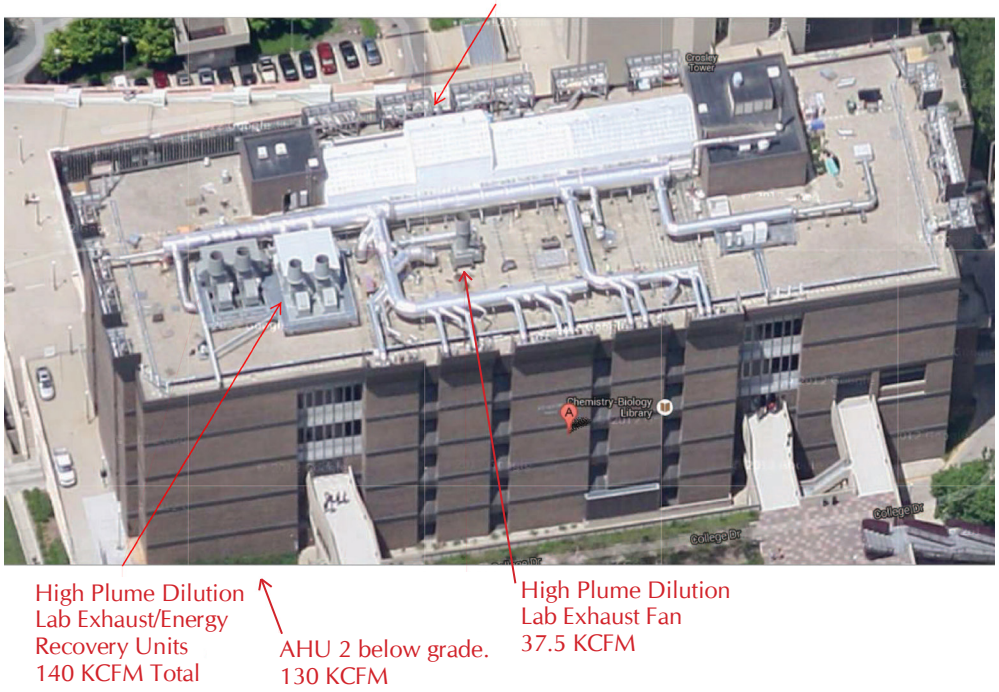
- One 7,900 ISO kW, 13.2 kV combustion turbine generator
- One 150,000 lb/hr, heat recovery steam generator with supplemental duct firing
- Two 80,000 lb/hr natural gas fired boilers, 315 psig saturated
- Natural gas compression system
- Water treatment systems
- Expansion of overhead pipe rack and support system
- Air source permit support (EPA)
- Utility Interconnect Permit support (AEP)
- Electrical switchgear including synchronization gear for interconnecting to existing utility power distribution system.
- Motor control centers including closed transition automatic transfer switches for use with the emergency generator, protective relaying, controls and logic for turbine black start and facility islanding capability
- 750 kW Black start generator
- Rockwell ControlLogix distributed automation and control system with Wonderware System Platform operator workstations in the control room

University of Cincinnati's Rieveschl Hall Undergoes Major Renovation

Tom Crompton, Mechanical Dept. Manager

Frog Room/Recirc/Filtration/Treatment System

Snakes in their new homes.



F&H provided MEPFS engineering for the multi-phase renovation of Rieveschl Hall, UC's permanent location of all chemistry and biology laboratories. F&H's scope included major renovation work upon all five building levels, plus the roof/greenhouse and the infrastructure level below grade. The scope has replaced and modernized most MEPFS systems in this 1968 facility. Budget for the projects (all phases) totaled about $25,000,000, not including equipment and furnishings. The last phase of construction will be completed by the end of 2014.

The mechanical work included a new 130,000 CFM VAV HVAC system (replaced CAV dual-duct system), and a new laboratory exhaust air heat recovery system (high plume dilution exhaust fans and energy recovery run-around coils loop system using glycol). New plumbing (CW, DHW, RO water, and laboratory gasses), fire suppression, and electrical services (electric distribution, lighting, audiovisual, and fire alarm) were provided for all renovated floors. Siemens direct digital controls and high-speed venturi air valves were provided for VAV supply, laboratory fume hoods exhausts and general exhausts to dynamically maintain spaces' proper relative pressurization. All spaces have occupancy sensors to shutoff lighting and switch HVAC to unoccupied modes, while the DDC controls track supply/exhaust airflows (supply, fume hoods, and general exhausts).

The Biology labs included: individually-controlled microclimates were created for numerous animal lab areas and plant growth rooms; space conditions for these ranged from 59 F up to tropical (85 F+ and high RH). Among the included spaces are rooms for frogs, fish, leeches, snakes, and an insectary. A new 3,000 GPD/3 GPM Reverse Osmosis water system (min. 1.0 Mega-Ω-cm resistivity) was designed by F&H and installed during construction.

Chemistry labs included areas of high-density fume hood use (24 in one lab), and higher demands for lab utilities. These include vacuum, compressed air, and natural gas. F&H added supplemental duplex vacuum pumps to serve designated areas due to a shortfall in the existing system's capacity.

We designed a laboratory-scale recirculating chilled water system to serve the condensing water requirements of numerous chemistry experiments at hoods and specialty lab equipment. Specialty laboratory equipment was accommodated throughout the project areas, and connected to various MEP systems as required. Examples include solvent recovery distillation systems, glovebox vacuum chambers, growth chambers/incubators, cold rooms, steam kettles, and low-temperature (-20 F) freezers.

We incorporated ceiling utility panels into many labs, with umbilical connections of power and lab gases down into casework from which multiple outlets are served. F&H designed power and HVAC (dual CHW & D/X cooling choices) for a 100 KW server room that was inserted into a partitioned-off portion of a lab classroom; the servers are for chemistry doctoral research analyses.