As BYU’s energy needs and air quality requirements change, Physical Facilities has been adapting to meet those needs. Because of that, a more efficient and environmentally-friendly method of providing energy is being put in place. Over the fall and winter, demolition and construction have been taking place at the heating plant. Bodell Construction as the contractor and FFKR as the design team have been hard at work installing a new Co-Generation (Co-Gen) Facility.

Major demolition needed to take place to the existing heating plant including the removal of three coal burning boilers while, at the same time, keeping the remaining gas boiler system in operation. This would be like performing open heart surgery while the heart continued to independently provide blood to the body. The heating plant needed to continue supplying building heat and hot water to almost all buildings on campus while areas were being demolished and reconstructed. The demolition included adding temporary exhaust and stacks so the old smoke stack, that was a landmark to campus, could be taken down. Many components were removed including coal silos, a bag house, roofs, exterior walls etc., leaving a shell through the winter. Even today, new structure and equipment continue to be installed with a new cogeneration turbine, heat recovery units, boilers, new stacks and associated equipment, again while maintaining the heating plant in full operation.

Associated with the work at the heating plant is the new power distribution systems throughout all of campus. This required large underground pull boxes, four new electric houses and added duct banks at nineteen locations throughout campus, miles of large conduit and medium voltage cable running through tunnels. BYU’s west substation is being completely rebuilt and two other substations modified as part of the added function of the new facility. The team effort of contractors, subcontractors, architects and engineers along with BYU physical facilities and heating plant personnel, have met challenges, made adjustments and kept the project progressing. The Co-Gen system will be a great improvement to the heating and electrical operations of our campus.
Student Spotlight

June

Paul Greenwood
Utilities Engineering

T he BYU Co-generation project is a heating, cooling, electrical- generation and emission-reduction project. With changes to the Federal Environmental Protection Agency over the last 10 years the State of Utah Department of Air Quality (DAQ) was required to initiate changes to the state emission allotments. One of the means by which the Utah DAQ initiated changes was to mandate changes on all state Title 5 holders. BYU historically has operated the central plant and other functions on campus via a Title 5 permit. BYU’s elected means of meeting new regulation was to install a Combined Heat and Power (CHP) Plant, also known as a Co-generation Plant. This plant utilizes a Natural Gas fired turbine (Jet engine) to power an electric generator of 16,3 Mw nominal power output. The heat that comes from the turbine as waste is forced through a series of heat exchangers to generate 400°F High Temperature Hot Water (HTHW). The HTHW will then heat and cool campus buildings and support other facility operations. The operation of the turbine to power and heat/cold campus will result in the total emission profile of campus to be a fraction of what’s its historical use was. The CHP is capable of operating independent of the Power Grid but will typically reserve that type of operation for emergencies only. It is anticipated that the CHP will serve campus for decades to come and be able to meet and exceed emission requirements into the future. The simplification of utility rates with this installation will likely be a large cost savings over the life of the equipment.

Garland

Clifford Alleman
Central Heating Plant Manager

BYU’s Co-Gen Plant will recover thermal energy from the turbine for the production of High Temperature Hot Water (HTHW) to meet the campus requirements for heating, cooling, steam and domestic hot water use. The new Co-Gen system is in the process of being installed into the existing Central Heating Plant building. This new system will replace the coal-fired plant that has been in operation since 1946. The plant has gone thru several renovations, first starting in 1961 and then again in 1970 to increase the load capacity by adding additional coal-fired HTHW Generators and their ancillary equipment. In 1992, the plant went thru another change to remove two of the five coal-fired generators and add two natural gas fired generators. This was done to meet environmental guidelines that were becoming more restrictive.

In 2016, Planning began to eliminate coal as a fuel source from the plant operation in order to meet even more restrictive guidelines that were being placed upon the University by the Utah State Division of Air Quality and the Federal EPA. It was decided that at time to eliminate coal as a fuel source and go completely to a natural gas fired facility.

The decision was made to go to a Co-Gen facility rather than adding more natural gas fired generators to the facility. This Co-Gen system will use natural gas as a fuel source to fuel the turbine. The turbine will rotate a 16.3 Mw megawatt generator to produce electricity, and the waste heat flue gas from the turbine will then be used to generate the 400°F HTHW needed for the plant operation.

A lecia Garzand was born in Reno, Nevada, and has resided in Las Vegas with her older sister and three younger brothers. She has worked at BYU in the AAVP office for 15 years where she loves working with all the good and talented people. Alecia served 19 months in the LDS Illinois Chicago Mission and loved teaching people about Christ. She and her husband, Tom, live in Spanish Fork, Utah, and have three wonderful children: Jessica (23), Joshua (22), and Jacque (19), all of which are currently attending college.

Alecia has joined them by attending online college through the Pathways Connect Program and plans to finally pursue her bachelors degree in web design. She enjoys photography, painting, illustrating, shooting/archery, Kempo karate, learning anything DIY and traveling with her husband. She is kind, dependable, friendly and a perfectionist. Physical Facilities is pleased to honor her as a great example of Service with Excellence.

Service with Excellence

Physical Facilities congratulates BYU’s landscaping team on their 6th national title in the National Collegiate Landscaping Competition. Many of the students on the team work for BYU’s Grounds, and a lot of staff members helped prepare them for their competitions.

Physical Facilities congratulates Richard Fifita for being a Brigham Award recipient. The award honors those who demonstrate the qualities of selflessness, charity & service to others.
We recently attended our ward’s youth conference where a number of outdoor activities were part of the learning experience. One of these activities had two participants, each standing on a 12” tall, 12” round log, placed on its end and spaced about 10 feet apart. Each person held an equal portion of the same 50 foot rope and, on a signal from the leader, tried to cause the other individual to lose their balance by pulling them off their precarious perch. Since each person had about 20 feet of rope, they could pull on the rope, or even let it slide through their hands, in an effort to upset the balance of the other. They could even cause their opponent to run out of rope.

After half an hour only two people were consistently undefeated, and the cheering commenced in a best-three-of-five competition. Afterwards, the winners explained some of the secrets of their success such as foot placement on the log and use of arms only for pulling the rope, thus not impacting their balance.

Our work at BYU is much the same. We are surrounded by many talented, hard-working people and the secret to being most successful often has to do with refining and improving the little things in the work we do. It is “by small and simple things [that] great things [are] brought to pass” (Alma 37:6). In the end, thinking small is often a better solution than thinking big.