2011 EXPO Award Winners

Featured Projects

» Real-World Value from an Out-of-this-World EXPO Project
» EXPO Project Allows State Board of Education to Mine Vital Data
» Students Engineer a Better Tool for Boeing

Capstone Design Projects

Engineering Club and Class Projects

Graduate Student Projects

QUESTIONS?
Please contact us:
expo@uidaho.edu
phone: 208-885-6479
PO Box 441011
Moscow, ID 83844-1011

Taylor-made Power

The Taylor Wilderness Research Station may be the country's wildest and most remote classroom. Set in the rugged terrain in the heart of the Payette Forest's Frank Church River of No Return area, the station presents unique opportunities for research.

But it also presents unique challenges.

Every ounce of fuel used at the station has to be carried in on foot or flown into the site. Because research often requires power to conduct tests, this can present a problem. To help support the research station, a system consisting of a hydroelectric generator and a small gasoline generator was installed. But after more than a decade of service, the system is ready for an upgrade.

"They wanted us to install a more robust system so residents can be less worried about conserving every watt of power," says Justin Schlee, a graduate student in electrical engineering. "They also want to install new equipment that uses more power, like machines used to process samples for analysis."

So Schlee and a team of electrical engineers are installing an entirely new system consisting of new hydroelectric and solar energy sources, a new bank of large batteries, and a data acquisition unit capable of recording power, current and voltage profiles throughout the site. This

FOR MORE INFORMATION

» Small Scale Power - Design Team Web site
» Taylor Wilderness Research Station
» Department of Electrical & Computer Engineering
» College of Natural Resources

Team Members:

Stephan Frazier

Wyatt Knepper

Ian Higginson

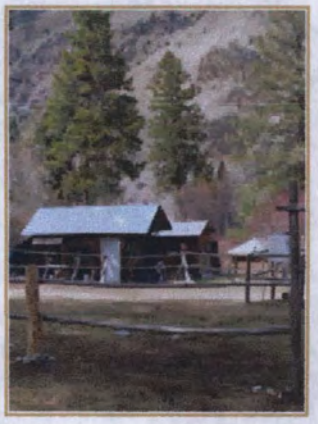
Paul Anderson

commercial unit not only can switch the system between charging and dispensing energy, it can be used to track the electrical history of the site, diagnose potential problems and aid in regular maintenance.

When all is said and done, the new system will supply up to 18 kilowatts of energy, more than four times that of the original system. When fully charged, the batteries can provide enough reserve energy to meet demand for four days without falling low on reserves.

The team will fly out to the location this summer to install the new system.

"Truly seeing water work for power has been the most memorable experience."



Access

Rates

Maps

Taylor Facilities

Taylor Power System

Taylor Power System

Taylor Renewable Power Expansion Project

Every ounce of fuel used at the station has to be flown into the site. Because research often requires power to conduct tests, this can present a problem. To help support the research station, a system consisting of a hydroelectric generator and a small gasoline generator was installed. But after more than a decade of service, the system is ready for an upgrade.

"They wanted us to install a more robust system so residents can be less worried about conserving every watt of power," says Justin Schlee, a graduate student in electrical engineering. "They also want to install new equipment that uses more power, like machines used to process samples for analysis."

An entirely new system consisting of new hydroelectric and solar energy sources, a new bank of large batteries, and a data acquisition unit capable of recording power, current and voltage profiles throughout the site. This commercial unit not only can switch the system between charging and dispensing energy, it can be used to track the electrical history of the site, diagnose potential problems and aid in regular maintenance.

When all is said and done, the new system will supply a peak load of up to 18 kilowatts of power, more than four times that of the original system. When fully charged, the batteries can provide enough reserve energy to meet demand for three days without falling low on reserves.

The new power system consists of 2 solar arrays of 9 panels, 18 in all. Each panel is capable of producing up to 235 watts of power. The photovoltaic arrays combines can produce up to 4200 watts when they are combined. The solar arrays are only a part of the story though. The power that is collected in the day must be stored for later use in the night. To accomplish this goal, 32 flooded 440 Amp-Hour lead acid batteries were added to the system. The old power system had 4 similarly sized batteries, but the amount of storage was too little to keep up with the demands of the system. In order to make up for this shortfall a gas generator had to be run for up to 3 hours per day. The new storage will allow for the entire site to be without generation for up to 3 days. The total amount of storage for the new system is approximately 80,000 kwhr.

The renewable energy project was designed and implemented through the University of Idaho College of Engineering Capstone Project.

TAYLOR POWER SYSTEM

University of Idaho Engineering students developed and installed new hydroelectric and solar energy sources at Taylor in 2010. Check out how student engineers put this project together!
» Taylor Power System

Taylor Wilderness Research Station
tayranch@uidaho.edu
Amie-June Brumble & Tyler Morrison
Station Managers
HC 83 Box 8070
Cascade, ID 83611