



**Case Study: Government**

**National Renewable Energy Laboratory**

National Renewable Energy Laboratory Installs Dedicated Audio Systems in High Tech Energy Systems Integration Facility

Housing the most energy efficient data center in the country, the National Renewable Energy Laboratory (NREL) in Colorado is the U.S. Department of Energy’s (DOE) primary national laboratory for renewable energy and energy efficiency research and development. They also conduct research for DOE’s Office of Science and Office of Electricity Delivery and Energy Reliability.

The NREL built the new Energy Systems Integration Facility (ESIF) to enable researchers to design, test, and analyze components and systems to enable reliable, economic integration of renewable electricity, fuel production, storage, and building efficiency technologies with the U.S. electricity delivery infrastructure.



“We’ve always liked Biamp offering a breadth of **components** that enable us to use multiple product lines across a variety of different spaces within the same project.”

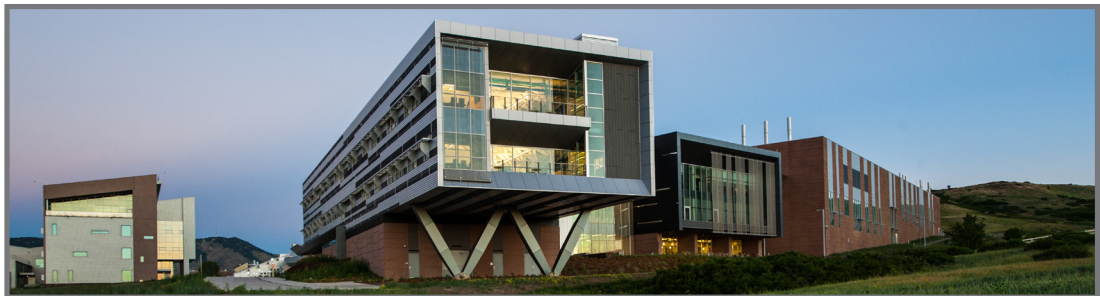
–Paul Corraine, *President*  
Convergent Technologies Design Group, Inc.

## THE CHALLENGE

ESIF is a 182,500-square foot facility that houses 200 researchers and staff in eight different work spaces. Each of the spaces needed to be uniquely designed to fit the research and testing needs of the different user groups. The spaces include:

- 3D collaboration lab
- Control room that monitors and controls the facility processes
- Visualization labs where experiments being performed in the electricity, thermal, and fuel labs can be visualized on a large, high definition screen
- Conference rooms in various sizes

NREL works with researchers from around the globe, and the ability to route quality audio, video, and other data into the conference rooms, as well as the control room, was a key necessity for the facility. Each of these spaces required a fully functional, standalone audio system with localized control. The systems also needed to be connected over the facility's network, but the individual systems were not unified on the building's audio/video distribution system.



**“ We specify Biamp on different projects across the country ”** from university campuses to executive boardrooms to facilities like this where they're doing high-end presentations and ground breaking research. The Biamp product provides the right level of sophistication.

*-Bill Holaday, Principal Consultant*  
Convergent Technologies Design Group, Inc.

## THE SOLUTION

With their long history of education and research facility installations, Convergent Technologies was chosen as the AV consultant by architectural firm SmithGroupJJR (SGJJR), who was hired to design the ESIF building. Having worked together successfully for over 10 years, Convergent and SGJJR made up the perfect design team for the ESIF building.

"We work extremely well with the SmithGroupJJR studio, and we have for a long time," said Bill Holaday, Convergent's Design Principal on the project. "There's a history there that enables us to bring all of their A/E experience together with our team's AV and acoustical expertise to create a compelling and impressive solution that we can all be proud of."

Completed in Spring 2013, the Convergent team identified the need for a modular approach to the installation, and chose Audia® and Nexia® as the best solution, at the best price. In the control room and one of the visualization labs, Audia was installed for core audio switching processing and teleconferencing. Nexia TC and Nexia CS were employed for their robust teleconferencing abilities and mic/line level inputs and outputs in the 3D collaboration lab, visualization rooms, and conference rooms.



## SYSTEM SPECIFICS

### Components:

#### AUDIA

##### (2) AudiaFLEX

- (2) AEC-2HD cards
- (2) VoIP-2 cards

##### (3) Nexia TC

##### (2) Nexia CS

Designed specifically to provide quality audio in teleconferencing applications, the Nexia TC DSP has Biamp's Sona™ AEC technology built into it. Nexia TC delivers true 20Hz to 20kHz bandwidth during multiple participant conversations, with natural sound and full duplex transmission of speech. The Nexia CS is a DSP with 10 mic/line inputs and 6 mic/line outputs that's intended for a variety of conferencing applications.

Each AEC-2HD card provides two channels of acoustic echo cancellation and background noise reduction. Designed using Biamp's Sona AEC technology, the cards provide increased frequency response, improved audio quality, and more natural sound during the transmission of speech.

Providing up to 24 channels of I/O, each AudiaFLEX uses CobraNet® to distribute multi-channel audio among multiple units. The VoIP-2 cards enable VoIP conferencing directly from each AudiaFLEX, with two channels of VoIP supported per card.



## COLLABORATION THAT SUPPORTS THE AUDIO SOLUTION

Because SGJJR engaged Convergent early in the design process, this dynamic design duo was able to create a facility that is not only singular among facilities of its kind in the country, but one of the most technologically advanced in the world. The high level of coordination and cooperation from both groups resulted in well-designed collaboration spaces that support a complex audio solution.

**“Early involvement** and our long term tenure with SmithGroupJJR allowed us to forecast and creatively solve many unique challenges while developing **a seamless architectural technology solution.**”

*–Paul Corraine, President*  
Convergent Technologies Design Group, Inc.



## ABOUT BIAMP SYSTEMS

Biamp Systems is a leading provider of innovative, networked media systems that power the world's most sophisticated audio/video installations. The company is recognized worldwide for delivering high-quality products and backing each product with a commitment to exceptional customer service.

The award-winning Biamp product suite includes the Tesira® media system for digital audio networking, Audia® Digital Audio Platform, Nexia® digital signal processors, Sona™ AEC technology and Vocia® Networked Public Address and Voice Evacuation System. Each has its own specific feature set that can be customized and integrated in a wide range of applications, including corporate boardrooms, conference centers, performing arts venues, courtrooms, hospitals, transportation hubs, campuses and multi-building facilities.

Founded in 1976, Biamp is headquartered in Beaverton, Oregon, USA, with additional engineering operations in Brisbane, Australia. For more information on Biamp, please visit [www.biamp.com](http://www.biamp.com).