

# FOCUSED ENERGY



PHOTOS: WENDY PATRIZIA PHOTOGRAPHY; LIBERIAN PHOTO AND PRACTICE; NUVERA

By Anne Vazquez

Nuvera Fuel Cells, Inc.  
needed a new facility.  
The manager of facilities  
and technical operations  
led the effort.

Fifteen months after moving into his company's new space, Jeff Cook still periodically glances up at the ceiling to make sure the dark purple paint overhead is not chipping. He's happy with what he sees. As manager of facilities and technical operations at Nuvera Fuel Cells, Inc. in Billerica, MA, Cook had questioned the wisdom of painting the open plan ceiling as well as the overhead ductwork and cabling.

"I'm happy to report," shares Cook, "that the paint is staying where it's supposed to be. It was one of my bigger concerns, and it hasn't been an issue. If the paint had flaked—to fix it right, the ceiling grid would either have to come down or repairs would need to be performed around it—not to mention protecting the furniture and occupants. It would be an absolute horror show."

In Fall 2007, Nuvera moved into its new headquarters after a major renovation transformed an existing structure into a consolidated base of operations. The energy technology company had been situated in Cambridge, MA since 1998, with its 100 plus employees spread throughout three buildings.

In 2005, the company began to research moving out of the Cambridge location to a facility that would meet its growing need for light manufacturing. "Our existing lease was expiring," Cook

explains. "At the same time, our requirement for manufacturing space was ramping up. We did not have enough space for that where we were, and it was also a compliance issue, since the location was not permitted for manufacturing."

Nuvera's search for a new facility began about a year and a half before its lease expired. Cook was chosen to serve as the owner's representative and project manager for the endeavor, and he was glad to have begun the process 18 months ahead of lease expiration. "We started just in time," he says. "If we had waited even a couple of more months, I think it would have been more difficult."

Tasked with finding an existing facility in the area with the potential to be renovated to meet Nuvera's needs on a relatively modest budget, Cook began by choosing members of the internal project team, determining basic requirements (such as square footage), and soliciting a "wish list" from senior management. He then moved on to sending request for proposals (RFPs) to real estate brokers and, shortly thereafter, sending RFPs to firms for architectural services.

Ultimately, Margulies Perruzzi Architects of Boston, MA was chosen by Nuvera to provide architectural/design services. The firm was brought on board before a facility was actually selected, and both Cook and Dan Madru, senior associate at

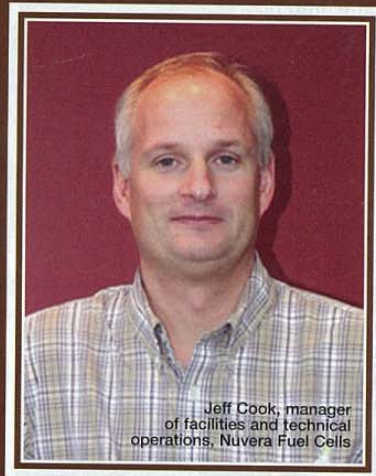


Clockwise, from opposite page: Conference rooms are interspersed throughout Nuvera's office area; a centralized service corridor runs between two rows of lab spaces; the café is located to allow for spontaneous interactions; large windows allow daylight to illuminate the interior; there is a multi-planed ceiling in the office area; and the lobby at Nuvera's new headquarters serves to welcome employees and visitors alike.

## A Chat With Jeff Cook

**What are your responsibilities at Nuvera Fuel Cells?** I have three pools of responsibility. I am the facilities manager, lab operations manager, and manage the R&D technicians. This entails handling all the facilities related issues, including leases and permit/compliance issues with the AHJs (authority having jurisdiction). I'm also responsible for all mechanical, fire alarm, elevator, landscaping, and cleaning contracts.

Especially after the headquarters project was completed, I am now the person senior management comes to when a facility project—whether facility- or lab-related—is being planned. Also, I am the project manager when it comes to anything to do with the building or lab operations. For instance, someone may come to me and say, "I have this new requirement. I need 150 psi of natural gas to feed my lab process." From there, I begin to go through all the engineering and code requirements and guide it through to implementation.



Jeff Cook, manager of facilities and technical operations, Nuvera Fuel Cells

**How long have you worked for Nuvera?** I have worked here for six years. I began at the Arthur D. Little company (Nuvera's predecessor) as an internal electrician, moved up to be a facilities supervisor, and then became the facilities manager. For about seven years prior, I was an electrician, which also gave me some project management experience. A lot of my training has been from hands on experience. However, I did go to Northeastern University for the facility management certificate program and the construction management program. Those programs definitely prepared me for working in both of those areas in a professional manner.

**How has the new facility made your work easier?** On the facilities side, it's easier because the building isn't 50 years old. On the flip side, because that aspect is under control, I have taken on other responsibilities that include R&D operations and manufacturing.

**What else are you working on?** We have a small space on the first floor that could be expanded. This will be an additional training center for people (both from Nuvera and outside the company) to receive training on our equipment so they can service it. Also, I am hoping to see the manufacturing spaces move to full productivity. We are in the process of getting them prepared to move to full-scale use. ■

Margulies Perruzzi, agree that establishing this part of the team early on helped to expedite the project once a building was chosen. Nuvera also selected RDK Engineers of Andover, MA to provide mechanical and electrical services.

"The timeline was key," says Madru. "Sometimes, [the parties involved do not] completely understood how much time it takes to create and complete a program; then [there is] the search and planning to find a space that meets the needs of the program for the client."

### Finding The Right Facility

The nature of Nuvera's business meant there were several "must haves" on the list. For a vibrant

(Continued overleaf)

*Focused Energy*

(Continued from previous page)

and expanding R&D operation, the company needed ample mechanically equipped laboratory spaces. Another criteria was a location that would allow for light manufacturing.

Nuvera's work in developing and manufacturing Proton Exchange Membrane fuel cells, fuel cell systems, and fuel processing products required a utility system beyond the conventional, and the related safety protocols were also at a higher level than those applied in a facility not in the business of handling compressed gases.

Says Madru, "There were some standard requirements—office space, conference space, manufacturing space, and a shipping and receiving area, to name a few. But understanding some of the quantities and configuration intricacies of the utility services needed was a challenge for us. We wanted to make sure we fully understood Nuvera's needs, and that is where a lot of engineering input came into play."

Margulies Perruzzi and RDK were also involved in Nuvera's building search. Explains Cook, "We needed to ask them questions like, 'Does it make sense to put money into this building to make it meet our lab requirements? Does it have the extra ceiling height to accommodate the extensive duct work for the lab area?'" High floor to ceiling measurements were also required in the manufacturing area.

In evaluating facilities, the project team also worked with another firm to conduct safety analyses. Local AHJs (authority having jurisdiction) also were involved to ensure Nuvera would be able to operate effectively at a given site. This is because the company's R&D activities involve compressed gases (natural gas, hydrogen, nitrogen, and calibration gases), and those materials require special handling.

Says Cook, "You need to use the proper materials and protocols for compressed gas systems. The gases we use are flammable, so that's where the AHJs (e.g., fire departments) become

involved. Their staffs would go into the building if there was an issue, so it has to be a controlled environment."

Adds Madru, "Because of the unique utility configurations and lab requirements, we needed to sit with the AHJs to go through the safety and precaution procedures that Nuvera had established in Cambridge—and that we enhanced here. We showed them that, in the case of an incident, one room could be isolated, shut down, and the rest of the facility protected."

A relatively low-tech requirement in the building search was where the loading dock was sited. "The location was huge," says Cook. "If we had to move the dock to another area, that would be another cost."

The team eventually chose a building about 20 miles from the company's Cambridge site. At a little more than 110,000 square feet, the building was formerly a light manufacturing warehouse and provided the right space parameters for programming the new headquarters.

**Designing The Space**

As a result of the move, Nuvera's operations would be consolidated under one roof, and a leading benefit of this was that the lab spaces would all be grouped together. "In Cambridge, we had the labs in three buildings, and the efficiency wasn't there," explains Cook. "Just by not having people walk back and forth between buildings anymore has increased our efficiency. The labs have been operating at over 95% uptime in the new building; in the old space, we had gotten used to 75% uptime."

When it came to the office areas "open plan was also key," states Cook. "In Cambridge, everyone had separate offices with doors, and this limited the ability of the staff to collaborate and share ideas. Team collaboration is needed to get products to market."

Says Madru, "The previous office space was in a dormitory style with a center corridor and rooms off the halls. And the manufacturing, which was a much smaller part at that point,

was in a different building (as was the R&D department). With the need to develop their product and have more of a collaborative effort, Nuvera had to vacate the space."

To foster the open plan strategy, office spaces were designed using cubicles located in the center plate of the building. The perimeter was used as a walkway, which achieved two things: people do not disturb employees by walking between cubicles if they don't need to, and natural light from the floor to ceiling windows illuminates common spaces.

Further, "scribble rooms" were included in the floor plan to provide space for impromptu collaboration sessions. These spaces, enclosed on three sides and with a drop ceiling above, contain furniture on wheels and a white board along one of the walls.

In addition to improving daily interactions, a streamlined layout was important to Nuvera in order to accommodate tours for its customers, suppliers, and investors.

Madru explains that existing conditions helped guide the process. "For one, with the existing location

of the main utility plant and shipping and receiving docks, we were able to design a natural manufacturing and lab area adjacent to these spaces. This allowed us to create a more natural flow for circulation around the building. From the lobby, we wanted people to go up the stairs or the elevator and walk through the space in a systematic way. It was streamlined, and the building itself helped us to do that."

In designing the circulation, Madru and his team used walls, flooring, and the ceiling to guide people through. For instance, the carpet features several different colors and patterns to highlight walkways.

A three-planed ceiling was also designed to create a traffic path. The lowest plane comprises pendant lighting and accompanying supports; above that is an open aluminum grid aimed at "lowering" the high ceiling; and the top plane is the exposed ceiling, ductwork, and cabling. (That top plane is the purple painted surface that caused Cook some conster-

(Continued on page 28)

**Project Information:**

**Organization:** Nuvera Fuel Cells, Inc. **Type of Construction:** Renovation of existing structure. **Function of Facility:** Headquarters, with R&D, laboratory, light manufacturing, and offices. **Location:** Billerica, MA. **Square Footage:** 110,684. **Project Timetable:** Mid-2005 to Fall 2007. **Facility Owner:** Nuvera Fuel Cells, Inc. **In-House Facility Manager/Project Manager:** Jeff Cook, manager of facilities and technical operations. **Architect/Interior Designer:** Margulies Perruzzi Architects. **General Contractor/Construction Manager:** Erland Construction. **Electrical/Mechanical Engineer:** RDK Engineers (MEP). **Lighting Consultant:** Reflex Lighting Group, Inc. (fixtures). **Fire System Consultant:** Rolf Jensen Associates.

**Product Information:**

**Furniture:** Herman Miller (workstations, desk chairs, task seating); National (offices); OFS (lounging seating); Harter (conference room seating, side chairs); Sit On It Seating (large conference room seating, training room, cafe); Versteel (tables). **Flooring:** Armstrong (vinyl composition tile); Forbo (linoleum). **Carpet:** Patoraft. **Ceilings:** USG. **Paint:** Benjamin Moore. **Fabrics:** Knoll; Herman Miller. **Building Management System/Services:** Siemens. **Security System:** S2 Security (card access and CCTV). **Lighting Fixtures:** Cooper Lighting. **Window Treatments:** Springs Window Fashions (Ball brand blinds).



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**Focused Energy**

(Continued from page 32)

nation at the outset. Purple was chosen over flat black to create a deeper tone that seems to recede more than a simple black would.)

Leaving an open plenum above the ceiling grid was also geared to meeting budgetary constraints, since the existing electrical bus duct, sprinkler heads, and HVAC ductwork did not have to be reconfigured.

A training center for sales agents and service partners was also placed in the new facility, along with several amenities including a café and a lobby showcasing objects from Nuvera's history.

"The challenge for our firm," says Madru, "was to understand the requirements from a technical point of view and from the point of view of trying to help clients and supporters understand and appreciate Nuvera's business. We needed to create a space that would be both professional looking and functional."

**Collaboration As Key**

"This project was very rewarding and a great learning experience," says Cook. "Dan and I had a great time doing the project together, and we had a great team that pulled it together and had the respect for each

other that was required. It was a clean effort. Some things came up, like issues with the telephone piping. But overall, I think it went smoother than anyone had expected."

Says Madru, "I have to agree. As the architect and project manager for my firm, it was gratifying to have Jeff on board with his understanding of what was going on, especially when it came to the budget and program requirements. From my perspective, it's very helpful to work with a project manager who understands the whole process and how it works."

Occupants are doing their part to keep Nuvera's facility in good shape, Cook has noted. "In Cambridge, the building was 50 years old, and people would bang into the doors with chairs and mail carts. Here, they are taking pride in the building. It has made me realize that it's even more important for us to do our job as facility managers and keep the building as new as possible. It does rub off on people; no one wants to be that one who destroyed something." **TFM**

*This article was based on interviews with Cook (www.nuvera.com) and Madru (www.op-architect.com).*

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**Facility Executive Of The Year**

(Continued from page 24)

Driessen feels strongly that green design—which he holds synonymous with good design—should not be more expensive. He asserts, "It's our responsibility as fms to hold our design teams accountable to that. Anyone can come up with a great design on an unlimited budget, but the challenge is to come up with great designs within the given budgets that are established on a return we would like to see."

**Support From The Top**

Based on his team's past accomplishments, Driessen had earned the confidence of Medtronic Vice President Steve Mahle for the Mounds View campus undertaking. Driessen recalls the following conversation with Mahle in the earliest planning stages for the Mounds View facility. "Mahle said, 'You did the world headquarters project very successfully. What was the key to that?' My response was, 'The key is going to be you. When we need decisions, I'm going to need you to make them. You may not have time to get consensus or additional information, because we might have 400 guys in the field ready to work.' He took that to heart, and we made those tough calls together."

This partnership resulted in a relatively smooth process and a positive collaborative attitude among those involved. And while he personally made thousands of decisions regarding the Mounds View site, Driessen credits the entire team for its success.

"At one point, we had more than 600 people working on this project. We defined everyone's roles and responsibilities, then we empowered them. I said, 'This is a large project, and I can't do it all. I'm counting on you to do your piece of it, and we're going to hold you accountable for your deliverables. Collectively, we're a whole lot smarter than any one of us.'"

As for enticing everyone to work together, Driessen offers this advice: check the egos at the door. "It's all

about collaboration. Owners, designers, and builders must all work together (particularly with the design-build approach used on the Mounds View campus). Fms need to lead and drive this process, not the architect or contractor."

The undertaking, including a massive staff relocation into a completely different type of flexible, collaborative work environment, has earned high marks from employees on post occupancy surveys. Judge Tim Springer, founder and president, HERO Inc., adds, "Medtronic has high employee satisfaction and relatively low turnover. It is one of the jewels in the Twin Cities."

Additionally, the company expects to reduce subsidies for food services across multiple leased facilities by over \$600,000 annually, cut annual operating costs by over \$20 million annually (by 2012), and vacate over 500,000 square feet of leased space as a result of this project.

In retrospect, Driessen is taken aback by his accomplishments. "It was my boss who asked, 'How many decisions do you think you made? How many do you think there were?' He realized I had been involved in all of them. When he put it in that perspective, I reflected—these were decisions we just made along the way. I wasn't overwhelmed while we were doing it, but after the fact, it was a little bit sobering."

As an fm who takes his job—but not himself—seriously, Driessen appreciates the importance of having fun. He asserts, "If you love what you're doing, it makes it that much easier. You treat people with respect even in the heat of battle, and it leads to a better outcome."

It seems as though Driessen, TFM's 2009 FEY, could get almost anyone to eat an elephant. **TFM**

*This article was based on the nominee's entry, submitted by Mark Louse, vice president, Workplace Employee Operations, Medtronic, Inc. It was supplemented by interviews with Driessen. To see the winning entry or read about past recipients, visit [todayfacilitymanager.com](http://todayfacilitymanager.com).*

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