CONQUERING INNOVATION FATIGUE

CHAPTER 15

ORION ENERGY SYSTEMS:

CREATIVE SOLUTIONS TO EXTERNAL FATIGUE

When vision and sound strategy are in place, courageous innovators and leaders can navigate around innovation fatigue factors and reach success. One example with many lessons comes from the journey of an intriguing innovator, Neal Verfuerth, and his company in northeastern Wisconsin.

Bemis Manufacturing in Sheboygan Falls, Wisconsin is the largest toilet seat manufacturer in the world. After meeting with Neal Verfuerth, President of Orion Energy Systems in Sheboygan, Wisconsin, Bemis Manufacturing agreed on an unusual project. Industry-standard high-intensity discharge lighting in the plant would be ripped out and Orion's new proprietary system would be installed to provide better, brighter lighting for this early adopter. When the project was finished and the new lighting system was in place, hundreds of employees began enjoying brighter, more comfortable lighting. But there is much more to this story. Over at the local utility company, alarms were being triggered. Operators were shocked. Eight percent of the entire power load for the city of Sheboygan Falls (population 6800) had been taken out overnight. Pinpointing the source of the change, the meters showed that Bemis Manufacturing suddenly was using 50 percent less energy. They knew the plant wasn't closed, so the dramatic drop in power consumption pointed to one troubling possibility: someone was stealing electricity. Was there a thief working for Bemis?

Since that day, Bemis Manufacturing has saved hundreds of thousands of dollars in electrical bills not though thievery, but through innovations in lighting

from Orion Energy Systems. Even with greatly reduced energy use, the plant is a brighter, better place to work.

Neal Verfuerth is a true leader of innovation who combines the best of environmental stewardship and capitalism to achieve solutions once thought impossible. Can a building be made brighter while using half the electricity? Can significant electrical power be added to a grid during times of peak demand without building new power plants? Can environmental advances be made in ways that also help businesses and utilities? Can improved technology replace antiquated lighting systems without creating any waste? In Neal's world, the answers are all "yes!" Neal's experiences highlight many wise behaviors for an innovator wishing to overcome innovation fatigue at all the levels considered in this book.

On a cold Wisconsin day in January 2008, the heat of innovation seemed feverish inside Orion's 200,000 square foot Manitowoc facility during a two-hour tour kindly conducted by Neal for Jeff Lindsay, just one month after Orion went public (Nasdaq: OESX). We also were assisted by Steve Heins, Vice President - Communications & Government Affairs, and Linda Diedrich, Director - Corporate Communications. They offered us a review of what persistent, directed innovation can do as innovators overcome fatigue factors and complete their "circuit of innovation" (see Chapter 18).

Orion provides specialized fluorescent lighting systems that use far less power than traditional fluorescent lighting, and offers higher efficiency than the LED lights that are often viewed as the standard for efficiency. Orion makes it possible to be even greener than LEDs and more cost effective, without having to rewire a building. Plants that previously installed high-pressure sodium, high-intensity discharge or metal halide lamps (often at the cost of employees unhappy with the color or noise) are now finding more significant energy savings with more pleasant lighting and longer life after switching to Orion's systems. Customers like the *Milwaukee Journal Sentinel* newspaper, who replaced their high-intensity discharge system, are achieving a return on their investment in about one year.[1]

Based on years of experience across the full supply chain in lighting, Neal has identified numerous gaps in prior systems and found solutions. For example, the reflectors behind fluorescent lights are far more important than previously realized. The details of the reflector shape control how effectively light is distributed below. By properly and uniformly distributing light, work areas can be made brighter with less power. For high bays with a 50-foot ceiling, the ideal reflector may be a deep, narrow valley, but for a 12-foot ceiling, a broader curved profile with a novel dimple in the middle gives the broad stream of light needed.

Orion also uses a special aluminum alloy that gives outstanding heat distribution for ballast longevity and offers superior reflectivity. To make the ideal shape for low-bay reflectors, Neal found that existing equipment was inadequate. Neal and his team actually invented a machine, one of a kind in the world with a series of rollers that turn a flat alloy panel into a beautifully curved reflector panel.

Neal also found that the design of popular high-intensity discharge systems resulted in half the energy wasted as heat and vibration. By separating the ballast from the lamp and using a highly-conductive alloy frame to cool the lamp, energy use is reduced and ballast life increased. The performance of Orion's high-intensity fluorescent system is surprising: more light with half the energy–so surprising that many prospective clients simply refused to believe it. But Neal did not let skepticism and the difficulty of making sales slow him down. He saw a need for further innovation to provide a compelling reason to believe. Thus Neal invented and patented a meter that is installed with the lights and helps clients see the dollars being saved. It was a technological invention, but one aimed at supporting a business model.

Lesson from Orion: When faced with doubt, innovate to create reasons to believe!

When prospective clients wouldn't believe the energy savings Orion's lighting systems offered, President Neal Verfuerth created and patented a meter that helped clients see how much energy was being saved. When that didn't break down the skepticism, he added a business model innovation: installing the new systems for free, and taking payment based on the measured savings clients experienced. Sometimes a great invention is not enough to deal with the social aspects of innovation. Further creativity is often needed to help customers change their behavior and try something new.

Clients still refused to believe that such significant savings were possible–after all, how could the massive electrical lighting industry have missed this opportunity after all these years? Undaunted, Neal added another twist to his business methods. He would install the new lighting system for free, accepting payments based on the savings he was delivering in the clients' lighting bills. When the contract expired, clients would own the lights. It took 18 months of homework to ensure that this approach would not need to be mentioned in SEC filings of his clients,[2] an example of the many regulatory barriers he had to deal

with. There were challenges at every turn, but through added innovation, persistence, and homework, Neal pressed forward.

The manufacturing process is filled with further innovation. Neal found that the painting of ballast boxes affected performance and installed his own advanced electrostatic powder coating system using energy from an efficient Capstone Turbine microturbine generator. Energy in the hot gases is recovered to help dry the paint.

Part of Orion's suite of solutions includes light pipes that, characteristically, offer innovations in design giving them an edge over traditional skylights. Further benefits come from Orion's wireless control systems that provide a desired level of lighting automatically by sensing the light from the light pipes and turning off unneeded fluorescent lights.

Continuing Orion's theme of profitable sustainability, partners have been found to recycle every component of old lighting fixtures that are sent back to Orion. Plastic lenses, ballasts, wiring, and reflectors are all recycled with the help of partners. Orion even developed specialty bandsaws for cutting the transformers that are received, facilitating their recycling.

Advanced robotics also play a role at Orion. The synchronized beauty of Finn Power robotic machining units preparing large sheet metal for transformation into ballast packs was an impressive sight. The payoff has been excellent. That success depended on properly programming the robotics. Neal said that he hired "a young guy who likes Nintendo video games and made him the robot programmer. His superb videogame skills gave him the edge we needed to achieve outstanding performance with the robots."

Lesson from Orion: Consider every aspect of the supply chain for innovation

By considering every aspect of the lighting business, from the design of individual components to system-wide performance, from installation challenges to uses for discarded components, Orion has found numerous innovation opportunities. Detailed knowledge of the business, the technology, and customer needs at every level gave Neal Verfuerth and his team a competitive advantage.

Neal has faced his share of opposition. Skeptics have said he was crazy, that it couldn't be done, and asked how he could compete against the giants of the industry who surely knew more than he did about lighting. Neal faced barriers in

finance, in law, and in other areas that would have stopped most people, but Neal had a vision and persevered to find a way. A key to his success was that he actually knew what he was doing and was familiar in detail with the barriers to efficiency that had been accepted through decades of tradition in the industry. Sometimes the long-held assumptions of the experts in an industry are the greatest barrier to progress.

Innovation in Business Methods

Orion Energy Systems has been diligent in creating intellectual assets to protect their business. This includes seeking business method patents that go beyond traditional patents for products and manufacturing methods. For example, Orion is pursuing patents on their "Virtual Power Plant" business model, in which multiple participating companies can respond to surging power demand by cutting back on lighting, using automated management systems from Orion communicating across the Internet, and collectively selling saved power to a broker for a profit. Financial rewards from returning power are shared among the participants. Orion's remote control systems and other tools come into play here.

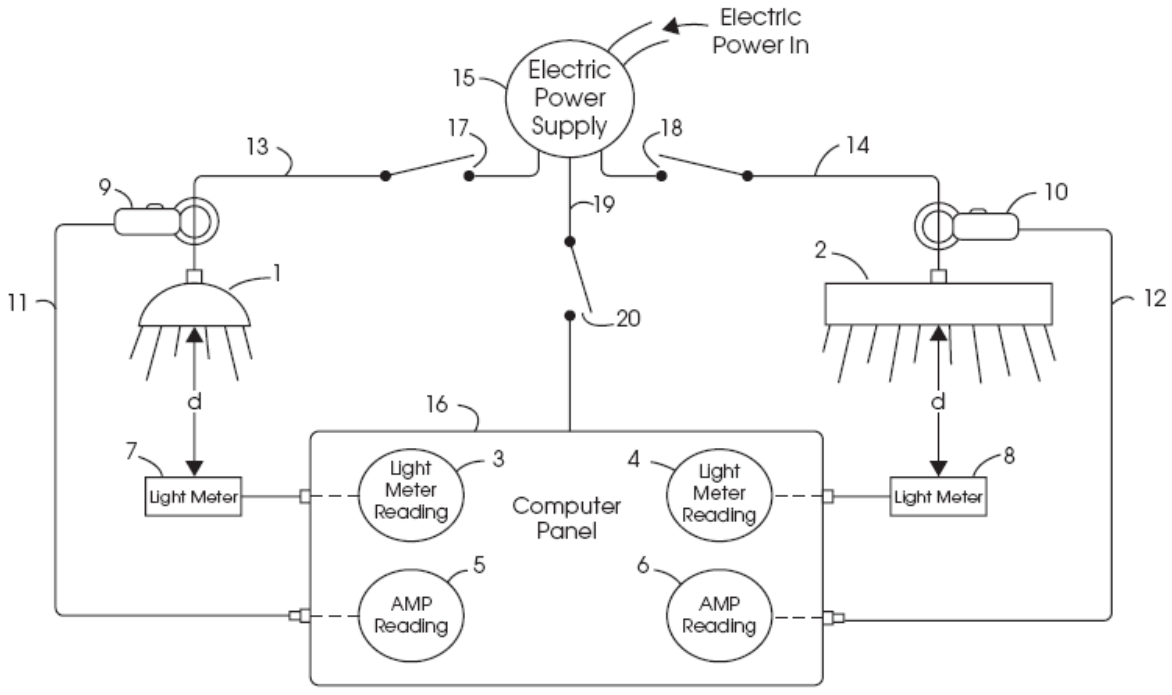

Exhibit 15.1. Figure from an Orion Energy Systems patent related to their virtual power plant concept.[3]

Their business method innovations extend to some of the hottest topics in energy. “We’ve been working on the notion of monetizing emissions through efficiency for three years,” Neal said. They monetized their first emissions trade in 2007. VP Steve Heins explains that Orion’s membership in the Chicago Climate Exchange and Environmental Markets Association helps keep them involved in the growing markets for emission reduction credits. Neal and Steve believe that once the door opens on market trades based on energy efficiency, there will be a transformation in our sense of how much it will cost to reduce emissions. Neal said, “We’re going to take energy efficiency and change it from being a social program to one that makes economic sense.”

Orion even started a non-profit foundation called E4, whose charter is to bridge the gap between environmentalism and capitalism. With the help of E4, the State of Wisconsin was able to recognize the future importance of emission credits when they structured a deal between Florida Power and Light and WE Energies of Wisconsin, in which Wisconsin’s Point Beach Nuclear Power Plant was sold. The original deal would have overlooked the value of emission credits entirely, but thanks to the efforts of E4, that value will be retained for the taxpayers of Wisconsin. WE Energy kept the rights to possible emission credits from the plant, preserving a benefit that may be worth up to $200 million a year.

A governmental fatigue factor was creatively conquered in this process. When the original proposal was made by Orion, a suspicious Wisconsin judge threw out the request and chastised the company for allegedly being self-serving and greedy. Rather than giving up, Orion sought to understand and allay the cause for suspicion. They openly and publicly repositioned their effort through a new non-profit foundation. No deception was involved–the relationship of E4 to Orion Energy Systems was made clear, and the same person then made the same pitch to the same judge, but this time with the added clarity provided by their non-profit status. Now the judge could see the opportunity more clearly, and told the representative he once chastised that the plan was pure genius. Orion was acting in the interests of the public, but sometimes those who don’t understand the nature of corporations can’t see past their assumptions, so repositioning was a smart move. Sometimes people need a little help in overcoming their own biases. (Remember: when faced with doubt, innovate to create reasons to believe.)

Business method innovations from Orion also include development of their own ERP (Enterprise Resource Planning) software. Neal found that existing ERP systems didn’t fit Orion. He tried two different commercial ERP systems, and after months and hundreds of thousands of dollars, determined that he would rather not have to change the way he did business to meet the demands of

rigid software. Instead, his team developed a custom tool for the way they needed to manage sales and manufacturing. The tool Neal envisioned would be intuitive and easy to use for people on the shop floor and people in the field, one that revolved around the work people needed to do, not around the needs of accountants. “I didn’t want the IT guys to be only ones who could make it work.” Some said they were crazy to develop their own enterprise software, but the system has proven to be successful and cost effective. Their proprietary TaskMaster system, which we have seen in operation, is a model of what corporate software systems should be.

Part of Orion’s leadership in business methods was expressed in their efforts to help Wisconsin benefit from carbon credits associated with the use of nuclear power. When Wisconsin was selling the management of its nuclear power plants to a third party, Neal recognized that the carbon credit benefits from Wisconsin’s nuclear power plants should be treated as a valuable future asset that should be retained by the state. Without his intervention, Wisconsin would have lost the value of those carbon credits. Early recognition of their future value allowed Neal to save millions for the State, though it took significant efforts on his part to make it happen. It’s just one more example of the innovations in business models that Neal brings to the table–a table sometimes freely shared with many.

Orion Asset Management

Orion Asset Management refers to Orion’s suite of business method innovations that help clients generate revenue from their capital expenditures around lighting and other sources of power consumption. Energy consumption is monitored in real time with Orion’s Intelite™ control system. Documented energy savings are aggregated with Orion technology and sold back to an energy broker. The Intelite™ control system communicates over the Internet to integrate local control with macro opportunities and needs. Users can remotely access data about their power usage, create budget reports, explore alternate usage and procurement scenarios, and implement load shedding strategies. The local control system can automatically turn lights off in areas that are not occupied. It can integrate information from fans, heating systems, cooling systems, lighting, etc., all of which can be controlled and can communicate with other components. The fans can respond to information from the lighting grid, for example, to optimize building performance. With this system, power can be reduced, emissions harvested, and multiple customers aggregated to sell power back to the grid, allowing the Virtual Power Plant to make money for participants.

As Orion works to provide the benefits of future emissions credits to their customers (a topic we discuss later in this book), Orion and its allies will be devising new ways of looking at how energy is used, how energy is procured, and even how energy issues are legislated. Steve Heins explains that "instead of 'greenwashing,' we are taking something that is measurable and verifiable, and ensuring that our customers get credit for what they are doing for their communities. In fact, our customers already have received more than 400 environmental stewardship awards."

Neal had more to say about this vision: "I've testified at the State Senate and Assembly. Everyone wants to beat their chest about energy issues, but not many are standing up to say 'I have a solution, it's cost-effective, here's how it will be paid for, and here are the benefits.' We can do that, and offer trickle-down economic effects and help for the environment."

That's what innovation is all about: *believable* real solutions to real problems that make life better for real people.

More Lessons from Orion

Growth has meant constantly seeking opportunity. In 2002, on a sales call to a manufacturing facility in Manitowoc, Wisconsin, Neal could see the signs of trouble there. "I could smell death in the air." Two years later, when he was ready to expand, he was able to negotiate a favorable deal for the facility, netting him a 265,000 square-foot facility on 30 acres of land. *Looking for opportunities in the midst of down markets is a key trait of many successful leaders and entrepreneurs.*

With a few negative experiences with vendors behind him, Neal has been careful to seek out and build relationships with partners he can trust. He knows that vendors get beat up by their customers, constantly being hammered down in price and being pressured to make concessions. When Neal finds good vendors, he makes it a point to keep them happy and build healthy relationships. "I tell them this: I want you to make money with us and to want to work with us, so that when we call, you'll be glad to answer instead of worrying about how much we're going to try to beat out of you now." Neal understands that building a mutually beneficial relationship of trust with vendors and other partners may mean some missed cost savings in the short term, but results in much more profitable business in the long term. This basic lesson is lost to many business leaders these days–relearning it could overcome several unintended but real barriers to success in relationships.

The importance of understanding end users is another lesson from Neal. For example, in the dairy industry, Neal knows that dairy farmers get higher productivity when the lighting is right. Using "long day lighting" can result in 8 percent more milk production. Neal is devising an entire product category for dairy farming, developed with the help of a dairy scientist. That's an example of another energizing factor for innovation: *turning to the right experts in a field to give you the insights to fuel further innovation.*

A customer-centric approach is shown in the Orion Energy Systems "org chart" that Neal uses. (See Exhibit 15.2.)

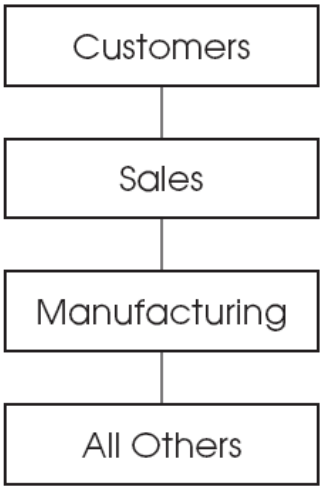

Exhibit 15.2. Orion's "org chart."

His approach to business recognizes that when a customer has a problem such as a warehouse with a section in the dark, they aren't interested in whose fault it is. They want the problem fixed. "When there's a mistake, we simply fix it rather than blaming others. It's amazing how far this goes to build a relationship with a customer." Coupled with this is Neal's conservative approach to commitments: "We will not over-promise and under-deliver. We will always strive to do the opposite." That's another great tip for building relationships of trust.

Leading Others to Innovate

Neal's credibility as a serial inventor and the visionary behind the success of Orion Energy Systems motivates others to listen and accept his challenge to find further innovations. Indeed, Neal expects his employees to be innovators, too. "I want MacGyvers here," Neal said, alluding to the ABC television show of

the same name about a resourceful secret agent, Angus MacGyver, which ran from 1985 to 1992. The hero in MacGyver was famous for finding clever ways, based on scientific and engineering knowledge, to use available materials to solve complex problems in fighting crime or escaping danger. In a sense, Orion's MacGyvers are like the modern "Da Vincis in the Boardroom" we call for in Chapter 21. Orion's innovators are routinely challenged, brought together to innovate, and encouraged to achieve a common vision: "Energy savings without compromise." The "compromise" part must be left behind if an innovation is to become fully adopted, for people stick with what works, according to Neal: "If an alleged energy-savings approach solution makes a facility darker and less productive, people won't stay with it. People want more for less. That's our heritage. That's how we innovate."

Notes

1. Paul Studebaker, "Back to the Future: Facilities Engineers Say They Enjoy Upgrading to New-Generation Fluorescent Lighting," *Plant Services*, Feb. 2005.

2. Arlene Weintraub and Michael Arndt, "A Bright Idea," *BusinessWeek SmallBiz*, Spring 2005.

3. Neal Verfuerth and Michael Potts, "Apparatus and Method for Comparison of Electric Power Efficiency of Lighting Sources," U.S. Pat. No. 6,774,619, issued Aug. 10, 2004.