



Moving Mountains with Good Research – A Case Study

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Moving Mountains with Good Research - A Case Study

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Mountains can be moved by good ideas based on good research. A wonderful example comes to us from, of all things, the Naval Facilities Command (NAVFAC), headquartered in Washington, DC. This agency of the Department of Defense is responsible for some \$5 billion per year in new and retrofit construction, with naval facilities all over the globe. The federal government alone is responsible for \$50 billion per year of construction, which Terry Emmons of NAVFAC claims is half of total U.S. construction. It seems that the Navy has 120,000 buildings around the world, some buildings, or groupings, are the size of cities.¹

NAVFAC was in the middle of a 2½ year program on improving both the energy efficiency and environmental impacts of the construction projects under its jurisdiction, but it was like pulling teeth to get the A&E firms to make the needed changes. Enter Amory Lovins of the Rocky Mountain Institute, which has been working on developing and/or identifying techniques for reducing energy use and environmental impact for decades. It seems that a high level Admiral in the Navy attended a meeting where Dr. Lovins was giving a talk on all the wonderful, cost-effective strategies that can be employed, not only to reduce energy use and environmental impact but to reduce first cost as well.

As most who have heard Lovins speak can testify, it's hard not to get excited by his message and want to implement his proposals immediately. The trouble is, most of us don't have the power of persuasion of a decorated admiral, nor the huge budgets available to work with. The admiral got Amory's message and issued an order which resulted in RMI being placed under contract an amazing 3 weeks later, to do a sustainable design charette for NAVFAC planners. Out of this came eight pilot projects around the country, to be converted *immediately* to RMI's principles of sustainable design and construction. The result was that everything Amory promised was realized, even lowering first costs in the process, and saving peak load and monthly energy costs in the long run.

The next step was to somehow carry the message to the 22,000 employees involved, and to get them to buy into the concepts and principles and press forward with the greening of the Navy. An extensive program of education and training was begun and the pilot program is now in full swing, with both new construction and retrofit applications in its portfolio. Preliminary results indicate that they "can do exactly what Amory said," according to Emmons, an AIA member and Associate Director for Design of the Naval Facilities Engineering Command in Alexandria, VA.

¹Terry Emmons slide presentation "Sustainable Design, A New Approach to Navy Facilities" to a Construction Specifications Institute meeting in Orlando, 27 June 1997.

The pilot projects have successfully lowered first costs and annual energy use, providing better illumination, better quality spaces, and achieving overall “great results.” A three-pronged program has begun to expand the greening process to all naval facilities. First is a series of workshops at NAVFAC field offices around the world. Second is the set of already one and a half year old pilot projects, testing the concepts proposed by RMI. The third component of the program was just started. It is called “performance based fee contracting” and it is being headed up by Charles Eley Associates of San Francisco in conjunction with the RMI Energy Foundation. With this approach, the compensation for A&E firms working on navy projects is based on how well the designs perform, both in saving energy and providing good human comfort and productivity in the process. Measurements of these features do not take place until the second year of a new building’s operation and permit the design firm to even share in a portion of the achieved energy savings on an ongoing basis! Now there’s a valuable incentive to learn about green design if every you’ve heard of one.

The going was not always easy, however. In one of the meetings held between the Navy and an A&E firm, a mechanical engineer sat through most of the meeting with his arms crossed, exhibiting the attitude: “I’ll listen but you aren’t telling me anything new. We know this stuff already.” After considerable convincing and working through the process, this same engineer became one of the Navy’s star presenters at a recent AIA conference. The conclusion all participants draw from the pilot projects is that the key to success in this area is *integration*.

If you just look at a building as a set of a number of separate subsystems and don’t tie them all together properly, from the beginning of the design process, you won’t have very good results. The key is to put all the design professionals together into a team. If you do, the process really pays off in the end, and in dollar terms even the most skeptical designer can understand.

Carnegie Mellon University has a new \$10 million laboratory recently completed for studying the interior environments of buildings. This laboratory is working with a large building performance consortium that includes the Department of Energy, the Environmental Protection Agency, as well as the Department of Defense. The collaboration recently produced a Sustainable Buildings Technical Manual which should be required reading for anyone in this field. It is available for free off of the internet. The address for the manual is <http://www.sustainable.doe.gov/ss/ptipub2.html> and the address for the main web site is <http://www.sustainable.doe.gov>. The manual can be downloaded from the first of these addresses in PDF format and is 292 pages long, 3.1 MB in size. The title of the main screen of this web site is “Center of Excellence for Sustainable Development. A project of the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy.” Also recommended is the Environmental Resource Guide published by the American Institute of Architects.

This wonderful case study proves that “where there’s a will (and the power to enforce it) there’s a way,” if the people involved are provided sufficient information and incentives to get them interested and keep them involved.