

U.S. Coast Guard Deploys Unique Asset Planning and Management System

Mission Readiness Drives all Facilities Decisions

Imagine this: You oversee 33 million sf of facilities averaging over 43 years old, located in more than 8,000 buildings on 65,000 acres scattered over more than 1,800 individual sites.

It takes \$500 million to properly maintain and operate these facilities, which have a total replacement value greater than \$7 billion, yet your facilities budget is only \$125 million, one-quarter of what you need.

That's what the U.S. Coast Guard is up against, as it tries to fulfill a complex set of missions: maintaining national security; regulating the fishing industry; assisting people in distress; protecting \$2.8 billion in property; interdicting illegal migrants at sea; conducting search and rescue missions; seizing millions of dollars worth of illegal drugs; educating people about boating safety; responding to oil and hazardous chemical spills; and conducting maritime security boardings. It guards 95,000 miles of coast line and patrols a 3.4-million-square-mile exclusive maritime economic zone; operates 230 cutters, 1,400 small boats, and 240 aircraft; employs more than 43,000 FTEs; and manages an annual budget greater than \$7 billion.

“The problem is that facility maintenance is not funded based on need or good business models but rather on availability of discretionary funds,” says James Watson, director of Federal Programs at NexDSS, a division of MACTEC Engineering and Consulting in Kennesaw, Ga. Watson serves as the liaison for the U.S. Navy's worldwide Building Facilities Condition Assessment Program and as program manager for the U.S. Coast Guard's “Roadmap to a High-Performing Organization” initiative.

“Facility recapitalization rates are in excess of 200 years,” he says. “Consequential costs are not presented in an auditable format and are subsequently not believed or considered in budget decisions. Our mission is to correct the obvious lack of stewardship of the taxpayers' investment in shore facilities.”

One problem is that Congress, which doles out the money, and the military brass, which asks for it, both have different funding priorities.

“Return on investment has high impact with Congress, but not with the admirals,” says Watson. “The admirals have to accomplish their mission; they're interested in mission readiness.”

So much money that should be used for facilities is directed elsewhere. It is very difficult to convince military leaders to change the way they do business—unless you convince them that they are hurting their mission capability by ignoring facilities.

The first task was to make the admirals see facilities as being critical to their mission; the next was to present that need in a way that Congress will respond to.

“Depreciation is a 50-year process,” says Watson. “It’s easy for commanders with a two-year window to completely ignore that. The real impact we have in a business case is the mission degradation. We can show that because buildings are degrading, it is harder to achieve the mission.”

In order to succeed—to survive really—the Coast Guard must make every dollar count by prioritizing each expense according to its relevance to those missions. Working with NexDSS, Coast Guard management involved in implementing its Shore Facilities Capital Asset Management (SFCAM) program used the principles of business case analysis to develop a new asset planning and management system that leverages information technology and capital asset management’s best practices.

The best way to attract the attention of the investors, in this case Congress, is to present an irrefutable business case. While the system is focused on a military government agency, “the principles are really applicable to any entity that owns a large portfolio of facilities,” says Watson. “We use the same process with Fortune 500 corporations and educational institutions.”

Everything is Relative

Developing an effective business case requires three critical elements:

- Data that is clear, comprehensive, and verifiable.
- The economic impact of addressing or ignoring that data.
- The consequences of those findings on the mission of the organization.

“The best business case will use only objective, verifiable, and auditable data,” says Watson. “No opinions allowed.”

Information about a single building is collected in many layers and iterations, all tied together in building information models (BIMs) with object-based technology. This technology allows users to access multiple databases of information about a building through the architectural drawings.

“All of these assessments produce unique information on the same facilities,” says Watson. “The only way to integrate and economically leverage this data is to reference it to a common geospatial database, and this is where object-based technology provides superior capabilities.”

The technology allows the user to scan a building schematic for information as critical as mission dependency and facility condition, and as mundane as space utilization and

building code compliance. The process is intuitive and visually powerful, which makes complicated issues easier to assess and long-range funding requests easier to make.

“If I want to draw a line using a CAD system, I would end up with a line, period,” explains Watson. “Object-based technology gives you an intelligent line. It knows how thick the wall is, when it was built, what kind of sheetrock was used. We’ve built a library of facts you can access by touching the line.”

Information about attributes and systems can be compared to performance metrics that are constantly updated. Say, for example, that a Coast Guard captain requires 140 sf of office space. If he ends up with that much, the office would be coded green in the drawing. If the office is 120 sf, it would be yellow, indicating that it falls short of the goal. If it is 100 sf, it would be red, showing that it is woefully inadequate.

“You can touch a room in the drawing and show all the performance metrics,” says Watson. “If you just produced an Excel spreadsheet, it would be very difficult to pick out which were high or low. The numbers themselves don’t mean anything, but with the visual images, you can look at a massive amount of data quickly. The color transmits the information.”

The color a space receives is based not solely on the room’s attributes, but on the ranking given that attribute by the Coast Guard’s “mission dependency index.” Two spaces can generate the same data but be coded in different colors because one space or attribute is more critical to the mission.

“System criticality is a way to triage the relative importance of various systems within a building,” says Watson.

The same process is used to portray facilities on a larger scale, to compare the mission criticality of buildings on a site rather than the elements within a building.

When everything is integrated, you can determine which systems are mission critical by assessing:

- Category code—what is the primary activity in that facility?
- User code—what missions are involved?
- What systems are critical to the mission?
- What service level or risk of failure is acceptable?

The systems in a warehouse, for example, generate various mission readiness indexes (MRI): Maintaining the electrical system is the highest priority, with an MRI of 95; roofing is next, with 75; paving is at the bottom, ranking only 15.

Economic Impact

The next kind of data the Coast Guard employs is qualitative rather than quantitative, which requires even more vigilance to make it auditable and trustworthy.

Using Vertex[®] software, an engineered management system (EMS), the Coast Guard can assess the condition of every aspect of a facility and assign a “condition index” from 1 to 100. The number is calculated from the density and severity of observable defects. An index of 100 represents an asset with all of its design life remaining; a 0 represents failure.

“It relies only on the data, on observations and measurements, not on the expertise of the person doing the inventory,” says Watson. “If the information were opinion-based, it could be ignored, because you couldn’t prove it.”

Watson stresses that the key to Vertex is that it is flexible and dynamic.

“An EMS is a *process* and a reporting *system*, not a report,” he says. “With EMS you get a dynamic database of current conditions from which you can always and evermore get valid facts for strategic planning. This is not a slice-in-time solution, neatly packaged with great graphics that ends up on a shelf in somebody’s credenza, never to be current or useful again.”

The condition index can then be used to graph the comparison between the design life (how long an asset or system should last according to its design specifications) and the service life (how long it will last taking into account the current defects.) The Coast Guard can look at that graph and instantly know, for example, if they do nothing to correct the defects, they will shorten the lifespan of the asset by four years. They then weigh the cost of correcting the defects with the cost of replacing the asset four years earlier. There is no guessing or opining involved.

A major shift in thinking is required to integrate operating expenses and capital funds; they cannot be considered as separate and unrelated entities.

“Colors of money being blended flies in the face of accounting rule-based entities,” says Watson. “We are finally getting the message across that rules established to make an accountant’s life easier can be trumped by a business case that increases the bottom line, assuming you have access to enabling IT.

“The President’s Management Agenda requires that every agency have a CFO,” he explains. “They are required to keep a total inventory of facilities and embrace best business practices. Now that the data is there, they have no reason not to use it.”

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Biography:

Jim Watson is director of Federal Programs for NexDSS, a division of MACTEC Engineering and Consulting Inc. where he serves as the liaison for the U.S. Navy's worldwide Building Facilities Condition Assessment Program and as program manager for the U.S. Coast Guard's "Roadmap to a High-Performing Organization" initiative. He has more than 20 years of experience in developing stewardship processes and programs for facility departments in both the public and private sectors, and he is an internationally recognized expert in facility asset management processes. He is also the inventor of Facts, the first patented facility asset management software.

This report was based on a presentation Watson gave at the Tradeline conference on *Leading-edge Management Models for Capital Projects and Facilities Management* in March 2006.

For more information:

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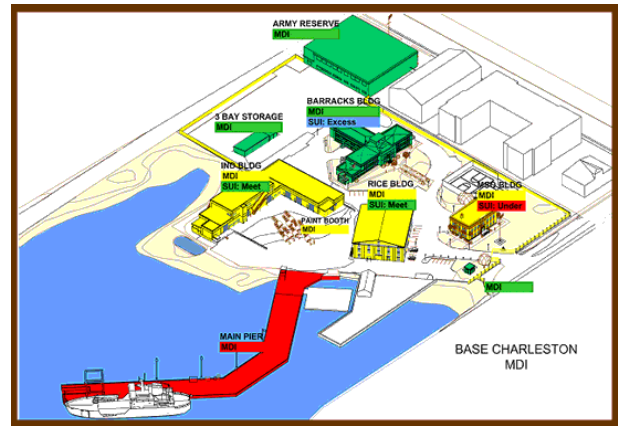
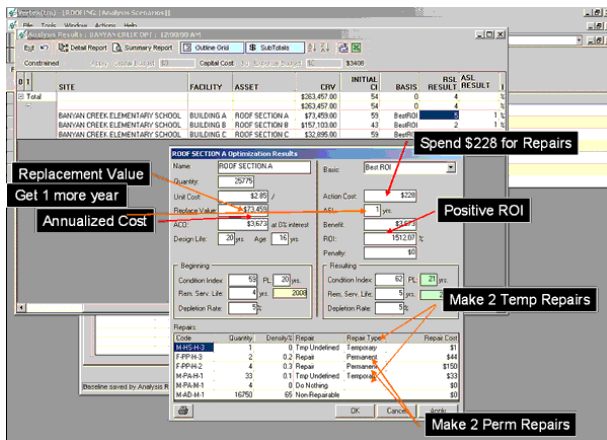
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The US Coast Guard Shipyard in Baltimore is one of 1,800 sites under the Coast Guard's jurisdiction. (Photo courtesy of U.S. Coast Guard.)

The Coast Guard color codes its assets to make it immediately obvious which are the most critical to the mission. On this base, for example, the main pier (in red) is the most critical element. (Image courtesy of U.S. Coast Guard.)

Replacement Value
Get 1 more year

Annualized Cost

Positive ROI

Make 2 Temp Repairs

Make 2 Perm Repairs

Spend \$228 for Repairs

SITE	FACILITY	ASSET	ESTM	INITIAL	DI	BASIS	RSE	ASL
							RESULT	RESULT
Total			\$263,457.00	54	0		1	1
	BANYAN CREEK ELEMENTARY SCHOOL	BUILDING A ROOF SECTION A	\$263,457.00	54	0		1	1
	BANYAN CREEK ELEMENTARY SCHOOL	BUILDING B ROOF SECTION B	\$75,400.00	50	BestROI		1	1
	BANYAN CREEK ELEMENTARY SCHOOL	BUILDING C ROOF SECTION C	\$32,699.00	55	BestROI		2	1

Code	Quantity	Density/Repair	Repair Type	Repair Cost
MSP43	1	0	Temp Undefined	\$1
FPP442	2	0.2	Repair	\$44
MFlak41	4	0.3	Repair	\$150
MFlak41	30	0.1	Temp Undefined	\$30
MFlak41	4	0	No Nothing	\$0
MAD441	1670	65	Non-Repairable	\$0

An “optimized financial decision,” produced by Vertex[®], shows the relative costs of making a repair and delaying the expense. (Image courtesy of U.S. Coast Guard, © NexDSS, a division of MACTEC E&C.)