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Successful Agency Strategic Planning Begins with a Good Working Model

By Steven J. Storts
Dublin, Ohio

THE beginning of a new year is always optimum for any local public agency to engage in a little introspective activity. Last January, Wisconsin's Jefferson County and its city of Watertown took introspection a step further; they shared their strategic planning blueprint with all local public agencies at a distance learning program sponsored by the Local Government Center of the University of Wisconsin-Extension in Madison. The content was presented by Steve Grabow, a professor and community resource development agent for the university's extension program.

Strategic planning is a disciplined effort to produce fundamental decisions and actions that shape and guide an agency and what it does, according to Grabow, who notes, "It's a powerful tool that helps organizations determine what is of most importance and what to do about it." The key phrase is "disciplined effort," as strategic planning must be a concerted effort comprising six steps: plan for planning; mandates; values and mission; assessments; strategic issues and consensus vision statements; and strategy formulation.

Step 1: Plan for Planning calls for diagnosing an agency's situation and readiness to plan by developing the plan process, the people to involve, and the process steps. One of the vital elements of this step, Grabow notes, is the "stakeholder analysis," which is an awareness of those individuals to directly involve and consider and of those affected by or who may affect the strategic plan, both externally and internally.

For instance, in Jefferson County's strategic plan, a steering committee identified the following as primary stakeholder groups: employees and unions (internal); clients of departments and customers of services (internal); future generations (external); current and future businesses (external); and the county's population (internal and external).

Step 2: Mandates simply refers to both formal (codified) and informal (community expectations) directives, goals, or objectives of the agency. Informal mandates may also "be embodied in the norms and expectations of key stakeholders," Grabow adds.

Step 3: Values and Mission defines what an organization believes and how it acts and what an organization does. For example, Jefferson County places its core values in three categories: service (respect, transparency, honesty, and responsibility); stewardship (trust and accountability); and skills (competence, professionalism and efficiency, and innovation). Watertown defines its core values as responsiveness, integrity, approachability, accountability, fiscal responsibility, and knowledge and learning.

Grabow emphasizes that when drafting a mission statement, an agency should include the following elements: purpose of the organization; its primary function; the organization's reason for being (work or services); and what the organization does uniquely well. Most importantly, any mission or purpose should define the agency's intentions toward the clientele served. Interestingly, Jefferson County and Watertown have created mottos or variations of their mission statements. Jefferson County's motto is "Responsible Government Advancing Quality of Life." Watertown's motto is "Community and Quality of Life."

Step 4: Assessments requires assessing both the immediate and surrounding environment. It is a planned exercise that alerts a public agency or community to conditions that may require a response; it provides a "systems view" of clues and prompts for possible issues, vision ideas, and new strategies. Grabow recommends the classic SWOC (strengths, weaknesses, opportunities and challenges) analysis as a viable assessment tool, where strengths/weaknesses are more subjective or internal by nature, representing both the past and present, and opportunities/hopes and challenges are more external or visionary, representing the future.

Step 5: Strategic Issues and Consensus Vision Statements represents the heart of strategic planning. "All the data generated and processed has led to this point," says Grabow. "The issues identified during this step represent those the organization believes will significantly affect its future." A strategic issue is a fundamental challenge affecting an agency, which is different from an "operational" issue. Strategic issues are characterized by one or more of the following: they have extensive impact on key stakeholders; they have extensive implications as suggested by earlier assessments; and they have significant consequences to an organization if *not* addressed. At the heart of this step is an agency's consensus vision, or basically what an or-

ganization wants to be in the future. Grabow defines a vision statement as a "description of a desired end-state" or a "description of what is desired to be in place at a future point in time."

Jefferson County's steering committee determined three strategic issues: education and communication, environmental/economic/cultural, and public services/quality. The committee's determination was based on a review of results from a decision matrix tool (seven candidate issues), findings from a countywide citizen opinion survey, and dialogue concerning the impact of issues on the future of county government. Watertown's strategic plan includes five issues: staffing/employees, organizational structure, capital funding/resources, economy/jobs, and community/culture/livability.

Among its consensus vision statements, Jefferson County will:

- Be known for its strong agricultural economy and farmland preservation.
- Attract new businesses and grow existing businesses because it becomes known as a place with a high quality of life, attractive business sectors, and high-functioning county government.
- Be our "home place" of nice small towns with proximity to urban areas, but retain our rich and diverse base of assets.
- Maintain and improve our environment that supports a healthy lifestyle.
- Become the center of the Glacial Heritage Area and be known for its recreational opportunities.

Step 6: Strategy Formulation, the final step, considers the definition of a strategy: a pattern of purposes, policies, actions, decisions, and/or resource allocations that address a strategic issue. More specifically, Grabow points out, the purpose of this step is to develop a set of individual strategies for each issue that was identified in Step 5. In exploring possible strategy ideas, an agency might look at practical alternatives or initiatives that could be pursued to target a specific issue, or it may examine key actions that must be taken to implement the major initiatives.

In summary, this plan implementation process step provides the direction as to how an agency's adopted strategic plan will be incorporated into relevant organizational systems, including policy committees and departments that will be critical leaders of plan management and implementation.

January 2017

Discussions of Alternative Financing For U.S. Infrastructure Continue

By Steven J. Storts
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WITH the recent drop in the price of oil and a slowly improving U.S. economy, has the discussion regarding national infrastructure financing subsided? Definitely not. Aside from the earlier proposed hikes in federal fuel taxes at the pump, the issue of funding needed infrastructure projects has been steadily gaining support and momentum at the federal level. In fact, for the last several months, innovative funding mechanisms have become a focal point.

In September, the U.S. Department of Transportation and the Department of the Treasury co-hosted a one-day summit to bolster recommendations addressing private investment in major infrastructure. As part of the program, Transportation Secretary Anthony Fox highlighted the development of public-private partnerships — commonly known as P3s — and offered helpful navigation for federal, state, and local public agencies in identifying projects under consideration that might qualify for P3 status, in addition to reviewing the best practices for P3 projects.

The U.S. House of Representatives also released a report in mid-September calling for DOT's procurement office to develop performance standards for P3 ventures and other project delivery methods. The report *Public-Private Partnerships*, issued by a special P3 panel of the House Transportation and Infrastructure Committee, further recommended directives in providing more public information about projects that draw on government and private financing. The panel emphasized that P3s are not a source of funding and should not be thought of as the solution to overall infrastructure funding challenges.

Regardless of the delivery approach or financing source, the end costs of infrastructure projects are borne by the users. The report indicated that a clear and transparent understanding of the relative costs and benefits of traditional and P3 project procurements to the public sector is a critical element to ensuring accountability.

After numerous roundtables, hearings, and meetings, the panel found that P3 procurements have the potential to deliver certain high-cost, technically complex projects more quickly and efficiently or in a different manner than would otherwise occur under traditional procurement and financing methods. However, given the limited number of high-cost, complex projects, P3 projects have the potential to address only a small portion of America's infrastructure needs.

Additionally, the report acknowledges that P3 procurements require higher financing costs and significant additional legal and consulting costs to structure a successful P3 agreement. In other words, not all infrastructure projects are suited for a P3, and the cost and benefits of a P3 procurement approach must be carefully assessed. Overall, though, successful P3s exhibit several common elements, including leveraging the strengths of the public and private sectors, appropriate risk transfer, transparent and flexible contracts, and alignment of policy goals.

The P3 report notes that unlike most other countries that do not offer tax-exempt municipal bonds, the United States possesses a substantial municipal bond market of about $3.7 trillion, of which a significant portion is for infrastructure financing. This debt is widely dispersed among nearly 44,000 distinct state and local government issuers, with the vast majority of issuers having relatively small amounts of outstanding debt. For example, the average municipal bond issuance in 2013 was less than $25 million. Despite the robust U.S. municipal bond market, though, billions of dollars remain in domestic infrastructure needs that are in search of funding.

The panel points out that P3 agreements often involve significant federal assistance through credit and tax programs, such as the Transportation Infrastructure Finance and Innovation Act program and private activity bonds, which are often critical elements of P3 project financing. The important role that TIFIA and other federal credit programs play in lowering the cost of capital for infrastructure projects makes these projects more feasible for private sector investment, according to the report.

In the Treasury Department's in-depth analysis, *Expanding Our Nation's Infrastructure through Innovative Financing* emphasizes that overall credit quality in the municipal market is very strong, with more than 95 percent of the outstanding state general obligation debt rated in the AA category or higher, with only a small percentage of governmental purpose debt rated below A. With the exception of several notable recent examples,

municipal defaults are rare compared to the corporate market. In 2013, only 0.107 percent of issuers defaulted, compared to 2.1 percent of corporate issuers.

The report further notes that municipal credit standards, covenants, disclosure obligations, and available financing terms are typically more flexible and advantageous to issuers than corporate and project finance requirements. Also, municipal debt is not subject to regulation by federal securities laws, except for antifraud provisions, thereby offering states and local governments of all sizes reliable access to low-cost capital.

However, there are certain limitations to the use of municipal bonds as a mechanism for investing in infrastructure, according to the agency. Tax laws can limit private sector participation in public infrastructure assets that will be financed with tax-exempt bonds. For instance, an asset generally cannot be financed with municipal bonds if it has a private equity ownership component. Infrastructure assets financed with tax-exempt bonds are also subject to significant limitations on the use of private sector maintenance and operation contracts.

Notwithstanding the United States' deep municipal bond market, the Treasury Department's Office of Economic Policy reaffirms that alternative financing for infrastructure investment is becoming increasingly important as public budgets continue to tighten at all levels of government. For example, as demonstrated by the Build America Bonds program from 2009-2010, taxable bonds with a federal interest subsidy paid directly to issuers could offer an effective complement to the tax-exempt bond market by expanding the investor base and increasing the market's efficiency.

Other innovative funding methods outlined in the agency's report, in addition to P3s and TIFIA, include the Railroad Rehabilitation and Improvement Financing Program, direct pay taxable bonds such as Build America Bonds, tax-exempt qualified private activity bonds, and credit enhancements.

As an added advantage, P3s can be more creative in their approach, often combining traditional financing with multiple forms of alternative financing. Credit enhancements, too, can make project debt more attractive to investors by reducing their risk exposure through several structured forms: loan guarantees, loss reserves on the project company's balance sheet to insulate investors in the case of lower-than-expected project cash flows, and public project sponsor guarantees for debt issued by the project company.

January 2015

Engineering Image in Public Service Always a Matter of Perception, Trust

By Steven J. Storts
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THE image of public servants at large has been a highly debated, contentious issue for decades and is one that will probably never gain a majority consensus in any direction — favorable or otherwise. On the plus side, though, past studies have shown that engineers in public service are generally held in higher regard than the average civil servant, which is not unexpected. After all, professional engineers at both the technical and administrative levels take seriously their daily responsibility to protect the public's health, safety, and welfare. The whole image concept, however, does revolve heavily around the issue of trust or its perception.

The Center for Local, State, and Urban Policy at the University of Michigan, in its *Michigan Public Policy Survey* last year pointed out that studies of public trust toward the federal government have revealed significant changes in trust over time, with occasional increases and decreases woven into an overall pattern of steep decline since the 1950s. The *MPPS* is conducted in partnership with the Michigan Association of Counties, the Michigan Municipal League, and the Michigan Townships Association.

In other national surveys conducted during similar time periods by Gallup News Service and the Pew Research Center, state and local governments have tended to receive somewhat higher levels of trust from the public as compared to trust in the federal government.

For instance, key findings in the *MPPS* noted that Michigan's local government leaders have very little trust in the federal government. Overall, just 6 percent trust the federal government in Washington, D.C. to "do what is right" nearly always or most of the time, while 59 percent trust it seldom or almost never. Moreover, local leaders' trust in Washington has declined from the low levels previously found in 2009, when 10 percent trusted the federal government nearly always or most of the time and 47 percent trusted it seldom or almost never.

The 2013 survey also indicates that local leaders have somewhat higher trust in Michigan's state government than in the federal government, though these levels are still very low. Overall, just 19 percent of Michigan's local leaders trust the state government in Lansing nearly always or most of the time, while 28 percent trust it seldom or almost never. Interestingly, too, local leaders of all political parties express particularly high levels of trust in other local governments across Michigan, and these high levels have remained consistent since 2009. In 2013, overall, 67 percent of local leaders trusted other local governments nearly always or most of the time, while only 4 percent trusted them seldom or almost never. At least in Michigan, the old adage of "all politics are local" could apply to trust as well.

Although perceived trust in government is no replacement for the sound administration of public policies, infrastructure maintenance, and general services, public servants seeking to bolster their image or that of their agencies still need to remember that perception is king in today's media culture — another factor that builds image. Engineering managers in particular must continually engage the public, establish and maintain cordial working relationships with the media, be attentive to all visible assets within the local community, and most important of all, encourage superior performance among all employees.

"Residents want elected officials to champion the efforts to maintain the quality of life they desire," says William Costick, director of community relations for Orchard, Hiltz & McCliment, a consulting engineering firm located in Livonia, Mich. Costick, a former 15-year city manager of Farmington Hills, points out that public support of image can translate to the support of tax mills or zoning changes. "The perception of a professional staff working for the best interest of its citizens establishes trust," he emphasizes. "Trust translates to support and a positive image."

Public opinion and the perceptions citizens hold toward their community can be shaped by a single incident or a number of issues that elected officials cannot always control, Costick notes. "The public's attitude toward its government can be apathetic and at times, very cynical," he continues. "Media coverage of national and state politics and issues can color public perceptions about government in general and even how people view all elected officials. Don't let that cynicism — or negative media coverage — dictate your community's image. If you don't make the effort

to promote your city, someone else will, sometimes to the negative. Call the media when something positive happens that you want others to know about." In other words, engineering officials, elected or appointed, must be ambassadors for their communities, blow their own horns, and visibly market their own efforts and successes.

At the federal level, just the few Ebola cases in the United States bring to mind the fact that a significant portion of the American public is unaware of engineering's role in addressing health issues, thus providing a timely opportunity for image building. In fact, did you know there is an Engineer Professional Advisory Committee (EPAC) within the U.S. Public Health Service, composed of licensed engineers and all of whom serve as military officers?

Engineering professionals in the Public Health Service Commissioned Corps help protect and advance the health of the nation by providing sound engineering expertise in the support of specific agency objectives, including the research and identification of solutions to the health-related problems currently facing the United States. They remain on the cutting-edge of engineering disciplines and technology in the face of future health and environmental challenges and provide assistance directly to the public in the form of professional consultation and the provision of health-related facilities.

EPAC acts as a communications link and information source for PHS's distinct engineering disciplines and provides advice and consultation to the agency's chief engineer, who in turn, reports to the U.S. Surgeon General. The advisory committee also provides assistance on engineer staffing issues, particularly recruitment, and serves as primary resource for career development and mentoring. EPAC members represent each of the major PHS engineer-user programs and are knowledgeable professionals at all grade levels representing a cross-section of the interests, concerns, and responsibilities of engineers in organizations staffed by agency personnel.

Some of EPAC's current public health engineering practice areas include sanitation, biomedicine, consumer and occupational safety, building and infrastructure safety, air and noise pollution, and community outreach or service opportunities relating to engineering education or assistance to underserved populations.

October 2014

Terrorism Threats on Water Security Real, But Face Constant Deterrents

By Steven J. Storts
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WITH the recently heightened threat of terrorism both abroad and on U.S. soil, one question continually arises: Are America's water resources adequately protected from physical disruption, bioterrorism/chemical contamination, or cyber attacks? The general consensus is "yes," but from an engineering perspective, safeguarding the public's health and safety from these threats can never be assumed without careful considerations.

In its 2010 report *Terrorism and Security Issues Facing the Water Infrastructure Sector*, the nonpartisan Congressional Research Service noted that the potential for terrorism is nothing new in the past century, citing J. Edgar Hoover, director of the Federal Bureau of Investigation (FBI). In 1941, Hoover wrote in the *Journal of the American Water Works Association*, "It has long been recognized that among public utilities, water supply facilities offer a particularly vulnerable point of attack to the foreign agent, due to the strategic position they occupy in keeping the wheels of industry turning and in preserving the health and morale of the American populace."

CRS points out that a fairly small number of large drinking water and wastewater utilities located primarily in urban areas (about 15 percent of the systems) provide water services to more than 75 percent of the U.S. population. Report author Claudia Copeland states, "Arguably, these systems represent the greatest targets of opportunity for terrorist attacks, while the larger number of small systems that each serve fewer than 10,000 persons are less likely to be perceived as key targets by terrorists . . . ." CRS adds, though, that the more numerous smaller systems tend to be less protected and, thereby, more openly exposed to potential terrorist acts.

Bioterrorism or chemical attacks still remain at the forefront of security readiness because the popular perception is that any contamination with small amounts of microbiological agents or toxic chemicals could endanger the public's health at large. "While some experts believe that risks to water systems actually are small, because it would be difficult to introduce sufficient quantities of agents to cause widespread harm, concern and heightened awareness of potential problems are apparent," CRS emphasizes.

The Pacific Institute for Studies in Development, Environment, and Security, a think-tank based in Oakland, Calif., says the typical scenario for a terrorist attack on domestic water supplies involves putting a chemical or biological agent into local water supplies or using conventional explosives to damage basic infrastructure such as pipelines, dams, and treatment plants. "This is not as straightforward as it sounds," according to *Water and Terrorism*, a water policy report issued by the institute in 2006. Report author Peter Gleick states, "The number of casualties that would result from such an attack depends on the system for water treatment already in place, the type and dosage of poison ingested, individual resistance, the timing of an attack, and the speed and scope of discovery and response by local authorities."

The institute contends that most biological pathogens cannot survive in water, and that most chemicals require very large volumes to contaminate a water system to any significant degree. Additionally, many pathogens and chemicals are vulnerable to the kinds of water treatment used to make it potable for human use, including chlorination, filtration, floculation, ultraviolet radiation, ozonation, and many other common treatment approaches. Many contaminants also break down over time through dilution, evaporation, and when exposed to sunlight and other natural processes, plus most infrastructure has built-in redundancy that reduces vulnerability to physical attacks.

Gleick claims, though, that even a plausible public threat has the potential to cause fear and anxiety. "The best defenses against such threats are public confidence in water management systems, rapid and effective water quality monitoring, and strong and effective information dissemination. While many water districts and providers have regular mechanisms for communicating with customers, new tools may be valuable in countering the threat of water-related terrorism and ensuring public confidence and calm," he advises.

To that end, research continues on water infrastructure protection. The U.S. Department of the Army is focusing on advanced detection of and removal treatment for various chemical agents, and the Federal Emergency Management Agency is producing or refining databases of wa-

ter distribution systems and developing assessment tools for evaluating threats posed by intrusion of biological or chemical agents into a water system. Moreover, the Centers for Disease Control and Prevention are developing guidance on potential threatening biological agents and the effects of standard water treatment practices on their persistence.

The Advanced Purification Engineering Corp., based in City of Industry, Calif., cites the *Journal of the American Medical Association*, which has issued consensus reviews on five toxic agents it considers the most likely candidates for a biological attack: anthrax, botulinum toxin, plague, smallpox, and tularemia.

Of the five agents discussed, only two — anthrax spores and Francisella tularensis — are capable of surviving in water. However, APEC notes that anthrax spores can be filtered effectively by a good submicron filtration system, and standard water treatment chlorination will effectively kill Francisella tularensis.

APEC further explains that activated carbon blocks are also effective at preventing most contaminants from entering a drinking water system, plus there are some systems that deploy two or more technologies simultaneously. For instance, many reverse osmosis systems utilize carbon blocks. These point-of-use technologies are sound for a multitude of terrorism agents, both biological and chemical in nature, and is the primary reason why POU equipment is playing such a significant role in securing the safety of water supplies for American troops worldwide.

On a different front, water utility engineers and operations management continue to monitor a relatively common phenomenon, backpressure, which occurs when the normal flow of water systems reverse (due to lost pressure or physical disruptions in a water system) with the water collecting contaminants as it flows backwards. The U. S. Department of Homeland Security has warned local utilities that terrorists could potentially use backpressure to introduce a chemical or biological agent into the water supply and spread it over long distances without immediate detection. However, the American Backflow Prevention Association contends that existing safety measures should be enough to thwart a potential attack. In fact, all 50 states have required the use of controlled cross-connections and backflow prevention systems.

In order to prevent water supply contamination, the FBI recommends that all water utilities and treatment facilities maintain secure perimeter around their operations. Equally important, security should be maintained around critical nodes such as tunnels, pumping facilities, and storage facilities, and the network of water mains and subsidiary pipes should be enhanced. The digital controls for pumps and treatment facilities, commonly known as supervisory-control-and-data-acquisition systems, also need advanced security measures against cyber-manipulation, although many SCADA systems also have manual backup capabilities to operate without a digital interface.

July 2014

Water, Sewerage Infrastructure Always In the Hunt for Vital Funding Dollars

By Steven J. Storts
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THERE should be little debate that funding the maintenance and improvement of the nation's transportation infrastructure is vital to sustaining standards of living. And it can be argued, too, that outdated water and sewerage infrastructures in many regions of the United States are equally deserving of viable funding strategies. After all, water is a necessity of life itself, first and foremost, and a continuing challenge for public utilities.

As of 2008, the United States had about 14,780 wastewater treatment facilities and 19,739 wastewater pipe systems, according to the American Society of Civil Engineers. In its *2013 Report Card for America's Infrastructure*, ASCE notes that the capital investment needs for the nation's wastewater and stormwater systems are estimated to total $298 billion over the next 20 years. Much of that capital need will be necessary for addressing sewer overflows, combined sewer overflows (CSOs), and other pipe-related issues.

Although access to centralized treatment systems is widespread, the condition of many of these systems is also poor, with aging pipes and inadequate capacity leading to the discharge of an estimated 900 billion gallons of untreated sewage each year.

In recent years, the capital needs for treatment plants have comprised about 15 percent to 20 percent of total water and sewerage demands, but that will likely increase due to new regulatory requirements, ASCE adds. For instance, the U.S. Environmental Protection Agency (EPA) and Department of Justice have made eliminating CSOs a national priority.

Since 2007, these agencies have signed consent decrees under the Clean Water Act requiring cities operating publicly owned treatment works to invest more than $15 billion in new pipes, treatment plants, and equipment to eliminate CSOs. ASCE points out, though, that some municipalities are using nonstructural solutions to address CSO issues at lower overall costs and with good results for the environment.

Addressing one element for municipal funding, the National Association of Clean Water Agencies recently urged President Obama in his deliberations of the fiscal year 2015 budget to ensure that the tax-exempt status for municipal bond investments remains intact, with no limitations placed on interest received from these investments. NACWA contends that any policy to alter the tax-exempt status of these bonds will prevent many projects from going forward, while significantly increasing rates for customers and slowing the momentum of the U.S. economic recovery.

"For more than a century, tax-exempt municipal bonds have been the most important source of funding for water and wastewater infrastructure projects in the United States," NACWA explains. "In 2012, 48 of the 50 states utilized tax-exempt financing to fund water and wastewater projects, and since 2003, municipalities have issued $258 billion worth of tax-exempt municipal bonds to fund water and wastewater infrastructure — comprising approximately 16 percent of all municipal bond issuance for all infrastructure projects over this period."

Last year, NACWA and the Association of Metropolitan Water Agencies released a report titled *The Impacts of Altering Tax-Exempt Municipal Bond Financing on Public Drinking Water & Wastewater Systems,* which discussed the ramifications for utilities if the exempt status of municipal bonds is limited. The report states that more than $39 billion in state and local tax-exempt water and sewerage bonds were issued in 2012. Imposing a 28 percent benefit cap on tax-exempt municipal bond interest would have increased water and wastewater project financing costs by about $6 billion.

Similar proposals to make municipal bond interest fully taxable would have increased municipalities' water and wastewater infrastructure financing costs by roughly $9 billion, the report adds. "With clean water infrastructure needs well above $180 billion, we cannot afford to make these upgrades any more expensive," the organizations emphasize.

Without sufficient cash reserves or replacement funds for maintenance and operation, smaller municipalities with water and sewerage systems serving populations less than 100,000 often rely on EPA-administered State Revolving Funds programs. These are separated under two major SRF programs — the Clean Water SRF, dedicated to stormwater and wastewater systems, and the Safe Drinking Water SRF, earmarked for drinking water systems.

It is not uncommon, either, for communities with populations between 10,000 and 100,000 to combine SRF and municipal bond approaches. Rural communities with

populations of 10,000 or less can and often do access various grants and loans programs through the U.S. Department of Agriculture.

American Rivers, an environmental advocacy group that focuses heavily on water conservation practices, points out that how federal loans and grants are distributed through an application process depends on individual state policies and can vary among the state fund managers. In its report *Drinking Water Infrastructure: Who Pays and How (And for What)*, the organization says infrastructure loans can be structured to have deferred principal payments, even possibly as zero-percent loans that accrue no interest. Also, they may include a portion of principal forgiveness, effectively serving as a partial grant.

Of course, financing costs vary considerably with the type of financing used and the creditworthiness of the water system, American Rivers emphasizes. "Ultimately, the cost of financing, in the form of interest payments and other transaction costs, is passed through to ratepayers or taxpayers depending on what the water system has pledged to secure repayment," the report explains. "This is why water systems are highly motivated to protect their credit rating, if they are large enough to have rated debt. As a general rule, the higher the credit rating is, the lower the cost of borrowing."

However, what is often overlooked by public policymakers is that even when the financing rate is low on infrastructure projects, the total financing cost can be significant, sometimes doubling the total cost of a project.

The water resources organization further notes that although public-private partnerships have the potential to expand the sources of capital available to water systems, at present they have been only minor participants in water infrastructure projects. Still, PPPs do afford viable financing alternatives, American Rivers contends. For example, private investors might assume an ownership or equity position in an asset and use private equity or bonds to pay for a portion of the construction cost. In the case of an ownership stake, the investor could secure a pledged revenue return through a long-term water purchase agreement with a public entity, or perhaps be granted marketing rights for the water produced by the asset.

A shorter-term alternative would simply be for private investors to help finance water project construction in exchange for marketing rights for a limited period of time. Also, a private investor could help finance the optimization of a water system and generate revenue returns by splitting the savings in operating costs resulting from that optimization, such as in the form of reduced energy or chemical costs.

April 2014

Privatization Offers Challenging Options for Public Financial Stress

By Steven J. Storts
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AMID a still sluggish U.S. economy, states and local municipalities often find themselves wrestling with solutions or approaches to funding and operating new capital projects or infrastructural improvements, including wastewater treatment plants, drinking water systems, solid waste disposal facilities, correctional facilities, and medical complexes. To bridge the gap between the demand for public services and limited public sector resources, many government agencies are exploring how private sector investment can help in the operation of capital improvements.

Although privatization is not a new concept, it is finding an increasing role in assisting cities and states to cope with fiscal stress — and at a time when public spending at all levels is coming under increasing scrutiny. By changing the incentives under which public enterprises operate, privatization can lead to important operational improvements as well.

Privatization is described simply as some form of private delivery of a facility or service that traditionally has been delivered — or at least managed in a delivery process — by the public sector. There are several approaches, however. First, privatization can mean contracting with a private firm for the operation of existing facilities, or secondly, it can refer to the development and operation of new facilities by a private firm, including the design, construction, and maintenance of the projects. Finally, privatization can also apply to the sale of existing public facilities to the private sector.

Globally recognized Deloitte Consulting L.L.P. describes several different ways to structure the private development of capital projects, depending on the number of parties and issues involved. They include the following:

- **Tax-Exempt Leveraged Leasing**. Typically with this approach, a private company will build and own a facility, which it then leases to a private operator that, in turn, has a service contract with the public sector.
- **Tax-Exempt Lease Purchasing**. With this arrangement, the public sector, while retaining title and not incurring long-term debt, acquires equipment or a facility under an installment purchase.
- **Turnkey Contracting**. In this type of transaction, private companies design and construct the facility, which the public sector can then enter into a long-term contract for the services.
- **Sale/Leaseback with a Service Contract**. Using this approach, the public sector builds a facility and then sells it to a private concern that operates it and enters into a long-term contract with the public sector to provide services. This approach can be effective, but it does have limitations.

Other transactions are also possible, Deloitte notes, ranging from simple leasing of a facility from the private sector to more creative revenue-sharing transactions involving split ownership and the sharing of responsibilities among the public and private sector interests.

The Reason Foundation, a Los Angeles-based organizational management think-tank, points out that even as far back as 1992, a White House executive order on privatization under President H. W. Bush offered state and local governments the option of selling or leasing any infrastructure enterprise that had previously received federal aid, as long as any depreciated value of the federal grants was paid back. That same executive order also directed relevant agencies — primarily the U.S. Environmental Protection Agency, the Federal Aviation Administration, and the Federal Highway Administration — to work with their grantees in removing obstacles, should they opt to pursue privatization.

In terms of operational efficiency, there are numerous potential benefits from privatizing infrastructure, including, but not limited to:

- Introduction of market pricing;
- Increased revenue opportunities;
- Cost savings and productivity gains;
- Private sector management expertise;
- Stimulated innovation and expanded use of new technology;
- Elimination of cumbersome and time-consuming procurement regulations; and
- Proper, continual maintenance of facilities instead of deferred maintenance.

Of course, none of these potential benefits is guaranteed to occur in every case of infrastructure privatization, the think-tank points out, but there are strong economic incentives encouraging each of them. While the immediate motive may often be purely financial, states and municipalities could end up improving the quality of the

infrastructure as a byproduct of addressing their fiscal problems, the Reason Foundation contends.

Moreover, privatization has now moved from traditional projects, such as highways and bridges, commercial airports, and water, wastewater, and sewerage treatment systems, to more profitable ventures like gas and electric utilities, turnpikes, parking structures, ports, and waste-to-energy plants. Most of these projects, if not all, are largely funded and operated through private investment and user fees in lieu of general taxpayer financing, preserving the tax base and saving public agency dollars for other services.

While the engineering interests of most state and local government agencies support privatization concepts, they also favor a balanced approach, one that assures efficient use of current engineering resources within the public sector before considering any extended privatization initiatives. Still, many public agencies are now considering privatization of facilities more frequently because user needs or demands are exceeding limited budgets, or because there has been a rise in taxpayer and ratepayer pressures to reduce costs of operations and management and improve efficiency and quality of service delivery.

Among the touted benefits of public facility privatization, there are inherent risks, though, for both the project owners and investors in accepting new challenges. Some notable risks are swapping financial security for debt, repair and replacement costs, buy-back provisions, regulatory requirements, payment of fines and penalties, price guarantees, inflation and taxes, and quantity and quality of end products.

Other considerations include who is ultimately responsible for performance and compliance with permits and laws, future growth or expansion, transfer of title, subcontracting of operational duties, service contract lengths, procurement methodology, and rate increases.

Each privatization project must be carefully reviewed to assure that no obstacles will block private initiative and to determine that it can be profitably owned and operated. This requires comprehensive financial forecasting; development of alternative transactions to determine which are best from a tax, finance, and procurement perspective; and an assessment of state and local statutes, regulations, and policies relating to taxes, contracting, user charges, and environmental considerations.

January 2013

Replacement of Licensed Engineers Still a Persisting Problem in New York

By Steven J. Storts
Dublin, Ohio

FOR several years, professional engineers employed in municipal government throughout New York have been challenged in curbing a disturbing trend that could adversely affect public safety: the replacement of PEs with non-licensed individuals. Aside from the vital health and safety concerns, these imprudent actions point to a lack of basic knowledge of state statutes regarding engineering practice.

The following is a recap of significant events since 2009 that define the alarming *ripple* effect spreading to New York municipalities:

- The town of Colonie did not reappoint its longtime public works commissioner — who is a professional engineer — and replaced him with a non-licensed individual, directly contradicting the town law's requirement of a PE license to hold the position.
- Syracuse amended its city charter and hired a non-licensed individual to replace its water commissioner who took a job with the Mohawk Valley Water Authority in Utica. Ironically, his unlicensed replacement was reported to make a higher salary, implying that economic stress was not a leading factor in the selection process.
- New York City hired a non-licensed engineer as commissioner of the buildings department, resulting in a lawsuit being filed against the mayor by the New York State Society of Professional Engineers (NYSSPE).
- The New York State Board for Engineering and Land Surveying forwarded a letter to the New York City Department of Buildings stating that the commissioner's duties are considered the practice of engineering and should be executed by a licensed engineer as required by the New York State Education Law. Despite being notified, the agency continues to defy the law.
- Similar correspondence from the engineering and surveying licensing board confirmed that certain construction inspections — known as special inspections which include sprinkler systems and sanitary piping — are also the practice of engineering and should be performed by a licensed engineer. Again, despite being reminded, the agency continues to defy the law.
- Both the Long Island Rail Road and the Metro North Railroad hired non-licensed engineers to serve in their top positions.
- In its former classified ads soliciting candidates for public works superintendent, Washington County stated that it would *consider* a non-PE for the position.

Professional engineer David Janover, town engineer for Islip, located on Long Island with a population of 330,000, notes that when a when a municipality hires a licensed professional in a top management or supervisory role, there is a level of professionalism that is expected. Moreover, most licensed professionals have a network of colleagues to consult when necessary and are incredibly resourceful, which are unique qualities deserving merit among high-level management and supervisory personnel.

"It is my opinion that the level of integrity brought to bear by a licensed professional as compared to a political appointee will more likely be at a higher level," Janover contends. "This is because the licensed professional, such as a PE, has much more to lose than the political appointee counterpart. If a licensed engineer is pressured to act in any way that is considered unethical, his license and the ability to practice his livelihood may be at stake. There is a higher authority, and I believe that keeps a great deal of us in line should the possibility of temptation rear its head."

Janover also admits that neighboring municipalities often tend to act similarly regarding matters of administrative policy. For example, if Municipality A removes a licensed professional from its public works division as an economic measure, then neighboring Municipality B will observe this action and possibly be pressured into following suit, particularly during recessive economies.

To counter this influence, he suggests that professional organizations need to move forward with open dialogue in municipalities across the United States for the expressed purpose of discouraging behavior that could jeopardize public safety and possibly expose local governments to additional liability risk. Former NYSSPE President Donald Nims, P.E., who agrees, has tasked a professional compliance committee with developing a protocol to concisely state the Society's position and provide alternatives to simply removing the PE requirement, in addition

to informing municipal representatives of the consequences of practicing engineering illegally.

Of course, making the case for professional accountability vs. tight municipal budgets can be a hard sell, and Janover knows firsthand the types of issues that local government officials face daily. "In situations where non-licensed personnel serve in positions of responsibility, a municipality may need to rely on outside professional consultants as needed to provide the necessary knowledge in design or inspection services," he points out. "This alternative, however, will most likely result in a higher cost to the municipality than the difference of the salary between a licensed and non-licensed individual."

Janover further explains that a non-licensed individual serving in a public managerial capacity could eventually find himself or herself in a position of making decisions that fall into the category of engineering practice, thereby raising questions of legality and increasing liability risk for the municipality involved.

Undoubtedly, a number of town councils or governing boards are entertaining resolutions of varying degrees to remove the PE license requirement as a condition for holding a critical job position. "They may believe they are legally following proper procedure," says Janover, "but if it is deemed that engineering duties are the responsibility of this position, it will be considered illegal by New York to have a non-engineer practicing engineering."

An experienced and licensed engineering professional can strike a balance in meeting the needs of the political machine, while keeping paramount the safety, health, and welfare of the public, Janover emphasizes. "Knowing the limitations, understanding the risks involved, and having the ability to communicate effectively to political motivators are key requisites for public engineering professionals serving in today's municipal environments," he notes.

July 2012

Federal Government Improves Employee Recruiting, Hiring Paths

By Steven J. Storts
Dublin, Ohio

FOR nearly two years, the federal government has been engaged in streamlining the employee recruitment and hiring process for all executive departments and agencies. And what does this initiative have in store for recent college graduates, young practitioners, and mid-career professionals interested in pursuing or advancing their engineering careers in public service? Hopefully, the end result will be an improved, more functional experience for applicants seeking federal jobs.

In his signed memorandum in May 2010, President Obama emphasized, "Americans must be able to apply for federal jobs through a commonsense hiring process and agencies must be able to select high-quality candidates efficiently and quickly. Moreover, agency managers and supervisors must assume a leadership role in recruiting and selecting employees from all segments of our society."

The presidential directive eliminated essay-style questions on initial application materials for any federal position, allowing individuals to submit resumes and cover letters or to complete a simple application process. Also, the reform measure now requires that job positions be filled from a larger pool of qualified candidates through use of a *category rating* approach, replacing the "rule-of-three" methodology under which managers could select only from among the three highest-scoring applicants.

A key component of the hiring reform initiative is a revamped USA JOBS.gov Web portal aimed at expediting the recruiting and hiring of both high-priority and commonly filled positions. The updated Web site features a specially designed resources center to aid applicants in their quest for federal employment, in addition to expanded job search tools and links denoting the status of various stages of the application process.

Professional engineer Scott Haraburda, director of manufacturing and engineering for Crane (Indiana) Army Ammunition Activity, an installation of the U.S. Army Joint Munitions Command, reports that his and other military agencies' civilian hiring systems will soon migrate into the overall USAJOBS system.

"If you are familiar with this online employment site and already have a completed resume in a Word document, it's simply a matter of copying and pasting your information into the USAJOBS resume system and then searching for job openings," he explains. "If you are a new user, you will have to create an account before fully accessing the system. If you don't have a resume already prepared, you can build one online. Just follow the USAJOBS screen prompts and be sure to save your information at each step. This will take some time to complete, but when finished, you're ready to apply instantly when an employment opportunity comes along."

Haraburda is currently developing an orientation program for NSPE's Professional Engineers in Government interest group which addresses the federal employment application process for Army civilians. He notes that while his tutorial focuses on a specific military branch of civilian service, the content is basically applicable to all levels of public service employment, including state and municipal governments.

"For instance, I discuss the basic principles of merit systems and equal employment opportunity and offer advice on resume preparation and job interviewing," says Haraburda. "More specifically, I look at the criteria for evaluating resumes and professional skills, provide guidance on finding position openings and applying online, and examine the intricacies of the interviewing process."

As part of his tutorial, Haraburda poses some sample questions from an interview panel:

- *This position involves planning for receipt, issue, transportation, and storage of material in a manufacturing organization. Please describe your skills and experience involving these tasks.*
- *Please tell us how you would leverage your supervisory skills, knowledge, and experience to ensure operations are adequately planned for to ensure both timely work execution and quality of repairs or installation.*
- *What topics should be addressed in a hazard control briefing? If possible, please provide examples of when you have done this.*

Haraburda stresses to engineers the importance of "knowing your resume cold" and addressing all qualification requirements for a job posting and suggests continual practice

prior to interviewing in "talking about yourself, your skills, aptitudes, and experience." And be sure not to overlook the obvious during an interview, either, he says, such as "staying calm, listening carefully to every question, being confident in your responses, and asking for clarification on anything you deem important."

It is also entirely appropriate, Haraburda points out, to ask for feedback after the job candidate selection process has been completed, "regardless if you have been successful or not." An interview panel should always offer constructive feedback on "what went well and what could have been better," he adds.

According to the Office of Personnel Management (OPM), there has already been measurable progress and achievement of the recent federal hiring reforms. For example, 92 percent of posted job announcements allow candidates to apply with a resume, and 97 percent of the job postings are free of the essay questions that used to haunt applicants, as compared to just 39 percent under former hiring practices. Also noteworthy, 26 days have been trimmed off of the average time to hire new employees.

For students and recent graduates, another federal hiring initiative is going through its final regulatory review phase before implementation — the Pathways Programs — whose mission is to improve recruiting efforts, offer clearer paths to student internships and to careers for graduates, and provide meaningful training and career development opportunities for those at the beginning of their public service. OPM expects to issue final regulations this year, although they would probably not take effect for several months.

March 2012

Coordination, Training, Practice Are Key to Emergency Preparedness

By Steven J. Storts
Dublin, Ohio

IT goes without saying that the American populace entrusts public agencies to prepare for and manage any disaster that arises—natural or man-made. What is not widely known is how local and state governments actually address emergency preparedness. What types of events do they prepare for? How do they plan for disasters? What approaches do they take?

Not surprising, the answers to these questions and others are as diverse as the public agencies themselves that serve communities across the United States.

In California for instance, Caltrans' Office of Emergency Management, headed by Professional Engineer Herby Lissade, prepares for 16 of the 17 recognized Federal Emergency Management Agency disaster types—all but hurricanes. Recent emergency responses this year have included the Japan tsunami in March and the September power outage in Southern California. These are in addition to annual wild fires, snow and ice storms, mudslides, sand and wind storms, and flooding.

Kentucky's Lexington-Fayette County Division of Emergency Management prepares mostly for weather events and large mass casualties. "I have worked floods, snow storms, ice storms, tornadoes, a plane crash, an anthrax scare, hazardous materials spills, H1N1 influenza outbreaks, and handled National Disaster Medical System evacuees," says Pat Dugger, director of emergency management.

Anthony Broom, emergency coordination officer for the Florida Department of Transportation (FDOT), has addressed wild fires, tropical storms, H1N1 influenza, cold weather events, floods, Operation Haiti Relief, the Deepwater Horizon oil spill, and freeze events.

And at the national defense level, Michael Hackler, emergency manager for the U.S. Air Force Air Mobility Command at Scott Air Force Base near St. Louis, provides oversight, guidance, and support to all AMC installations. "Our main focus is on the physical effects of natural disasters, major accidents, and the terrorist use of chemical, biological, radiological, and nuclear material," he explains. During 2011, his team has responded to several hurricanes, tornadoes, and radiation hazards from Japan's Fukushima Dai-Ichi nuclear power plant.

FDOT's emergency response functions during activation fall under the more traditional responsibilities: providing and coordinating available resources of member agencies to support basic emergency transportation needs—air, ground, rail, and water—and public works and engineering transportation needs during any declared emergency or disaster. Broom emphasizes that in preparing for emergencies, even those that may never occur, "reviewing plans and testing are key factors to promote success," and he notes the importance of having pre-established baselines for success and treating every emergency situation as a high priority.

For Dugger, emergency preparedness in Lexington-Fayette County takes on a more personal, one-on-one approach. "We are responsible for providing preparedness information and training to the community and first responders," she points out. "We publish brochures, newspaper and magazine articles, maintain a Web site, Twitter, and Facebook accounts, and appear regularly on radio and television programs to promote emergency awareness and preparedness. Our theme for this year is: Be Aware, Get a Kit, Make a Plan."

In preparing for the unexpected, Lissade touts Caltrans' participation in the California Emergency Management Agency's annual Golden Guardian Exercise Series—the largest statewide training exercise program of its kind in the country—aimed at coordinating prevention, preparation, response, and recovery mechanisms of city, county, and state governmental entities and private sector and volunteer organizations.

On a more local scale, Andrew Bencomo, deputy chief of operations for the Las Cruces Fire Department in New Mexico, says his team maintains emergency preparedness by conducting "table top exercises" on a regular basis. "Prioritizing possible events comes by taking input from various personnel and agencies and then evaluating what would be the most likely events to occur that we have the least experience with, and then determining what the impact might be to our community should they occur," he explains.

The role of engineering in emergency management and response is still at the forefront of many agencies. "Caltrans engineers recently formed Haiti Engineering, a nonprofit organization, to help respond

to the Haiti earthquake," Lissade notes. "Many of the engineers and professionals at Caltrans and other state agencies have learned valuable lessons through participating with this nonprofit [and others]. This helps us stay in good practice for events that may occur in California."

Bencomo adds, "Having a perspective outside of traditional emergency responders can open up new ideas and out-of-the-box thinking." He cites the importance of engineering in designing safety and seismic restraint systems in public buildings and other types of structures such as bridges and roadways, in addition to the design of safety equipment and personal protective gear that emergency responders use daily.

The construction of buildings to make them more disaster-resistant in a cost-effective manner remains one of the most challenging objectives for today's engineers, says Dugger. And from a post-disaster perspective, Hackler emphasizes engineering's vital role in gathering and analyzing basic information before planning and implementing any recovery operation.

Although technological advancements in emergency communication systems and the use of social media such as Twitter and Facebook have greatly assisted in emergency preparedness, Hackler contends that personal responsibility cannot be overrated. "Everyone knows being prepared is important," he says, "but most believe the work should be done for them. Preparing yourself and your family isn't difficult or time consuming."

October 2011

Ethical Awareness Evolves Through Competency, Experience, Training

By Steven J. Storts
Dublin, Ohio

THERE was a time that engineering ethics in public service was a seamless melding of technical competency and moral business principles, and doing things right also meant doing the right things. That ethical paradigm, of course, changed dramatically with the space shuttles *Challenger* and *Columbia* disasters in 1986 and 2003, respectively, significantly eroding public confidence in the U.S. manned space program. The ethical breaches in both of these tragic events revealed flaws in both technical design and management leadership.

Technical shortfalls and management conflicts have, indeed, blurred the ethical picture for today's engineer in government. Compounding these issues is the fact engineers in government have a vested interest in ensuring that public funds and property are managed properly, a role that can sometimes require unpopular disclosure of activities promulgating extensive government waste and inefficiency.

Related to these interactions is the following premise: professional licensing determines level of competency, whereas ethics help determine leadership and character in how business is conducted. Professional engineer Mark Dubbin, a fire protection engineer with the Las Cruces Fire Department in New Mexico, agrees that the premise is a fair assessment, noting, "I've often said, 'Professionalism is a virtue, not a license.' It's more about how you conduct yourself and are respected by your peers rather than your resume and credentials."

From a slightly different perspective, Arthur Schwartz, Esq., deputy director of the National Society of Professional Engineers, says, "I think it is a good starting point, although licensure informs ethics and the reverse is true as well," meaning that each enlightens the other. "They are inextricably bound," he emphasizes.

Dubbin, who serves on the NSPE Board of Ethical Review, points out that the line between legality and ethical conduct is not always clear. For instance, he notes that when one is acting as a faithful agent or trustee of the government at any level, it is important to avoid any conflict of interest.

"Some engineers will try and serve two masters, some moonlighting as consultants or serving on a board or commission that has an opposing interest," Dubbin explains. "They could find themselves involved in litigation trying to explain how they can be objective in both roles."

"Even if they are not guilty of a crime," he adds, "they may find themselves charged in civil litigation or penalized by their state for unethical practice. I'd say in many cases the line is not clear, and engineers faced with this decision would do well to consult with a peer or maybe even an attorney."

Both Schwartz and Dubbin have addressed major ethical issues, including conflicts of interest, unlicensed practice, protection of the public health and safety, obligations to the employer/agency vs. obligations to the public, changes to designs by contractors, "rubberstamped" plans, engineers with no control of the design, and engineers-of-record who have never physically been to the project or who are not involved with changes.

"In almost all cases," Dubbin points out, "I've been able to resolve the issues by bringing the engineer back into the project, either by requiring the owner/developer to keep the engineer informed of the changes or by requiring addenda and the engineer's involvement." Sometimes through direct communications, he adds, a conscientious engineer will step up and propose solutions to keep the project on track, particularly when changes or redirection require engineering expertise.

"The culture of some contractors has been to take care of conflicts as quickly as possible and not to involve the engineer, fearing it will delay the project," Dubbin continues. "This culture is changing slowly. Many bonding companies, owners, and small contractors don't understand licensure laws, requirements, liability of engineers, and responsible charge. I remind myself that I'm often the only engineer that might visit the site. Those of us who are in this role are ambassadors for the profession and should try to educate contractors who don't know what the role of the engineer should be and why."

The ethical culture is not without its challenge of perception, either, says Schwartz. "A significant part of ethics is appearances," he emphasizes, "so even if something is technically legal, it could create the appearance of impropriety, cause embarrassment to the agency and its employees, or harm the public."

Engineers often have to consider this "perception of impropriety," Dubbin adds, especially in the public sector. "We are entrusted to be faithful agents of the citizens we serve and many times, their tax dollars or impact to their lives as well." When considering the proper course of action, Dubbin always looks at the familiar newspaper publicity angle. "If you think a story describing your actions might cast you in a bad light, chances are that it's probably something you should avoid," he advises.

Advancing ethical behavior within any profession will always remain a challenge. And for engineering, it involves more than simply studying ethics or taking examinations as such. The process is ongoing and requires diplomacy, leadership, working with others, and earning the respect of co-workers, clients, and employees, according to Dubbin. "This is not a part of the certification or education process but is more about a person's character and personality. It is only through your actions that your reputation will develop."

If young engineers ask themselves what mentor has made an impact in their lives and why, Dubbin contends, they will often find these leaders have made some tough decisions based on their ethical beliefs and, hopefully, will try to do the right thing as a rule.

Schwartz expands on Dubbin's learning curve observation, emphasizing the importance for public agencies in "making it clear that ethics is a top priority at the highest levels of management" and by exhibiting ethical leadership by example and through interactive ethics training, such as the customized programs offered by NSPE.

August 2011

Public Safety Potentially Put at Risk in Several New York Municipalities

By Steven J. Storts
Dublin, Ohio

GENERALLY speaking, the unseen chain reactions that occur everyday through the laws of nature, science, and physics are a good thing; they help sustain life. Sometimes, however, a chain reaction has the opposite effect, creating a potential for adversity to public safety. Such is the case in several New York municipalities where professional engineers in public service have been replaced with non-licensed individuals. To the engineering community, these actions defy prudence, if not basic common sense.

The following examples point to the disturbing *ripple* embracing New York:

- The town of Colonie did not reappoint its longtime public works commissioner—who is a professional engineer—and replaced him with a non-licensed individual, directly contradicting the town law's requirement of a PE license to hold the position.
- Syracuse amended its city charter and hired a non-licensed individual to replace its water commissioner who took a job with the Mohawk Valley Water Authority in Utica. Ironically, his unlicensed replacement will be making a higher salary, according to online news sources, which implies that economic stress was not a leading factor in the selection process.
- New York City hired a non-licensed engineer as commissioner of buildings, resulting in a lawsuit being filed against the mayor by the New York State Society of Professional Engineers (NYSSPE).
- In its classified ads soliciting candidates for public works superintendent, Washington County has stated that it would *consider* a non-PE for the position, although to date, the county's Web site still lists the previous licensed engineer in this post.

Professional engineer David Janover, town engineer for Islip, a small populated municipality of 330,000 located on Long Island, points out, "While I am unaware of other levels of public agencies following this trend, I am concerned that this could catch on and spread as neighboring municipalities tend to act similarly." His contention is that if Municipality A removes a licensed professional from its public works division and saves money, then neighboring Municipality B will see this and may be pressured into following suit, particularly during recessive economies.

To counter this trend, Janover suggests that professional organizations need to be the "voice of reason" in moving forward with open dialogue in municipalities across the United States, all for the purpose of expressing concern and discouraging behavior that could jeopardize public safety and possibly burden local governments from a liability standpoint.

For instance, not only is NYSSPE engaged in a legal harangue with government officials from the city of New York, it also stands behind a Colonie resident who has filed a lawsuit in the New York Supreme Court. His suit alleges several violations of local and state laws by actions promulgated by the town supervisor and governing board, among those being the replacement of Colonie's public works commissioner with a non-PE.

Professional engineer James Yarmus, in addressing the Colonie supervisor back in January as president of NYSSPE, emphasized, "We realize that due to the economy, there may be a desire to reorganize your operations; however, such changes should not interfere with sound professional judgment. Removing the professional engineer's requirement from a position that is so immersed in technical decision-making is not a wise way to streamline operations."

Yarmus also published an editorial earlier this year in the *Buffalo News*, opining that the unlicensed individuals replacing qualified professionals may be certified by new groups to "create the illusion of competency and to generate the needed perception of legitimacy for the appointee."

So how does the engineering community make the case for professional accountability vs. tight municipal budgets?

Janover knows firsthand the types of issues that local government officials face daily. "In situations where non-licensed personnel serve in positions of responsibility, a municipality may need to rely on outside professional consultants as needed to provide the necessary knowledge in design or inspection services," he explains. "This alternative, however, will most likely result in a higher cost to the munici-

pality than the difference of the salary between a licensed and non-licensed individual."

Additionally, he says that if the commissioner of a local public works department is not a PE, some municipalities may rely on laborers or other experienced field personnel to make engineering decisions. This approach, he warns, could have potentially serious repercussions involving decision-making at a higher level beyond one's pay grade (a civil service issue). Should any contentious issues arise as a result of such decisions, the municipality will be in a disadvantageous position.

Indeed, Janover's warning is actually good advice. As shown earlier in a number of instances, town councils or governing boards have entertained resolutions to remove the PE license requirement as a condition for holding a critical job position. "They may believe that they are legally following the proper procedure," says Janover, "but if it is deemed that engineering duties are the responsibility of this position, it is considered illegal by New York to have a non-engineer performing engineering."

Some municipalities, he adds, have skirted the licensing issue by having a deputy commissioner or lower-ranked individual within the public agency be responsible for the engineering duties, while the commissioner (unlicensed) is responsible for administrative decisions. However, this approach, too, is likely to raise legal concerns should administrative duties sometimes contravene the practice of engineering, casting doubt in the public's perception of its elected and appointed officials to act responsibly.

"I see the hiring of a licensed professional from the onset as its own insurance policy," Janover observes. "The bottom line is that when the safety, health, and welfare of the public are at stake, we cannot afford to cut corners. Taxpayers deserve a professional in the administration of a public works hierarchy. From a budgetary standpoint, municipalities should be aware of the higher cost over time by *not* hiring licensed individuals at the top. The risk and liability assumed by any municipality could be substantially minimized in this way."

November 2010

New Orleans Storm Safeguards Require Short-Term Fix, Long-Term Strategies

By Steven J. Storts
Dublin, Ohio

THE findings from continued inspections of the New Orleans levee system show that extensive hurricane damage by Katrina has left the city without any major assurances of protection from future flooding as a result of severe storms or hurricanes.

Weaknesses in the levees inspected by the U.S. Army Corps of Engineers include breaches created by Katrina or deliberately created for drainage; levee overtopping that decreased design height through erosion; and sections completely eroded by the hurricane. Many of these weaknesses were identified through use of sophisticated assessment methods, such as aerial surveys and light detection-ranging analysis.

"The state of the levee system requires an urgent plan of action to provide an interim level of safety for the duration of this hurricane season," says Brig. Gen. Robert Crear, commander of the Corps' Task Force Hope for hurricane recovery.

"Our intent is to make these repairs as quickly as possible," Crear explains. "There are no equipment or human resource constraints to this mission. Our number one priority is to first bring the system back to its pre-hurricane level of protection and then to determine what longer term course of action is needed."

The Corps has developed a phased plan for restoring the New Orleans area's storm safeguards, working in partnership with local levee boards and contractors. The levees consist of multiple components—pumps, flood walls, canals, and other systems—which are interdependent and must function properly to afford the design level of protection. The target date to restore the system to its previous level of protection is June 2006, in time for next year's hurricane season.

In addition to developing a repair schedule, the Corps is working closely with local officials to identify weather and other conditions that would trigger an early warning system for residents who return to New Orleans before repairs are completed. These warning signs would activate an evacuation plan prior to the expected event.

"Until we can upgrade the hurricane protection system, residents who return to previously flooded areas will be at some risk," Crear points out. "It's imperative that an effective process is in place to evacuate if that becomes necessary."

One critical component to the repair and restoration of New Orleans—and the entire Gulf Coast—is the long–term investment in waterways infrastructure projects by the federal government, according to the Associated General Contractors of America.

Historically, such programs have had numerous benefits, AGC contends, noting that flood damage reduction projects alone have prevented an estimated $706 billion in damages—a six–to–one return on the federal government's investment and a $14.10 return for every dollar invested on operations and maintenance.

AGC is calling on Congress to pass H.R. 2864, the Water Resources Development Act of 2005, which is designed to provide long-term strategy for the nation's waterways infrastructure and reaffirm the government's pledge to help protect communities from floods and keep waterways open to commercial navigation.

WRDA would authorize funding for the Corps to carry out studies, projects, and programs relating to navigation, flood control, shoreline protection, dam safety, water supply, and recreation, including lock expansion and environmental restoration along coastal Louisiana. "The up-front cost of long–term investments to prevent flooding and storm damage pales in comparison to the costs of cleanup and restoration after the fact," says Stephen Sandherr, the organization's chief executive officer.

In July, the U.S. House of Representatives quickly passed a WRDA package with a bipartisan vote of 406 to 14, while the full Senate has yet to schedule a vote on its version, S. 278. In fact, the last major action on S. 278 was last February, when it was referred to the Senate Committee on the Judiciary.

"Further inaction by Congress on a comprehensive plan will undermine the national flood protection efforts that have been saving lives and property for nearly two centuries," Sandherr adds.

"In this bill, we have been able to get past the rhetoric, identify real issues, and come up with workable, bipartisan solutions that will help the Corps of Engineers carry out its important missions," says House Transportation and Infrastructure Committee Chairman Don Young (R-Alaska). "This bill will also help alleviate congestion on our highways by improving our waterways, which is a cheaper, safer, and more environmentally friendly method of transporting goods," he emphasizes.

Oak Ridge Laboratory to Develop Leading Science Computing Capability

By Steven J. Storts
Dublin, Ohio

OAK Ridge National Laboratory recently received $25 million in funding to begin building a 50-teraflop supercomputer. A teraflop is equal to one trillion calculations per second. When finished, the advanced system is expected to have a sustained capacity of more than 250 teraflops at its peak.

The U.S. Department of Energy selected ORNL and its development partners—Cray Inc., IBM Corp., and Silicon Graphics Inc.— from proposals solicited from all 10 of DOE's Office of Science laboratories. "This new facility will enable the Office of Science to deliver world leadership-class computing for science," says Secretary of Energy Spencer Abraham, "and will serve to revitalize the U.S. effort in high-end computing."

ORNL won the development funding through competition with three other federal facilities: Brookhaven National Laboratory, Lawrence Berkeley National Laboratory, and Stanford Linear Accelerator Center. The four laboratories submitted proposals designed to significantly improve the computing capability of national research—or the ability to perform the largest, most complex simulations—thereby enhancing prospects for important research advances and scientific breakthroughs in all science disciplines supported by DOE and other science agencies.

The Tennessee-based laboratory will work with vendors, users, and its development partners to determine the best system architecture for any expected set of computation problems. The total cost of the five-year project, estimated to range from $150 million to $200 million, will be used primarily by DOE for mission-related research, but it will also be open to other organizations for competitive, peer-reviewed research.

"The leadership-class computing capability that will be developed at ORNL will enable researchers to probe the deepest secrets of nature and facilitate the technical, economic, and social benefits such understanding will yield," Abraham emphasizes. "It's no exaggeration to say that this machine will give both the U.S. scientific community and industrial sector a significant competitive advantage over the rest of the world."

The Office of Science's Advanced Scientific Computing Research program supports fundamental research in applied mathematics, computer science, and networking, providing the necessary tools to enable DOE to fulfill its science, energy security, environmental remediation, and national security missions. More than 2,400 scientists in universities, federal agencies and U.S. companies use ASCR-funded high-performance computers each year.

The capacity of the current ORNL Cray X1 computer will be expanded to 20 teraflops this year, with a 20-teraflop Red Storm-based system from Cray added in 2005. Argonne National Laboratory also expects to install a 5-teraflop IBM Blue Gene computer as part of the five-year project. A 100-teraflop Cray system at Oak Ridge is planned for 2006, with the potential to increase to 250 teraflops in 2007.

The future supercomputer will be housed in a new 170,000-square-foot facility that includes 400 staff and 40,000 square feet of space for computer systems and data storage. The machines will run on 12 megawatts of power supplied by the Tennessee Valley Authority.

Federal energy officials point out that computer simulation is now a major force for discovery in its own right. Research has moved beyond using computers to solve very complicated sets of equations to a new plateau where computer simulation now enables engineers and scientists to obtain scientific results and make discoveries in the same manner that experiment and theory have traditionally been used. In summary, high-end computation today joins theory and experimentation as the third pillar supporting scientific discovery.

Moreover, there are research areas where the only approach to a solution is through high-end computation, DOE notes, claiming that computing capability is now essential for the research advances and scientific progress that will produce vital economic and societal benefits.

According to the federal report *Science-Based Case for Large-Scale Simulation*, "The availability of computers 100 to 1,000 times more powerful than those currently available will have a profound impact on computational scientists' ability to simulate the fundamental physical, chemical, and biological processes that underlie the behavior of natural and engineered systems."

September 2004

House Bill Targets Major Tax Break For Fire Sprinkler System Installations

By Steven J. Storts
Dublin, Ohio

THE number of federal legislative co-sponsors continues to grow for a bill that provide a substantial tax benefit to building owners and developers who equip their properties with new or retrofitted fire sprinkler systems.

With nearly 80 cosponsors, H.R. 1824, the Fire Sprinkler Tax Incentive Act of 2003, would amend the *Internal Revenue Code of 1986* to accelerate the depreciation schedule for fire sprinkler systems. The Mechanical Contractors Association of America reports that the bill recently returned from the Joint Committee on Taxation with a cost assessment well within the feasibility range given the high public safety and economic stimulus value of the package.

Allowing a five-year depreciation schedule for fire sprinkler installation and retrofit (down from 27 and 39 years, respectively), H.R. 1824 would cost $3.5 billion over five years (2004-2008) and $9.4 billion over 10 years (2004-2013). If the bill covered sprinkler retrofits only, the cost would drop to $878 million over five years and $2.4 billion over 10 years.

MCAA points out that if the legislation is enacted, a sprinkler system costing $250,000 would be depreciated at $110,000 the first year, with the balance deducted over the next five years. This compares favorably to the existing system, which only allows depreciation of the system at $3,205 the first year, with the balance of depreciation spread out over the remaining 38 years.

In the wake of nursing home fires in Nashville and Hartford, Connecticut, where a total of 24 people died, Rep. Curt Weldon (R-Penn.) is urging lawmakers to pass H.R. 1824, which he introduced earlier this year and was referred to the House Ways and Means Committee. A former volunteer fire chief and founder of the Congressional Fire Services Caucus, Weldon has been one of the most outspoken and knowledgeable members of Congress with regard to fire and emergency services issues.

"This deadly fire was a horrific and preventable tragedy," he contends. "It is disgraceful that in this day and age, a nursing home is not properly protected from fire. I only hope my colleagues will continue to work with me and pass the legislation I've introduced to help install this life-saving technology."

Earlier this year in February, a fast-spreading fire in a nightclub in West Warwick, Rhode Island, killed 97 occupants. The horrifying aftermath of these fires and other similar incidents have heightened Americans' concerns about fire safety, based on the results of several national surveys.

In March, Weldon and Rep. Jim Langevin (D-R.I.) created the task force that drafted H.R. 1824, providing financial incentives to owners of older buildings who want to install sprinkler systems. Weldon notes that many buildings built before 1974 are often exempt from installing the more expensive fire protection systems.

"Many business owners and landlords want to do the right thing by installing sprinkler systems," Weldon explains. "However, the often prohibitive costs are preventing their installation. This means that the longer we wait, the longer we continue to put lives at risk. If we can justify tax incentives to purchase certain types of automobiles or business investments, we can justify incentives for life-saving sprinkler systems."

Backing the need to mitigate fires in commercial and public buildings more effectively, the National Fire Protection Association has called for all nursing homes in the U.S. to be equipped with fire sprinklers. In an October statement, NFPA President James Shannon said that although the nursing home industry has made great strides in recent years to ensure residents are safe in the event of fire, more still needs to be done.

Sprinklers are already required in all new and many existing nursing homes, but where they are not yet required, they must be added to the fire protection package provided by existing codes and standards, Shannon noted, pointing out that nursing homes should have more stringent fire protection because their residents are the least capable of saving themselves from fire.

Statistics show that one-quarter of all nursing home fires occur in facilities not equipped with sprinklers. It is also estimated that 10% to 15% of all nursing homes are not equipped with any fire sprinkler systems.

According to NFPA research, when sprinklers are present in a building, the chances of dying in a fire are reduced by one-half to two-thirds, compared to fires where sprinklers are not present. In fact, when measured by the average number of deaths per thousand fires in 1994-1998, the reduction associated with sprinklers is 82% for properties that care for the elderly or sick.

"NFPA, as a century-old fire safety advocate, has an obligation to be an advocate and lead on issues crucial to safety," Shannon says. "In this case, the need is for greater safety for nursing home residents. These tragedies have taught us that we must do more to keep our elderly and disabled safe from fire."

The association executive emphasizes that fire sprinklers can control fires where they start and alleviate the burdens placed on staff to deal with the fire while relocating or evacuating patients. "Sprinklers must be included in our stock of existing nursing homes because it is evident that common fire protection measures in nursing homes that work well now need to be strengthened," he adds.

MCAA further reports that Rep. Stephanie Tubbs-Jones (D-Ohio) has introduced a narrower measure providing grants to educational institutions to install sprinkler systems in student housing structures. H.R. 1613, the College Fire Prevention Act, would earmark up to $100 million in annual grants (2004-2008) to colleges on the basis of need. The bill, which has more than 50 cosponsors, is before the House Education and Workforce Committee.

December 2003

Tampa Bay Seawater Is Key Element Of Regional Drinking Water Plan

By Steven J. Storts
Dublin, Ohio

LOCAL residents and businesses in the Tampa Bay area will soon be tapping a new resource of drinking water, one that's environmentally friendly, drought-proof, and produced from desalinated seawater.

The Tampa Bay Seawater Desalination Plant, a 30,000-square-foot, reverse osmosis desalination facility located near Apollo Beach, will eventually provide the region with 10% of its drinking water. Initially, the plant will produce desalinated water at a rate of 4.9 million gallons a day, and later increase that capacity to 25 mgd or higher, making it the largest RO seawater desalination facility in North America.

Tampa Bay Water, which owns Tampa Bay Seawater Desalination, is Florida's largest wholesale water supplier. It develops and supplies drinking water to its member governments—Hillsborough, Pasco, and Pinellas counties and the cities of New Port Richey, St. Petersburg, and Tampa—which in turn supply water to nearly two million people in the region.

Development of the $100 million desalination project began in November 1999 with the permitting process, followed by the start of construction in spring 2001 at the Tampa Electric Company's Big Bend Power Station site in Florida's Southern Hillsborough County. With project construction recently completed, the new plant is now undergoing pretreatment and system testing.

The Big Bend location is significant to the project because the desalination plant will use cooling water from Tampa Electric's power-generation process as one of its sources of raw materials. Tampa Bay Water officials selected the site for several reasons, the first being an abundant supply of seawater. Forty-four million gallons of seawater are needed to make 25 million gallons of drinking water every day. The power facility already has 14,000 million gallons of seawater moving through it daily for cooling purposes. Because of the volume of cooling water, an ever-present supply of seawater is available for making high-quality drinking water.

The agency also emphasizes that the power station provides an environmentally safe mechanism for concentrated seawater dilution and return after processing. Another major reason for locating the desalination plant near the power facility is because there's reasonable access to existing water supply pipelines for distribution to the community.

Tampa Bay Seawater Desalination uses a semipermeable membrane system in tandem with a reverse osmosis process to process the saltwater, once it has been put through a series of mechanical filters to remove suspended solids and debris. This is followed by a second pretreatment process in which smaller, finer particles are filtered out of the water to prepare it for the next level of purification.

In a two-stage process, seawater is forced under pressure through a semipermeable membrane system. During the process, the freshwater is "squeezed" from the saltwater, leaving concentrated seawater behind and freshwater to drink. In the desalination plant, the freshwater and saltwater are now in two separate systems. Because pure desalinated water is of the highest quality and purest water available, it has little taste. Therefore, calcium carbonate, which is found in natural freshwater, is added to make the taste more palpable—the same as water coming from the tap.

The desalination project is a key component of Tampa Bay Water's master water plan, which contractually requires the regional water utility to reduce pumping from the 11 regional well fields from an average of 158 mgd to an annual average of 121 mgd, effective January 2003. The agency is further required to reduce well field production from an annual average of 121 mgd to 90 mgd beginning January 2008. To offset those reductions, the plan calls for the creation of 53 mgd of new water sources this year and a total of 111 mgd by 2008.

The commitment to reduce pumping is part of the agency's governance contracts, in addition to a partnership agreement with the Southwest Florida Water Management District, which is funding part of the capital costs of the region's new water plan. That agreement earmarks up to $183 million for the development of alternative water supply sources to help offset pumping reductions at the regional well fields. SFWMD will provide up to $85 million for the desalination project once the plant has passed the required performance tests and evaluations.

To date, the desalination plant is producing the world's least expensive desalinated water. Its average wholesale cost over the next 30 years is projected at just $2.49 per thousand gallons. Co-funding by SFWMD through its partnership agreement with Tampa Bay Water has further lowered the 30-

year projected average cost to $1.88 per thousand gallons.

Another key element of the agency's master plan is the blending of groundwater, surface water, and desalinated water. The blending of groundwater and surface water actually began last fall. A fourth type of water supply source, desalinated brackish water, is expected to come online in several years but will contribute only a small percentage of water to some limited areas. The blended water will be as high or higher quality than the water the region has been receiving and will meet or exceed all federal, state, and local quality standards.

Surface water from the Hillsborough River, Tampa Bypass Canal, and the Alafia River, and a small amount of groundwater will be treated at a new 433-acre, industrial property site in central Hillsborough County. When desalinated seawater from the new plant in Apollo Beach is piped to the county facilities site, all three sources of water will be blended. By tapping into these diverse water resources, Tampa Bay Water will be able to reduce its pumping of stressed well fields by at least 50% over the next five years.

The Tampa Bay Seawater Desalination Plant has two built-in protection systems that monitor the salinity of the source water, desalinated water, and the seawater discharged back into the bay. An early warning system alarm will sound if the blending ratio of the seawater being returned to Tampa Bay falls below the optimal blending ratio of 70:1. The facility's second alarm system will instruct plant operators to check, adjust and, if needed, shut down affected areas of the plant if the salinity of the discharge reaches the Florida Department of Environmental Protection's permit level.

May 2003

Fire Protection Experts to Review Safety Issues Relevant to Public Buildings

By Steven J. Storts
Dublin, Ohio

IN LIGHT of two recent nightclub incidents resulting in nearly 120 deaths, the National Fire Protection Association has called for an immediate review of the safety issues relevant in public assembly buildings.

The NFPA Technical Committee on Assembly Occupancies will be examining several core components of a total system of building safety pursuant to a crowd stampede that killed 21 patrons of a Chicago establishment on February 17 and a fast-spreading fire that killed 97 occupants in a West Warwick, Rhode Island, nightclub, February 20.

"We must not waste any time in examining all the available information about public assembly occupancies in the wake of these building emergencies," notes NFPA Executive Vice President Arthur Cote, P.E. "Although we still don't have all the facts about these terrible incidents, we know enough right now to warrant a serious review and scrutiny of the future direction of codes and standards, and their enforcement locally. We must learn from these tragedies, and the time to act is now."

NFPA facilitates the development of more than 300 building, fire, electrical, and life safety codes and standards through a consensus process that is accredited by the American National Standards Institute. More than 6,500 volunteers serve on NFPA technical committees, writing model codes, standards, and recommended practices.

Even before the February tragedies, criticism had been directed toward Chicago city officials in January for not enforcing the state's high-rise fire safety code. Tom Lia, executive director of the Northern Illinois Fire Sprinkler Advisory Board, points out, "One year after the State Fire Marshal's Office adopted a code requiring high-rise buildings be equipped with fire sprinkler systems, the city of Chicago is still not enforcing the code." January marked the one-year anniversary of high-rise fire deaths at two locations in Chicago.

NFPA Life Safety Code 101, which requires existing high-rise buildings to be equipped with fire sprinkler systems, went into effect January 2, 2002, in Illinois. More than 800 high-rise buildings (75 feet or greater in height) built in Chicago before 1975 do not have fire sprinkler systems. Lia reports that since the code's effective date, there have been no inspections or action to implement the code, nor has any action been taken to provide a timetable for enactment.

According to a 1999 report prepared by the Chicago High Rise Commission, the rate of fire deaths in the city's high-rise buildings is about 3.5 times greater than the national average. The commission, developed after the Paxton Hotel fire in 1992 where 22 people died, recommended in 1999 that all high-rise buildings in Chicago be protected with fire sprinklers, given a 20-year phased-in timetable.

Lia emphasizes, "In contrast, the city's own contracted consultant study that was also completed in 1999 recommended a six-to-eight-year implementation schedule for the fire sprinkler retrofits. Neither plan was implemented."

To facilitate serious dialogue on building safety systems, NFPA is requesting a review of the following:

- The minimum thresholds for requiring automatic fire sprinkler protection;
- Allowable interior finish and decorations;
- Adequate egress;
- Exiting arrangements;
- Retroactive application of code requirements; and
- Inspection and permitting.

"Some building owners are installing voice alarms or annunciation alerting devices instead of suppression devices just to be able to obtain a quote on their fire insurance," says Lia. "While this will get them that quote, building owners won't receive insurance reductions. More importantly, alerting devices do not stop fire from spreading as does a sprinkler system." He notes that after building owners install fire sprinklers, they can receive a 25% to 50% reduction in their fire insurance rating, which over an amortization period helps offset the initial cost of installation.

In a related issue, NFPA is part of the team of professionals recently dispatched by the National Institute of Standards and Technology to investigate the fire and any building-related failures at The Station nightclub in Rhode Island. Conducted under the authority of the National Construction Safety Team Act, NFPA is working in close cooperation with the Bureau of Alcohol, Tobacco and Firearms; the Centers for Disease Control and Prevention; the U.S. Fire Administration; and state and local fire and law enforcement agencies.

The NIST investigative team has several primary objectives, including determination of the conditions in the

nightclub prior to the fire, such as the building construction materials and contents; the location and conditions of doors, windows, and ventilation ducts; the installed fire protection systems; and the number of occupants and their approximate locations.

Using computer models, the team is also reconstructing the fire's ignition, how it spread, and the survivability factors inside the building. Under controlled conditions, the team will further examine the survivability potential of having a fire sprinkler system in place and analyze the emergency evacuation procedures and occupant responses to better understand the impediments to safe egress.

Early statements from local West Warwick fire and safety officials indicated that The Station—a one-story wood building that was at least 60 years old—was not required to have a sprinkler system because it was "grandfathered" under a 1976 code requirement, but that it did have a fire alarm system and emergency lighting, which reportedly operated during the fire.

April 2003

Innovative Waste Treatment Project In Louisville Addresses Several Challenges

By Steven J. Storts
Dublin, Ohio

DISPOSING of solid wastes, while reducing odor sources, has often posed unique and expensive challenges for municipal treatment facilities throughout the U.S. However, Kentucky's largest municipal wastewater utility, the Louisville and Jefferson County Metropolitan Sewer District, has an innovative waste treatment project underway that expects to save millions of dollars in overhead expenses and nearly eliminate major odors.

The $64.6 million contract to design and build an alternative system for handling solids at the utility's Morris Forman Wastewater Treatment Plant (MFWTP) was approved in April 2000. The three-year project, the largest contract in MSD's history, was negotiated through a joint venture between Black & Veatch Corp. and J. S. Alberici Construction Co. Inc. During the course of the project, the joint venture team plans to award nearly $18 million in subcontracts to businesses owned by women and minorities—a figure that exceeds MSD's 15% diversity requirement.

"We've found that the design-build approach takes less time, saves money, and provides opportunities for more creative approaches that add value to the project," says MSD Executive Director Gordon Garner. Additionally, the new waste treatment process will provide a fertilizer byproduct that MSD can use or sell, reduce landfill disposal volume by 50%, and save an estimated $4 million a year in operation and maintenance costs.

MFWTP, a 43-year-old facility that treats 105 million gallons of wastewater daily, is located less than 10 miles from Louisville's downtown business district in a largely industrial sector, although many residential neighborhoods are nearby. In addition to treating its own solids, the plant also processes solids from other MSD wastewater treatment plants.

When completed next year, solids at the plant will initially be treated by an anaerobic digestion process and blended with secondary solids before they are dewatered and dried. The dried solids can then be used as a fertilizer, much in the same manner as the Milwaukee Metropolitan Sewerage District has successfully done since the 1930s. However, while the sewer district in Milwaukee has been marketing its biosolids for more than 60 years under the brand name Milorganite, MSD is exploring options to market the pellet-sized biosolids that will result from its new treatment process.

"Our best opportunities may be teaming with area fertilizer manufacturers," Garner notes. "We're not in the fertilizer marketing business, but it is possible that our product may be sold to manufacturers as a base ingredient for their products." Indeed, MSD may already have a potential customer for its product—right in its own backyard—through the Louisville/Jefferson County Metro Parks Department, which currently purchases Milwaukee's Milorganite for use in the more than 12,000 acres of city and county parks.

The alternative waste treatment process designed for MSD will replace the plant's low-pressure oxidation or Zimpro system, which conditions and dewaters solids before they are sent to a landfill for disposal. The existing system is the main source of annoying odors from the Morris Forman facility since the 1970s, according to Saeed Assef, the plant team leader.

During project planning, the joint venture team found ways to use MFWTP's existing structures to house the new treatment system, totally enclosing the dryers to minimize odor and reduce construction costs. The team is working with MSD operations staff to update and restore four existing anaerobic digesters instead of building new ones.

Blake Childress, Black & Veatch project director for the MSD project, explains, "Many plants have historically used incineration for solids, but odor, air quality, and disposal issues exist with this method. Heat drying is increasingly preferred as an alternative to incineration."

Additionally, the project team scaled up heat-drying technology to minimize the number of dryers required. To maximize the project's long-term impact on MSD, plans also call for using methane gas produced in the anaerobic digestion process to fuel the dryers.

Although the initial capital costs for the project are significant, Assef points out that MSD will rapidly recoup some of those costs because the new process will reduce the volume of solid waste generated at MFWTP and save on landfill disposal charges. The total cost for each dry ton of solids now treated at the plant is about $288 per ton. When the new system is fully operational, the cost will drop to about $145 per dried ton.

Created in 1946, MSD's primary job is providing sanitary sewer and drainage service for more than 200,000

residential, commercial, and industrial customers in a 375-square-mile service area throughout Louisville and Jefferson County. The utility operates six regional wastewater treatment facilities, 38 small treatment plants, and 12 major pump stations; maintains more than 3,000 miles of sewer lines; and monitors water quality in more than 790 miles of streams.

January 2003

Senate Committee Moves Bill Forward To Secure Whistleblower Protection

By Steven J. Storts
Dublin, Ohio

IN a unanimous vote, the Senate Governmental Affairs Committee recently approved legislation aimed at protecting federal government whistleblowers from retaliation. The measure, which now moves to the full Senate for consideration, is part of a reauthorization bill to fund the Office of Special Counsel, the government office charged with reviewing whistleblower claims.

Introduced in early October by Sen. Daniel Akaka (D-Hawaii), S. 3070 reauthorizes and revises some rules for the Merit Systems Protection Board and Office of Special Counsel, agencies that, according to committee members, "safeguard the merit system principles and protect employees who step forward to disclose government waste, fraud, and abuse."

Akaka's bill contains many of the same provisions of legislation he introduced last year, S. 995, the Whistleblower Protection Act Amendments of 2001, which sought to counteract decisions by the U.S. Court of Appeals for the Federal Circuit that the bill's sponsors noted, "have eroded statutory protections provided to federal whistleblowers." That measure stalled, however, in a subcommittee on international security, proliferation, and federal services.

"Protecting whistleblowers is vital to protecting the security of our nation," says Sen. Patrick Leahy (D-Vt.), chairman of the Senate Judiciary Committee and one of the sponsors of S. 3070. Leahy, whose committee oversees federal law enforcement agencies, including the Federal Bureau of Investigation, emphasizes, "People who literally risk everything to point out waste, fraud, and abuse in our government deserve a reasonable guarantee that they will not suffer retaliation for their patriotism. Unfortunately, current laws have been interpreted so narrowly that such a guarantee does not exist."

Leahy's reference to narrow judicial interpretation is another criticism of the Federal Circuit appellate system, which has sole jurisdiction over the Whistleblower Protection Act. Passed in 1989, the law was later strengthened through bipartisan amendments, unanimously approved in 1994. Under WPA, federal employees are protected from retaliation when disclosing workplace violations.

According to proponents, the 1989 and 1994 laws were necessary to counter loopholes created by courts and administrative agencies that limited employee protections. These loopholes made exceptions to the types of disclosures covered under WPA. The Senate Governmental Affairs Committee report on the 1994 amendments refuted these judicial and administrative interpretations, in addition to subsequent enforcement actions, stating, "The plain language of the Whistleblower Protection Act extends to retaliation for 'any disclosure,' regardless of the setting of the disclosure, the form of the disclosure, or the person to whom the disclosure is made."

The whistleblower provisions proposed in S. 3070 by Sens. Akaka, Leahy, and another sponsor, Sen. Carl Levin (D-Mich.), would end what they call a "monopoly of the Federal Circuit" on whistleblower cases. Leahy says the new language would also reverse several specific decisions of that court that have narrowly interpreted whistleblower laws.

One decision, Leahy cites, prevents whistleblowers from prevailing unless they produce "irrefragable" evidence of government waste, fraud, and abuse—a standard not found in any statute. Another questionable decision, he notes, allows the government to avoid liability by not firing a whistleblower, but instead, revoking his or her security clearance as retaliation for properly reporting misconduct to authorities or Congress.

Akaka backs up Leahy's contentions, alleging that the Federal Circuit continues to disregard clear statutory language. According to Akaka, among the judicially created exceptions that are contrary to legislative intent are disclosures made to supervisors, disclosures made to possible wrongdoers, and disclosures made as part of an employee's job duties.

"There is significant history defining congressional intent with respect to ensuring that federal whistleblowers are protected from retaliatory measures," Akaka points out. "Unfortunately, since its enactment in 1989, the Federal Circuit has failed to respect congressional intent."

December 2002

At the Federal Level, the Virtual Workplace Is a 'Work in Progress'

By Steven J. Storts
Dublin, Ohio

THE concept of virtual teams—a network of employees who work from their homes or other locations—has been somewhat sluggish in gaining favor within federal government, particularly among agency managers and supervisors. Still, information technology consultants estimate that nearly 25,000 federal employees are "telecommuting" to some extent between home and work.

With early federal leaders in the virtual workplace such as the General Services Administration; the U.S. Departments of Agriculture, Defense, Energy, Interior, and Treasury; and the U.S. Environmental Protection Agency, why is the acceptance of new IT trends still lagging in the public sector?

Management consultants cite one of the main obstacles as telecommuting itself. Some of the basic concerns include whether employees will work too much or not enough, whether work should be measured in hours or in output, and whether telecommuting actually means "less managing."

Personnel policies are another major concern in establishing virtual teams, notes *Government Executive* magazine. Managers are often unclear about how much supervision they need to provide, how work should be rewarded, and how they should lead virtual teams.

Despite these doubts, though, IT consultants emphasize that telecommuting can enable productivity, save overhead costs, and be a good recruiting tool for a future workforce.

However, *Government Executive* points out that federal managers who want to take advantage of a networked world must adapt to the idea of supervising virtual teams, but in order to set up such teams, managers must adapt to new ideas of the workplace. The payoff, the magazine reports, is worth the investment, according to two federal executives who have made virtual teaming work at their agencies.

At the U.S. Army Materiel Command, the key to success is to measure and reward employees for products and services they deliver, says James Buckner, the agency's chief information officer. "Workers should focus on product delivery, versus hour delivery," he emphasizes.

Leadership skills, as always, are important, Buckner adds, but they take on a new meaning with virtual teams. "Leading by example is not as effective in the virtual environment," he explains. "You've got to apply mentoring skills across the wires."

Robert Whiting, deputy director of human resources at the U.S. Agriculture Department, says that his agency is familiar with the unique personnel issues raised by virtual teams. At USDA's National Plant Data Center, for example, 90% of interaction is via teleconferencing, e-mail, and videoconferencing. "Some of the team members have never met actually each other in person," he notes.

At USDA, clear goals and measures of success for teams are established before they begin their work, and the goals are very specific about what the teams will accomplish, Whiting explains, adding that early legwork helps avoid frustration later on.

"The bottom line is that virtual teaming is happening," observes Buckner. "You can get productivity gains if it is carefully monitored and tracked."

Apparently, some federal lawmakers are also in agreement with Buckner and Whiting. Rep. Frank Wolf (R-Va.) introduced legislation last July—the National Telecommuting and Air Quality Act—that included a proposal to develop a telecommuting pilot program in several major metropolitan regions to help reduce traffic congestion, improve air quality, and provide financial incentives to participating companies and employees.

The bill, H.R. 2556, was signed into law in December as part of the Department of Transportation and Related Agencies Appropriations Act. Major metropolitan areas selected for the telecommuting pilot program include Chicago, Houston, Los Angeles, Philadelphia, and Washington, D.C.

Other companion legislation, H.R. 3819 and S. 2431, has been introduced by Rep. Wolf and Sen. Rick Santorum (R-Pa.), respectively, that would establish tax credits for expenses paid or incurred under teleworking arrangements for furnishings and electronic information equipment that are used to enable employees to telework. Under the Telework Tax Incentive Act, employees would be required to telework at least 75 days per year in order to qualify for the tax credit.

November 2000

Federal Safety Engineer Sheds Light On Whistleblowing 'Nightmare'

By Steven J. Storts
Dublin, Ohio

WITH seven federal laws on the books to protect whistleblowers, employed professionals should not be reluctant to report ethics violations or criminal activity, nor fear reprisals. Right? Well, before answering, you may first want to discuss the matter with safety engineer Joe Carson, P.E., of West Knoxville, Tennessee.

Carson considers himself an "unprecedented prevailing whistleblower" in the U.S. Department of Energy. He describes his professional role of trying to protect the health and safety of workers at DOE's Oak Ridge (Tennessee) nuclear weapons complex for much of the last decade as "a living nightmare."

Since 1990, Carson has worked as a nuclear safety assessor for DOE facilities, including the Oak Ridge National Laboratory and the Oak Ridge Y-12 Plant. The agency's vital missions at Oak Ridge, according to Carson, include the sole responsibility for the safety and security of America's nuclear weapons stockpile and weapons material.

Additionally, he says, the agency is responsible for the safe cleanup and disposal of the radioactive and hazardous waste it generated during the Cold War. "This is the most expensive environmental cleanup project in history," Carson notes, "estimated to cost about $200 billion. Because DOE is exempt from outside regulators, it is crucial that DOE's safety professionals perform their responsibilities accountably, competently, and ethically."

However, Carson says his experiences in DOE as "an assessor, witness, and victim of a gross breakdown of the self-regulating aspect of DOE's health and safety program are profoundly disturbing." He points out that the agency's health and safety programs impact more than 120,000 federal workers and contractor employees in addition to the millions of people who reside and work near DOE sites.

The safety professions are largely self-regulating, based on a "strict honor code," Carson explains. By that code, he says, safety professionals are required to report knowledge of ethical violations by other safety professionals to the appropriate authority. He also emphasizes that safety professionals are required to inform the appropriate officials, employees, or the public when their judgment is overruled in matters involving worker and public safety.

"The professional opinions I express, and the career risks I incur in stating them, are based on my understanding of my professional duty," Carson stated in a recent editorial column in *The Oak Ridger*, where he alleged that DOE's accident investigation of a chemical explosion at the Oak Ridge Y-12 Plant clearly showed gross negligence and incompetence on the part of the safety professionals and technicians involved at the facility.

"In my professional opinion," Carson said, "DOE does not want knowledge of blameworthy behavior on the part of DOE safety professionals to be properly referred to the appropriate professional body." He concluded that the agency's policy is not in harmony with the code of ethics of the safety professions, emphasizing that he reported his concerns to DOE supervisors but received no response.

During the 1990s, Carson further alleged that at least two workplace-related fatalities at the Oak Ridge facilities—a waste handler who was crushed because of an illegally rigged hoisting apparatus and a welder who caught fire and burned to death for lack of a simple "fire watch"—could be linked to the suppression of his related safety findings.

Moreover, Carson says he's also identified numerous safety violations at DOE's Brookhaven National Laboratory in Long Island, New York, some of which contributed to a nuclear reactor fire, he claims. But, he points out that these findings, too, have been suppressed by his managers or supervisors.

"They [DOE safety professionals] don't want people to get hurt," Carson contends. "But they are not willing to risk their jobs for the sake of professional duty to see that workers or the public don't get hurt. That's the ugly truth, and it needs to be clearly stated and accepted, if it's to change."

Carson has more than 20 years experience in nuclear energy—six years as a U.S. Naval officer aboard nuclear submarines, seven years as an engineer at three different commercial nuclear power plants, and nine years in DOE as a nuclear safety assessor. In 1991, one year after joining DOE ranks, he voiced concerns about contract procurement methods within the agency. Since then, Carson says he's been "singled-out," confronting reprisal that has included:

- Stripping his job responsibilities to conduct safety inspections in DOE facilities;
- Suppressing many of his valid and significant safety findings;
- Isolating him in a small windowless office and refusing to give him job assignments;
- Attempting to revoke his "Q" security clearance in order to fire him; and
- Circulating false rumors that he is a violent man and a workplace threat.

In summary, Carson claims to have filed more than 20 disclosures about safety conditions at Oak Ridge and other DOE facilities—actions that have prompted conscious reprisals against him, he says. In December 1997, he was told that he must relocate from Oak Ridge to DOE headquarters in Germantown, Maryland, by March 2, 1998 (later extended to June 30, 1998), or be fired. In response, Carson filed a federal lawsuit against DOE for his "directed reassignment" to Maryland and earlier reprisals and sought a preliminary injunction to stay his relocation.

Prior to his filing the lawsuit, however, Carson prevailed in his first whistleblower reprisal appeal against DOE when the Merit Systems Protection Board found DOE in "material breach" with an earlier February 1994 settlement agreement. According to Carson's "petition for enforcement" that was filed in September 1996, DOE not only failed to uphold the 1994 settlement agreement, but failed to honor then DOE Secretary Hazel O'Leary's promise of "zero tolerance for reprisal" that was made in November 1993 in Carson's presence.

Carson was finally vindicated April 29, 1999, when a MSPB administrative judge ruled in his favor and ordered DOE to return Carson's responsibilities as a nuclear safety inspector. When the decision was handed down, Carson's job duties had been downgraded to preparing training materials for DOE.

MSPB Judge Stuart Miller found that Carson had been punished by the agency for alleging fraud, dangers to public health and safety, and other violations at the Oak Ridge facilities. He further ruled that DOE should retract a letter admonishing Carson for his behavior and cancel an assignment that would have transferred him to agency headquarters against his wishes.

DOE was given a June 2, 1999, deadline to reinstate Carson or appeal Miller's decision to the full MSPB in Washington, D.C. On June 2, the agency filed a "petition for review." For Carson, the nightmare still lives.

June 2000