United States Environmental Protection Agency

Key Features in Action

The Water Sector has developed the Key Features of an Active and Effective Protective Program (Key Features) to assist owners and operators of drinking water and wastewater utilities in preventing, detecting, responding to, and recovering from adverse effects of all hazards, including terrorist attacks and natural disasters. The Key Features describe the basic elements of a "protective program" for utility owners/operators to consider as they develop utility-specific approaches.

PURPOSE

The Environmental Protection Agency (EPA) conducted two Key Features case studies in the spring of 2010:

- New England Utility Case Study
- Mid-Atlantic Utility Case Study

These case studies build on previous Key Features case studies, but are smaller in scope.

The objectives of the case studies were to:

- Document how drinking water and wastewater utilities have successfully incorporated one or more of the Key Features into their operations.
- Provide examples of specific protective practices that can be replicated by other drinking water and wastewater utilities.
- Highlight benefits to utilities of implementing the Key Features.

CASE STUDY METHODOLOGY

EPA developed a questionnaire with questions related to the 10 Key Features. EPA contacted the utilities to invite them to participate in the case study and subsequently met with the utility staff to conduct interviews.

The Key Features

1. Integrate protective concepts into organizational culture, leadership, and daily operations
2. Identify and support protective program priorities, resources, and utility-specific measures
3. Employ protocols for detection of contamination
4. Assess risks and review vulnerability assessments (VAs)
5. Establish facility and information access control
6. Incorporate resiliency concepts into physical infrastructure
7. Prepare, test, and update emergency response and business continuity plans
8. Develop partnerships with first responders, managers of critical interdependent infrastructure, other utilities, and response organizations
9. Develop and implement internal and external communication strategies
10. Monitor incidents and threat-level information

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New England Utility Case Study

The utility interviewed in the New England Area Utility Case Study is a large community water system as defined by the Public Health and Bioterrorism Preparedness and Response Act of 2002 (serving a population of 100,000 or more). An average of 67 million gallons per day (MGD) is consumed by the cities and towns it serves. The water supply is comprised of a series of surface water reservoirs, including one primary reservoir with 90 percent of the utility's total combined capacity.

Highlights of Key Features Implemented

FEATURE 2. Identify and support protective program priorities, resources, and utility-specific measures: The utility uses strategic planning to identify protective program priorities, which includes review of performance measures that assess security effectiveness. Priorities are then funded through a separate budget for security and emergency management. The utility has been systematically replacing its aging infrastructure and making security improvements. Improvements have been funded through a series of small annual rate hikes, instead of borrowing or deferring rate increases. The utility has also received two Department of Homeland Security Urban Area Security Initiative (UASI) grants, which were used for upgrades to video cameras, emergency testing equipment, a radiological testing kit, and interoperable communications equipment to link utility staff with state and local first responders.

FEATURE 5. Establish facility and information access control: The utility has established facility and information access controls and is preparing to install a new security system. The security system will include hardening of assets, motion detectors, enhanced video surveillance and relocated security room and servers. The security system under consideration has an internet backbone; managers would have remote access and all remote facilities would have video monitoring capability. Additionally, the utility controls 95 percent of the land surrounding the reservoir and prohibits public access to the watershed. Security patrols monitor the watershed for trespassers and a system of monetary fines has been implemented for violators.

FEATURE 7. Prepare, test and update emergency response, recovery and business continuity plans: The utility has prepared, tested and updated its emergency response, recovery and business continuity plans. Approximately 85 percent of all employees have had Water Sector Incident Command System (ICS) 100/800 training. All managers will go through the ICS 400 training by the end of 2010. The utility has also participated in several water security tabletop and field exercises. Additionally, the utility has recently reviewed its Emergency Response Plan; which is National Incident Management System (NIMS) compliant; and its Water Supply Plan, Business Continuity Plan, and Dam Action Plan. The utility's overall goal is to simplify the plans and integrate them into one comprehensive document – an all hazards plan that will be NIMS compliant.

BENEFITS

- ICS/NIMS training has drawn attention to the fact that utilities are first responders and need the training and equipment to support this function.
- The utility's security initiatives have made their employees more aware of safety and security. Employees are better informed, more observant of outside activities, and more sensitive to potential consequences of their actions.

ISSUES/CHALLENGES

The utility felt the impact of substantial lost revenue due to lower consumption during the recent recession. It has lessened the impacts with rate increases and grant funding.

The utility is working to address the challenges of interstate mutual aid. This is a particularly important issue in New England where the states are small and the infrastructure is often interconnected.

The utility believes that security and emergency management should be approached from an all hazards standpoint, instead of being based solely on malevolent acts. Protective programs need to be tailored to specific regional issues, such as flooding and hurricanes in New England.

FEATURE 8. Develop partnerships with first responders, managers of critical infrastructure, other utilities and response organizations: The utility is a member of its state Water/Wastewater Agency Response Network (WARN). The utility has not had to use the WARN, to date, though it offered assistance to a nearby county that had an incident. The state WARN has completed one tabletop exercise, and is considering setting up response teams within WARN to do initial screening and evaluations for situation reports. The utility also interacts with critical customers and interdependent infrastructures. The transmission and distribution staff communicate with the local health sector, including hospitals and dialysis centers, and have meetings with wholesale customers to keep them informed of utility activities.

Mid-Atlantic Utility Case Study

The utility interviewed in the Mid-Atlantic Utility Case Study is a medium community water system as defined by the Public Health and Bioterrorism Preparedness and Response Act of 2002 (serving a population of 50,000 or more, but less than 100,000). The utility is part of the county government and provides an average of 10 MGD to the county and city it serves. Drinking water is supplied by drinking water reservoirs and intakes on area rivers.

Highlights of Key Features Implemented

FEATURE 2. Identify and support protective program priorities, resources, and utility-specific measures: Water security is funded by one line item in the locality's Capital Improvement Plan (CIP). The utility finances aging infrastructure improvements and security upgrades through the CIP. Projects are funded according to the priorities identified in the utility's Vulnerability Assessment (VA). The utility also conducts Strategic Planning Exercises with a security component. Major capital improvement projects are primarily bond-funded, while maintenance and operations are funded by water/sewer rates and fees.

FEATURE 6. Incorporate resiliency concepts into physical infrastructure: The utility has taken several measures to incorporate resiliency concepts into its physical infrastructure. The utility conducted an assessment of critical points of failure and provided redundancy in the system for those points. There is also redundancy built into the drinking water and wastewater systems, and all new infrastructure is analyzed to assess redundancy. There is extra capacity at the treatment facilities that could be utilized if there were a disruption in operations at another facility. The utility also has interconnections with an adjacent county, which increases resiliency.

FEATURE 8. Develop partnerships with first responders, managers of critical infrastructure, other utilities and response organizations: The county has signed a multi-jurisdictional agreement with an adjacent county and city to provide water and emergency assistance for drinking water and wastewater. The main purpose of the agreement was to set water rates, however it also serves an emergency preparedness purpose. The utility meets annually with the other jurisdictions to discuss the agreement. They also exercise the interconnections with the other jurisdictions monthly to ensure they are working properly. During a two-year drought, the county utilized the multi-jurisdictional agreement to provide water to the adjacent county. *continued on page 4*

BENEFITS

- Dedicated funding has allowed the utility to make necessary security improvements.
- Addition of security cameras has helped to eliminate vandalism and the audio on the cameras has assisted in maintenance of pump stations.
- Employee accountability has increased with the addition of security cameras.
- Redundancy in the system has reduced service disruptions.
- Utility's multi-jurisdictional agreement increases system redundancy and improves emergency response time.

ISSUES/CHALLENGES

The utility has considered using online continuous monitoring devices, but struggled with placement and reliability of the devices.

FEATURE 8...continued from page 3

The utility also developed partnerships with first responders, managers of critical infrastructure, and response organizations. It maintains close working relationships with other critical infrastructure partners, including electrical utilities, oil suppliers and chemical suppliers. The utility has also established relationships with the local hospital and local dialysis centers. A system is in place to alert major water users in the event of a water emergency. Through Table Top Exercises, the utility has also established a relationship with the state Department of Emergency Management and the Federal Bureau of Investigation Emergency Response Team.

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CONCLUSION

The New England Utility and Mid-Atlantic Utility Case Studies highlighted several of the Key Features that are critical to protective program success:

- Assess program priorities / critical points of failure (Feature 2)
- Fund identified priorities (Feature 2)
  - Ensure that there is a dedicated source of funding for the protective program
  - Apply for grants to assist in funding security improvements
- Build resiliency into the system where vulnerabilities are noted (Feature 6)
- Develop partnerships with critical customers and interdependent sectors (Feature 8)
- Exercise Emergency Response Plans with partners to ensure efficient coordination during an emergency situation (Feature 7)

These case studies also emphasized the importance of utilities approaching security and emergency management from an all hazards standpoint, tailoring the protective program to specific regional issues.

There are many benefits of implementing the Key Features into daily operations including, for example:

- Increased protection of public health
- Ability to more quickly detect, respond to, and recover from any adverse event
- Increased access to resources during an emergency through mutual aid and assistance
- Better coordination among all levels of government and emergency responders
- Improved public confidence in drinking water and wastewater systems
- Better understanding of the interdependencies between the water sector and other critical infrastructure sectors
- Enhanced water security capabilities and infrastructure protection

Additional Information: For more information on the Key Features of an Active and Effective Protective Program please visit: **http://water.epa.gov/infrastructure/watersecurity/index.cfm** or contact: **WSD-outreach@epa.gov**