

National Drinking Water Advisory Council Water Security Working Group

January 25–27 2005 Meeting Summary

The Water Security Working Group (WSWG) of the National Drinking Water Advisory Council (NDWAC) held its fourth in-person meeting in Phoenix, AZ, January 25–27, 2005. Mr. David Binning and Dr. Rebecca Head, the WSWG co-chairs, opened the meeting at 2:30 PM MT on January 25, 2004. The meeting ended at 2:15 PM MT on January 27, 2004. Marc Santora, the designated federal officer for the WSWG for the Environmental Protection Agency (EPA), was present. WSWG members Gregg Grunenfelder, Bud Schardein, and Diane VanDe Hei were unable to attend. Bridgett O’Grady served as an alternate for Mr. Grunenfelder. Mr. Schardein and Ms. VanDe Hei did not send alternates. WSWG member Doug Anderton arrived late and was not present January 25, 2005. WSWG members John Young and John Betkoski left early and were not present January 27, 2005.

Federal partners present were David Travers from EPA and Tim Mukoda from the Department of Defense (Major. Mukoda was not present January 25, 2005). Jasper Welsch from the Mississippi Department of Emergency Management was present as an identified outside expert to the WSWG. Dan Rees from SyenTech Inc. was present as an identified outside expert to the WSWG on January 26 and 27, 2005 only. The meeting was facilitated by Rob Greenwood and Elizabeth McManus from Ross & Associates Environmental Consulting, Ltd. (Ross & Associates), the support contractor for the WSWG.

The mission of the WSWG is to provide findings and recommendations to the NDWAC that:

- (1) identify, compile, and characterize best security practices and policies for drinking water and wastewater utilities, and provide an approach for considering and adopting these practices and policies at a utility level;
- (2) consider mechanisms to provide recognition and incentives that facilitate a broad and receptive response among the water sector to implement these best security practices and policies, and make recommendations as appropriate; and
- (3) consider mechanisms to measure the extent of implementation of these best security practices and policies, identify the impediments to their implementation, and make recommendations as appropriate.

The WSWG had three objectives for their January meeting.

- Review and converge around a framework for security program measures so that draft recommendations can be developed for Group consideration.
- Review and stabilize draft recommendations on incentives.
- Receive comments from the public.

The WSWG meeting was open to the public.

This document provides a summary of key areas of WSWG discussion, tentative areas of agreement, and next steps. The summary is organized by key discussion topic area and synthesizes conversations that occurred throughout the three days. The meeting agenda and

non-draft meeting materials are available through the WSWG website at <http://www.epa.gov/safewater/ndwac/council.html>.

A draft of this document was distributed to the members of the Working Group for comment, and comments were incorporated. Changes made in response to comments from WSWG members clarified the discussion of potential aggregate measures of security, added the idea of achieving better insurance ratings to the list of possible incentives, and fixed typos and made other clarifications. The meeting summary was also revised to reflect a change in the date of the final WSWG meeting and related schedule changes.

Attributes of a “Good” Measure

The third part of the mission given the WSWG by the NDWAC is to “consider mechanisms to measure the extent of implementation of these best security practices and policies, identify the impediments to their implementation, and make recommendations as appropriate.” The WSWG began the discussion of measures at the January meeting by describing attributes of a “good” measure. The WSWG identified eight attributes of good measures.

- *Objective.* More objective (less subjective) items make better measures.
- *Measurable.* Items that can be measured by standard, accepted methods or devices, with standard units of measure, are better.
- *Defined.* Items that use standard, well understood definitions of key terms make better measures.
- *Trackable.* Items that measure changes in performance that can be tracked over time against a stable baseline make better measures.
- *Relevant/useful.* Items that are relevant and useful to the utility owners and operators who are expected to gather and use measurement data make better measures.
- *Specific.* The more specific the item being measured, the better.
- *Communicable/understandable.* Items that can be easily communicated and understood within a utility and to external partners and the public make better measures.
- *Generalizable/comparable.*

The WSWG discussed the attributes of good measures as broad indicators or preferences, rather than strict criteria. The Group recognized and was comfortable that (1) there is considerable overlap among attributes, and (2) not all measures described or recommended by the Group will exhibit all attributes of good measures. The attributes of good measures are considerations that the Group will use in identifying, describing, and recommending measures; however the Group may describe or recommend measures that do not exhibit all the attributes of good measures.

Strict Comparability and Quantification Not Necessary

The WSWG discussed use of common measures and comparability of measures results across water and wastewater utilities. The Group also discussed the ability to quantify measures results. The Group determined that, in general, strict comparability of measures results across water and wastewater utilities and strict quantification are not possible or necessary at this time. This is consistent with the Group’s early agreement that “one size does not fit all” and recognition that utilities will develop specific security program approaches and tactics that are appropriate to individual utility circumstances and operating conditions.

The Group discussed examples of other industries that have developed strict comparability across installations and strict quantification ability, in particular the nuclear power industry. From this discussion, the Group identified a number of commonalities that are required to support strict comparability, these include the following.

- Well defined and documented quantitative methodology for risks and benefits.
- Well defined scope of analysis that is standardized to include assets to be evaluated, level of detail, and standard evaluation parameters.
- Agreed-upon set of “initiating events” (i.e., design basis threats) including probability of occurrence.
- Agreed-upon database of security system reliabilities and probability of failures (or standard means of calculating reliabilities and probably of failures) for security protection devices for each specific threat.
- Agreed-upon method for calculating and quantifying consequences.
- Common, agreed-upon “outcome measures.” In nuclear power plants, the most frequently used outcome is “core damage frequency per year.” For water and wastewater utilities there are multiple outcomes of interest in water and wastewater utilities that make this challenging.

The WSWG agreed that, at this point, the water and wastewater utility sector is sufficiently diverse as to make development of these commonalties unnecessary. The Group was very comfortable with the notion that, consistent with the recommended features of an active and effective security program, individual utilities will develop utility-specific security program approaches, tactics, and measures that are appropriate to individual utility circumstances and operating conditions and that this reliance on utility-specific approaches will preclude strict comparability or quantification across utilities.

Measures a Necessary Part of an Active and Effective Security Program

While the WSWG was comfortable that strict comparability or quantification of measures across utilities is not necessary, the Group does agree that, as part of an active and effective security program, water and wastewater utilities should develop utility-specific measures that they can use to understand and track progress, activities, and achievement. The Group discussed that each utility should develop measures that are appropriate to its circumstances and operating conditions and that reflect the specific security approaches and tactics the utility has chosen. Although each utility’s measures will be different, just as each utility’s specific security approaches and tactics will be different, the WSWG discussed a number of types of activities and achievements that utilities should measure as part of active and effective security programs.

- *Existence of program policies and procedures.* The WSWG anticipates that as part of their specific security approaches and tactics, most, if not all, utilities will choose to develop some policies and procedures related to security. For example, as part of developing an explicit, visible commitment to security (recommended program feature #1), many utilities may choose to develop an overarching security policy. As part of intrusion detection and access controls (recommended program feature #6), many utilities may choose to develop employee identification procedures and visitor identification procedures and access limitations. Where utilities have chosen to develop policies and procedures as part of their specific security program approaches or tactics, the existence of these policies and procedures should be measured as part of implementing an active and effective security program.

- *Training.* The WSWG anticipates that training on security approaches and tactics will be part of most, if not all, utility security programs. Where security-related training is planned, utilities should measure whether the training has been carried out as planned as part of implementing an active and effective security program.
- *Testing.* As a complement to measuring where security-related policies and procedures are in place, utilities that choose to develop policies and procedures as part of their specific security approaches and tactics should test and measure whether staff (including contractors) are operating consistently with established security-related policies and procedures.
- *Implementing schedules and plans.* As part of developing an active and effective security program, individual utilities will develop utility-specific schedules and plans. For example, utilities will develop schedules and plans for carrying out regular updates to assessments of vulnerabilities (recommended feature #3) and emergency response plans (recommended feature #11). Where these schedules and plans are in place, utilities should measure whether they carry out updates in accordance with schedules and plans.

Third-Party Assessment and Self Assessment

The WSWG discussed how and by whom measures would be used, and who would be responsible for measurement. The Group considered a third-party assessment measurement model, where a neutral third-party or auditor would be responsible for evaluating utilities' security program performance and measuring the extent to which active and effective security programs are in place. In particular, the Group discussed whether third-party assessment would be necessary to bring about any of the responses to active and effective security programs that the Group might hope to encourage. For example, the Group discussed that if financial markets were to respond to an active and effective security program by lowering insurance rates, it might be necessary to have independent verification that an active and effective security program is in place. The Group also discussed that independent verification might serve to provide further assurance of industry performance and thus decrease any pressure for security regulation.

After discussion, the WSWG rejected the notion of a third-party assessment in favor of reliance on utility self assessment. The Group prefers self assessment for a number of reasons. For example, because of the variability of utility-specific security approaches and tactics that will be developed, the type of standardization necessary to support third-party assessment or auditing likely will not be available. Given the diversity of security approaches that will exist in the sector, the Group believes that individual utilities are best equipped to truly understand their progress towards implementing an active and effective security program. The Group was not convinced that any benefits that third-party assessment or verification might have the potential to bring about relative to incentives, or confidence that it might provide relative to regulations, were sufficient to justify the difficulties and resources that would be needed to establish a third-party assessment or verification program.

While the WSWG rejected the notion of third-party assessment and verification, they did see promise in the idea of peer review and assistance. The Group discussed the successful peer review and assistance program that is currently in place to help rural utilities in Georgia and some other areas prepare for sanitary surveys and agreed that this type of peer-based approach might be extended to security as a way to help utilities develop active and effective security programs and document that such programs are in place.

Types of Measures to Recommend

From their deliberations on attributes of good measures, comparability, quantification, and assessment, the WSWG agreed on three types of measures to recommend.

First, the Group will develop a list of examples of good measures of activity and/or achievement relative to each feature of an active and effective security program and recommend that utilities consider these examples as they develop utility-specific measures.

Second, the Group will develop a number of particular measures that address critical needs and apply regardless of utility size or circumstance that they will recommend all utilities put in place. These recommended measures might be feature related, or might cut across features to address overall achievements of active and effective security programs.

Third, the Group will develop measures that can be aggregated to indicate something about security progress within the sector at a national level. These measures may be feature related, or might cut across features to address overall program achievement.

Examples of Measures Related to Features of an Active and Effective Security Program

The Group is continuing to work with and refine the lists of example measures related to features of an active and effective security program. Significant progress was made in refining these possible measures at the January meeting. The current list is attached as attachment _____. The Group agreed that Ross & Associates will develop draft recommendations on example measures as part of preparing the next draft of the WSWG report.

Measures Utilities Should Use

The WSWG considered, but did not fully resolve, identifying specific measures (either feature related or cross cutting) that all utilities should use because they address critical needs and apply regardless of utility size or circumstance. The Group discussed identification of measure that all utilities should use in the context of the types of activities and achievements that utilities should measure: policies and procedures in place, training, testing, and updating. (The WSWG's deliberations on these activities and achievement are described more fully earlier in this document.) The Group created a task team to follow up on this issue by identifying specific measures that utilities should use.

Aggregate Measures of National Progress

The WSWG began to converge around three aggregate measures or measure of national progress as follows.

- (1) Measurement of the number of utilities that have, based on self assessment, put in place an active and effective security program. The Group discussed measuring, on a utility-by-utility basis, whether all the features of an active and effective security program have been addressed, and aggregating utility-specific achievement as an indication of the performance of the sector overall.
- (2) Measurement of, based on the results of assessments of vulnerability, the percent of identified high-priority security improvements that have been resolved, the percent that are being resolved, and the percent that have not yet been started. The Group discussed that one of the outcomes of an assessment of vulnerabilities, and a common feature of active and effective security programs, is a list of high-priority security

improvements. These lists of high-priority security improvements are utility specific, based on individual utilities' unique circumstances and operating conditions. The Group discussed measuring, on a utility-by-utility basis, the number and percentage of high-priority security improvements that have been resolved, the number in progress, and the number not yet addressed, and aggregating these achievements could provide an indication of overall security risk reduction within the utility sector. The Group discussed that this measure of progress would need to be made against a baseline measure of the number of high-priority security improvements that each utility identifies (for itself) as needed, and that the baseline would need periodic adjustment (the Group discussed once every three to five years) as vulnerabilities are reassessed over time. This could yield, a measure of the number or percentage of high-priority security improvements that are addressed against a baseline need. The Group also discussed, but did not resolve, how to address shifts in the baseline of identified security priorities that likely will occur as utilities reassess their vulnerabilities on a periodic basis.

- (3) Measure of the number of people living in and/or the area of a hazardous chemical release vulnerability zone. The Group discussed this as a measure of overall sector performance that could be based on existing data submitted by regulated utilities under the Clean Air Act, and of the need to ensure that the overall measure could not be disaggregated to individual utilities, since such utility-specific information could create a potential target for attack. The group took note that even though a utility was making progress reducing the potential for hazardous releases, this measure could reflect a deteriorating situation over which the utility has no control. If greater density of people move into a sparsely-populated area around the facility, this statistic could be used against the utility.

The Group created a task team to further refine these potential aggregate measures as needed, to identify and describe any additional aggregate measures, to consider how common methods to assess vulnerabilities (e.g., RAM-W, VSAT, and SEMS) could be used to create lists of high-priority security improvements, and to develop strategies for baselining, reporting, and otherwise gathering information relative to aggregate measures.

Discussion of Incentives

The WSWG continued their deliberations on the second part of their mission: recommendation on mechanisms to provide recognition and incentives that facilitate a broad and receptive response among the water sector to implement an active and effective security program. The WSWG again discussed incentives as ways to “motivate” utility owners and operators to implement security program enhancements.

The WSWG is beginning to converge around eleven security incentives.

- Emphasizing the potential negative consequences, including liability, of failing to adequately address security.
- Better insurance ratings delivered in recognition of active and effective security programs.
- Public recognition of superior security performance, and security-related performance awards.
- Technical assistance, including easy-to-use information on effective security program approaches and tactics; model and/or example policies, procedures, templates, and agreements; and verified information on the performance of various security-related

products and technologies, such as the type of verification provided through the environmental technology verification program.

- Financial support for implementation of security improvements.
- Awareness of the need for security and security costs in rate setting and utility oversight organizations.
- Access to needed security-related support, such as special joint incident command communication technologies and related communication band width.
- Availability of security-related collaborations and partnerships, such as the CALWARN network.
- Developing an active and effective security program and clear measures of performance as an industry standard to provide a clear goal for utilities and create a sense of due diligence.
- Support for joint table-top and other exercises to help foster testing of security approaches and tactics and to encourage closer connections with fire, public health, police, and other first responders.
- Peer review and assistance.
- Threat of regulation.

The WSWG rejected the notion that bond markets might react favorably to the presence of an active and effective security program by, for example, offering better bond ratings, and has removed those ideas from the incentives under consideration.

The WSWG discussed the idea of providing regulatory flexibility of some sort to utilities that implement active and effective security programs, but chose not to carry this idea forward because of the difficulty in linking existing regulations (which are largely water quality based) to security. The Group did converge around the idea that if security regulations ever were to be developed, providing appropriate regulatory flexibility to utilities who voluntarily develop active and effective security programs would be a significant incentive to program development.

The WSWG continues to have a diversity of views about the role that regulations might play. Some members support responsible regulations as a key incentive for security program enhancements. Other WSWG members are less comfortable with considering regulations and instead suggest that motivation should be as strong as possible, stopping just short of regulations. The WSWG continues to converge around the idea that the threat of regulation is a separate incentive from regulation, and might motivate the utility industry to voluntarily take actions to implement active and effective security programs in an effort to avoid, or lessen, state or federal mandates.

The WSWG was interested in the idea of peer review and assistance. In general the Group was supportive of the idea of peer review and assistance programs as providing incentives for utilities to adopt active and effective security programs and, under the right circumstances, providing a way to enhance measurement of security performance at individual utilities and across the water and wastewater sector.

The Group agreed that Ross & Associates would revise the draft recommendations on incentives and provide an updated draft to the WSWG for review. After the updated draft is provided, if necessary, a Task Team on incentives may be formed.

Review of Draft Security Program Recommendations for Fatal Flaws

The WSWG continues to converge around the draft recommendations on security programs and, in particular, the recommended features of an active and effective security program. While

the group identified a number of refinements and improvements to the draft recommendations and supporting text, no fatal flaws were identified. The Group agreed that Ross & Associates will revise the draft recommendations and supporting text in accordance with the Group's deliberations in January and will provide a revised draft to the WSWG for review. The Group further agreed that Ross & Associates may make efforts to coordinate and facilitate discussions between and among WSWG members as necessary to refine and resolve particular points in the draft recommendations and supporting text.

Update on the Water Sector Coordination Council and Coordination with the Council

Paul Bennett provided an update on the Water Sector Coordination Council (Council). The Council is made up of representatives of the utility sector. Each of the eight largest trade associations for water and wastewater utilities identified one staff person and two members, and these twenty-four representatives make up the Council. Mr. Bennett is vice-chair of the council. Mr. Gritzuk and Ms. VanDe Hei are members of the Council.

Because the Council has not met since the last WSWG meeting, the update focused on strategies for coordination with the Council. Because of timing issues, the WSWG emphasized the need for the Council to remain up-to-date on the Group's emerging recommendations and to provide input into the WSWG process through the three Council members who also serve on the WSWG. Mr. Bennett indicated that this coordination is ongoing and that, to date, the Council has identified no "red flags" in the WSWG's deliberations or emerging consensus. Mr. Bennett explained that the Council would be briefed on the WSWG's progress and emerging consensus at a February meeting. The WSWG also agreed that the Council and other interested parties would be provided with a draft of the WSWG report in mid-March, so that comments could be received in time for discussion at the final WSWG meeting in early April. The Council remains very supportive of the work of the WSWG.

Presentations to the WSWG

The WSWG considered two presentations during the January meeting. On January 26, 2005, Doug Anderton gave a presentation on the peer review and assistance program currently in place for rural utilities in Georgia and other locations, and on the possible relevance of this approach to security. January 27, 2005, Mike Gritzuk and his staff gave a presentation on the Phoenix Water Department security program, including a demonstration of remote reservoir intrusion detection capabilities.

Public Comment

Public comment was offered each day of the WSWG meeting.

On January 25, 2005, John Porco of Micheal Baker Corporation offered the comment that his company is working for DHS on a study of the state-of-the-art in water security. This study will examine four scenarios: damage to key components of a water system from the trusted insider threat; intentional contamination of a distribution system from an agent that has toxicity/morbidity impacts even in highly diluted concentrations; decontamination of significant portions of a distribution system because of contamination by a long-lived radiological isotope; and the challenge of post-event recertification of a water system. For each scenario, the project will examine the following:

- How effective are current measures against this threat, including detection, mitigation

measures, and decontamination?

- What level of physical, economic, or human damage might be inflicted on a system?
- What are the state-of-the-art emerging concepts for improved defenses against the threat?
- Can the threats be reduced through enhanced organizational or operational processes?
- Are there technical gaps in our ability to protect against these threats that can be addressed through research and development, and what are the optimal sources for this research and development?

Mr. Porco distributed a handout on the project and invited WSWG members to contact him with input for the project or ideas.

Also on January 25, 2005, Kevin Morley of the American Water Works Association offered the comment that successful approaches to contamination detection and monitoring should not focus exclusively on chemical detection and monitoring technologies, but instead should be nested in a detection and monitoring program that involves consideration of unusual water quality events, consumer complaints, and public health data. Mr. Morley referred to a recent conference on early warning systems and indicated that he would provide the report on this conference to the WSWG when it becomes available. Mr. Morley also advised that discussion of recommended feature #5 include a reference to Homeland Security Presidential Directive #5 and the National Incident Management System. Finally, Mr. Morley advised the WSWG in their consideration of measures to make an effort to link program measures back to the core threats, system failures, and adverse conditions that active and effective security programs are designed to prevent.

On January 26, 2005, Mr. Morley offered the comment that the WSWG should consider and come to consensus on whether their intention is to develop measures only for use by individual utilities, or whether they are developing measures for use by EPA or DHS on the national level (e.g., in support of the National Infrastructure Protection Plan). Mr. Morley indicated his belief that it is unlikely the same measures or measurement program could well serve both individual utilities and EPA and DHS. Mr. Morley expressed concern about WSWG discussion of using a program measure based on the percentage of identified high-priority security actions addressed, because it might not indicate legitimate security improvements if, for example, a utility focused on only the easy-to-implement, high-priority security actions, leaving the harder-to-implement and potentially more important actions unaddressed.

Also on January 26, 2005, Ed Thomas of the National Rural Water Association offered the comment that he agreed with Mr. Morley's concerns and advised the WSWG to consider a peer review and assistance program to both provide an incentive to utilities to implement and maintain active and effective security programs and as a way to measure and monitor security performance at individual utilities and across the sector.

On January 27, 2005, Mr. Morley expressed support for the WSWG's efforts to simplify their approaches to measures and again advised the Group to make an effort to link program measures back to the core threats, system failures, and adverse conditions that active and effective security programs are designed to prevent.

Schedule for Completion of WSWG Deliberations

The WSWG briefly reviewed a proposed schedule for completion of deliberations, as follows.

- February: task teams and drafting

- February 28: draft out to WSWG (*Revised proposal: March 2*)
- February 28–March 4: WSWG Review (1 week) (*Revised proposal: March 2 – 9*)
- March 4: comments due (*Revised proposal March 10*)
- March 4–14: revisions and incorporation of comments (10 days) (*Revised proposal March 10 – 18, 8 days*)
- March 15: draft out to WSWG and interested parties (2 weeks) (*Revised proposal March 18 – April 1*)
- March 29: comments due (*Revised proposal April 1*)
- (*Revised proposal: full-group conference call to discuss comments on or about April 5*)
- April 5: last WSWG meeting (*Revised proposal April 18*)

Note that after completion of the January WSWG meeting, the Group moved its final meeting to the week of April 18, and a slightly revised schedule was proposed. Revised schedule dates are noted in italics above.

Meeting Wrap-Up and Next Steps

Mr. Binning closed the WSWG meeting by reminding members that they were approaching the end of their deliberations and by reinforcing the need to seek common interests and consensus.

The following action items and next steps were identified during the meeting:

- Ross & Associates will revise the draft WSWG report to incorporate changes to the discussion of security, changes and additions to the draft recommendations on incentives, and development of draft recommendations on measures. Ross & Associates will provide a revised draft to the WSWG to review.
- Ross & Associates will organize meetings of two WSWG task teams to further discussion of measures. After the task team discussions, Ross & Associates will prepare draft recommendations on measures and provide the draft recommendations to the WSWG for review.
- Ross & Associates will revise draft recommendations and supporting text on security and incentives and provide an updated draft to the WSWG for review.
- Paul Bennett will give the Water Sector Coordinating Council a detailed briefing on the status of WSWG deliberations and the Group's emerging consensus and transmit any WSCC concerns to the WSWG.

The final WSWG meeting, scheduled for April 2005, will focus on reviewing comments on the draft WSWG report and finalizing the WSWG report. Opportunities for the WSWG to go into closed session will be provided for use if needed.

Closed Session

The WSWG found no issues at the January, 2005 meeting which they believed needed to be heard in closed session.

Attachments

Meeting Materials—Non-Draft Documents

- Attachment A: Meeting Agenda
- Attachment B: NDWAC Working Group Ground Rules
- Attachment C: WSWG Project Plan

- Attachment D: List of Measures
- Attachment E: Presentation of Doug Anderton, dated January 26, 2005
- Attachment F: Presentation of Mike Gritzuk, dated January 27, 2005

Meeting Attendance and Participation

- Attachment G: WSWG Roster and Contact List
- Attachment H: List of Others in Attendance