

Policy Issue
(Notation Vote)

August 20, 2014

SECY-14-0088

FOR: The Commissioners

FROM: Mark A. Satorius */RA/*
Executive Director for Operations

SUBJECT: PROPOSED OPTIONS TO ADDRESS LESSONS-LEARNED REVIEW
OF THE U.S. NUCLEAR REGULATORY COMMISSION'S
FORCE-ON-FORCE INSPECTION PROGRAM IN RESPONSE TO
STAFF REQUIREMENTS MEMORANDUM –
COMGEA/COMWCO-14-0001

PURPOSE:

To obtain Commission approval of proposed enhancements to the force-on-force (FOF) inspection program based on the lessons-learned review and the U.S. Nuclear Regulatory Commission (NRC) staff responses to the nine specific questions posed by the Commission in staff requirements memorandum (SRM) COMGEA/COMWCO-14-0001.

SUMMARY:

The NRC staff conducted a lessons-learned review of the NRC's FOF inspection program. The purpose of this review was to evaluate whether any adjustments are necessary to ensure that NRC-conducted FOF inspections accomplish intended objectives effectively, and whether the NRC's and licensee's efforts are focused on the most important issues to ensure safety and security at the sites.

While the lessons-learned review considered both nuclear power reactors and Category I fuel facilities, this paper focuses on the NRC security inspection program for nuclear power plants, consistent with the SRM. Based on the lessons-learned review, the staff found that the NRC's force-on-force program:

CONTACT: Patricia K. Holahan, NSIR/DSO
(301) 287-3664

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1. Is consistent with applicable statutory and regulatory requirements, including the Atomic Energy Act of 1954, as amended;
2. Is generally consistent with similar programs conducted by the Departments of Energy and Defense; and
3. Properly focuses NRC and licensee resources on the most important issues to ensure security and safety of the site.

The staff found that the current program has the necessary processes in place to evaluate and incorporate lessons-learned on an ongoing basis. The staff is taking action on issues identified during the lessons-learned review through established processes authorized by the Commission.

The detailed results of the lessons-learned review and the responses to each of the nine questions in the SRM are provided in Enclosure 1 to this paper. Based on the lessons-learned review, the NRC staff identified several options and recommendations for the Commission to consider for revising the NRC security inspection program. These options relate to composite adversary force (CAF) tactics, exercise realism, and unattended opening (UAO) requirements. The staff is also taking action on additional issues identified during the lessons-learned review through established processes, as previously authorized by the Commission. These actions include reducing the number of complex simulations, providing the opportunity for stakeholder input to the significance determination process (SDP), and clarifying compensatory measure requirements. The NRC staff is also evaluating guidance and training in exercise control and mission planning and guidance on insider information provided to the CAF. These areas do not require Commission action, and are undertaken through the FOF inspection program's existing revision and enhancement processes.

BACKGROUND:

The NRC's FOF inspection program has changed significantly since the commencement of the program over 30 years ago. The inspection program has always focused on ensuring that licensees can effectively protect their facilities from potential internal and external threats. The first FOF inspection program was the Regulatory Effectiveness Review Program, which was compliance-based and began in 1982. In 1991, the NRC transitioned from the Regulatory Effectiveness Review Program to the Operational Safeguards Response Evaluation (OSRE) Program. This performance-based inspection program focused more comprehensively on site security effectiveness.

Under the OSRE Program, the NRC planned to conduct evaluations at each nuclear power plant site every 8 years; however, several power reactor sites were not evaluated under this program. In July 2001, the Commission approved a staff recommendation to conduct a pilot of a new Security Performance Assessment Program, under which licensees would take a larger role in performing self-assessments of their security programs, and the NRC would evaluate licensee-conducted FOF exercises on a triennial basis. However, the NRC suspended both the OSRE Program and the pilot Security Performance Assessment Program following the September 11, 2001, terrorist attacks. This suspension was necessary to allow licensees to focus on meeting post-9/11 NRC requirements to enhance security measures at their facilities. After taking steps to ensure that the nuclear power reactor industry implemented measures to protect against the new threat environment, the NRC developed and implemented the current FOF inspection program in 2004.

The objective of the NRC's current FOF program, as required by Section 170D of the Atomic Energy Act of 1954, as amended by section 651 of the Energy Policy Act of 2005, is to conduct exercises that, to the maximum extent practicable, simulate security threats in accordance with the applicable NRC-established design basis threat (DBT). These exercises are designed to assess whether the private security force for a licensed facility has the ability to defend against those threats. The NRC's oversight ensures that licensees correct any performance deficiencies that adversely affect the ability of the licensee's security force to protect against the applicable DBT. For operating reactors, NRC-conducted FOF exercises are inspections within the security cornerstone of the NRC's Reactor Oversight Process (ROP). Security is one of the seven cornerstones that inform the NRC's assessment of licensee performance and associated regulatory response through baseline inspection and, if warranted, supplemental inspections. The objective of the security cornerstone is to ensure that the licensee's physical protection system can protect against the DBT of radiological sabotage. The ROP includes continuous improvement features and annual self-assessments, the results of which are documented and provided in annual Commission papers. These annual self-assessments have revealed the need for improvements to the NRC's inspection programs and associated SDPs, and many of those improvements have been incorporated into the security cornerstone since the ROP was implemented in 2000.

In addition to the annual self-assessments and other continuous improvement features of the ROP, the NRC reviews and assesses the FOF program during each triennial cycle to make the program more effective and efficient while ensuring that it continues to meet its objectives. Enhancements made to the program over the past 3 triennial inspection cycles, including those implemented at the beginning of the current cycle, have significantly increased the level of realism of NRC-conducted FOF exercises, while ensuring the safety of plant employees and the public.

Cycle 1 (November 2004 – December 2007) – During this first cycle, the staff worked closely with the industry to capture and resolve lessons learned from expanded table-top drills and pilot FOF exercises. For the first time, the FOF inspection program included the use of Multiple Integrated Laser Engagement System (MILES) equipment and a dedicated CAF to ensure a credible, well-trained, and consistent mock adversary force. The new program also included adversary actions that commenced in the owner controlled area rather than the protected area, increasing the realism of the FOF inspections. These actions allowed the protective force to engage the mock adversaries before they reached the protected area. During this first cycle, the NRC made several program adjustments in response to lessons learned, including developing general inspector guidance, developing and implementing an interim inspector qualification program, and hiring security specialists with specific skill sets suitable for conducting effective FOF inspections.

Cycle 2 (January 2008 – December 2010) – During the second cycle of the program, the NRC worked with licensees to address lessons learned from the first inspection cycle. Specifically, the NRC staff developed an appeals process for licensees to raise concerns about proposed scenarios and adversary actions, and developed and implemented a formal qualification program for inspectors implementing the FOF inspection program. The NRC staff also worked with industry to identify gaps related to exercise controller responsibilities and adversary tactics. To address these gaps, the Nuclear Energy Institute (NEI) developed NEI 05-05, "Controller Responsibilities Guidelines," and the NRC developed Addendum 5 to Inspection Procedure 71130.03, "Guidance Related to Contingency Response Force-on-Force Testing." Finally, the

NRC worked with industry to develop and implement an Executive Lessons-Learned Program, which began in September of 2010. These changes made the FOF program more stable and consistent, while it continued to meet its objectives.

Cycle 3 (January 2011 – December 2013) – During the 2011 ROP realignment, the staff identified additional opportunities to improve the flexibility, efficiency, and resource alignment of the FOF inspection program. The staff used the biennial ROP realignment as an opportunity to focus on security baseline inspection activities with respect to assessing exercise controller performance during licensee-conducted FOF exercises; the licensees' CAF training programs; and the licensees' performance evaluation programs, including the FOF critique process and the licensees' ability to identify and correct deficiencies.

The NRC staff developed and incorporated program threshold criteria into the FOF exercise assessment process in 2012. The program threshold criteria relate to the licensee's overall security performance and the effectiveness of its corrective action program. The NRC inspectors use these criteria to evaluate the licensee's overall physical protection program in addition to the licensee's performance in an FOF exercise. The FOF inspection evaluation is thus one input into the NRC's assessment of overall licensee performance, which the NRC communicates to licensee management, members of the public, and other stakeholders.

Finally, the NRC determined that guidance document NEI 11-02, "Change Management Plan – Evaluated Force-on-Force Exercises," was acceptable for use (Agencywide Documents Access and Management System (ADAMS) Accession No. ML120060212). This document describes an acceptable Change Management Process that ensures that adversary characteristics are within the DBT, safely controlled, and contribute to scenario realism.

Current FOF Inspection Cycle

The NRC implemented several changes in Cycle 4 of the FOF inspection program, which began in January 2014. These changes include:

1. Reducing the number of NRC-conducted FOF exercises from three exercises per inspection to two;
2. Eliminating the training exercise (commonly referred to as the beyond DBT exercise) from the NRC-conducted FOF inspection;
3. Expanding and enhancing the formal FOF exercise critique process (a previous area of concern, where the staff assessed that licensees should have a more robust critique process);
4. Adding an NRC inspection of licensee-conducted annual FOF exercises to the baseline inspection program; and
5. Revising the FOF SDP to expand the use of program threshold criteria in determining the final significance of FOF exercise findings.

Previously Planned Future Program Changes

Prior to the issuance of the January 2014 SRM, the NRC staff identified and began working on additional program changes for implementation in the next FOF inspection cycle, which begins in calendar year 2017. These planned program changes include:

1. Development of performance indicators related to the licensee's protective strategy;
2. Refinement of the formal self-critique process and expansion of the process to include licensee-conducted FOF exercises; and
3. Comprehensive review and revision of the SDP for the security baseline inspection program.

DISCUSSION:

The staff performed the SRM-directed FOF lessons-learned review and the development of its response to the SRM in two phases. Phase I was comprised of data collection and analysis regarding the history and implementation of the FOF program, including a literature review, the benchmarking of the NRC program against similar programs conducted by other Federal agencies, the assessment of international best practices, and the solicitation and review of stakeholder input. In Phase II, the staff analyzed the Phase I information and prepared Enclosure 1 to this paper, including detailed responses to each of the nine questions posed by the Commission for consideration in a lessons-learned review. Enclosure 1 is being withheld from public disclosure because it contains security-related information. Enclosure 2 contains internal budget information associated with the options and recommendations discussed below and, therefore, is also being withheld from public disclosure.

Stakeholder Perspectives on FOF Exercises

As part of the lessons-learned review, the NRC staff held a public meeting, including an open and closed session, on May 5, 2014, to discuss the FOF program and the questions posed by the Commission in the SRM. The Union of Concerned Scientists provided input during the open session of the meeting. They conveyed support for the NRC's current process for State and Congressional notifications and for the SDP. Additionally, the Union of Concern Scientists stated that all techniques and tactics that are consistent with the DBT and adversary characteristic should be considered valid and should be employed in NRC-conducted FOF exercises. They expressed concern that the NRC would consider including a cost/benefit consideration of tactics in FOF because there is neither a reason nor a mechanism to do so. The Union of Concerned Scientists also conveyed support for requiring that all deficiencies and vulnerabilities be immediately corrected before the NRC inspectors leave the site. Talisman International also provided input during the May 5, 2014, public meeting. Talisman International requested that the Commission issue a decision regarding FOF inspections for plants undergoing decommissioning and recommended that the NRC consider relaxing the requirements for UAOs.

NEI provided several comments during the closed session of the May 5, 2014, public meeting and expressed its intent to submit a letter to the Commission detailing their perspectives on the FOF program. By letter dated June 11, 2014, (ADAMS Accession No. ML14163A727) NEI outlined several points for the Commission to consider in evaluating the NRC staff's lessons-learned review. NEI expressed support for the Executive Lessons Learned Program and for the reduction in the number of NRC-conducted FOF exercises. NEI expressed the overarching concern that FOF exercises and scenarios are overly complex and, in some instances, exceed the DBT. To address this stated concern, NEI proposed that the Commission take two actions:

1. Establish a formal change control process that requires Commission approval for modifications to adversary tactics and techniques, similar to that used for modifications to the DBT and adversary characteristics, and
2. Direct the staff to focus the role of the U.S. Special Operations Command (USSOCOM) advisors on providing technical expertise on explosives and breaching.

NEI also requested that the Commission eliminate NRC-conducted FOF exercises entirely, and rely on NRC observation of licensee-conducted annual exercises to demonstrate that the site's protective strategy meets regulatory requirements.

NRC Lessons Learned

Through the Commission-directed lessons-learned review, the staff found that the FOF program is consistent with the NRC's statutory authority, NRC regulatory requirements, and associated guidance. The NRC staff found that the FOF program meets its stated objectives through performance-based inspection activities undertaken by the staff no less than once every 3 years. The review found that strong inspector training and qualification programs contribute to effective interactions between NRC inspectors and licensees. The NRC staff reviewed the results of multiple NRC-conducted FOF exercises and their associated scenarios and did not find any instance in which the mock adversary characteristics exceeded the applicable DBT.

As discussed in more detail in Enclosure 1, USSOCOM personnel support the NRC as advisors during FOF inspections. These advisors have the expertise to analyze the effectiveness of nuclear power plant and Category I fuel cycle facility physical security programs, physical protection systems, and the site security force's protective strategies. Additionally, USSOCOM advisors assist the NRC in ensuring that adversary capabilities demonstrated by the CAF during NRC-conducted FOF exercises are consistent with the applicable DBT. They also provide an independent evaluation of the CAF's performance. The expertise and training of senior USSOCOM advisory personnel is essential to the execution of the program and can be neither replicated nor maintained by the current NRC security inspection staff without implementing significant personnel and programmatic changes to the program framework. Therefore, the NRC staff does not consider NEI's recommendation to narrow the role of the USSOCOM advisors in NRC-conducted FOF exercises to be a viable option to improve the NRC's security inspection program. The NRC staff will continue to conduct regular refresher training with the NRC FOF inspectors and USSOCOM advisors on their roles and responsibilities in NRC-conducted FOF inspections.

The changes to the FOF program that have been implemented since 2004 demonstrate that the current program has the necessary processes in place to evaluate and incorporate lessons learned to continue to achieve effective and efficient program implementation. Insights from each inspection cycle inform future program enhancements, which are applied and refined over future inspection cycles.

Through the lessons-learned review, the NRC staff identified several areas for improvement to the program that can be addressed by the staff through established, Commission-approved processes:

1. In response to lessons-learned from Question 1 of the SRM, the staff will work with industry to identify and validate a mechanism, such as simulation software, to evaluate potential vulnerabilities that may be inappropriate for performance testing during an NRC-conducted FOF exercise;
2. In response to lessons-learned associated with Question 8 from the SRM, for example, the NRC staff will ensure that the industry and cleared stakeholders have the opportunity to provide input to planned revisions to the physical protection SDP for the baseline security inspection program; and
3. In developing the response to Question 9 of the SRM, the staff identified that licensees are applying immediate compensatory measures in cases where such measures are not required; to address this issue, the staff plans to issue a generic communication to clarify the NRC's expectations regarding the implementation of compensatory measures.

The NRC staff identified additional actions for program improvement based on insights from the lessons-learned review that are not tied to specific questions from the SRM, including guidance and training in mission planning and exercise control to improve the realism and effectiveness of both NRC- and licensee-conducted FOF exercises, and updates to the inspection procedure to provide flexibility and better guidance regarding the inside information provided to the CAF for NRC-conducted FOF exercises. The staff actions are discussed in more detail in Enclosure 1 and in the “Commitments” section of this paper. The NRC staff recommends no further action on lessons learned related to SRM Questions 2 and 3. Finally, the NRC staff identified options for the Commission to consider regarding the security inspection program related to SRM Questions 4 through 7. These options are discussed in more detail below.

Adversary Tactics

Questions 4 and 5 from the SRM relate to CAF tactics, knowledge, and capabilities. The tactics, techniques, and procedures (TTPs) that the CAF employs in NRC-conducted FOF exercises are areas of industry concern. Both NEI and the NRC staff agree that CAF TTPs could more effectively incorporate real-world threat information, as discussed in more detail in Enclosure 1.

The NRC staff has identified two options for Commission consideration to address adversary TTPs concerns, as follows.

TTP Option 1 - Require Commission review and approval of all CAF TTPs: NEI recommended that the Commission establish a formal change control process that would require Commission approval for modifications to adversary TTPs, similar to that used for modifications to the DBT. NEI stated that this process is required because TTPs are “de facto requirements that licensees are expected to defend against yet they are not clearly defined and currently exist outside of any formal regulatory framework.” The advantage of this option is that it would provide a formal framework and list of TTPs to be used in NRC-conducted FOF exercises. The disadvantage of this option is that it is neither efficient nor effective for the full Commission to vote on each TTP challenged as “new” by a licensee. The NRC staff believes that the Commission has defined adversary characteristics and tactics through the DBT, with additional information contained in Regulatory Guides 5.69 and 5.70 and, as discussed in Enclosure 1, the FOF program includes both formal and informal processes in place for licensees to raise concerns with specific TTPs. Licensees have used these processes to address their concerns with NRC-conducted FOF exercises and have acknowledged their effectiveness.

TTP Option 2 - Establish an NRC working group to determine how to better integrate knowledge of adversary training methodologies and actual attacks with the TTPs used by the NRC CAF: The proposed working group would consider analyses of unclassified and classified sources on terrorist training methods and actual attacks to better define adversary TTPs for NRC-conducted FOF exercises. The advantage of this option is that it would address concerns that the CAF is not acting in accordance with the DBT and, depending on the working group’s analyses, may increase the CAF capabilities in some areas while reducing them in others. The disadvantage of this option is that it would require additional NRC resources to implement. The NRC staff recommends this option.

Exercise Realism and Reduction of Timeouts

Question 6 from the SRM relates to the realism of NRC-conducted FOF exercises and the number of exercise timeouts. The NRC staff assesses that the most significant challenges to exercise realism come from a lack of standardized controller guidance and training, and from unplanned timeouts caused by MILES software errors introduced by a 2010 modification to the MILES equipment (discussed in more detail in Enclosure 1). The NRC staff is working to develop standardized controller guidance and training to improve the realism of NRC-conducted FOF exercises and to reduce the number of exercise timeouts; thus, the staff does not believe

that Commission action is needed to improve controller guidance and training. The staff identified two options for Commission consideration to address the realism of NRC-conducted FOF exercises and to reduce the number of timeouts.

Realism Option 1 - Maintain the MILES equipment in its current condition: Under this option, the Commission would direct the staff to maintain the current configuration of the MILES equipment such that only “near miss” and “killed” inputs are provided by the MILES equipment. The advantage of this option is that it would not require additional resources to implement. The disadvantage of this option is that it relies solely on the observation and engagement of controllers to take immediate actions on error messages as they are received, and would leave in place the potential for unnecessary timeouts in exercises. The current configuration also reduces the capabilities of the MILES system and, thus, adversely influences the realism and effectiveness of FOF exercises.

Realism Option 2 - Restore the MILES equipment to its original condition: Under this option, the Commission would direct the staff to restore the MILES equipment to its original programming configuration such that “light” and “critical wound” message inputs would be provided in addition to the “near miss” and “killed” messages. The advantage of this option is that this configuration would allow for more realistic MILES engagements and would remove the error messages that were introduced when the equipment was reconfigured. The disadvantage of this option is that it would require some NRC resources to implement and may increase exercise complexity if the new equipment inputs are not effectively addressed in responder training and controller guidance. The NRC staff recommends this option.

Unattended Openings

Question 7 from the SRM relates to the realism of the NRC’s guidance on UAOs. The NRC staff found that the current guidance provides high assurance that unattended openings cannot be exploited by an adversary and that the guidance is consistent with other Federal agency programs. NEI believes that NRC guidance is overly conservative and suggests that the NRC adopt different standards for 2-dimensional openings and 3-dimensional openings, as outlined in a 2012 supplement to NEI 09-05. The staff identified three options for Commission consideration to address UAO requirements.

UAO Option 1 – Maintain the current requirement: Under this option, the Commission would not direct the staff to make any change to the requirements for UAOs. The advantage of this option is that the NRC standard for unattended openings would remain consistent with other Federal agency programs, as well as with the North American Electric Reliability Corporation (NERC). Further, this option helps provide high assurance that licensees can protect against the applicable DBT. The disadvantage of this option is that both licensee and NRC resources are required to evaluate the site vulnerabilities for UAOs that exceed the diameter currently required for security protective measures at licensee facilities. The NRC staff recommends this option.

UAO Option 2 – Relax the requirement for unattended openings: Under this option, the Commission would direct the staff to relax the requirement for 3-dimensional UAOs, consistent with NEI’s proposed guidance in the 2012 supplement to NEI 09-05. The advantage of this option is that it could allow licensees to focus their resources on higher priority security concerns. The disadvantage of this option is that it would potentially allow UAOs to be exploited by adversaries, thus compromising the licensees’ ability to protect their sites from the applicable DBT, and that the NRC requirements for UAOs would no longer be consistent with the requirements of other Federal agencies and NERC.

UAO Option 3 – Evaluate the possibility of relaxing unattended opening requirements based on the licensee’s integrated response program: Under this option, the Commission

would direct the staff to evaluate relaxation of UAO requirements based on a licensee's integrated response program (IRP) and performance in IRP limited exercises and tabletop exercises. The advantage of this option is that it could allow licensees to focus their resources on higher priority security concerns, while law enforcement response to the site could help to offset an increased potential for adversaries to exploit UAOs. The disadvantage of this option is that, based on current IRP implementation progress, it would be at least several years before any licensees might benefit from potentially relaxed requirements under this approach, and that any relaxed requirements might compromise licensees' ability to protect their sites from the applicable DBT and the NRC's requirements would no longer be consistent with the requirements of other Federal agencies and NERC.

COMMITMENTS:

In developing the response to SRM Question 1, the staff identified that the number of extensive simulations used in NRC-conducted FOF inspections could be reduced by evaluating whether a particular potential vulnerability is appropriate for performance testing. The NRC staff intends to work with industry to identify, validate, and benchmark mechanisms, such as the use of simulation software, to evaluate potential vulnerabilities that may be inappropriate for performance testing during an NRC-conducted FOF exercise.

Both NEI and the NRC staff believe that the SDP for the FOF inspection program is effective in prioritizing deficiencies identified by NRC-conducted FOF exercises (Question 8) but NEI expressed concerns relating to the physical protection SDP used to prioritize deficiencies associated with the security baseline inspection program. The NRC staff is currently working to review and update the physical protection SDP and will solicit input from industry and cleared stakeholders, via a closed public meeting, as part of the review and update process.

In developing the response to SRM Question 9, the NRC staff identified that licensees are applying immediate compensatory measures in certain cases where such measures are not required under NRC regulations and guidance. While licensees are not required to implement immediate compensatory measures in all cases, they are required to take an immediate action to assess the identified deficiency and determine the cause and impact of the deficiency. This assessment will be used to determine the cause of the condition, assess the impact of the condition on the physical protection program, and evaluate when, or whether, a compensatory measure is required. To address this issue, the NRC staff will issue a generic communication to licensees that an immediate action is required to provide an assessment of identified deficiencies in security equipment, systems, and components.

Because of this overall lessons-learned review, the NRC staff plans to take several actions to improve the FOF and security baseline inspection program. The NRC staff is working to develop and incorporate guidance and training in mission planning and exercise control to improve the realism and effectiveness of NRC- and licensee-conducted FOF exercises. Additionally, the staff is evaluating updates to the inspection procedure to provide flexibility and better guidance regarding the inside information provided to the CAF for NRC-conducted FOF exercises. The NRC staff will also continue to evaluate lessons learned from the FOF and security baseline inspection and assessment programs, including potential revisions to applicable ROP policy documents, future program enhancements, and any unintended consequences from recent program changes.

RECOMMENDATION:

The NRC staff recommends that the Commission direct the staff to establish a working group (TTP Option 2) to inform CAF TTPs using real-world adversary training and attack information in order to improve the realism of the CAF. To improve FOF exercise realism, and reduce the number of timeouts, the NRC staff recommends that the Commission direct the staff to restore the MILES equipment to its original configuration (Realism Option 2), to include light and critical wound inputs. Finally, the staff recommends that the Commission maintain the current requirements for UAOs (UAO Option 1) to provide high assurance that an adversary cannot exploit these openings.

RESOURCES:

Resources to support the options outlined in this paper are provided in Enclosure 2.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed the paper and has no objection.

/RA/

Mark A. Satorius
Executive Director
for Operations