SAFETY AND SECURITY CULTURE

In the February 25, 2008, Staff Requirements Memorandum (SRM) for COMGBJ-08-0001, "A Commission Policy Statement on Safety Culture," the Commission directed the staff to review specific issues related to safety culture in consideration of the safety culture components of the reactor oversight process and fuel facility pilot and their potential applicability to other U.S. Nuclear Regulatory Commission (NRC) licensees. This enclosure addresses the following specific SRM question for consideration: whether publishing NRC's expectations for safety culture and for security culture is best accomplished in one safety/security culture statement or in two separate policy statements.

Conclusion

The NRC staff considered how best to convey the Commission's expectations for safety culture and security culture. Based on the staff's review and stakeholder feedback, the staff concluded that the Commission's expectations for safety culture should be published in one policy statement entitled, "A Safety Culture Policy Statement," but emphasize that safety and security should be treated equally within the overarching safety culture.

Review

The staff considered how to address the safety and security culture issues to inform the draft policy statement. In consideration of the SRM question on safety and security culture, the staff developed the following three options: (1) separate policy statements, one for safety culture and one for security culture; (2) one policy statement that covers both safety and security; and (3) an organizational high-level policy statement. Option (2) had the following three sub-options: (2.a) safety and security are treated equally as a safety and security culture; (2.b) there is a hierarchical treatment of safety over security or security over safety, and (2.c) there is one overarching culture (i.e., a safety culture where safety and security are treated equally within it).

To consider the safety and security issues and the above options, the staff gathered data and reviewed the organizational safety and security culture literature, international reports, and non-nuclear industries information. A summary of these reviews appears in a separate section below. The staff agreed that the NRC should base the policy statement on the following criteria with regard to how culture affects the safety and security functions and goals:

- ensure equal treatment of safety and security functions and goals;
- articulate that both safety and security serve the same ultimate purpose of protecting people and the environment from unintended radiation exposure;
- acknowledge that cultural manifestations come from a common or shared source of values, beliefs, and attitudes;
- encourage attention to the ways in which safety and security interface;
- acknowledge that the goals of ensuring safety and security may be accomplished in different ways; and

- ensure that the policy statement is understandable to the spectrum of licensees.

Based on the information gathered from the document review, a February 2009 public workshop and in responses to questions posed in (74 FR 4260; January 23 and 74 FR 6433; February 9, 2009) *Federal Register* Notices, the staff decided on option 2.c (i.e., there is one overarching culture, a safety culture, with safety and security functions and goals treated equally within it). In summary, the staff developed its conclusion on the following considerations derived from the document reviews and stakeholder feedback:

- A single policy statement builds on the fact that safety and security have the same ultimate purpose of protecting people and the environment from unintended radiation exposure and encourages attention to the ways safety and security interface.

- The term "safety culture" should be considered as all encompassing because there would be no need for security in this area if it were not for radioactive material.

- The policy statement should give special attention to the safety and security interface within the safety culture; it should acknowledge clearly that the goals of ensuring safety and security may be accomplished differently; and it should apply to the entire spectrum of licensees and certificate holders.

- "Safety culture" is a well known term and will be less confusing to the public; however, it should clearly address the equal treatment of safety and security within it.

- Most stakeholders providing views on this question in the public workshop and in written comments supported one policy statement using the term "safety culture."

- There can only be one overarching culture in the organization with recognition that there may be subcultures within it. However, the organization should ensure that the subcultures support and do not undermine the overarching safety culture.

- The agency's enhanced safety culture characteristics include security in addition to safety in their descriptions to reinforce that safety and security should be treated equally.

Because the safety and security interface is a significant issue within safety culture, a separate section of this enclosure contains a discussion of safety and security interface considerations and NRC actions.

Summary of Stakeholder Comments on Whether Publishing NRC's Expectations for Safety Culture and for Security Culture is Best Accomplished in One Safety/Security Culture Statement or in Two Separate Policy Statements

Overall, the comments favored a single safety culture policy statement that included both safety and security culture. Although there is significant diversity among licensees and certificate holders, the commenters noted that the treatment of safety culture should not result in differing standards when it comes to maintaining a nuclear safety and security culture that protects the health and safety of the public. The policy statement should recognize that security culture is one of several integrated parts of safety culture (i.e., there is no real distinction between cultures, and there is not a stand alone radiation safety culture, a nuclear criticality safety culture, a fire safety culture, or an environmental protection culture). The commenters also

discussed the concepts of a performance-based methodology and a graded approach. The policy statement should recognize and allow for a graded approach to a safety and security culture based on the relative risks of the authorized materials and activities and should not apply a one-size-fits-all approach.

Reactor licensees noted that they have made substantial progress over several years toward the goal of fully integrating security into plant processes. To address security in a separate policy statement might provide negative reinforcement to the ideas that security is held to a different standard and that current proven processes are not sufficient. Fuel cycle licensees also supported a single policy statement to establish the expectation that the safety culture inherently includes a security culture as an integral and necessary component. Views supporting a hierarchical structure considered in option 2.b came from some materials licensees while other material licensees believed that a single policy statement should be drafted to address both safety and security. A few stakeholders supported option 1. They believed that the NRC should concentrate on defining safety and security policies separately while avoiding obvious conflicts between the statements.

The Organization of Agreement States/Conference of Radiation Control Program Directors representative at the February 3, 2009, workshop indicated that safety and security should be considered together (which is the approach that is currently taken in most of the States). A comment from the Illinois Emergency Management Agency suggested that safety and security policies should be defined separately, obvious conflicts should be avoided, and resolution of conflicts between the policies should be allowed at the lowest possible level such as at an Agreement State.

The staff will continue to consider these and other stakeholder comments during further development of the safety culture policy statement.

Document Review Summary

As noted above, the staff gathered data and reviewed the organizational safety/security culture literature, international reports, and non-nuclear industries information.

Organizational

Information gathered from organizational literature did not provide a definitive answer to the one policy statement or two policy statements question. However, in either case, the document should recognize the interface between safety and security. Organizational theory supports the notion of subcultures within a larger organization; so from the theoretical point of view, expectations are best expressed in one policy statement that reflects the idea that the subcultures are part of a whole. However, the research on organizational culture is not conclusive on this topic. While none of the research compared safety and security functions within nuclear power plants, research in European railways showed that in these organizations safety culture is oriented towards preventing accidents while security culture is oriented to preventing intentional harm. The distinctions that clarify the functions of safety and security support the conclusions of the North American Treaty Organization conference on nuclear security which suggested that, even though security culture could adapt concepts from the work in safety culture, it is important to avoid combining safety and security into one concept.

International

The staff concluded that there is no clear guidance from the International Atomic Energy Agency (IAEA) or an international consensus on how countries should implement both safety and security cultures or on the hierarchy of the cultures. Many international documents promote a security culture (i.e., the IAEA Convention on Physical Protection of Nuclear Material dated March 3, 1980, and amended in July 2005; the IAEA 20/20 report issued February 2008; the IAEA Code of Conduct on the Safety and Security of Radioactive Sources issued March 2005; and the best practices developed by the Institute of Nuclear Materials Management). IAEA has endorsed the concept of security culture as being fundamental to nuclear security implying co-equal status with the nuclear safety culture. The International Nuclear Safety Group (INSAG)-4 report issued in 1991 was used to develop the recently published nuclear security culture guide (Nuclear Security Series No. 1). The IAEA guide on "Considerations to Launch Nuclear Power Programme" dated March 5, 2007, infers that security culture should be part of safety culture or that Member States with existing safety culture statements should expand them to include security culture. The basic components of each culture are similar and in general do not contradict each other at a high level although there are some differences in the implementation of security culture at the operator and individual levels. All these documents stress that the cultures should be complementary to each other rather than conflicting and that differences should be identified and managed appropriately. However, some international papers argue that safety and security cultures should not be merged into a single entity because of differences in individual attitudes, potentially different competent authorities, and the need for State involvement caused by information confidentiality and threat concerns.

Non-Nuclear Industries

The staff's limited review indicated that the issue of safety culture and security culture and their interrelationships does not appear to be highly developed in other hazardous industries or on domestic corporate agendas as it is in the nuclear industry. Additional research would be needed to provide a firm conclusion. As a result, the staff could draw only mixed inferences from the information. In the biological industry, reference was made to the fact that bio-security has to be built on a robust bio-safety practice and culture. In aviation, a Government Accountability Office report on industry safety and security did not address the culture aspects, but the Arab Airline Carrier Association defined security to be a part of safety with a goal to promote safety and security culture at regional levels. In the maritime industry, safety and security are considered to have the same goal – namely the protection of people, property, and the environment. Security risks are connected to protection against willful (i.e., intentional) acts of disturbance, damage, or destruction while the safety is concerned with minimizing the risk of something accidentally going wrong. Safety and security go hand in hand, in that security threats, latent or acute, will influence the behavior of the crew on board and thus also have an impact on safety.

The chemical industry, however, had the closest relationship with the nuclear industry regarding safety and security. In the chemical industry, there is an intrinsic link between chemical safety and chemical security – two concepts with the shared objective of making the operation of a chemical facility trouble free. There is also a certain tension between safety and security. For example, the proponents of the engineering approach to safety typically call for building additional redundancy into at-risk systems; proponents of security reply that greater redundancy tends to render these systems, equipment, and components even more vulnerable to malicious acts making security even more costly and problematic than would otherwise be the case. Another important characteristic of an effective safety culture which is often treated quite

differently in security culture is error tolerance. Such a culture focuses primarily on the ability of employees to perform their duties effectively; it downplays assessing blame and punishing errors. In this regard, because of the nature of the threats, the security culture does not encourage an atmosphere of openness in which employees throughout the organizational hierarchy feel comfortable about discussing errors and near misses. Despite occasional conflict between the tenets of chemical security and chemical safety, the former is emerging as a distinct and important approach to enhancing physical protection at chemical facilities. The American Chemical Council has indicated that attention to security is a natural corollary to the chemical industry's safety culture. Security efforts, like safety efforts, protect the community and employees while keeping the transportation of hazardous materials operational. By reducing the risk of a wide range of threats to the transportation of hazardous materials, security measures can enhance the goal of the safe transportation of hazardous materials.

Discussion of the Safety and Security Interface and NRC Actions in this Area

Safety has been the primary pillar of the NRC's regulatory programs. However, the current heightened threat environment has created a renewed focus on security; therefore, the staff has taken a number of steps to enhance security and strengthen the safety and security interface. It is important to understand that both safety and security share the common purpose of protecting public health and safety. In today's environment, safety and security activities are closely intertwined, and it is critical that consideration of these activities must be integrated so as not to diminish or adversely affect either safety or security. The importance of considering both safety and security in an equal and balanced manner within the NRC's regulatory framework is clearly evident in its mission and strategic goals. Further, it is important for licensees and certificate holders to provide personnel in the safety and security sectors with an appreciation for the importance of each emphasizing the need for integration and balance to achieve optimized protection.

While many safety and security activities complement each other or are synergistic, potential differences remain. It is then imperative that mechanisms be established to resolve these differences if the NRC is to ensure the protection of public health and safety and promote the common defence and security. Hence, safety and security have implications for each other in connection with all aspects of nuclear activities. For example, the enhanced risk of a sabotage event has highlighted the importance of integrating safety and security in the field of protection and of identifying areas where they need to complement each other, so that a terrorist event, if and when it occurs, can be dealt with in as seamless a fashion as possible.

One important difference or challenge is the way in which individuals involved in safety and security activities approach the goal of risk mitigation and protection of public health and safety. The safety staff is typically focused on preventing errors that would result in an inadvertent accident; however, the security staff is focused on preventing deliberate attacks or diversion of certain materials that could cause harm. Another difference is the way in which individuals involved in safety and security activities approach information sharing. The safety staff promotes information-sharing and collaboration, but the security staff promotes the sensitivity of information and the need-to-know. These aspects and others identified through stakeholder interactions must be resolved and managed. Another challenge is that the organization/facility must ensure that the existence of motivated and capable persons with ill intent is understood, the importance of nuclear security to prevent such persons from access is recognized, and the insight into the complexity of nuclear security as a distinct discipline from nuclear safeguards and nuclear safety is achieved. The need for an improved sensitivity to this environment is exacerbated by the significant growth in nuclear utilization leading to more players in the field.

Due to the fact that globalization leads to new players and threats, the enhancement of intelligence and the importance of protecting some sensitive material (confidentiality) is necessary.

The NRC has undertaken a number of activities to address the safety/security interface. During its evaluation of a petition for rulemaking (PRM 50-80) submitted by the Union of Concerned Scientists and the San Luis Obispo Mothers for Peace, the NRC staff determined that it might be appropriate to establish requirement(s) to address changes made at nuclear power plants to address potential adverse interactions involving the safety and security interface at nuclear power plants and other types of facilities. The staff was aware of instances where the failure to promptly and effectively communicate actions taken by operations, maintenance, or security personnel at licensed facilities to potentially affected organizations could result in adverse effects on plant safety or security. Some examples included the placement of security barriers that diminished access to fire suppression equipment, the placement of scaffolding during maintenance activities that affected security lines of fire, and the staging of temporary equipment within security isolation zones. The NRC was already considering these issues as part of a rulemaking but highlighted these issues to licensees in an expedited manner. In 2005, the staff published Information Notice (IN) 2005-33, "Managing the Safety/Security Interface," dated December 30, 2005. The IN urged licensees to explicitly consider the safety and security interface issues and take appropriate actions so as not to degrade either safety or security of the facility. Copies of the IN were shared with Category 1 materials licensees.

In 2006 and 2007, the NRC published in the *Federal Register* (FR) proposed rules for nuclear power plants, "Power Reactor Security Requirements" (71 FR 62663; October 26, 2006), and for a geologic repository operations area, "Geological Repository Operations Area Security and Material Control and Accounting Requirements" (72 FR 72522; December 20, 2007). These documents proposed requirements to address the potential for adverse safety and security interactions. The final reactor security rule was published on March 27, 2009 (74 FR 13926). One of the key new features of this rule was to add a regulatory requirement for a safety and security interface (Title 10 of the *Code of Federal Regulations* (10 CFR), Section 73.58, "Safety/security interface requirements for nuclear power reactors"). These requirements mandate that licensees establish adequate programs for assessing, managing, and coordinating proposed changes and activities to identify potential adverse interfaces between safety and security and take appropriate compensatory or mitigative actions to maintain both safety and security. Specifically, the rule requires licensees to (1) assess and manage the potential for adverse effects on safety and security (including the site emergency plan) before implementing changes to the plant configurations, facility conditions, or security and (2) where potential adverse interactions are identified, licensees must communicate them to appropriate licensee personnel and take compensatory and/or mitigative actions to maintain safety and security under applicable Commission regulations, requirements, and license conditions. The scope of changes to be assessed and managed must include planned and emergent activities (such as, but not limited to, physical modifications, procedural changes, changes to operator actions or security assignments, maintenance activities, system reconfiguration, access modification or restrictions, and changes to the security plan and its implementation).

In addition, 10 CFR Part 73.55(c)(7), "Security implementing procedures," of 10 CFR 73.55, "Requirements for the physical protection of licensed activities in nuclear power reactors against radiological sabotage," requires licensees to review and update existing procedures to reference the requirements of the interface between safety and security as outlined in 10 CFR 73.58. These procedures should clearly define processes to ensure that a comprehensive and effective network of communications between the operations (safety) and security staffs is maintained at

the facility. In addition, 10 CFR 73.55(m), “Security program reviews,” of 10 CFR 73.55 requires licensees to ensure that the reviews and audits of its site physical protection program include activities involving the interface between safety and security.

As part of this effort, the NRC also developed Draft Regulatory Guide DG-5021, “Managing the Safety/Security Interface,” for nuclear power plants. The guidance states that a licensee’s management controls and processes for the interface between safety and security should ensure that the security staff is notified of potential changes to the characteristics of the site’s physical layout (including topographical changes); the configuration of facilities, structures, systems, and components; the site’s operational procedures; and day-to-day or planned activities. Controls and processes should also ensure that the security organization has the opportunity to review proposed changes and activities to identify potential adverse impacts on the functions and performance of the elements of its site physical protection program established within the owner-controlled, protected, and vital areas.