



**BNL-90416-2009-CP**

***Self-Reliability and Motivation in a Nuclear Security  
Culture Enhancement Program***

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*Presented at the 4<sup>th</sup> Russian International Conference*

Obninsk, Russia  
October 19- 23, 2009

October 2010

**Nonproliferation and National Security Department**

**Brookhaven National Laboratory**

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## **TOPIC: Nuclear Security Culture**

### **Self-Reliability and Motivation in a Nuclear Security Culture Enhancement Program**

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The threat of nuclear terrorism has become a global concern. Many countries continue to make efforts to strengthen nuclear security by enhancing systems of nuclear material protection, control, and accounting (MPC&A). Though MPC&A systems can significantly upgrade nuclear security, they do not eliminate the “human factor.” Gen. Eugene Habiger, a former “Assistant Secretary for Safeguards and Security” at the U.S. Department of Energy’s (DOE) nuclear-weapons complex and a former commander of U.S. strategic nuclear forces, has observed that “good security is 20% equipment and 80% people.”<sup>1</sup> Although eliminating the “human factor” is not possible, accounting for and mitigating the risk of the insider threat is an essential element in establishing an effective nuclear security culture.

In 2008, the International Atomic Energy Agency (IAEA) published a Nuclear Security Culture (NSC) Implementing Guide.<sup>2</sup> In this guide nuclear security culture is defined as “The assembly of characteristics, attitudes and behavior of individuals, organizations and institutions which serves as a means to support and enhance nuclear security.” The guide also asserts that effective nuclear security is based on the belief, shared by all personnel, that a credible threat exists. Nuclear security is further enhanced when all personnel share the belief that a credible threat exists and when each staff member identifies his or her individual role in and commitment to minimizing the ever-present threat. Thus, the IAEA is advocating for accounting for the “human factor” in addition to implementing MPC&A systems when attempting to establish an effective nuclear security culture. A nuclear security culture enhancement program is believed to improve the effectiveness of MPC&A by influencing the attitudes, behaviors and beliefs of personnel, by encouraging personal responsibility, and by addressing the human aspect of MPC&A. Elements of a nuclear security culture enhancement program are highlighted below.

Some of the key elements of a nuclear security culture enhancement program include commitment by top management and baseline analysis. If top management does not institute nuclear security as a priority, both in policies and in practice, then personnel within that organization will find it difficult to internalize the importance of nuclear security and their role in this process. In order to understand the “human factors” affecting nuclear security, an organization must perform a baseline analysis to assess previous security incidents, determining common human factors (e.g., depression, substance abuse, financial irresponsibility) of such incidents. The findings of this analysis can then be used to set up the nuclear security culture enhancement program.

Once the nuclear security culture enhancement program has been implemented, organizations must regularly assess employees' understanding of and commitment to the nuclear security culture. Assessment programs may include (1) appraisals conducted by management, (2) interviews of various levels of the organization, and (3) analysis of performance and incidents. Ultimately, the assessment activities will set the stage for continuous performance improvement, helping to establish which resources, support systems, and appropriate motivational techniques should be made available.

Organizations should also monitor potentially flawed factors of current and prospective employees (i.e., applicants) and can opt to incorporate a Human Reliability Program (HRP) as an element in the nuclear security culture enhancement program. Human Reliability Programs in the United States are comprised of managers supervising personnel in positions of trust, psychologists, physicians, personnel security, and, most importantly, the HRP participants themselves. HRP's work to promote open communication and self-reporting without fear of negative consequences. Personnel security, psychologists, and physicians perform regular assessments, ensuring proper judgment and reliability of all HRP participants. HRP participants have ready access to free and confidential counseling and education programs to assist in mitigating risk factors (e.g., depression) and are encouraged to take advantage of these resources without fear of negative effects upon their occupational status or security clearance.

Organizations may engage in extrinsic motivational techniques (e.g., rewards for self-reporting and early detection) to further enhance nuclear security. Additionally, intrinsic motivational factors (e.g., desire for safety, nationalism), being more powerful and enduring than extrinsic motivators, are included when presenting HRP and its purposes to participants. Finally, motivational factors that undermine the nuclear security culture (e.g., unwillingness to report known concerns, disgruntlement) are also included in the orientation, education, and assessment processes for HRP participants.

Organizations that accept the existence of a credible threat, employ management with dedication to establishing and maintaining an enhanced nuclear security culture, continually analyze their current level of nuclear security culture, monitor individuals' reliability and judgment in positions of trust via an HRP, and offer support and motivational techniques to enhance and encourage HRP participants' reliability and proper judgment will undoubtedly experience more effective nuclear security than organizations that rely upon MPC&A systems alone. This paper will describe some of the key elements of a comprehensive, sustainable nuclear security culture enhancement program and how implementation can mitigate the insider threat.

## REFERENCES

1. Matthew Bunn and Anthony Wier, *Securing the Bomb: An Agenda for Action* (Cambridge, MA: Belfer Center for Science and International Affairs, Harvard University, May 2004), p. 50, <[http://bcsia.ksg.harvard.edu/BCSIA\\_content/documents/securing\\_the\\_bomb.pdf](http://bcsia.ksg.harvard.edu/BCSIA_content/documents/securing_the_bomb.pdf)>.
2. IAEA Nuclear Security Series, No 7, *Nuclear Security Culture*, STI/PUB/1347, 2008, ISBN 978-92-0-107808-7

3. Landers, J.E. (June, 2009). Mitigating the Insider Threat: Risk Management through Behavioral Science. Workshop presented to nuclear facility managers in Moscow, Russia.