World Institute for Nuclear Security

Training Course Report for

WINS Training for Libyan Scientists, Technicians and Engineers (STEs)

6-8 August 2019

Tunis, Tunisia

Overview of the Training Course

From 6-8 August 2019, 15 participants from Libya attended a WINS STE Training Course in Tunis, Tunisia. The event was supported in collaboration with the Tunisian National Center for Nuclear Sciences and Technologies and CRDF Global. Participants attended from the Nuclear Regulatory Office, Radiation Measurements and Training Center, Tajura Nuclear Research Center, and the Libyan Atomic Energy Establishment.

The event served as a foundational introduction to basic nuclear security concepts and highlighted the essential aspects for successful nuclear security management. It also facilitated discussions among regulatory, scientific and research agencies to help them reach common ground. The training discussed the development of security competences for STEs and helped participants understand the fundamental issues associated with nuclear security in their organisations. In addition, the course addressed potential security threats that nuclear organisations face and highlighted the roles of different stakeholders to mitigate such threats. Culture was a major theme in the course as a key contributor to improving security.

Throughout the three-day course, participants took part in a **table-top exercise (TTX).** that highlighted the seriousness of insider threats while drawing attention to the critical roles that need to be considered and carefully controlled to ensure security.

Day 1 of the training course provided participants with insights on integrating policy and technical knowledge to optimise security and safety interfaces. Various IAEA and WINS recommendations were discussed and analysed to provide examples of best practices in nuclear security operations. Day 2 continued to explore the influence and impact of culture in supporting security efforts. Discussions throughout the day encouraged participants to work collaboratively to find solutions to pressing security problems facing Libyan facilities. The concept of a design basis threat (DBT) was also a topic of interest. Day 3 consolidated the learning from Days 1 and 2 and gave participants the opportunity to reflect on the table-top exercise and develop takeaways.

Highlights / Key Points

Following are the key points identified during the training course:

- Participants have major challenges with national and organisational culture, including a hierarchical system that makes it difficult to challenge supervisors and tribal systems that support nepotism and favouritism.

- Participants very much need support with comprehensive, strategic and ongoing training programmes to improve the security understanding and competence of all staff within their organisations, especially that of senior managers. A culture of teamwork among the various professions also needs to be developed.

- Participants were keen to understand the difference between safety and security risk. (Safety risk focuses on human error or natural causes whereas security risk focuses on malicious intent.)

- After many years with little support, basic security knowledge needs to be rebuilt within their organisations.

- Participants enjoyed learning about insider threat mitigation and participating in the TTX because it allowed them to simulate security scenarios and identify potential malicious acts that may arise within a facility. The TTX also helped them understand various plans and formations that malicious actors might use to infiltrate vulnerable locations.

- The security situation in Libya is highly volatile, and participants have a major concern with external threats. There is also concern that security protocols might not be followed in an emergency.

- Participants said their threat assessment process is weak and that it is not well-defined among various stakeholders in Libya. They were also unsure whether a DBT exists. If it does, the information is not well shared. Participants noted that they need support to undertake a threat assessment and re-analyse their DBT.

- Participants indicated that although they have good security protocols and measures at their institutions, most of their facilities still lack support mechanisms when it comes to response. They do have an emergency management committee; however, its protocols and

responsibilities are mainly theoretical and do not include enough practical training and exercises. Support in this area is clearly needed.

— Participants said they are lacking in spare parts for their equipment and that maintenance is challenging. For example, at the Tajoura site, they have a cobalt 60 source that has been used for food sterilisation. Put into service in 1987, it now has less than 1,000 curies (after starting with 50,000) and is no longer operable. The original supplier will no longer support the device, so the Libyans have been buying spare parts from other suppliers. Participants said they would now prefer to replace the source with an x-ray machine.

— There is a need for an adequate national legal framework that ideally separates the Nuclear Regulatory Office (NRO) from the LAEE and ensures regulatory independence.

— International support is needed to help participants update their safety and security systems. As an overarching concern, they have scarce resources and limited—or no—government support to address security challenges. Improving this situation will require significant external support.

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Introductory Session

Dan Johnson, WINS Senior Adviser, Dr Nafaa Reguigui, Director of the National Center for Nuclear Sciences and Technologies in Tunisia, and Dr Salem Alarbi, from the Libyan delegation, spoke during the introductory session. Mr Johnson began by introducing the scope of the training course and the instructors and facilitators.

Speakers and Support Staff Included:

- Dan Johnson, Senior Adviser, WINS
- Oum Keltoum Hakam, Professor, University of Ibn Tofail
- Russell Clark, Consultant, IB3 Global Solutions
- Nafaa Reguigui, Director, National Center for Nuclear Sciences and Technologies, Tunisia
- Yazan Alwashah, Senior Project Lead, CRDF Global

Mr Johnson gave a brief history of WINS, including its role in sharing best nuclear security practices around the world and in building nuclear security competence. He invited participants to use their WINS membership to gain access to various documents and materials on nuclear security and also encouraged them to benefit from certification opportunities through the WINS Academy.

In his remarks, Dr Reguigui highlighted the importance of policy for increasing security and safety in addition to technical knowledge. He also noted that it is extremely important to promote collaboration

between Tunisian and Libyan SMEs to improve security in different institutions in both countries. Dr Salem Alarbi thanked CNSTN and WINS for coordinating the event.

Mr Johnson then solicited feedback from participants on their expectations for the training course. Some of the initial issues identified by participants included:

- They would like to better understand threats to their nuclear and radioactive material.
- They would like to learn how to deal with an emergency.
- They have a disused cobalt-60 source they would like to dispose of and replace.
- They are looking for pragmatic solutions.

Session 1 – Introduction to Nuclear Security and Security Culture

Dr Hakam, University of Ibn Tofail, Morocco, opened Session 1 with a presentation on nuclear security and security culture. She introduced key nuclear security concepts presented in IAEA and WINS documents, the differences between security and safety risks, and the need to harmonise safety and security culture. She also described the role of international agreements in supporting the nuclear security regime and the role of various stakeholders, including the regulator, in enforcing nuclear security. She highlighted the importance of culture by saying that "Good nuclear security is 80% culture and 20% equipment."

Table Discussion

In a table discussion that followed the presentation, participants eagerly engaged with each other and the presenters. They asked a number of questions about how culture impacts on security. For example, they said that in Libya there is a cultural norm against "snitching" or reporting violations. They also said that the culture is strongly hierarchical, that supervisors are never challenged, and that there are major problems with nepotism in hiring.

Participants asked many questions about how to address such problems. They also said there is a need for additional training of all staff in Libya, especially senior managers, on security challenges and behaviours. In addition, there is a need for better security awareness and competency across their organisations, and teamwork among the different disciplines is currently lacking and needs to be encouraged. It was suggested that security culture issues be addressed early—even in university—as has been done in Morocco.

Session 2 – Understanding the Nuclear Security Threat

Dr Reguigui opened Session 2 with a presentation on nuclear security threats. He drew attention to the number of incidents reported in the IAEA's Incident and Trafficking Database and explained that all member countries are requested to report any nuclear security incidents that take place. In addition, he noted that significant numbers of incidents have taken place that involve radioactive material. Dr Reguigui also gave an overview of the types of threats to nuclear material, including an extensive discussion on insider threats. He explained that insider threats are especially concerning because individuals who work in a facility have direct knowledge about its protocols and security procedures. As an example of the threat, Dr Reguigui mentioned the terrorist attacks in Belgium and the threats on nuclear facilities there.

Table Discussion

During the table discussion that followed the presentation, participants agreed that radioactive sources that are onsite, such as calibration sources, medical/pharmaceutical products, and other liquid sources, are at greatest risk of theft. Although no thefts have yet occurred, participants said that the reluctance to report incidents in Libya increases the risk. Most importantly, participants said there are serious security problems in Libya and that they were worried that people might be careless with nuclear and radioactive material during an emergency.

Session 3 – Introduction to the Security Programme

In his presentation, Russ Clark, Consultant, IB3 Global Solutions, focused on security programmes. He began by highlighting the importance of culture in changing actions and behaviours and driving security excellence. He also emphasised the value of WINS guidelines in providing simple and pragmatic advice toward improving security. In addition, Mr Clark discussed the concepts of risk and vulnerability in detail. He said the DBT is an effective method for identifying threats and prospective scenarios and introduced the concept of a blended attack.

Mr Clark also gave an overview of key security concepts, such as defence in depth and the graded approach. Participants were not familiar with these concepts, and wanted to learn more about such basic approaches to security. Discussions also focused on the role of STEs in assessing the risk of certain materials and the level of security required.

Table Discussion

During the table discussion, participants said that the threat assessment process and DBT is not well defined or shared within their organisations. They also said that their safety and security systems need to be upgraded to more advanced technology and that they would like to see the human role reduced as much as possible by the adoption of technology. In addition, they said that the focus should be on improving the preparedness and competency of security personnel and staff.

Some participants said that their security protocols are actually quite good from gate to target; the challenge is that they don't have the funding to support a modern security system. Nor do they have the laws, regulations and required structures to support this. Furthermore, the threat assessment process is weak. All disciplines should be involved to leverage and standardise the DBT process.

They said they do have an emergency management committee composed of multiple disciplines, with the facility manager as the decision maker. However, practical exercises and drills are never conducted to test the response during an emergency, and the current security layers are insufficient when considering the current security situation.

Session 4- Intersections between Safety and Security

In Session 4, Dr Hakam discussed the relationship between safety and security. She also addressed material control and accountancy, security by design and other approaches that support security. Significant time was spent discussing the Y-12 National Security Complex break-in case study, which provides an excellent example of failed preventative maintenance and poor security culture.

Table Discussion

During the table discussion, participants noted that they have major problems with spare parts and resources for their equipment, which makes preventative maintenance challenging. One of the key

lessons participants took away from the discussion was the importance of communication among departments. They said they would like to have more inter-departmental training and facilitation.

Session 5 – Bridging the Gap between STEs and Security

In the final presentation of the course, Mr Clark emphasised the importance of communication, which had been identified throughout the course as a key component for improving trust and reliability. He also emphasised the importance of vetting, liaison programmes and security working groups as key contributors to security. He said all of these activities help to overcome problems associated with hierarchical cultures in which senior management are particularly dominant. Mr Clark also addressed human reliability as a key contributor to security and said human reliability programmes should be viewed as a way to support and take care of employees rather than to punish them.

Table-Top Exercise

Participants had several takeaways from their experience of participating in the TTX throughout the training course. These include:

- Training security guards and raising their awareness are key elements for addressing insider threats.
- The TTX made it clear to participants where their colleagues are located around the facility, which they did not know before. It also gave them the opportunity to compare their different roles and authorisation and access levels.
- Participants concluded that carrying out a successful malicious act would require collusion because it would be very challenging for one individual to steal material on their own.
- Most of the scenarios focused on insider threats; however, participants are also concerned about external threats.
- The insider scenarios did not consider the dangers associated with handling radioactive material during an attempted theft. However, participants also noted that individuals who are stealing the material might not care about damage to their health, especially if they are radicalised.

Focus Groups

The training course had a final session to consolidate all of the lessons learned over the three days and to propose solutions to the various security challenges that had been identified. Participants were split into three mixed groups to address five challenges:

Challenge 1: How can participants carry out a comprehensive assessment of their security programmes and their threat assessment process? How can they work with their security colleagues to benchmark their security programme with international recommendations?

Participants said that their security programmes are out of date and need to be revised to address new threats. They also need to build staff capacity and acquire new technology. In addition, they need to:

- Limit the number of access gates.
- Modify internal regulations and bylaws and strengthen regulations.
- Cooperate with senior management to set specifications for the security programme that are benchmarked with international recommendations.
- Build a comprehensive training programme. (Their last training programme was created in 2010.) Training should be modernised according to WINS and IAEA guidance.

Challenge 2: Participants identified specific security challenges associated with their national and organisational cultures (e.g. nepotism, difficulty challenging authority). What actions could they take to improve security while working within their cultural context?

Participants said that the hiring of relatives needs to be restricted to eradicate this problem. The regulator also needs to enact controls.

Challenge 3: How can participants develop a culture of teamwork among the different professions at their facilities? What concrete actions can they take?

Because hierarchy interferes with cross-functional cooperation, participants said they need to enact teamwork and avoid individualism. They should share the knowledge they have gained during the training sessions with their colleagues at work, including WINS and IAEA guidance, and try to implement practical programmes that encourage teamwork.

Challenge 4: Participants identified the need for additional training and awareness that includes all stakeholders, including first responders and senior managers. What are the next steps for developing this training? Who can support it?

Participants said they need WINS and the IAEA to provide them with ongoing international and national training. In addition, they need to:

- Facilitate communication with the regulator and the human resource department on training.
- Overcome challenges with the budget and funding (no funding from government for training) through protocols and routines.
- Include more participants in the training.

Challenge 5: Participants indicated they want to conduct a simulated security incident using the emergency preparedness committee. How would they go about doing this? Who are the stakeholders involved in addressing a security incident? How will these stakeholders communicate during an incident?

Participants said it is difficult to transport radioactive materials within their facility, so they proposed creating a simulation exercise involving a nuclear security incident similar to the TTX that was run during the training course. In addition, they said that the security department, facility management and regulator all need to communicate effectively with each other should an incident occur.

Conclusion

Mr Johnson thanked the participants, CNSTN, the SMEs, and the interpreters for their active engagement. He added that he had learned a great deal about the Libyans' needs and requirements and invited the group to sign up for WINS membership and apply for scholarships to the WINS Academy. In their closing remarks, Mr Reguigui and the Libyan delegation thanked everyone for their support during the event.

Observations resulting from the feedback that participants shared on their evaluation forms include:

- Overall feedback for the course was very positive. The primary request was for a longer training with additional information.
- Participants asked that a series of strategic workshops be offered in the future, coordinated with the same group who attended the training. They want to stay connected and maintain the relationship with WINS.
- The course helped participants develop relationships with colleagues that they previously hadn't worked with before.

- The TTX was very challenging at first, but gradually the participants began to understand it. By the end of the course, the discussions were very lively and the TTX became competitive. Feedback on the evaluation sheets was highly positive. (One participant said it was the best exercise he'd ever done.)
- Participants liked learning about insiders, but they would also have liked to spend more time discussing external threats, which are a big concern for them.
- Participants liked the general flow of information and the case studies and examples that were provided. They also liked how each session ended with questions and discussions.
- Numerous participants said they liked learning about security threats, gaps and nuclear security culture.