**CAPACITY BUILDING TO ACHIEVE**

**SUSTAINABLE SECURITY:**

**Successful International Cooperation**

**in the Dominican Republic**

J. MANION

Pacific Northwest National Laboratory

Richland, WA, United States of America

Email: jill.manion@pnnl.gov

M. HAZEL

Pacific Northwest National Laboratory

Richland, WA, United States of America

O. TEJEDA

Comisión Nacional de Energía

Santo Domingo, Dominican Republic

N. ALMONTE

Comisión Nacional de Energía

Santo Domingo, Dominican Republic

**Abstract**

The U.S. Department of Energy/National Nuclear Security Administration’s Office of Radiological Security (ORS) cooperates with partner countries throughout the world to enhance the security of radioactive sources used for legitimate purposes. The IAEA and member states recognize that sustainability and capacity-building with partners is the foundation for a successful security program. Many factors can impede sustainability and capacity-building; nevertheless, a number of partner countries have enjoyed significant success in moving toward long-term security training initiatives and security culture development. The Dominican Republic is one country that has embraced its radiological security mission and taken remarkable strides toward establishing a sustainable radiological security structure. In addition to developing and enacting the regulatory structure necessary to underpin its security efforts, the National Energy Commission (CNE) has been proactive in ensuring operators, regulatory staff, and response stakeholders in the country possess the tools and capabilities to properly implement their respective security responsibilities at fixed sites and have begun expanding these efforts to sources in transport. CNE not only convenes workshops to direct and assist operators in the development of site security plans, it also collaborates closely with law enforcement entities to develop and deliver training to response personnel to improve the effectiveness of a law enforcement response to an attempted theft of radioactive materials, and has convened stakeholders from across the response spectrum to maximize efficiencies and eliminate confusion during a multi-agency response effort resulting from the loss of control of radiological material. CNE recently evolved to a greater level of capacity building through its development of a curriculum for targeted training sessions to raise awareness of the threats, risks, and consequences associated with radiological or nuclear material; explain security management and related performance expectations; teach principles of security and security system design through hands-on instruction using physical security equipment in the training environment; ensure stakeholder awareness of the security requirements codified in national regulations; and emphasize security culture development among operators. The example of the Dominican Republic offers several lessons that can be applied by other countries seeking to achieve similar success in capacity-building efforts. Analysis of the underlying conditions that have lent themselves to success in the Dominican Republic also helps identify areas where efforts can be focused to foster an environment where capacity-building can be more fruitful and sustainable security truly achievable. This paper will review the actions undertaken in the Dominican Republic, identify the circumstances that facilitated success and the hurdles overcome in the process, and seek lessons and best practices that can be applied in similar efforts elsewhere.

## INTRODUCTION

The Office of Radiological Security (ORS), an organization within the US Department of Energy’s National Nuclear Security Administration Office of Global Material Security, assists partner countries in implementing their security commitments under the International Atomic Energy Agency (IAEA) Code of Conduct on the Safety and Security of Radioactive Sources. This assistance includes, among other activities, consultation on development of security regulations, as well as consultation on development of guidance to operators to draft site security plans (SSPs), and development of training curricula to support regulator, responder and operator personnel, as recommended in the guidance of the International Atomic Energy Agency. In particular, the Code of Conduct underscores the importance of training, stating, “Every State should ensure that adequate arrangements are in place for the appropriate training of the staff of its regulatory body, its law enforcement agencies and its emergency services organizations.” [1] Further, the importance of training and qualification for operators is underscored in NSS-14, Nuclear Security Recommendations on Radioactive Materials and Associated Facilities: “Operators should be required to ensure that all personnel with security responsibilities are appropriately trained and qualified prior commencing their responsibilities and afterwards periodically.”[2] And finally, in NSS-7, Nuclear Security Culture, the IAEA notes, “training and professional development are essential to the formulation of norms for expected cultural behaviour. At all levels of an organization, managers must ensure that training is conducted to develop skills and provide tools to promote and implement security culture.” [3]

For the past ten years, ORS has partnered with the Comisión Nacional de Energía (CNE), the regulatory authority in the Dominican Republic, in support of radioactive source security. In that time, cooperation with CNE led to enactment of radioactive source security regulations, establishment of processes for operators to develop acceptable security plans, and a range of training opportunities for inspectors, operators, and law enforcement responders. Today, ORS cooperation with the Dominican Republic has reached a level of maturity that makes sustainability of radiological security improvements a key consideration. In light of this success, CNE has adopted a proactive approach to its administration of radiological source security in the Dominican Republic. This paper examines the training program being developed and executed by CNE, including the conditions that have contributed to CNE’s success in establishing security, key accomplishments, lessons to be learned from the CNE experience, and considerations for applying the Dominican Republic experiences to similar efforts elsewhere.

## SUSTAINABLE RADIOACTIVE SOURCE SECURITY

ORS pursues a multi-faceted approach to radiological security cooperation with its partners. While the physical protection of radioactive sources in their stationary locations for use and storage has been the foundation of the program strategy for a decade or more, ORS and its partners recognize a more comprehensive approach is necessary. Technology development efforts seek to address specific challenges, such as security for mobile sources used in oil and gas well-logging and industrial radiography, and mitigating the ubiquitous threat posed by an insider when dealing with radioactive source applications. ORS also explores and promotes the use of non-ionizing technologies to replace radioactive sources where feasible in order to eliminate radioactive sources as targets for a malicious actor. Another key aspect of ORS cooperation is the objective of assisting partners in achieving sustainable security.

ORS and its partners frame the pursuit of sustainable security in terms of a series of sustainability elements at both the national level and the site level. Some of the elements focus on development of basic infrastructure to support radiological security, such as national-level regulations that establish requirements for radiological source security or development of site security plans to define procedures for managing and executing security functions at that level. Other elements address development of key capabilities, including maintenance and testing of security equipment, the establishment of an effective armed response to thwart an attempted malicious act, and fundamental knowledge of security-related job tasks. Taken as a whole, the sustainability elements underpin a robust security culture which, on its own, helps ensure the sustainability of radiological source security.

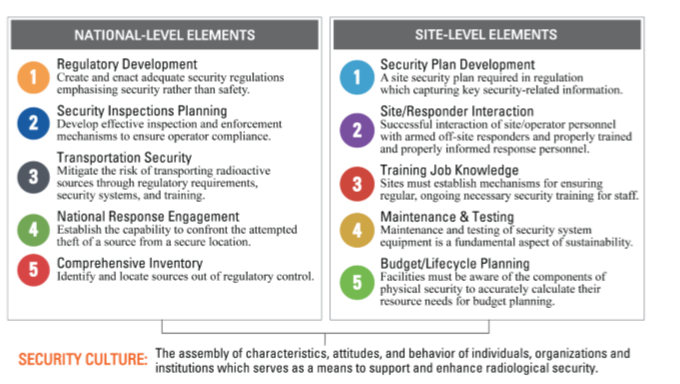


Figure 1: ORS Sustainability Elements

## CAPACITY BUILDING FOR SUSTAINABILITY

ORS cooperation is based largely upon funding from the U.S. Department of Energy. As with all such programs, the eventual curtailment of financial support is a key inflection point, whereupon it will become evident whether radiological security improvements are sustainable. As ORS and a partner country progress in the development of radiological security, it can be difficult for the partner country, for a variety of reasons, to capitalize on the initial capacity building efforts initiated in the course of Department of Energy funded activities. Overcoming this problem is perhaps the greatest challenge to the ultimate success of the ORS radiological source security mission. In the Dominican Republic, the National Energy Commission (CNE) has recognized this challenge and has made significant progress in addressing it and moving closer to sustainable radiological source security.

## SUSTAINABLE SECURITY FOR THE DOMINICAN REPUBLIC

In the Dominican Republic, the National Energy Commission has been consistently proactive in improving radiological source security, as well as the conditions necessary to sustain it. With the enactment of a national regulation in 2013 that established requirements for radiological source security, the authority of CNE to lead radiological security efforts was undisputed. The organization quickly took advantage of ORS opportunities to train regulatory personnel in the conduct of physical protection inspections, worked to establish a process for the development of site security plans by operators in the country, and deepened its relationship with key stakeholders responsible for responding in case of an attempted malicious act involving radiological material. While the CNE effort was distinctive for its pace and rigor, to this point the ORS-CNE dynamic adhered largely to the established model. At this point, however, CNE proceeded to break new ground in taking ownership for radiological source security.

### Response Stakeholder Engagement

It is a cornerstone of radiological source security that effective and timely response is necessary to ensure the security of the source. While ORS and CNE partnered to initiate training of armed response stakeholders, it was evident at an October 2018 training development workshop that the Dominican Republic had taken ownership of its radiological source security. CNE convened a working group comprising law enforcement personnel and representatives of the emergency operations center to develop training material for armed responders. When it became clear that additional impetus was needed, CNE set about planning a separate, larger stakeholder meeting to establish support for the program to train armed responders to respond effectively to malicious acts. Convening this large group of response experts and response training experts, CNE solicited input and opinions from these stakeholders, establishing a broad foundation to support the further development of its response training curriculum.

In July 2019, CNE convened its pilot training course for armed responders to a malicious act involving radiological sources. The training course, attended primarily by police, armed forces and other first responder stakeholders, proved to be effective in communicating the risks and consequences associated with radiological materials, as well as the considerations for effectively responding and interrupting an adversary. Feedback from participants in the initial course delivery was integrated into a revised curriculum, and CNE has secured funding for two response training events scheduled in 2020 that will focus on table-top exercises to validate and improve communication and planning among responders in anticipation of a malicious act involving radiological sources.

### A Physical Security Training Program

CNE’s engagement of response stakeholders proved to be only the beginning. Again, demonstrating a unique commitment to ensuring the sustainability of radiological source security, CNE unveiled in 2019 its plan for a Physical Security Training Program. Having constructed a training facility with physical security equipment, CNE announced a series of courses to target a wide range of stakeholders involved in the security of category-1, 2, and 3 radioactive sources. By the end of 2019, CNE successfully conducted two courses from their program, with additional courses on the calendar for the coming year (see below).

#### Beginning with the Basics

The first course in CNE’s new catalog is “Basic Security Course and Management of the Physical Security of Radioactive Sources.” Nearly every initial interaction with operators regarding source security is quickly derailed by scepticism regarding the need for security and misunderstanding regarding security expectations. This basic course was designed to establish the necessary baseline for additional, in-depth discussions in subsequent engagements. It includes topics such as understanding the threat; managing the risk; the consequences of failure to secure a source; an overview of regulatory requirements; the fundamentals of physical security systems; roles and responsibilities related to security; and security culture. The first delivery of this course is scheduled for early 2020, with funding identified and preparations under way.

A second course, “Workshop to Socialize the Regulation for the Physical Security of Radioactive Sources, Including its Transportation,” addresses another frequently encountered shortcoming in the physical security realm: a general lack of awareness of the legal requirements that drive physical security activities for operators. In this one-day event, CNE informs operators of the role and authority of CNE as the regulatory body, discusses the text of the regulation, as well as its meaning in practical terms. This discussion lends significant weight to the concepts previously broached in the first course by moving from a notional discussion of the desirability of security for radiological sources to a legalistic discussion that clearly articulates legal obligations for compliance. The inaugural delivery of this foundational workshop took place in December 2019. Discussion among the participants underscored the value of a focused dialogue on the regulatory requirements. CNE was able to rectify misconceptions, clarify expectations, and provide critical explanations of the reasoning behind regulatory requirements that operators may have viewed as poorly justified.

#### Applying Physical Security Knowledge

After establishing the conceptual and legal foundation for physical security activities, CNE’s curriculum turns to the practical implementation physical security. The “Basic Course of Design and Evaluation of a Physical Security System,” explains the purpose and function of security system components, along with the principles that underpin system design. While all facilities now have security systems installed, by delivering this course to operator personnel it helps to establish buy-in for the use of the system, thereby improving both security culture and security itself at the facility. This instalment in the curriculum is followed by a “Workshop of Elaboration of a Security Plan.” Security plan development serves multiple purposes. For example, developing the security plan compels operators to articulate the procedures according to which security systems are operated, define security-related roles and responsibilities for staff, consider the range of security management activities (staff trustworthiness, security budget planning, information security, access control, etc.), and analyze the mechanics of coordinating with response stakeholders in the event of a malicious act. The workshop also allows the regulatory body another opportunity to impress upon operators the regulatory expectations to which they will be held during inspection activities. CNE opted to address physical security during transportation in a separate course, “Basic Course of Physical Security During the Transportation of Radioactive Sources.”

#### Identifying Security Culture as an Objective

The final course in CNE’s Physical Security Training Program is the “Workshop on Physical Security Culture of Radioactive Sources.” This course is based upon NSS-7, Nuclear Security Culture Implementing Guide, and addresses the phases of security culture, key actions to create a strong security culture, how to evaluate security culture, and discusses lessons learned in the area of security culture. Certainly by implementing this series of courses, CNE is exerting immeasurable positive influence on the security culture of radiological source operators and other stakeholders in the Dominican Republic. Including a one-day event to specifically define and discuss security culture allows CNE to place security culture in the conscience of stakeholders as a concrete objective to be pursued in its own right, rather than simply as a corollary of security policy implementation. CNE opted to tackle security culture by dividing its target audience according to the type of activities in which the operators engage. During the first delivery of this course in October 2019, CNE convened the industrial operators of the Dominican Republic and crafted the message around specific examples and conditions found at these facilities. Subsequent courses in 2020 will address medical institutions and research institutions.

## FAVORABLE CONDITIONS IN THE DOMINICAN REPUBLID

The success of the Dominican Republic has been hard-won over a considerable period of time. Nevertheless, the Physical Security Training Program initiative is unique among ORS partners with similarly lengthy history for its comprehensive approach to capacity building. An examination of the conditions present in the Dominican Republic may enable the replication of this success with other partners.

CNE and the Dominican Republic took advantage of several conditions that facilitated successful pursuit of its Physical Security Training Program. First, considerable credit must be given to the personal investment of CNE staff in furthering the radiological source security agenda. Key staff were actively involved in each facet of source security, from regulation development, to inspector training and responder engagement, and site security plan drafting and beyond. This continuity has ensured that lessons learned throughout the process are remembered and applied, to continually improve effectiveness.

A second positive factor is the relatively straightforward administrative and bureaucratic environment in the Dominican Republic. While there were occasional roadblocks resulting from questions of bureaucratic authority or responsibility, CNE was largely successful in establishing and maintaining its position as the competent authority for radiological source security. This continuity resulted in stable relationships with operators and stakeholders, allowing for frequent, direct interactions to address confusion or uncertainty and nurture a commitment to security from all parties.

Another impactful circumstance found in the Dominican Republic is the close relationship between the competent authority and the various stakeholders in law enforcement and the broader government, as well as with the operators. A general sentiment that all the organizations share a common goal continues to contribute to a collegial and trust-based pursuit of radiological source security. Stakeholders have participated in training material development, and subsequently ensure their staff participate enthusiastically in the resulting training opportunities.

Geography also had a positive impact. In a compact country like the Dominican Republic, where the distance between the competent authority and operators is under 200 kilometers, the ability to both engage operators and hold them accountable in the radiological source security context is greatly improved. It was relatively easy to incorporate operator personnel into training and other learning opportunities, and it will continue to be manageable in the future as CNE fully implements its Physical Security Training Program.

## a road map for repeating the success of the dominican republic

CNE certainly enjoyed a handful of conditions that contributed to its success in advancing sustainable radiological source security in the Dominican Republic. It must be accepted that the likelihood of encountering a similarly favourable convergence in a different location is quite minimal. Nevertheless, it is worthwhile to consider whether a similar environment could be manufactured as part of initial steps toward achieving similar success. The first condition identified above, the strong personal commitment from CNE staff, is perhaps deceptively difficult to achieve, though not due to a lack of will on the part of competent authority staff. ORS enjoys enthusiastic cooperation and involvement from most of its partners; unfortunately, workload and resource realities impose very real limits in terms of the magnitude of staff engagement in activities specific to radiological source security. Perhaps identifying a mid- or junior-level staff member who can take ownership of radiological security engagement without the managerial fetters that occupy more senior staff would help achieve a more consistent level of focus in this area.

Similarly, identification of a mid-level “champion” may help to foster the types of close interactions among stakeholders that CNE enjoys, cultivating a broader pool of stakeholders who actively buy into the radiological security mission.

Geography is an uncontrollable circumstance, and in this sense the Dominican Republic has a natural advantage over other states. In larger countries though, applying a geographical filter to the development and engagement strategy may have value. Rather than seeking to tackle radiological security on a nationwide scale, it may make sense to identify a geographically constrained sub-set of organizations for engagement. This could be driven by a higher concentration of sources or operators in a region, by proximity to the competent authority in order to facilitate more frequent and consistent engagement, or other considerations that may confer an advantage. Pursuing this gradual approach will generate a larger cadre of advocates within the country who can then be leveraged to spread the message further afield and will also lead to increasingly efficient deployment as the competent authority and other stakeholders incorporate lessons learned from their successes.

While bureaucracy was counted among the favourable conditions in the Dominican Republic, it is unrealistic to expect to encounter a similar situation in other places. Mitigating bureaucratic obstacles is an eternal challenge, and no real solution exists. Working to foster the other circumstances mentioned above will drive progress, to a certain extent, in spite of the bureaucratic limitations. In addition, helping to maintain a focus on the need for security regulations in the face of delays in the enactment of the regulations can nurture a security culture within the bureaucracy that can help drive development of the foundation for sustainable radiological source security that can be deployed when bureaucratic constraints are ultimately overcome.

## conclusion

The success of the Dominican Republic’s Comisión Nacional de Energía in launching its capacity-building framework for stakeholders in radiological source security represents a significant milestone, both for the Dominican Republic and for the Office of Radiological Security. At its most fundamental level this accomplishment puts to rest many assertions that sustainable security may be an unachievable fantasy. The Dominican Republic’s multi-faceted curriculum, developed with buy-in from a range of stakeholders and carried in short order from concept to implementation, will be the foundation for continued growth for radiological source security in the country.

The conditions CNE enjoyed as it pursued its security objectives – minimal bureaucratic obstruction, significant personal commitment from CNE staff, close interaction among the range of stakeholders, and compact geography may not occur organically elsewhere in the same fashion. Nevertheless, recognizing how these factors contributed to the success of CNE, we can view other situations through the prism of that success in order to devise a strategy for similar success with other partners in the future.

References

1. INTERNATIONAL ATOMIC ENERGY AGENCY, Code of Conduct on the Safety and Security of Radioactive Sources, IAEA/CODEOC/2004, IAEA, Vienna (2004).
2. INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Security Recommendations on Radioactive Material and Associated Facilities, STI/PUB/1487, IAEA, Vienna (2011)
3. INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Security Culture, STI/PUB/1347, IAEA, Vienna (2008)

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