

# THE EFFECTIVENESS OF SCENARIO-BASED DISCUSSIONS

**Bill Petoskey**

Oak Ridge National Laboratory

**David S. Corderman, PhD**

Oak Ridge National Laboratory

## ABSTRACT

Training and workshops are conducted to enhance an agency's radioactive material location and response capability when control is lost. A lecture format using visual presentation, often with limited knowledge transfer, is frequently used to convey information about material outside of regulatory control (MORC). A recent training event used scenario-based discussions and real-world investigative case examples with positive results. The delivery process included intelligence injects, a by-product of the Socratic method, which increased participant engagement, created an active learning format, and facilitated interagency communication. Participants could share their understanding of the cases, including criminality and mitigation efforts, and demonstrate critical thinking skills within a classroom environment. Forms of communication included listening, verbal response, and nonverbal communication skills. Observed second-order effects included credibility and bonding between participants and staff, which was due to a shared goal of responding to MORC.

## INTRODUCTION

Many training engagements about radioactive or nuclear MORC are conducted in a classroom using a lecture format. Observed results indicate limited knowledge transfer using this methodology, even when using authentic examples. Exercises and training engagements focused on the recovery of MORC should mimic the physical and mental operations required to return the material to regulatory control. The presented case examples should include the components of criminality and mitigation, as well as the role of information and intelligence in the investigative process.

A complete real-world case study used in such training is rare because MORC recovery operations and full-scale investigations—compared to other smuggling investigations—often involve tightly held security information, so the details are not always available to the public. Those in the public domain often lack complete information, making them less than ideal learning tools. As a result, a minimal number of fully documented MORC investigations are used in classrooms.

Consequently, instructors focus on the one or two aspects of a MORC case that satisfies a class learning objective or is open-source information. Examples include safety issues, MORC, or MORC recovery.

Missing data about a presented case—from the initial information alert and intelligence analysis through prosecution—results in a potential lost opportunity for learning. Absences may include

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criminal motives; the initial stages of a case; shared information between agencies; forensic issues; gathered, transported, and stored evidence problems; chain of custody matters; criminal charges of the perpetrators; steps taken to prevent a follow-on incident; adjudication of the subjects; and post case after-action reviews. Additionally, the lecture methodology typically provides one-way communication—from instructor to student. When two-way dialogue occurs, the student often asks the instructor a question.

Scenario-based discussions and fully detailed real-world case studies are some of the most effective learning tools for students to understand aspects of MORC. Participants can be challenged by imagining a case is theirs through the gradual introduction of investigative details and being asked how they will proceed or respond. In this way, participants can compare their thinking to what is in a scenario or to what occurred. This process is a modified form of the Socratic method—a give-and-take between facilitator and student.

Unfolding a case in this manner challenges students and allows them to deal with potential or actual situations. This learning methodology most closely mimics the physical and mental operations involving MORC. It provides knowledge gained through higher-order thinking, which comes from discussions about ambiguous concerns, including intelligence sharing; jurisdictional authorities; task force organization; the stage national-level supraorganizations delegate authority; sorting specialists; when a relevant legal authority is engaged; and other investigative issues.

To illuminate these points, this discussion includes a jointly taught course between the US Federal Bureau of Investigation (FBI) and the US Department of Energy’s (DOE) Nuclear Smuggling Detection and Deterrence (NSDD) Program. Recently piloted after modifications, the course title is “Radiation Detection and Investigative Techniques” (RDIT). Advancement through a continuous evaluation and improvement process—including introducing real-world case studies in conjunction with this instructional methodology—saw the course mature.

## **RADIATION DETECTION AND INVESTIGATIVE TECHNIQUES COURSE**

Two US government entities, the FBI and DOE’s NSDD Program, offer the RDIT course. The objectives of the course are

- bridge traditional law enforcement response and follow-on steps for an effective radiological/nuclear investigation, including crime scene safety, evidence collection, analysis, prosecution, and post prosecution information sharing;
- apply a risk assessment process to radiological/nuclear material outside of regulatory control; and
- enhance collaboration among participants through involvement in facilitated discussion and exercise.

The RDIT course encompasses MORC investigations beginning with information alerts and continuing through post prosecution information sharing, with a strong emphasis on crime scene processing.

## **CRIMINALITY**

When working with students in training and workshops to enhance an agency's radioactive material location and response capability, including recovery when control is lost, it is effective for them to understand the criminal mindset. Most participants attending such training will have a role in the mitigation or response to MORC, but they may have a less formal understanding of the mindset of those involved or how such cases begin.

Regarding the criminal aspect of MORC, there are a few key considerations. One is whether the individual(s) involved has a motive that includes their willingness to die while causing harm or death to others. Individuals with this motive may be separatists, terrorists, violent extremists, disgruntled employees, or psychotic. The suicidal outcome is extreme but is proven through bombings and "suicide by cop" for various causes.<sup>i</sup> Done with a dirty bomb or radiological dispersal device, this is a radical aspect of MORC.<sup>ii</sup>

Second is the individual(s) who may not want to die but is bent on destruction for hate or revenge and may be labeled as described above. A radiological exposure device could be their means for causing harm to others.<sup>iii</sup> Another reason for the unlawful obtainment of MORC is financial. The monetary aspect of criminality is universal, historical, and most common, and this is often why MORC finds its way into students' area of operation.

When working on cases involving MORC, investigators are often informed and develop leads through traditional communication channels that align with recognizable criminal activity—particularly smuggling. Smuggling of one kind of contraband often overlaps with others. Smuggling MORC frequently includes the same actors, routes, and motives associated with other offenses, including drugs, human trafficking, illegal weapons, and transporting stolen goods.

## **MITIGATION**

In addition to the role of the two US government entities responsible for the RDIT course, other significant efforts go into preventing radiological and nuclear material from becoming MORC. Among these are international legal instruments, including the Convention on the Physical Protection of Nuclear Material (CPPNM) and its 2005 Amendment, as well as the Code of Conduct for the Safety and Security of Radioactive Sources with its Supplementary Guidance adopted under the auspices of the International Atomic Energy Agency (IAEA).<sup>iv</sup>

Another international effort to mitigate the threat of nuclear terrorism is the Global Initiative to Combat Nuclear Terrorism (GICNT), formed in 2006. In part, the mission statement of the GICNT says that it "is a voluntary international partnership of 89 nations and 6 international organizations that are committed to strengthening global capacity to prevent, detect, and respond to nuclear terrorism."<sup>v</sup> Additionally, many governments have specific mandates that apply to MORC, including laws and regulations. Most also have agencies designated for executing nuclear smuggling incident protocols—and policies, procedures, and practices—to mitigate, deter, detect, and respond to MORC.

Finally, concerning potential rogue state actors, the IAEA “verifies through its inspection system that States comply with their commitments, under the Non-Proliferation Treaty and other non-proliferation agreements, to use nuclear material and facilities only for peaceful purposes.”<sup>vi</sup>

The international responsibility to deal with MORC and understand how criminals will leverage their criminal enterprises to steal, buy, or sell such materials makes it imperative that countries establish and maintain robust programs to respond to and investigate these incidents. Bringing perpetrators of these crimes to prosecution should be a significant focus; consequently, preparation through training and exercise is critical. Only through continuous vigilance can the global community combat would-be actors who seek to do harm or profit from such actions.

## **EXERCISE**

Exercises are a significant part of the development of students in many fields. Typically, exercises are conducted to evaluate policies and procedures. The exercises used in law enforcement and incident management are divided into two categories, known as operations-based and discussion-based exercises.<sup>vii</sup> This paper focuses on discussion-based exercises, including scenario-based discussions.

Typically, courses in academia use a lecture methodology. Discussion-based exercises are presented differently than academic courses and employ a questioning process.

According to the reference.com website, “the lecture method is a teaching method where the instructor acts as the primary information giver.”<sup>viii</sup> Courses delivered this way are valuable for providing primary data, but they minimize the students' knowledge, experience, and skills. Because the participant's role is to take in information with little or no challenge, this is considered passive learning.

Implemented through a series of injects in the form of questions, some preplanned, a discussion-based exercise allows a facilitator to stimulate dialogue. An activity of this type is limited only by the facilitator's ability to promote conversation with follow-on questions used to challenge participant responses. This process is analogous to the Socratic teaching method, which requires a sophisticated facilitator who is knowledgeable about operations, policies, protocols, and practices pertaining to MORC.

## **SOCRATIC METHOD**

Fabio states, “the Socratic method is named after the Greek philosopher Socrates who instructed students by asking question after question. Socrates sought to expose contradictions in the student's thoughts and ideas to then guide them to solid, tenable conclusions.”<sup>ix</sup> Usually done in a classroom setting, the Socratic method is a form of a collective dialogue between and among the facilitator and students, based on asking and answering questions. In the purest sense, “the Socratic method focuses on moral education, on how one ought to live.”<sup>x</sup> However, modifications of this technique are used in many training programs to increase student engagement and challenge thinking.

When exercising the Socratic method, a facilitator controls the discussion, stimulates critical thinking, and draws out ideas and underlying presuppositions. Billings and Roberts (2006) explain that a Socratic seminar is an instructional method to improve understanding of ideas through engaged discussion.<sup>xi</sup>

From a practical standpoint, the Socratic methodology can be used in scenario-based discussions about MORC and applied to historical case studies—a modification made for the recent RDIT pilot course presented in Eastern Europe. Although a lecture can add value to students’ understanding of situations involving MORC, the exchange stimulated through a facilitator’s questions forces participants to engage in active learning.

This form of Socratic methodology increases students’ attention through the risk of being challenged by the facilitator for response or feedback. The exchange between facilitator and participants is richer and more insightful than a lecture, and facilitators receive immediate feedback about the curriculum, delivery, and participants’ level of insight. If done well, the engagement is organic, and participants are unaware they are being challenged or engaged in a learning process.

Socratic reasoning, active engagement, metathinking, and careful “pushing” at the openings—uncovered through this methodology—often lead to improved planning and changes in policy, procedures, and practice; enhanced learning opportunities; and future exercises based on exposed gaps. Outcomes derived from the Socratic method may include memories, notes, or a written record of self-identified action plans used to improve performance. These are a few possible results of the “hard” learning obtained from planned, purposeful, and directed questions used in scenario-based discussions.

## **SCENARIO-BASED DISCUSSIONS**

Leskowski (2023) states, “scenario-based learning is an interactive instructional strategy that uses real-life situations and narratives to engage learners. A scenario describes a premise, including just enough detail for the learner to react with a ‘best’ decision on how to proceed in that situation.”<sup>xii</sup> Referred to in this document as a *scenario-based discussion*, this approach focuses on effectiveness, including dialog and the modified Socratic method. For classification purposes, a scenario-based discussion is a type of discussion-based exercise.

Created by an instructional designer, the scenario-based discussion differs from a real-world case study. Often it is based on an actual incident, which the instructor enhances or diminishes. Details about the scenario usually include regional idiosyncrasies, an appropriate physical location, and cultural norms to fit the scenario context. In the recent RDIT course, designers included scenario-based discussions and real-world cases to ensure student exposure to cultural and contextual aspects of MORC and that facilitators met course objectives.

The designed RDIT scenario-based discussions also stimulated higher-order thinking. The focus was on engaging the various organizations participating in the training, especially those with evident or suspected conflicts. Dialogue concentrated on the inevitable challenges of multiagency

response, disparate regulatory authorities, and led thinking past “book” responses to how participants might react in proposed challenging circumstances.

A more subtle aspect of using scenario-based discussions is the development of junior leaders. A skilled facilitator can engage the more experienced students by drawing from their historical perspectives about their involvement with MORC, allowing attending junior staff to learn the strategies and associations presented and to see how senior leadership responds to issues.

A drawback to this learning archetype is that a participant can always “cry foul,” claiming the scenario is unrealistic.<sup>xiii</sup> Nevertheless, scenario-based discussions are a solidly proven methodology for engaging students.

## **INTELLIGENCE AND EXERCISE INJECTS**

The scenario-based discussion often begins with an information alert, also called an *intelligence inject*, that is shared, reviewed, and explored with the participants. Starting an exercise with an intelligence inject should be based on actual operations. The facilitator prods participants with additional information using the modified Socratic methodology, which is followed by additional injects.

In this context, *information* is raw facts, and *intelligence* is information that is evaluated and analyzed. Before use, an intelligence analyst must examine information to determine its viability and worthiness. This process becomes the basis for a law enforcement inquiry and is often how a case begins.

The role of shared intelligence between trusted agencies and governments is a critical element, leading to the interdiction and recovery of MORC within the criminal supply chain. In a recent article by an experienced international law enforcement smuggling team, their last 29 radiological smuggling investigations resulted from intelligence-driven operations (Miorin, 2022).<sup>xiv</sup>

The intelligence process is a significant part of any investigative procedure, including MORC, and participants should understand that they need to develop intelligence through private sector partners that control radiological/nuclear material. This kind of outreach is essential for a faster and more comprehensive law enforcement response and understanding of what may be lost or stolen.

## **FACILITATION CONSIDERATIONS**

Scrutiny of MORC cases for classroom use is essential. Once selected, the facilitators should analyze the unlawful motive of the actor(s). Some cases will be straightforward, but others will require more thoughtful consideration. The key is for course designers and facilitators to think through how possible motives caused the perpetrators to act and use their conclusions to form questions asked of participants. To do this well, designers and facilitators must understand their students’ regulations, policies, and standard operating procedures regarding MORC.

Real cases used with carefully designed scenario-based exercises can ensure that students will be exposed to distinct aspects of MORC detection, deterrence, response, and recovery, adding

credibility to the course. Not all real-world examples are created equal, but engaging the imagination of participants in actual cases employs their higher-order thinking skills. Consequently, they can be significant for learning outcomes.

## **RECENT EXAMPLE**

The FBI and DOE's NSDD Program recently conducted the RDIT course in Eastern Europe. The event focused on an interactive learning process by facilitating discussions about investigative cases, evidence collection, decontamination, information sharing, and incident command. Significant interagency dialogue occurred between the participating country's law enforcement, fire service, transportation authority, laboratory personnel, and the general prosecutor's office. This dialogue continued throughout, including discussions related to future mutual support agreements.

During the course, actual case studies were presented and allowed participants to share their possible investigative responses and propose actions based on the facts of the case. Fostering the guided discussions increased the collaboration between different agencies. For example, several participants shared their opinions about how they would recover radiological evidence possibly contained in a glass jar. Participants addressed credible threats (white crystal between the lid and jar as a possible explosive) to collect depleted uranium safely. The actual case studies helped remove the "this is not realistic" participant argument.

This training event included investigative case examples with positive results. Facilitators achieved enriched participant engagement by using shared intelligence injects while reviewing the actual case studies and scenario-based discussions, generating an active learning environment, and facilitating interagency communication. Participants shared their understanding and demonstrated critical thinking skills within a classroom environment. Illustrated communication forms included listening, verbal response, and nonverbal communication skills. Observed second-order effects included credibility and bonding between participants and staff due to a shared goal of "resolving" a response to MORC.

## **CONCLUSION**

Traditional approaches to training using a lecture format may include missed opportunities for learning (resulting in passive learning as identified in this paper) with limited knowledge transfer to students. Training events involving MORC using scenario-based discussions, real-world investigative case studies, and facilitated discussions provide a more robust learning experience because of better student engagement. This active learning format helps participants—particularly those from diverse backgrounds, including different agencies—speed up their understanding of each other's role regarding MORC and provides a more holistic learning environment.

Scenario-based discussions may uncover problems that need addressing—known as gaps—that are individually or collectively identified. Issues emerge through questioning, active engagement reasoning, and metathinking. These lessons can lead to policy and procedural changes, future training, and extended learning opportunities.

Facilitators who understand the essence of the Socratic method are key to these successful breakthroughs. Critical for a positive outcome of training delivery is the facilitator's ability to use a modified version of this methodology to draw out ideas from participants through dialogue and exchange, which is done by adapting real-world case studies or creating scenario-based discussions. Minimizing and reducing inconsistencies in participants' understanding of MORC can be effectuated through this training, as was done in the recently modified and piloted RDIT course discussed in this paper.

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Mr. Petoskey's contact information is petoskeybj@ornl.gov, and Dr. Corderman's is dcorderman@alallc.us.

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<sup>i</sup> "Suicide by cop (SBC) is a situation where individuals deliberately place themselves or others at grave risk in a manner that compels the use of deadly force by police officers." T. Salvatore. "Suicide by cop: Broadening our understanding." US Federal Bureau of Investigation, Washington, DC (September 9, 2014).

<https://leb.fbi.gov/articles/featured-articles/suicide-by-cop-broadening-our-understanding->

<sup>ii</sup> "A dirty bomb is a mix of explosives, such as dynamite, with radioactive powder or pellets." Centers for Disease Control and Prevention. "More information on types of radiation emergencies." Centers for Disease Control and Prevention, Atlanta, GA (April 4, 2018). <https://www.cdc.gov/nceh/radiation/emergencies/moretypes.htm>.

<sup>iii</sup> Ibid. "Radioactive material could be hidden from sight to expose people to radiation without their knowledge. These devices are called Radiological Exposure Devices (RED) or hidden sealed sources."

<sup>iv</sup> International Atomic Energy Agency. "Nuclear Security Conventions." International Atomic Energy Agency, Vienna, Austria (February 12, 2023). <https://www.iaea.org/topics/nuclear-security-conventions>.

<sup>v</sup> Global Initiative to Combat Nuclear Terrorism. "Global Initiative to Combat Nuclear Terrorism." *Global Initiative to Combat Nuclear Terrorism*. Accessed February 18, 2023, <https://gicnt.org/>.

<sup>vi</sup> International Atomic Energy Agency. "The IAEA mission statement." International Atomic Energy Agency, Vienna, Austria (May 26, 2014). <https://www.iaea.org/about/mission>.

<sup>vii</sup> US Federal Emergency Management Agency. "Homeland Security Exercise and Evaluation Program." National Standard Exercise Curriculum. US Federal Emergency Management Agency, Washington, DC. Accessed February 18, 2023, <https://training.fema.gov/programs/nsec/hseep/>.

<sup>viii</sup> IAC Publishing. "What Is the Definition of 'Lecture Method'?" Accessed February 18, 2023, <https://www.reference.com/world-view/definition-lecture-method-3c6bb0c8e22ac3d8>.

<sup>ix</sup> Michelle Fabio. "What Is the Socratic Method and Why Is It Popular in Law School?" *ThoughtCo* (July 15, 2019). <https://www.thoughtco.com/what-is-the-socratic-method-2154875>.

<sup>x</sup> "The Socratic Method: What It Is and How to Use It in the Classroom." Tomorrow's Professor Postings. Accessed February 18, 2023, <https://web.archive.org/web/20220511021023/https://tomprof.stanford.edu/posting/810>.

<sup>xi</sup> L. Billings and T. Roberts. "Planning, practice, and assessment in the seminar classroom." *High School Journal* 90, no. 1 (2006): 1–8.

<sup>xii</sup> A. Leskowski. "How to write a scenario that actually engages your learners." *Maestro*. Accessed March 8, 2023, <https://maestrolearning.com/blogs/how-to-write-a-scenario/>.

<sup>xiii</sup> Conversely, the student does not have this advantage using a real-world case.

<sup>xiv</sup> F. Miorin. "Responding to the threat of radiological material through law enforcement and intelligence operations." *A Georgian Experience* (2002).