

Title: ORS/Iraq Collaboration on the Securing of Medical Radioactive Source Devices in Iraq

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Abstract:

This paper will describe how numerous obstacles were overcome in a three-year period, 2019-2022, to secure radioactive sources in Iraq, resulting in a national comprehensive approach. Lawrence Livermore National Laboratory (LLNL), on behalf of the National Nuclear Security Administration (NNSA) Office of Radiological Security (ORS), has worked with the Iraq Radioactive Sources Regulatory Agency (IRSRA) to enhance security for radioactive sources at five hospitals throughout Iraq and create a centralized remote monitoring system in Baghdad, Iraq. This work has been accomplished without the benefit of the LLNL team being able to travel to Iraq, thus requiring extensive planning, coordination, and cooperation amongst all stakeholders.

Paper:

In 2019, the U.S. Department of Energy (DOE), National Nuclear Security Administration (NNSA), Office of Radiological Security (ORS), contacted the Lawrence Livermore National Laboratory (LLNL), and asked if physical protection upgrades could be accomplished in Iraq, given travel there was not allowed. The answer, yes, was based on LLNL experience gained from working with countries where access was limited, if not prohibited. Past success had been gained through a combination of third-party involvement and LLNL remote project management, coordination and implementation. A primary objective in Iraq was securing six hospitals with radiation treatment areas using Gamma Knives. These instruments utilize multiple cobalt-60 sources amounting to IAEA Category 1 material, requiring the highest level of protection.

The LLNL team reached out to the Iraq Radioactive Sources Regulatory Agency (IRSRA) and established an agreement for IRSRA to conduct site assessments based on established LLNL criteria. Data from the assessments would allow LLNL to complete a required Site Protection Assessment (SPA) and develop a conceptual design for the upgrades.

The pilot assessment was applied first to a hospital in Basra, Iraq. During the site assessment, IRSRA collected information on the radiological source target, along with floorplans, room dimensions, site physical and operational characteristics, as well as other pertinent information needed for the SPA and design. The information received was sufficient for LLNL to complete a design for the upgrades, contract statement of work, and the SPA.

Physical protection upgrades typically include two layers of bounded protection zones, including multi-function access control, intrusion detection, closed circuit television (CCTV) with recording, insider protection, remote monitoring, duress alarms, window barriers, and audible/visual alarms. The systems are monitored in a central alarm station. External systems such as CCTV and barriers serve to complement interior protection measures.

After a competitive request for proposal (RFP) process, the first contract for a site survey and implementation was awarded to a company in Kuwait, Kavaal LTC. Unfortunately, the covid pandemic

ensued, thus delaying implementation in Basra. In addition, due to covid restrictions, site assessments for two hospitals in Baghdad, were also delayed. Despite the covid obstacles, IRSRA managed to complete the site assessments for the two Baghdad hospitals. The Kavaal company, however, found the covid restrictions to be a barrier for entry into Iraq. Through rigorous coordination between LLNL, ORS, IRSRA, and Kavaal, visas were finally obtained, allowing Kavaal to begin their project and conduct their initial site visit. Unfortunately, covid restrictions affected the supply chain, further delaying the Basra project. Ultimately, a different equipment provider was selected and the project installation was able to begin.

Greater momentum was achieved, when LLNL selected SOC, Ltd., to implement work at the two Baghdad hospitals. The SOC vendor had an advantage of having an office in Baghdad and having previous interactions with IRSRA. Upgrades for the two Baghdad hospitals were completed within an 18-month period, just prior to completion of the Basra project.

Shortly after completion of the Baghdad upgrades, a security incident occurred at one of the Baghdad hospitals. An employee's attempt to steal medical supplies was observed and recorded by the newly installed CCTV system. The employee, who had attempted to obscure the view of two cameras, was identified and apprehended after staff viewed the camera recordings of the incident. This incident demonstrates the vulnerability from an insider, and the importance of increased security to protect assets.

To acquire more comprehensive data from the initial site assessments for use in the conceptual design and SPA, LLNL with ORS approval, a decision was made to compete contracts for site assessments at a hospital in Erbil and a hospital in Mosul. This was in lieu of a traditional single contract combining the site survey and implementation. The contracts were awarded to SOC and included a task to prepare a preliminary design for each hospital. After completion of these assessments, LLNL again conducted a competitive process to award implementation contracts. Upgrades for the Erbil and Mosul hospitals were completed within a 12-month period, by SOC. The earlier theft, at a Baghdad hospital demonstrated the importance of physical security and timely completion of upgrades underscored the commitment at Erbil and Mosul to a positive security culture. The incident response underscored the hospital commitment to security culture.

By the end of 2022, the joint team of ORS, LLNL, SOC and Kavaal, had completed upgrades at five Iraqi hospitals, within less than four years, despite numerous obstacles. Subsequently, a sixth hospital, the third hospital in Baghdad, was identified as also needing upgrades. This work scope is now in the process of contract award for the site assessment. Upon completion of the assessment, the conceptual design and SPA, an installation contract will be let, using a competitive process.

As the overall ensued, LLNL and IRSRA identified an offsite location to monitor hospitals and completed the site assessment for the Remote Monitoring Station (RMS). A future LLNL contract will be awarded to install necessary equipment at the RMS with secure connectivity to all six hospitals. This will allow redundant monitoring of all category 1 radioactive sources complementing the onsite alarm monitoring at each hospital.

As physical protection upgrades have been in the process of completion at the Iraqi hospitals, LLNL and IRSRA have also been conducting essential training for staff personnel. Training has included, Physical Protection Security Management (PPSM), Site Security Planning (SSP), and International Response

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The earlier theft, at a Baghdad hospital demonstrated the importance of physical security and timely completion of upgrades underscored the commitment at Erbil and Mosul to a positive security culture.

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Training (IRT). Key personnel from IRSRA and the hospitals attended the training courses, which were conducted both virtually and in-person. In-person training for IRT was conducted at the CYCLOPS Training Facility, in Cyprus, in 2022. Follow-on training, scheduled for June 2023, will be conducted in Cyprus to jointly work on, and revise, hospital site security plans. In addition, LLNL contractors have conducted on-site training for hospital personnel regarding use of the physical protection systems, effective monitoring of the systems, and response actions. As indicated throughout, international coordination has been essential. Periodic coordination by ORS and LLNL occurs with Interpol, US Department of State, Iraqi and regional stakeholders, and the International Atomic Energy Agency.

As the final physical protection upgrades are installed at hospitals and IRSRA, planning for future activities and sustainability continues. Alternative technologies, that may one day replace the radioactive sources, are being discussed. In addition, redefining and strengthening Iraqi government roles and responsibilities for radioactive materials is also underway. These activities are being implemented by LLNL and IRSRA and are endorsed by ORS.

In conclusion, it is with full appreciation from all involved in the work, that the security measures in Iraq have reduced risk, primarily due to the commitment of Iraqi personnel.

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