

Surveillance using unattended transmission: A powerful control tool for enhancing nuclear security

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Abstract

Nuclear material accounting in any nuclear installation is an important tool to ensure that the nuclear material (NM) inventory is maintained on a regular basis and thereby detecting unauthorised removal at the earliest [1][2]. In general, the Agency verifies the accounting reports at a specific frequency, and the physical verification is done annually. Any discrepancy in actual inventory or the monthly declarations submitted by member states could thus be detected only during these periods. Unattended transmission of information from nuclear facility to the Agency headquarters may be a better option for detecting discrepancies if any, resulting in enhanced nuclear security. Nuclear material surveillance methodologies include equipment used to monitor nuclear material and its associated equipment. The technical measures used should be capable of providing near real-time alarms to indicate failure of surveillance itself or that of the material control measures under surveillance [3][4]. This information can be made available to both the facility operator / State as well as the Agency at any desired time frequency including the scope for near-real time provision. In this context, India's experience in providing remote data transmission from one of its facilities to the IAEA enabling strengthening of nuclear security is shared in this paper.

One of India's nuclear facilities is being monitored remotely by the Agency through unattended data transmission methodology and the efficacy of this system has been demonstrated very effectively. The usual physical inspection frequency to this facility prior to the remote data transmission regime was once in a month. At present, the data is collected on a daily basis and remotely sent to the Agency headquarters. The frequency of data collection is software controlled and could be further increased even to near real time also, if required. This technology not only improves the verification efficiency, but reduces the inspection efforts as well, including cost reduction.

The remote data transmission deployed in India by the Agency is based on surveillance of electronic seal information, transmitted to the Agency headquarters through a secure Virtual Public Network (VPN) connection using the public internet services. The security of data is ensured using hardware encryption modules provided by the Agency deployed both at transmission as well as receiving end. Data (seal information) is collected at every day at 00:00 hrs in a programmed manner. Extending this remote data transmission technology to other area for improving verification efficiency and thereby contributing to nuclear security is addressed in this paper.

References:

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