Contribution ID: 337

Exploration on the application of Unattended and Remote Monitoring Systems at the level of government and facilities

The concept of Unattended and Remote Monitoring Systems is commonly used in the field of IAEA nuclear safeguards. Usually, those technologies such as alarm detectors, gamma or neutron detectors, video cameras and data remote transmission network are used to transmit real-time or regular measured data back to supervisory departments (e.g. IAEA). It is mainly used to supervise those nuclear materials in semi-enclosed areas or areas where staff rarely enter, which is helpful to supervisors determine whether the nuclear materials are under control. However, with the development of those technology such as "Internet +" and 5G network etc., the concept of Unattended and Remote Monitoring Systems can be further extended to expand the application of the technology in the field of nuclear security. Similar applications have been widely applied at the level of nuclear facilities. For example, for one unattended nuclear materials or radioactive source warehouses, and some automatic processing workshops of nuclear materials, etc., there is no longer a guard post at the main gate. Instead, some technologies such as door magnetic alarm and video review are adopted and managed by the remote monitoring center. However, there are many problems such as so much kinds of detection means and data transmission equipment that can be used, and many work focuses of the guard in the monitoring center, etc., which need to be systematized and integrated. This paper analyses the current situation of the development and application of Unattended and Remote Monitoring Systems, explores what problems exist in the application of those technologies in the field of nuclear security, discusses the feasibility of selective use of advanced monitoring technology at the level of government supervision for real-time or timely monitoring of key units or key parts, and puts forward countermeasures and suggestions combined with the application of new technologies.

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Track Classification: CC: Advances in nuclear security research and development; international cooperation on nuclear security research