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Cyber Security Evaluation of the Wireless Communication for the Mobile Safeguard Systems in Nuclear Power Plants

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This paper introduces cyber security evaluation results and a design of the wireless communication technology to apply to safeguard systems in nuclear power plants. While wireless communication technologies can generally make mobility and efficiency on plant operation, those have seldom been installed on the nuclear I&C systems due to the negative concern of unexpected outcomes that stem from electromagnetic interference and cyber attack. New design of advanced digital safeguard and I&C systems uses computer-based systems for the safeguard and safety functions. On the other hand, those are being exposed to various types of new and existing cyber threats, vulnerabilities and risks which significantly increase the likelihood that those could be compromised. In order to employ the wireless communication technology in safeguard function, licensees assess and manage the potential for adverse effects on safeguard and safety functions so as to provide high assurance that critical functions are properly protected cyber attack. It is expected that the safeguard function, specifically on the area of real-time monitoring, logging, can be enhanced by employing the mobile safeguard devices (: smart phone, laptop, smart pad, etc). In this paper, we deal with the cyber security evaluation, which consists of threat analysis, vulnerability test, establishment of security plan, and design solutions for the wireless communication on the basis of IEEE 802.11(Wi-Fi) protocol. Proposed evaluation and design solution could be a basis for the design of wireless communication and mobile safeguard systems in nuclear power plants.

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