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Hardware and Software Upgrade for the Solution Measurement and Monitor System at Rokkasho Reprocessing Plant

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Rokkasho Reprocessing Plant is the largest reprocessing facility subject to the application of IAEA Safeguards. Within the numerous unattended measurement and monitoring systems (more than 20 NDA detectors), one of the most important and complex is the Solution Measurement and Monitoring System (SMMS). SMMS is applied to the chemical liquid processing part of the plant operation and involves over 90 vessels or extractors. The installed measurement instruments consist mainly of manometers and temperature sensors. The pressure readings from the manometers are used to calculate the density and the mass of the solution in each monitored tank. For the 12 most strategic tanks, IAEA owned manometers are directly connected to the Operator's dip tubes with associated data collection system, (SMMS-I type instruments) aimed at collecting and sending data to a common database. For the remaining tanks/equipment the operator's instruments are used (SMMS-II). The data coming from both types of SMMSs are pre-processed and reviewed by the Solution Monitoring Software (SMS). The software basically provides a calculation of volumes, densities, flow rates in major process vessels, and includes, as well, advanced automatic features to support the inspectorate in the verification activities.
This paper describes the upgrade of the SMMS-I acquisition hardware and the SMMS Operating Software (SOS) at the IAEA local cabinets, for a much more robust and reliable overall system through different levels of redundancy and new features. The software also allows the in situ calibration of manometers using an ad hoc portable calibration system.

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