

## The CIPM MRA Working on Traceability in Trade for Time-and-Money Saving

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In 2003, Samsung Heavy Industries received an order from the Sakhalin Energy Investment Company Ltd. (SEIC)<sup>1</sup> to develop, manufacture and deliver two special offshore platforms intended for well-boring and recovery of oil and gas as a part of the “Sakhalin – 2” project.



Fig. 1 The world's biggest offshore platform having a daily capacity of 2.6 M m<sup>3</sup> gas and 70 000 barrels of oil

In the same year, the Russian Research Institute for Metrological Service (VNIIMS) was nominated by the Gosstandart of Russia as the responsible body for the metrological assurance of dangerous industrial objects in construction and operation, including the “Sakhalin – 2” project, with potential problems on industrial safety and environmental protection.

Documentation review over the years of 2004 – 2005 with participation of OGS-ED Company Ltd. (Oil-Gas-Safety – Energy Diagnostics) found out that both platforms had more than 100 separate sub-systems for controlling and operating functions, containing several thousands so-called “instrumentation loops” or “measurement channels.” More than 600 loops were subject to the State metrological control, for the sake of safety and environmental protection. Holding more than 10 000 measuring instruments of approximately 60 different types in fields of temperature, pressure, level, flow rate, density and substance analysis measurements (each instrument was calibrated in advance by manufacturers), all loops (channels) were calibrated on the site of Samsung Heavy Industry in Geoje with the SEIC standard check-and-test equipment. In accordance with the Russian Federation Measurement Law “On assurance of measurement uniformity,” every one of the loops is required to be validated before platforms are delivered into the territory of the Russian Federation. It was necessary to determine the

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<sup>1</sup> The Sakhalin Energy Investment Company Ltd. (SEIC) is a consortium of Royal Dutch Shell, Russia’s Gazprom, and Japan’s Mitsui and Mitsubishi formed to exploit oil and natural gas.

traceability to the National Measurement Standards of the Russian Federation in quite a short period of time for each loop by the procedures of verifications which must be done only in-situ by the Russian verification officers or by some other verification organizations accredited and authorized by the Russian accreditation body. Searching for ways to avoid such a difficulty, to save time and money, and trying to avoid additional barriers to trade, it was decided in VNIIMS to implement the CIPM MRA. In September 2005 when a meeting of directors of NMIs was held at the BIPM, the representatives of VNIIMS and the Korea Research Institute of Standards and Science (KRISS) discussed how to solve the problem.



Fig.2 The dimensions of the platform is approximately 95 m x 130 m x 120 m

Practically the calibrations of all measuring instruments on Geoje site were done with usage of SEIC standard check-and-test equipment, which were in turn calibrated by the two Korean calibration laboratories, – SCTI (Standards Calibration Technological Institute) and KIC (Korean Instrument Co., Ltd). Both laboratories are accredited by the Korea Laboratory Accreditation Scheme (KOLAS), the accreditation body of Korea. The reference standards of both calibration laboratories had certificates of KRISS, the NMI of Korea, confirming their traceability to the national measurement standards of Korea. In turn VNIIMS as an NMI of Russia has the full data on the calibration and measurement capabilities of KRISS, which are available in compliance with the CIPM MRA in the BIPM key comparison and CMC databases. Taking into account the participation of KRISS and VNIIMS in the CIPM MRA, it was confirmed by a special Protocol in May 2006 between the two NMIs “*on realization of the CIPM MRA for recognition of certificates on calibration of SCTI and KIC standards for calibration of SEIC standard check-and-test equipment for calibration of instrumentation loops (channels) of the special platforms for the ‘Sakhalin – 2’ Project.*”

The Protocol has finally arranged an opportunity for acceptance of calibration results performed on site as the primary verification for the loops (channels), satisfying the requirements of the State metrological control in the Russian Federation and allowing Samsung Heavy Industries to fulfill its duties to deliver the platforms in time. As a result of the collaboration, the company was able to save an estimated US \$ 1.1 B in costs.

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