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12.37 Upgrades and enhancements of the in-vessel calibration light source on JET

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Since 2010, an in-vessel calibration light source (ICLS) has been used periodically on JET to calibrate a range of diagnostics at UV, visible and IR wavelengths. During shutdowns, the ICLS (essentially an integrating sphere) is positioned within the vacuum vessel by the remote handling (RH) system. Following the 2013 run, several changes were made to improve the efficiency and quality of calibrations. Among these: the replacement of a heavy 20 m cable which carried power and other electrical signals through a vessel port to/from a control cubicle. A lightweight 2 m cable now plugs directly into a connector on the "chest" of the RH manipulator, greatly reducing the time required for deployment and improving operational flexibility. This change also provides compatibility with calibrations after high neutron-fluence campaigns. To improve repeatability and accuracy, new baffles were designed and installed within the integrating sphere itself, greatly improving the uniformity at non-normal viewing angles (this was necessary due to orientation uncertainties with the RH system); calibrations which had shown variations as great as ˜ 20% are now consistent to ˜ 5%. In addition, an on-board micro-spectrometer now allows for real-time verification of the emitted spectrum.

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