Enabling remote corrosion detection on Oil and Gas installations with the stand-alone Field Kelvin Probe (FKP)

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The Field Kelvin Probe (FKP) is a contactless corrosion detection instrument designed for use in laboratories but also on oil and gas installations. To enable long-term, accurate corrosion measurements on remote installations with the least human intervention, the FKP must undergo a qualification process with special focus on self-calibration and self-diagnosis capabilities. We present the highlights of the testing program, which was carried out on controlled laboratory environment and on varying industrial environment. To validate the FKP data and to better correlate the FKP signal to the actual corrosion condition, we relied on measurements achieved with a state-of-the-art Scanning Kelvin Probe (SKP). In one particular experiment, a pipe sections partially filled with various corrosive media (such as artificial and natural seawater, sulphide-containing seawater) simulated a real-life oil and gas installations. The pipe section was mounted on a rotating stage while the FKP instrument was attached on the outside of the pipe to a motorised XYZ scanning stage. This setup allowed the continuous scanning of the pipe length and diameter and thus the mapping of the corrosion activity inside it.

Similar measurements carried out on large-scale test facilities on the Norwegian coast-line are discussed.