Of the 31 measurement locations (no. 1 to 31) tested in the first run, 21 were found to be well performing. Nine underperforming locations had log Z >7 and only one underperforming location (no. 31), found in a preload tank, had a log Z ≈6 and was classified as doubtful. After a further six measurements were taken in the same tank (no. 32-37), one location was classified as well performing (no. 35), one as underperforming (no. 37), and four as doubtful (no. 32, 33, 34, and 36).

The conclusions after the second run may be summarized as follows. Of 31 measurement locations from the first run, 15 locations were found well performing in both runs. Four locations were found underperforming in both runs. Five locations shifted between well performing and underperforming in each direction. Tank location no. 31 remained doubtful in the second run. Another doubtful location was found on the deck of the jacking system (no. 13), but the site was not investigated further. At an additional six tank locations the three previously doubtful locations were found to be underperforming. One additional location measured inside the tank in the second run was found underperforming (no. 38) and the two additional locations measured at sites other than the tank have shown to be well performing (no. 39 and 40).

Figure 5 shows the typical appearance of the log Z ≥7 coatings (left) and the doubtful coating within the tank (right) after two years of atmospheric exposure. It has been discussed previously that low impedance coatings are more likely to exhibit visible early degradation at edges and welds.[2] Subsequent analysis of the coating specifications revealed that the tanks were the only site where a two-layer self-priming epoxy coating system of 2 by 150 µm, without a need for stripe coating, had been specified and applied.

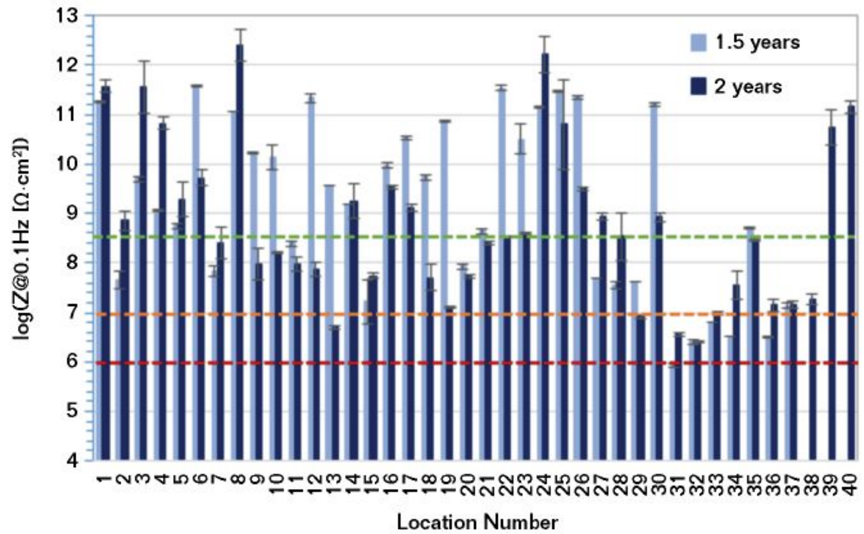

FIGURE 4 **Log Z measured at different locations on the platform 1.5 and 2 years after renewal. Error bars denote the RMS of five consecutive measurements.**

FIGURE 5 **Appearance of the log Z >7 coatings (left) and of the doubtful coating within the tank (right), after two years of exposure.**

Conclusions

The investigated QCQ approach proved to be applicable to offshore-grade coatings in early stages of coating degradation. Rapid measurements can be repeated and performed in multiple locations to ensure quality of results. The high field measurement precision indicates that the AC interferences were successfully managed by the EIS signal amplitude optimization. Similar conclusions from the two independent runs unequivocally indicated the preload tank as a location of limited coating durability. The rationale for this observation was later found in the specification of the tank coating system. Laboratory and field QCQ testing based on EIS and subsequent statistical analysis have shown the potential to serve as a valuable tool for predictive coating maintenance.

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