DEEPWATER

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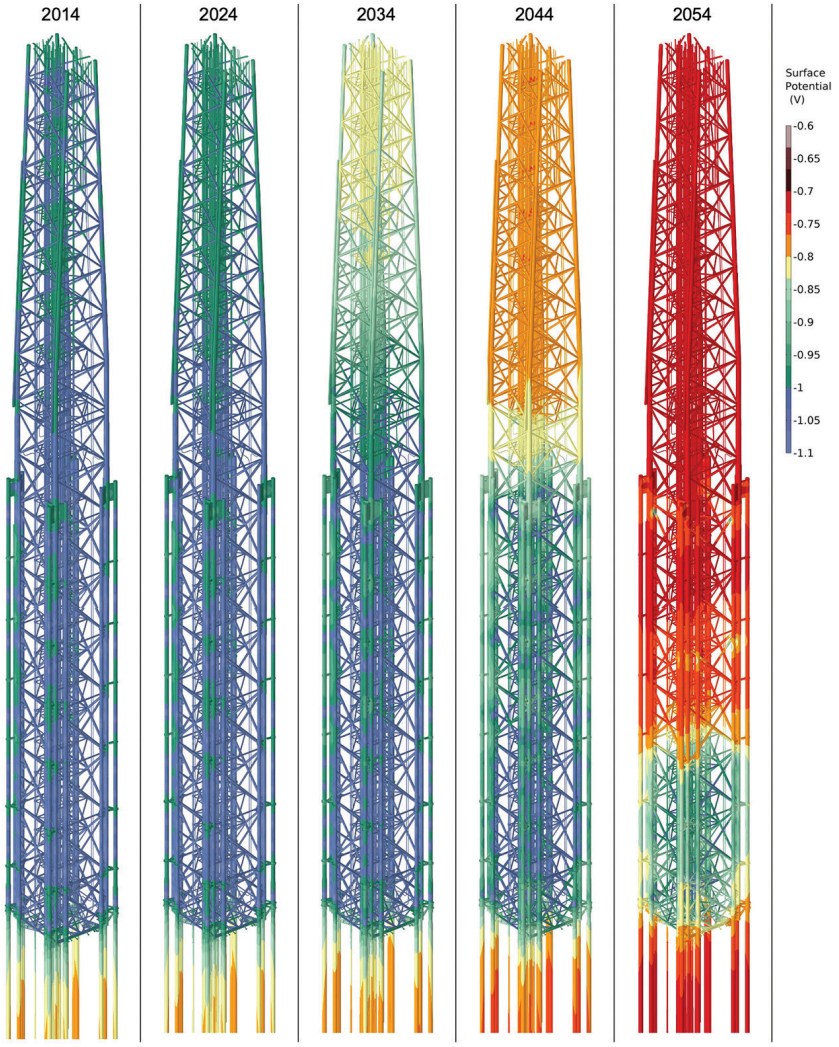
TOWER CP MODELING: GULF OF MEXICO

Constructing a timeline for depolarization

A predictive model of a tower and its corrosion prevention system located in 1,700 feet of seawater was constructed and calibration of the model was accomplished by a least-squares error optimization method considering 16 potential contact measurements and 20 anode depletion values visually graded at various times since installation. The tower was found to have a well-designed cathodic protection (CP) system and anode quality that is performing as expected. The model predicts that beginning in two years, the rate of depolarization will rapidly increase, the 800 mV criteria will be crossed in eleven years in some regions and will be largely noticeable in 16 years. Initial corrosion is expected to occur in 18 years, when some locations fall below -765 mV vs Ag/AgCl in seawater.

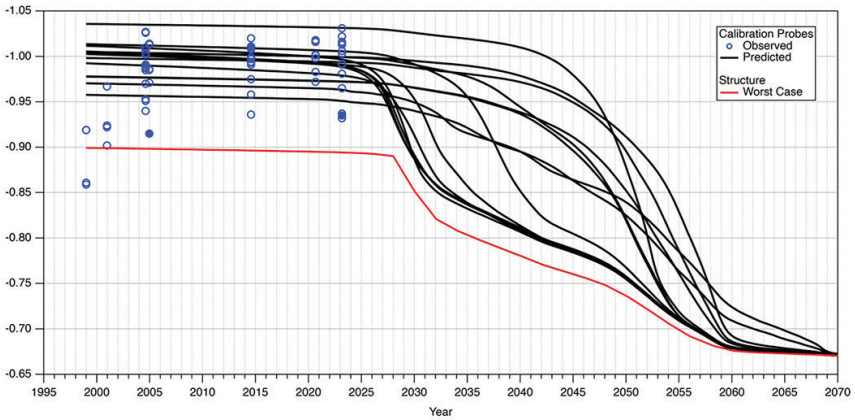
Further life extension is possible with the installation of a retrofit cathodic protection system. Given the size and complexity of the structure, the model produced in this scope will be essential to the design of such a system and affords the opportunity of additional cost reduction through optimization of placement for most efficient performance, thus reducing material and installation costs. Given the top-down depolarization trend on this structure identified by the model, upper-elevation supplemental CP systems will give the most benefit.

More info at www.stoprust.com



LOCATION WITH MOST DEPOLARIZED POTENTIAL

The red line in this graph represents the location on the structure with the most depolarized potential and is used to estimate the year when potentials cross important thresholds. The black lines are the model outputs for each location calibrated during parameter optimization and the blue dots are recorded observations from past surveys.



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