

CP Design for the Opti-Ex™ Semi-submersible Oil Rig of Exmar Offshore Company.

Elsyca's was approached by Exmar Offshore Company, based in Houston, to evaluate and redesign the cathodic protection installation for the Opti-Ex production semi-submersible oil rig. With Elsyca's technology, reliability of the corrosion protection over the complete structure is assured, leading to substantial cost reductions over the service life of the system. The technology mitigates the risk of not meeting the design goals and enables future management of assets to be planned effectively.

Sacrificial anodes have a proven performance and the amount of required anodes can be calculated from standards like DNV RP B401. However, the use of sacrificial anodes has its limitations:

- only local protection around anode in high resistivity medium
- no adjustment to changes in environmental conditions due to fix current output
- limited life time leading to expensive retrofit programs in view of extending the service life of the structure to be protected
- high installation cost due to involvement of skilled dive teams/welders

As an alternative, ICCP systems have many benefits over SACP systems:

- adjustable current output
- no need for retrofit
- drastically lower installation and maintenance cost
- possibility for continuous monitoring so that the protection level is safeguarded at all time
- limited weight for reducing the mechanical load on the structure

However, ICCP systems have the danger of overprotecting the structure which can lead to hydrogen embrittlement in high-strength steels and to coating disbonding. Whereas in the past this could not be accurately predicted and dealt with, today, with Elsyca's simulation technology, a proper design is modeled and gives the owner full confidence in the corrosion protection of the assets.

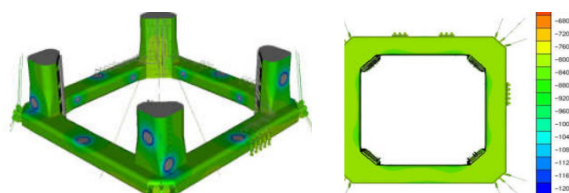
Elsyca's simulation technology was used to validate the ICCP design of the new semi-submersible oil rig Opti-Ex™ from Exmar Offshore Company (Houston, Texas).

Simulations were performed for different situations: different coating breakdown factors, interference on and from nearby CP systems of subsea structures, effect of mooring chains, etc



Exmar's Opti-Ex platform, unacceptable IR-free potentials after 10 years of service life with original CP design

From the simulation, it can be concluded that the initial design containing 12 ICCP anodes was insufficient to protect the structure after 10 years of operation (30% coating breakdown). A redesign was proposed, including a total of 20 ICCP anodes and the diameter of the dielectric shield around the anodes was increased. No interference with subsea structures was to be expected.



Approved IR-free potentials after 10 years of service life with new CP design

