Coatings for protection of boat landings against corrosion and wear

Astrid Bjørghum, Ole Øystein Knudsen and Sébastien Equey, SINTEF Materials and Chemistry and Arya P. Bastiko, NTNU

Introduction

In addition to corrosion protection boat landings need protection against impact and scour due to impact from the service boat. Coating maintenance offshore is expensive. Boat landings located in tidal and splash zones are particularly difficult to maintain due to constant wetting by seawater. Offshore oil & gas industry has reported lifetimes above 20 years for certain coating systems also in the splash zone. Offshore wind farm owners, however, have seen that protective coating systems on boat landings are damaged after few years in service.

To ensure secure access to the wind turbines for the O&M people, high friction coating systems are preferred for the boat landing.

The objective of this study has been to study abrasion and mechanical properties of different corrosion protective coating systems for boat landings.

Experimental work

Coating systems used to protect boat landings and/or known to have long lifetimes in the splash zone of offshore oil & gas installations were applied on steel samples by the coating suppliers:

- Vulcanised neoprene rubber applied on steel samples in approximately 4.5 mm thickness were used to simulate the fenders on service boats.

Abrasion testing was done to determine the ability of the boat landing coatings to resist wear due to contact with the rubber fender on the boats. Testing was performed by sliding the rubber sample against the coated surface, applying a 200 N weight load at a frequency of 0.1 Hz for 700 s in air and 1800 s in artificial seawater. The load used was estimated from Herz' equations assuming that the service boat acts with a propulsion force of 10,000 N against the boat landing.

Impact testing of the coating systems showed
- Cracking of the PU, PSO and HDG-powder coatings
- No cracking of Epoxy1a, Epoxy1b, Epoxy2 and Reinforced coatings

Conclusions

- Increased roughness and low weight loss in the abrasion test indicate that the well cured Epoxy1a is suitable for boat landings
- High friction coefficients but high weight loss may question use of the Reinforced coating on boat landings
- High surface roughness and low weight loss indicate that HDG may be a compromise to organic coating systems for boat landings