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Real life can often be extreme: here a foot switch forms part of an anchoring system for a coal terminal at the North Sea in Germany.

Extreme tests in real-life conditions

Various steute switchgear series are currently being tested in real-life conditions on the island of Helgoland. The results are used to improve the development of new product series.

The benchmark is high: the switches from the steute "Extreme" range aim to achieve lifetimes which far exceed those of conventional products. They are then suitable for use in, for example, offshore technology, process plants or port terminals.

The designs of these switches, which include foot switches, pull-wire switches, position switches and sensors, therefore feature effective sealings, as well as housings made of robust reinforced plastic or especially coated aluminium. Screws and other fastening elements are made out of high-quality stainless steel.

Relevant tests are conducted to document compliance with the requirements of this application field, e.g. impact tests with splash water to ascertain IP protection class, as well as salt spray tests to DIN EN ISO 9227. These tests are mainly conducted in the steute laboratory, but also at specialist service providers and test bodies.

But do laboratory tests really reproduce real-life conditions? A test series which has

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been running since September 2017 is providing comprehensive answers to this question. On the island of Helgoland in the North Sea, the Fraunhofer IFAM institute has a remote test facility. Here, components are fixed to a test rack and then lowered into the sea – directly on the quay and thus in real-life conditions, either in splash water or tidal water. In addition to the salt water and the weather, other real-life factors such as fouling (algae growth) also impact the test specimens, which are then examined on land after a fixed period

The tests aim to make very extreme and changing demands on the switchgear, going beyond all standard tests, in order to expose any weak points. And this aim is being achieved.

COMMENT

A fascinating question which the steute developers asked themselves: do the relevant laboratory tests really reproduce real-life conditions? Even more fascinating, in my opinion, is that they wanted an answer to this question and set out to conduct tests which could not be any closer to real-life conditions – and that they are now incorporating the test results in their development work.

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Tough

The test results are positive, both optically and functionally: even after a year in tidal water or exposed to the impact of splash water, the devices from the various series all still work without any problems. Even the labels and laser inscriptions are still attached and legible. The pre-treated and powder-coated housings of, for example, the foot switches present in a very good condition, while the internal switching inserts, plungers or pedal pivot shafts are free of corrosion.

Unexpected results which have occurred to date include corrosion on the housings of one switchgear series, which quickly turned out to be due to material problems on the part of the supplier, however. Not unexpected, but very pleasing were the excellent test results for all housings and actuators made out of plastic. The steute developers have concluded from this that metal can increasingly be substituted in the future – even for actuators subjected to excessive mechanical wear and tear. And the tests on Helgoland are not over yet. New pull-wire switch series are currently being tested, for example, and are due to be brought out of the water for an interim assessment in April 2020.

Of course, the ambient conditions on the Helgoland quay go way beyond the usual requirements of steute Extreme switchgear users. But, as boundary tests, they do permit the specific detection of any weak points and ultimately they are more realistic than standard corrosion tests, which always take place in unchanging conditions.

FACT

*After one year in tidal water or splash water, the various devices are all **still functioning**. Even labels and laser inscriptions are still attached and legible.*

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