

COLUMN

UPTIME OR DOWNTIME?



'It is better that the optimist is wrong than that the pessimist is right.' I used to have a colleague who added this wisdom to every e-mail he sent. It came to mind when I was asked to write a column for this InSide Magazine on the theme of 'Uptime'. Uptime? I had never related the topic of workability to uptime, but rather to the other side of the same coin: downtime. And I always thought I was an optimist....

But seriously: uptime is a very important topic in our maritime industry. It couples the design to the operation. That is why we often refer to it as 'operability' or 'workability'. It forces the designer to concentrate on the specific tasks of a ship. A ship is only fit for purpose when it can perform its tasks safely and effectively for a major part of the time. Only in that part of the time does it offer value for money.

This all sounds logical, but ship design and ship operation have seemed to inhabit different worlds for far too long. In shipbuilding, the resistance and propulsion of a ship were (and sometimes still are) optimised for one specific draft. The result: a completely optimised ship, but for conditions under which it will hardly ever sail. Something similar happened in the offshore sector when we were engineering our structures for the '100 years storm', without asking whether these highest waves would actually be critical for the safety and operability of the ship. A smaller wave with a more critical wave period could, for instance, be far more important.

It is good to see that there is nowadays a strong focus in shipbuilding on the actual operation of the ship. The hull is not just optimised for this one 'design' draft and speed anymore, but for the complete operational profile of speeds, drafts, trim angles and weather conditions it will encounter during its lifetime. We call it 'design for service' or 'design for operation', and the resulting ship will be very different.

Also in the offshore we now use a 'response based' methodology to check the survivability of the structure in a much wider range of realistic conditions than just the highest wave. For the actual operability the situation can be even more complex, especially for structures that perform a series of tasks. As an example: a wind turbine installation jack-up has to load the wind turbines, manoeuvre safely in port, sail rapidly to the offshore location, lower its legs on DP, touch the seabed, jack up, perform the installation, raise its legs and sail back to port in quite a different loading condition. The operability levels of all these steps will be different and the sequence of events is very important. We cannot just add the downtime of the different tasks to come to the total operability. Within the complete chain of tasks, the weakest link determines the operability of the entire operation. For this purpose we need 'scenario simulations', linking a representative time sequence of the weather conditions of wind, waves and current at the location(s) to the actual sequence of tasks in the operation of the structure.

Only when we couple the time sequence of the weather conditions to the time sequence of the tasks during the design phase can our structures be optimised for the ultimate operation phase. So the 'up' or 'down' are not essential, but the time is!

Bas Buchner
President of MARIN
(Maritime Research Institute Netherlands)