Q&A for Digital Twin | Simulation Webinar 9 December 2020

How long does it take to produce a training simulator for a typical piece of equipment? Just an example of your choice.
This depends on the required level of accuracy, complexity and numbers of equipment/systems, level of detail, scenarios, connection to actual control systems, availability of training philosophy etc. Typical lead-time is approx. 1 to 6 months if we need to start from scratch.

Is it time domain-based or statistical-based?
Our in-house C-how simulation platform is, by definition, time domain-based. Statistics is mostly done in Excel based on time series logging data. Of course, we also use other more statistical input as guidance for our simulators.

How are the models validated and reflecting reality for complex operations with weather influences?
We do static analyses based on physics laws and verify the time series using statistics. Since it is real-time, a trained eye (experienced operators/engineers) gets a feel if this looks real. In addition, we use external companies like DNV GL and Korean Register to validate the accuracy and reliability of the outcomes of our software. Besides, we use weather models and wave models in our simulation, with certain equipment behaviour influence, which will as a result be visible in the real-time representation of behaviour.

What does “real-time” mean in the simulations?
Our definition of real-time is that the equipment simulated dynamics run 1:1 in time with real-time. This means that if you change a certain parameter/move a component/ use a controller, it reacts directly as a result exactly the same as it would in the real world.

To what extent are technical experts needed from MacGregor to build simulations?
Our engineering experts are ‘key’ as they are closest to the equipment design, and they have the main domain knowledge on its expected behaviour. And that input is being used in our simulation. Secondly, we use our simulation experts to set-up the simulator from scratch, but modular with all the content needed. In case of a training simulator, during its use no MacGregor experts are needed, unless additional support is requested from the customer side.

Can your simulation application deploy other equipment than MacGregor?
First of all the highest value and benefits can be created when we use our in-house simulation knowledge and equipment expert knowledge.

Lately we have made some exceptions to this. However, this does not have our preference, as it is challenging to include external equipment in our simulation, as it requires full access to input from the supplying party. As we do not have the same detailed knowledge of the equipment behaviour of external suppliers, it takes more effort to make it act 100% accurate.

Will our company name be visible if we cooperate with MacGregor on a simulation?
We nurture our customer privacy and their projects more than anything. In case customers or partners prefer to use simulation results for PR purposes, we can discuss presentation material in mutual agreement.

Can the hydrodynamics and stability of an existing ship, or a ship in the design phase be combined with simulations?
Yes, we currently have two different hydrodynamics simulation modules. One of them is RAO based and the other option is the “floating-box”. The first is scientifically accurate, but it has limitations regarding load transfer on the ship as it does not change behaviour if a large object is moved on the ship, so we are further looking for another third alternative, which actually looks promising.