Offshore Solutions BV | 1970 AE IJmuiden | The Netherlands

Firm grip

Innovative access to platforms at sea

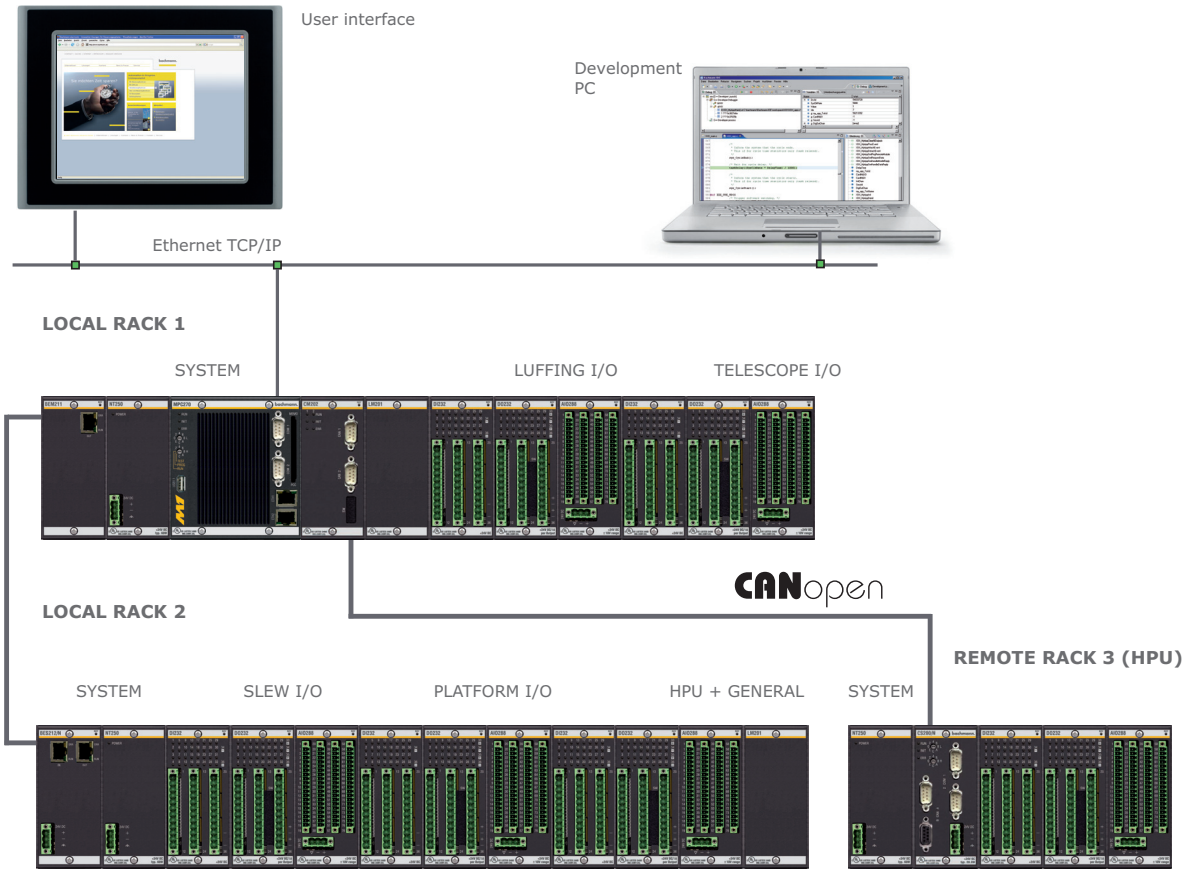
bachmann.

The OAS (Offshore Access System) is – expressed simply – a bridge that securely connects a ship and a rigid platform at sea, e.g. an oil or gas rig, even in rough seas and so permits access. The complex control technology to manage the bridge was developed in MATLAB®/Simulink® and ported directly to the Bachmann M1. The openness and robustness of the M1 automation system was convincing.

Offshore rigs are normally supplied via helicopter. In view of the increasing number of small and also unmanned rigs (including the towers of offshore wind power systems) a search was made for alternatives to reach them at a lower cost and no longer from the air. Against this background the Dutch company Offshore Solutions, a joint venture of the two offshore specialists AMEC and Fabricom Oil and Gas, developed a movable bridge mounted on a ship, which permits a safe transition for service and operating personnel from the ship to a rig at sea.

The great challenge consists in safely mooring the violently pitching ship in a heavy swell to the rigid structure of the rig. "When compensating for the swell, we have to consider six variances that describe the position of a ship at sea: the movements in the direction of the three spatial axes x/y/z and of course the revolutions around these axes," is how Arnaud Witlox, project manager at Offshore Solutions, describes the demands on the OAS system.

▶ **In a rough environment:** an MPC270 controls and manages the entire system.



▲ **Controller System:** M1 in tough deployment on the high seas.

Sophisticated controller technology

The core of the solution is consequently sophisticated controller technology. Waves up to 3 m high, depending on the ship deployed, can be compensated with the hydraulics installed. The Dutch company Seatools, a specialist for underwater and offshore system solutions, provided the corresponding software for this. The controller system was simulated and fully tested beforehand there, based on extensive models, which included the ship, the hydraulics and entire mechanism. Their engineers have been using MATLAB®/Simulink® for a long time to model and develop all of their systems. However, up to now the C-code generated by the simulation had to be ported manually to the controller. While looking for a successor to the controller platform previously used, the company learnt of the Bachmann M1 system. It quickly became clear that it met all of their requirements: reliability, sturdiness, GL certification, far-reaching programming features in all standard languages and of course above all the possibility of making the code directly generated in Simulink® executable on the M1.

Sieds Tamsma, the development engineer and Matlab specialist responsible, was impressed by the features M-Target provided him with for Simulink®, especially also during the commissioning of OAS: "In the 'external mode' we can bridge all inputs of the system and based on the reaction of the 'neutral system' to the controller determine the parameters for fine tuning." These are fed directly into the actual compensation control via SVI (Standard Variable Interface).

C-tasks and PLC tasks next to each other

The multitasking capacity of the M1 and its sturdiness were also what convinced Jurriaan Hartog, chief applications engineer at Offshore Solutions, of the Bachmann M1 system: "On the MPC270 deployed, the PLC tasks of our system run in parallel to the compensation software from Seatools, which so represents for us an actual 'Black Box.'" This simplified, as he adds, the cooperation in developing the overall system considerably.

Even in heavy seas the extended bridge of the OAS is kept horizontal by means of hydraulics during the landing manoeuvre. A hydraulic claw at the end of the bridge encloses a steel post on the oil or gas rig: the only facility that the rigs need. After the grasping arm has been locked, the swell compensation is switched off and the bridge is then located "floating", so to speak, between the ship and platform. The telescope in the bridge and joints in the bearing on the ship and at the claw permit all the variances required between the moving ship and the rigid platform.

Decisive advantages

"In an environment that places extraordinary demands on the reliability and availability of the controllers, the M1 system, which has already been certified by German Lloyd, convinced us", says Arnaud Witlox, summarising the system decision. Additional important arguments

were that the openness of the system, its easy programmability and the direct porting of the codes by the simulation system make a considerable contribution to time- and cost-saving.

▼ **Securely linked:** the OAS platform has moored next to a gas rig.