CASE: NAN HAI VI
UPGRADING AN OBSOLETE POWER MANAGEMENT SYSTEM WITHOUT INTERRUPTING OPERATIONS

ENERGY
ENVIRONMENT
ECONOMY

The drilling rig 'Nan Hai VI' was experiencing blackouts which made it unreliable. When a drilling rig is on hire for hundreds of thousands of dollars a day, even a short stoppage is expensive.

– Wärtsilä's upgrade solution was successful, since it was executed while the rig was fully operational, says **Ulrich Neumann**, Technical Superintendent of Maersk Drilling Australia.

Maersk Drilling Australia was established to oversee projects in Australia, representing its parent company that has been operating world-wide since 1972 and is one of the leaders in the offshore exploration industry. The global fleet consists of deep-water semi-submersibles, drilling barges and jack-up rigs including the world's largest and most advanced harsh environment jack-ups.

Maersk Drilling Australia, the rig manager of the Nan Hai VI, and COSL, the rig owner, presented Wärtsilä with an interesting problem.

– We wanted Wärtsilä to determine the root cause of the power management issues and produce a plan to resolve them without interrupting our drilling project in Australia, Ulrich Neumann says.

It might sound easy, but finding a solution that would ensure continuous operation was not that simple. The core problem, an obsolete power management system, was not going to be a minor upgrade.

A SMART SOLUTION LETS OPERATIONS CONTINUE NORMALLY

Managing major assets is more than just monitoring equipment and recognizing that there are issues to be dealt with. The real problem is scheduling rehabilitation work around tight project schedules.

– We knew that the client needed a smarter solution. We had to implement the project without taking the system offline and with operations continuing normally, says **Matthew Riley**, Technical Manager at Wärtsilä Australia.

– With a well planned and executed project, we knew that we could do the work on site and potentially save them millions of dollars in downtime, Matthew Riley continues.

A careful audit of the vessel allowed the Wärtsilä team to determine precisely what components would need to be upgraded. They then set about performing the task – four complete engine overhauls, replacement of four sets of engine and generator controls and safety systems, four new governors, a new power management controller and the installation of two new full colour 19" LCD operator interfaces.

"WELL PLANNED AND EXECUTED UPGRADE WHILE RIG WAS FULLY OPERATIONAL"

Typically, a project of this magnitude would require a week's transit to a dockyard in Asia, several weeks of layup whilst the entire power

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management system was powered down, removed, replaced and re-commissioned, Followed by another week travelling back to restart operations.

– When a drilling rig is on hire for hundreds of thousands of dollars a day, even a short stoppage is an expensive exercise. A typical rig of this size would risk about 2 million dollars in lost earnings each week, says **Craig Abbott**, Area General Manager, Oil & Gas of Wärtsilä.

SMOOTH CO-OPERATION AND TEAM WORK

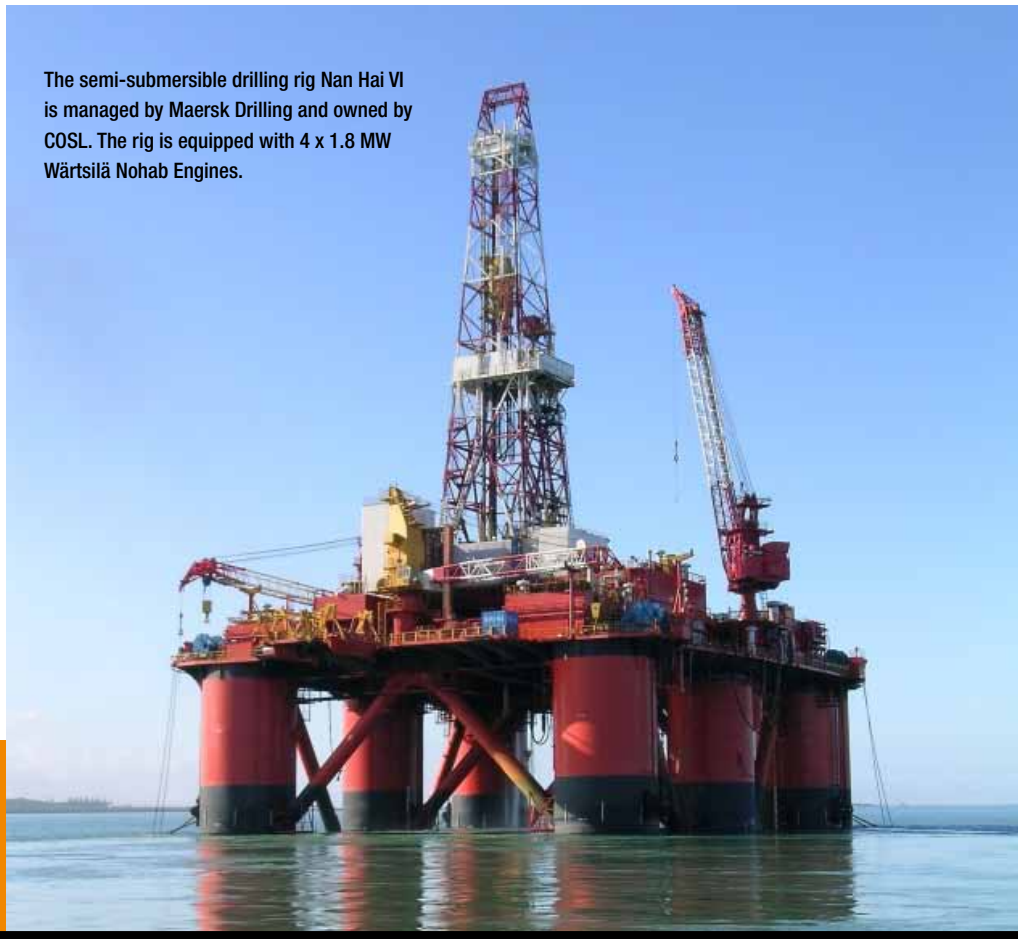
An additional challenge was that there were room only for a small team on the rig, and insufficient storage capacity for all 4 tonnes of new equipment. Careful planning, running the project over an extended period and taking only one engine/generator set offline at a time, meant that normal power generation demands could be met, crewing requirements were minimized and all necessary equipment could be stored safely.

The project lasted, as planned, for a total of three months. This amounted to approximately three weeks per engine – two weeks for installation by four people, and one week for commissioning by two people.

During the 90 days from the first day of installation to the final day of commissioning, there was no requirement for the rig to be without normal operational power.

– This project represented a breaking of new ground, and the experience of performing a power management upgrade on an operational and active facility will surely benefit all our customers, emphasizes Craig Abbott of Wärtsilä.

– This was a successful project that featured a smooth co-operation and true team work. The upgrade was well planned and executed while the rig was fully operational. The new and reliable electricity supply is the basis for safe and successful operation of Nan Hai VI in the future, concludes Ulrich Neumann of Maersk.



The semi-submersible drilling rig Nan Hai VI is managed by Maersk Drilling and owned by COSL. The rig is equipped with 4 x 1.8 MW Wärtsilä Nohab Engines.

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Challenges	Solution	Benefits
– Ensuring operational reliability of a system with obsolete components – Minimizing downtime and avoiding a long layup, which is the typical situation in a project of this magnitude – Scheduling rehabilitation work around tight project timetables, with reduced staff numbers – Transporting 4 tonnes of equipment offshore – Minimizing project costs.	– Replacement of the on-engine safety and control system, the local engine and the remote engine and circuit breaker control stations and the alternator control and protection equipment. – Decommissioning of the former power management unit during the project without the rig having to enter a downtime maintenance cycle to complete the installation. – Installation of a Wärtsila Operator Interface System (WOIS) in the control room console facilitating constant monitoring and touch screen operational control of the generation plant both in the rig control room and remotely in the engineers' office via a second WOIS. – The four engines were completed, one by one, while the rig continued normal operations.	– Power management system upgrade ensures operational reliability. – Project completed without taking the system offline and with operations continuing normally. – Project completed at sea, not while docked or laid up, in other words several weeks' layup was avoided, which generated substantial cost savings.

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