

Remote support of drilling equipment

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Current challenges

- Availability of senior resources
- Communication lines offshore/ onshore to efficiently support rigs in operation
- Difficult to retrieve, define and convey facts for further analysis
- Draw potential of available technology into services

Introduction

- Utilization of Aker Solutions front end technology, eg services as **spin off of available technology**, eg extend existing training technology
- Move from **reactive** to **proactive** services
- Move from “Houston, we have a problem” to “Houston, we have a solution”
- Major benefits from efficient utilisation of senior engineering resources
- HSE gains by reduced travel requirements, offline testing ability and training in a safe environment
- Reduced response time and cost towards end user
- Reduced non-productive time (NPT) for the client

Services

- Remote diagnostics v 1.0 (**reactive**)
 - Remote hook up to rig via internet
 - Display drillview/PLC/control system data real time
 - Challenging to capture the specific incident/situation
 - Availability of specialists

- Remote diagnostics v 2.0 (**proactive**)
 - as an integrated part of the “Remote e-Support Centre” to troubleshoot, repair and maintain the equipment in a correct and optimal manner

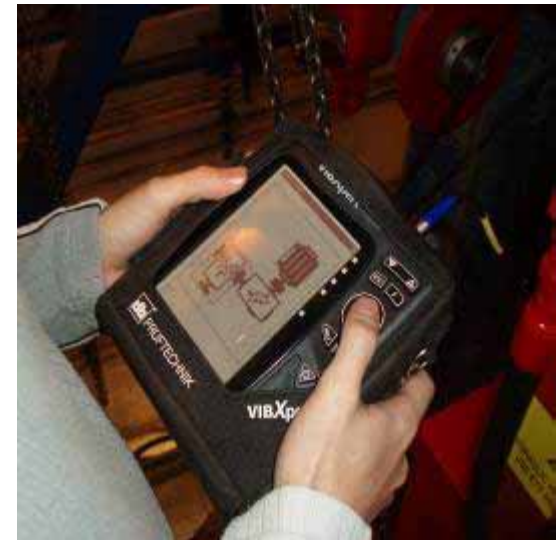
Services

- Condition-based maintenance (CBM) v 1.0 (**offline**)
 - Predefined measurement schedule, passive monitoring
 - Early notice on error trends for vital components
 - Focus on offline vibration monitoring of bearings and oil quality

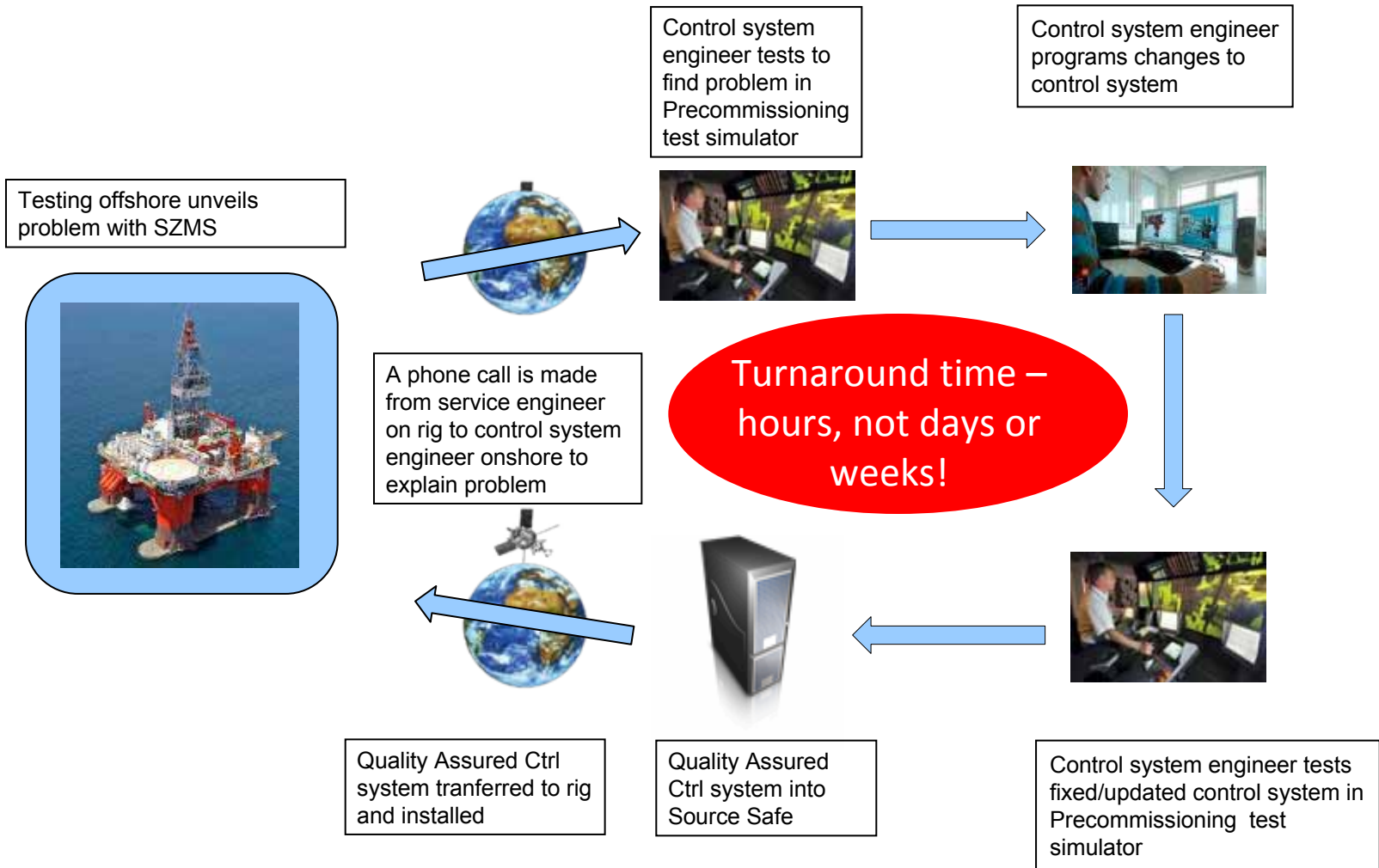
- Condition-based maintenance (CBM) v 2.0 (**real time/online**)
 - as an integrated part of the Remote e-Support Centre to continuously monitor the current (real time) condition of the equipment,
 - perform error analysis and contribute during incident investigations (playback function)
 - convert from calendar-based (reactive) to “on condition” (proactive) maintenance, and
 - from down time to a planned maintenance task, major cost savings

Experience with CBM

- Since 2005, 58 different drilling machines have been subjected to offline vibration monitoring by Aker Solutions
- A total of 86 measurements have been collected from new, overhauled and operational machines
- Status:
 - 7 reports requiring further checks or repair
 - 16 reports requiring follow up
 - 1 of these cases was gear problems, the rest were bearing defects
 - All checks done by means of portable equipment (offline system)
 - All 23 cases have “show-stopping potential”
 - The cost for 1 online system is less than 2 shifts of downtime



Equipment and system services

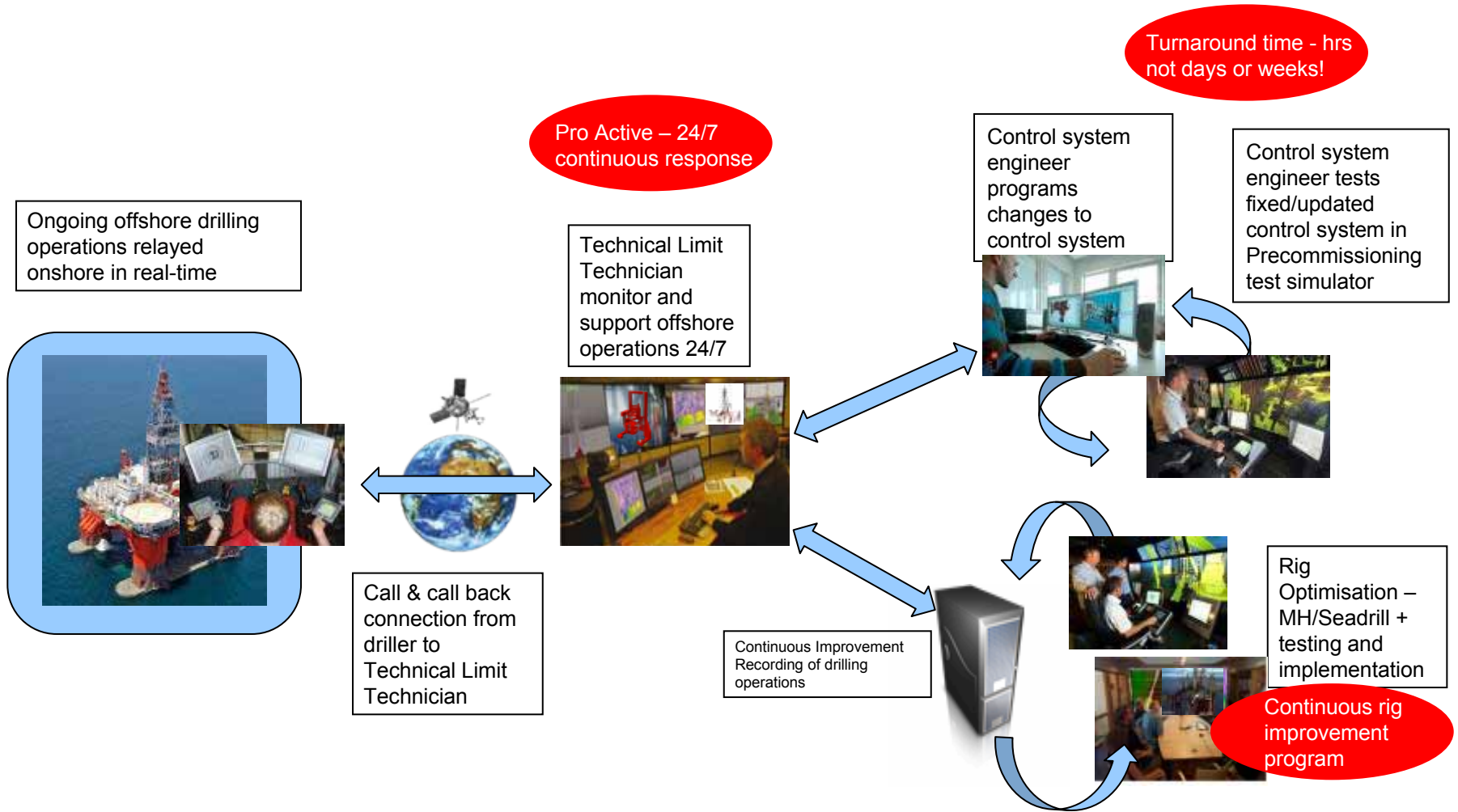


Rig Operation

Remote support of drilling equipment



24/7 Proactive monitoring services



Rig Operation

Remote support of drilling equipment



Services

■ iPort

- integrated onshore operation support services, to assist the client in operating the equipment in a correct and optimal manner (best practice/ technical limit)
- Covers in addition all phases from concept, sales, engineering, pre commissioning, training, operational support, throughout upgrade and modifications offline

Crew Changeover Briefing/Training



Multi Discipline Operational Training



Well Construction and Drilling Management



Operator Simulator Training



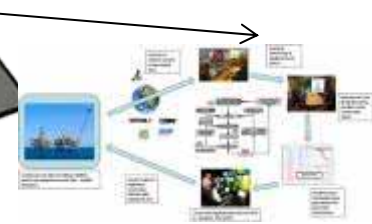
Mission Control and Support



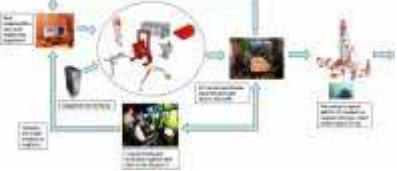
Rig Construction



E support - Condition Based Monitoring



Rig Concept Phase



Upgrade and Modification



Remote support of drilling equipment



Summary

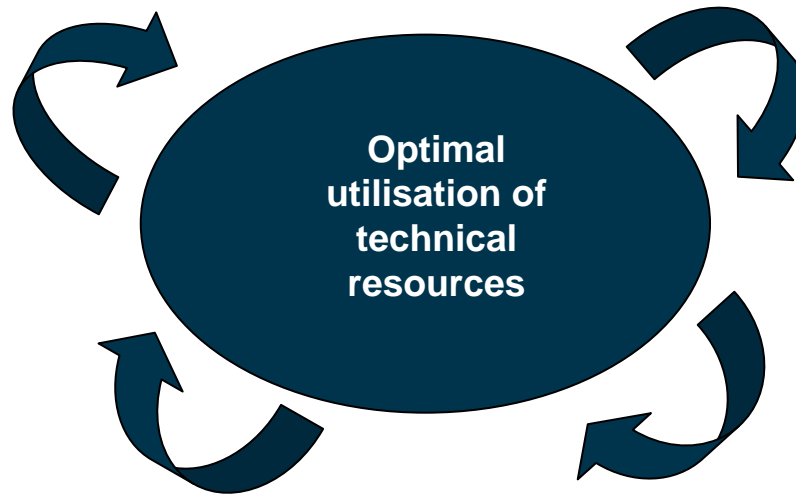
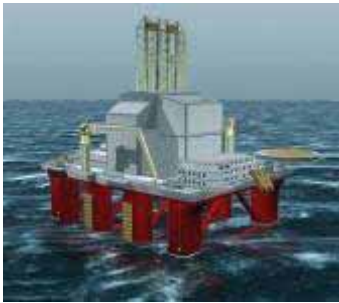
- Key effects from implementation of remote e-Support services

- Support services:
 - Reduced response time
 - Intelligent utilisation of senior engineer resources
 - Delivery of the most efficient life cycle support to the global rig market
 - Predictable business performance

- Environmental/HSE:
 - Less travel/lower stress factor

- Incentives:
 - Perceived as the best overall supplier of drilling systems and support
 - Optimised use of senior resources
 - Experience transfer and documentation
 - Supporting the clients in building trust and reputation
 - Converting from reactive to proactive and predictable mode

e-Concepts Services – a new generation remote diagnostics services



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Summary

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