ASSET RELIABILITY
RIGHT MAINTENANCE • RIGHT TIME

Transocean

Asset Reliability Project

Phase I: Discovery & Definition

Final Report

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Lloyd's Register

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Executive Summary

1 Overview

Transocean recognise that the current company-wide Maintenance Management System needs to be improved to achieve the Executive Imperatives around operational excellence. Lloyd's Register has been engaged to help in the development and implementation of the Asset Reliability (AR) Project, which is designed to address this need by understanding and managing the fundamental risks associated with both operational integrity and asset integrity, lifting Transocean to a status of 'Operational Excellence' over a proposed five year timeframe.

The keys to managing the asset-related risks to the business are:

- People working as a team with common objectives around the performance of the physical assets
- Integrate both the asset and performance business processes
- Understand the condition of the physical assets and how that condition translates into "risk" to the performance of the assets.
- Develop and use proper technology as an enabler to achieve the business objectives

The current Maintenance processes and systems within Transocean are not best in class and do not properly support customer expectations. This is costing the business approximately $755m per year in inappropriate (excessive) maintenance and maintenance related downtime.

Achieving a status of "Operational Excellence" is estimated to cost $490 million and will result in a substantive return for Transocean that is worth some $4-6 billion over ten years.

This saving is equivalent to having 11 new rigs in the Transocean fleet:

- 3 new Ultra Deepwater / Deepwater
- 3 new Harsh Environment / Mid-Water Floaters
- 5 new High Spec Jackups / Jackups

2 Why Asset Reliability

By introducing the need to effectively manage risk and embrace the concerns of stakeholders, a focused definition for the Transocean Asset Reliability Program becomes:

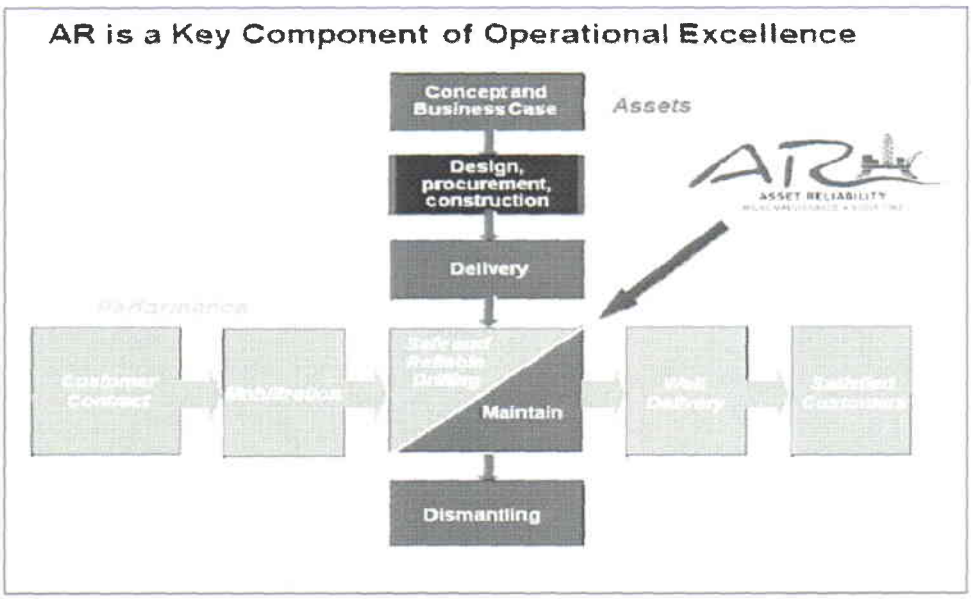
"... a systematic process to generate maximum value from a physical asset base - for the business and for society - by balancing the operational performance of the asset against the asset life-cycle cost and its risk profile for all relevant stakeholders."

Asset Reliability deals with the interaction between the asset performance / asset management functions as illustrated below. The care of the physical assets is normally the responsibility of

the maintenance (asset) organization; the operation of the physical assets is normally the responsibility of the operations (performance) organization. There are a set of business processes, technology and people on both sides of the organizational model.

An Asset Reliability Program will guide Transocean to make and execute the highest value decisions regarding the assets during each step of the life cycle. "Best Practice" AR systems, therefore, focus on understanding and managing the risks associated with the physical assets, including both HSE and operations threats.

A strategic element of Asset Reliability is an understanding of the risks associated with the physical assets within the AR System and how those risks vary, or might vary, based on the decisions and actions that are taken or not taken. As an example, if a major maintenance event on a rig is deferred, AR Risk Management should be able to assess the increased risk to the business using a what-if scenario. Based on the anticipated change in risk, an informed decision can be made at the appropriate level in the organization to support the proper action, including the use of alternate maintenance or condition monitoring events to manage the risk to an acceptable level prior to the major maintenance event being performed.



Asset Reliability: a Key Component of Operational Excellence

Risk management will help in the selection of appropriate maintenance and inspection tasks and intervals (Risk-Based Maintenance Strategies), and will be used to prioritize the scheduling of maintenance backlog.

The AR Review has clearly demonstrated that the Maintenance Management System needs to be improved to achieve the Executive Imperatives around Operational Excellence. Some of the long range goals include realigning maintenance costs to the level of asset risk, capturing asset

lifecycle costs, and extending the useful economic life of rigs. The key driver for implementing Asset Reliability is its ability to create significant value for Transocean.

There is also the question of when should a program like Asset Reliability be implemented? The following are some of the key reasons on why it should be implemented now:

- The current Maintenance processes and systems within Transocean are not 'best in class' and do not properly support customer expectations
- This is costing the business approximately $755m per year in inappropriate (excessive) maintenance and maintenance related downtime
- Transocean personnel required for project – opportunity with stacking rigs.
- The project will not be implemented on the rigs until after CMS implementation, OHP and ERP rollout.
- AR will be implemented on the rigs by 2012 in time for the next expected "boom" in the drilling industry.
- A true culture change to achieve Operational Excellence will take at least 5 years to fully engrain company-wide.
- The risk-based system will require time to "learn" and generate optimum maintenance requirements.

For more information regarding 4th Generation Maintenance System and Asset Reliability Technology, please see Section 3 and Appendix 3 of this report.

3 Asset Reliability Review

3.1 Findings

The in-depth AR Review process was based on the Lloyd's Register framework designed to assess the level of maturity of Asset Management across an organisation. The framework examined the management systems in place, the procedures associated with the systems, and actual practices that are in place in the organization.

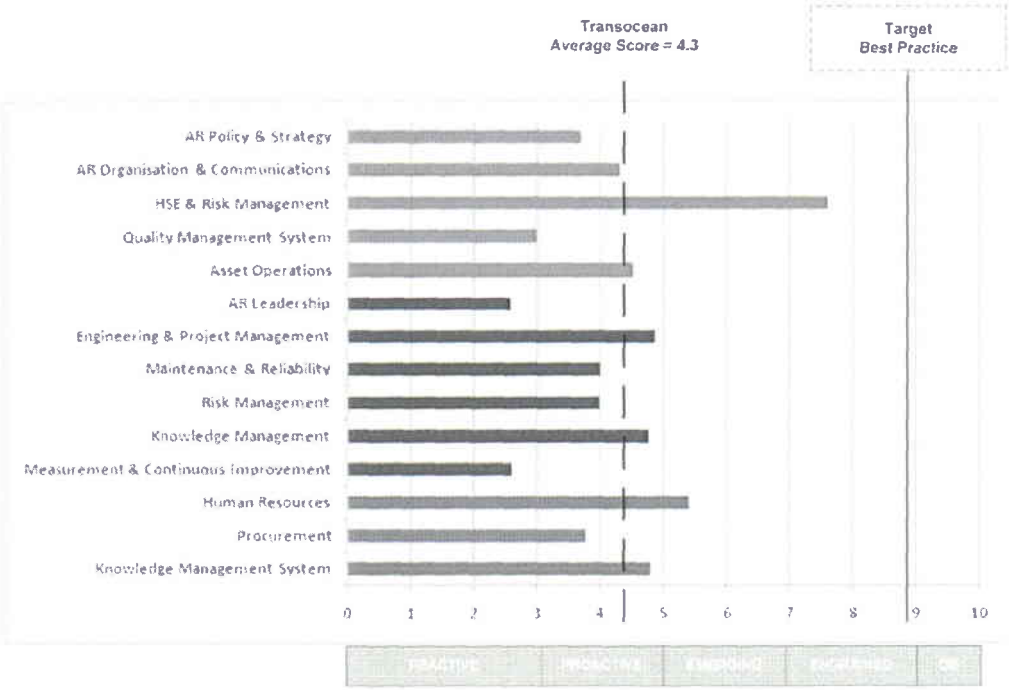
The AR Review Team interviewed 250 Transocean staff across three Business Units (BU), nine offices and nine rigs, taking feedback and opinion from Senior Executives, Regional Directors, Director of Sales & Marketing (BU) and frontline marketing support staff, Technical Field Support staff, Rig Managers Assets, Rig Managers Performance, OIM's, Chief Engineers and Supervisors, Barge Engineers and Marine Superintendents, Toolpushers, RSTC's, and Electrical and Mechanical craft representatives.

The results of those interviews are captured in the findings and recommendations of this report.

The composite results of the AR Review for Transocean are shown below. The average score is 4.3 out of a possible 10 (10 is OE - Operational Excellence). Based on the scoring system this represents the following level of maturity.

Proactive Asset Reliability System

- Many of the Elements of an Asset Reliability System are in place but the System is not yet formalised
- Procedures have been written, several elements are not complete, control is being instituted
- Practice usually exists, procedures being followed but not being managed well, training in place but effective competencies not adequately controlled.
- Risk driven maintenance has been recognised but it is still dependent on consequence assessment only
- There are signs of emerging asset reliability management but it is far from robust



AR Review Findings on the organization's level of maturity

3.2 Asset Reliability Review

The five elements scoring lowest in the review and thus representing the biggest gap to 'Operational Excellence' are:

1. AR Leadership
2. Measurement & Continuous Improvement
3. Quality Management System
4. AR Policy & Strategy

5. Procurement

When AR Leadership is measured and compared with AR Policy & Strategy and AR Organisation & Communications (ranked 7th), they point to significant weaknesses at the systems level for Asset Management generally, and maintenance activity in particular. As an example, the MTS Department in HQ 'owns' the Maintenance Management System, but the BU's 'own' implementation – there is insufficient interaction between the two entities to make implementation effective.

By a significant margin, the highest scoring element – representing best practice - is 'HSE & Risk Management'. This shows a HSE System and related culture which is strong, reinforced and complied with across Transocean.

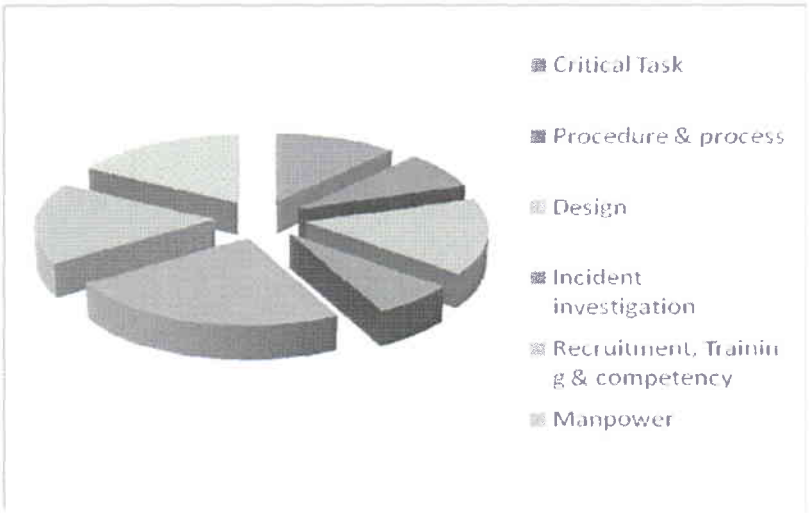
3.3 Human Factors Review

Within a management system there needs to be people-related measures to preserve and defend organisation integrity – the 'softer' issues that impact Asset Reliability. The most important core elements of organisation integrity are listed below:

- Critical task identification
- Clearly defined procedures & processes
- Organisation culture (control of work)
- Design
- Incident investigation
- Training and competency plans and standards
- Risk-based manpower management
- Rig Crewl Fatigue management
- Recruitment processes relevant to critical tasks

Having reviewed evidence from the assessment, the chart below shows the subjective weighting attached to the current risks affecting the organisation integrity areas[1].

[1] This has been rated subjectively based on expert opinion and using the Asset Performance Management Scoring System.



Subjective weighting attached to current risk

The AR Review has shown that improvements are available in all areas of organisation integrity. The majority of the risk (approximately 73%) is posed by the issues centred on the following areas:

- Recruitment, training and competency management
- Risk-based manpower management
- Rig Crew Fatigue management
- Design (specifically human factors integration into capital projects).

3.4 Safety Initiatives Review

The evaluation of Transocean's safety indicators has shown that:

- Transocean's safety indicators have improved in-line with the industry average.
- Over the past 10 years Transocean's safety indicators overall and regionally have been better than the industry average.
- Across the BU's Transocean's safety indicators show little difference, indicating a uniform management of safety and safety culture. However, between Divisions there are significant differences, suggesting disparity in the management of safety and safety culture - this is likely to also be the case between rigs and possibly between rig crews.
- There is a relationship between how well a Division performs in terms of safety and mechanical reliability. 'Piggy-backing' asset reliability and safety initiatives will help drive performance improvement in both areas.

4 Recommendations

Improved operations through the implementation of a risk driven Asset Reliability program will allow Transocean to mitigate risk and realise significant value. Having reviewed the current state of maintenance activity across Transocean, the following key recommendations are made to improve asset reliability and support the movement to the level of Operational Excellence.

4.1 Asset Reliability Policy & Strategy

- Define and write a new risk-driven Asset Reliability Policy and Strategy aligned with Corporate objectives
- Assure alignment with existing policies that will impact the AR area – HR / Training / Procurement etc.
- Revise the Risk Management Policy to be Asset (Rig & Equipment) focused & include Probability of Failure (PoF) for Criticality assessment
- Rewrite the Management of Change Policy and Procedure to include risk assessment, acceptable risk thresholds and revised authorities
- Write a Knowledge Management Policy to cover all AR documents and systems
- Map and align all AR related information requirements and supporting policies
- Include AR data related security and backup requirements in Policy document
- Write a new Communications Policy for AR related activity
- Write a risk based inventory Management Procedure (based on revised Risk Management Policy)

4.2 Vision, Mission and Objectives

- Define a new Mission and Vision Statement for the AR Function and related activity that complements corporate policy, Transocean FIRST Core Values and Mission Statement

4.3 Effective Functional Management

- Redesign the Maintenance functional organisation to better reflect/underpin AR objectives
- Establish AR Steering Team in HQ & Leadership Teams across Transocean BU's & Divisions
- Change the global structure of Technical Field Support to provide proactive AR maintenance support
- Define & Implement AR Leadership Team accountability, responsibilities & levels of authority to ensure empowerment of Teams and individuals and establish meeting forum, agenda and reporting requirements
- Get Stakeholder input to the Vision and direction of the AR Program
- Identify and resolve key strategic and tactical issues and constraints

4.4 Defining & Measuring Objectives

- Formulate a new set of Objectives focused on optimising risk and costs across the asset lifecycle
- Assign revised responsibilities and accountability for AR Objective achievement
- Define AR audit criteria and establish audit program aligned with Corporate requirements
- Consider company-wide independent ,external third party QMS Certification to ISO 9001-2008
- Develop a set of Key Performance Indicators (KPI's) to measure performance against objective using a balanced scorecard
- Establish fully auditable QMS Program
- Ensure KPI transparency, and defined reporting schedule
- Benchmark AR performance inside and outside the Drilling Industry
- Revise and strengthen the Vendor QA Audit program
- Establish and leverage Transocean buying power into new AR related Vendor Partnerships and link to audit program
- Ensure Partnerships understand and embrace the new Critical Spares regime

4.5 Training & Competency

- Develop & implement an AR Training program – all levels including Senior Management
- Develop Training material / activity to cover Risk Management, Management of Change, and Maintenance Deferral activity
- Develop Training material / activity to cover Data Collection justification and requirements,
- Develop a procedure to audit data input to RMS
- Develop & implement AR requirements training for the HR Function
- Develop an AR related Competency Matrix
- Enhance the OJT and mentoring programs
- Develop & implement AR requirements training for the Procurement Function

4.6 Remuneration & Incentivisation Policy

- There is a need to realign staff remuneration and incentives – they should be revised and brought in to line with the new AR Strategy & Objectives, and linked to annual appraisals, succession planning and career progression

4.7 Human Resource Harmonisation with Asset Reliability

- Ensure Job Descriptions and related roles are aligned with AR requirements
- Revise HR recruitment practice to align with the needs of AR Function – skills / competency, compensation, interaction with key Divisional and Regional staff
- Revise the appraisal process for AR staff, link to remuneration, succession planning and career progression with active reviews

4.8 Knowledge Management: Documents, Data, Systems

- Ensure risk ranking in HSE activity is benchmarked using industry data
- Re-examine Permit to Work system and separate permits into Hot and Cold
- Write a new stand alone Corporate Quality Manual
- Write and implement a procedure to align AR requirements with asset/equipment acquisition (design & construction) and divestment (decommissioning)
- Define and implement Failure Codes to capture actual failure categories
- Write & implement 'Bad Actor' Program to manage problematic equipment
- Write and implement a robust Fitness for Service procedure for defective equipment
- Define AR Data requirements to satisfy RMS and Arivu
- Revise and audit the Management of Change procedure to more effectively use risk assessment in the maintenance processes
- Develop Risk Models by equipment type to standardise maintenance planning
- Ensure best use of Well Timeline to assist in maintenance planning
- Rewrite Maintenance Procedures and bring in to line with AR requirements
- Write procedure to govern Equipment Files and establish Files for each piece of equipment
- Equipment Excellence Manuals - begin writing Manuals, prioritised based on Critical Equipment
- Assess key Supply Chain Risks
- Establish equipment & AR data requirements and formats & embed in Vendor/Yard contracts for return to RMS

4.9 Communication

- Develop and implement a Communications program for the new AR Policy, Strategy and Objectives
- Introduce a formal communication procedure for Drilling & Maintenance onboard rigs
- Ensure the Communications Program contains detail on communication flow up and down the new Functional structure
- Ensure 'lessons learned' are effectively communicated in line with Bulletins and Alerts

4.10 Safety and Training

- The Asset Reliability Project will benefit from a clear and concise vision statement that can then be consistently and continuously communicated within Transocean.
- The tools and training approaches used for the Asset Reliability Program will work best if fully integrated into existing material, tools and techniques (e.g., START, THINK, TOFS, and FOCUS).
- Any training developed for the Asset Reliability Project should involve high engagement methods, with behavioural modelling, facilitated feedback and two-way dialogue.
- An effective safety training technique currently used by Transocean is the facilitated class-room training, backed up by on-the-job reinforcement. The current approach should be leveraged to ensure the effectiveness of an Asset Reliability training approach.

- Asset Reliability initiatives or training content shall address the needs and motivations of the audience. For employees, the content will stress the direct relationship between improved reliability and compliance with planned maintenance and inspection regimes, and also the fact that compliance does not slow down task completion. At the supervisory and managerial level, a key component will be the requirement for positive reinforcement, praise and reward for individual initiative shown by team members.

5 FIRST Scorecard (KPI's)

A set of leading and lagging Asset Reliability key performance indicators (KPIs) will be developed that measure both current base line and changing performance at the Corporate, Business Unit, Division and Rig levels. The indicators can then be used to track progress and effectiveness of AR implementation activity, interventions and training in driving Asset Reliability performance. The KPIs will be developed to create a balanced scorecard aligned around Transocean's FIRST core values.

By focusing not only on financial outcomes but also on the operational, market and developmental inputs that affect financial performance, the balanced scorecard helps provide a more comprehensive view of the business. For example, measurements could include process performance, market share / penetration, long term learning and skills development, and so on. Four perspectives are used to help the assignment and development of appropriate performance measures:

1. Financial perspective
2. Customer perspective
3. Operational process perspective
4. Innovation and learning perspective

The measures or Key Performance Indicators (KPIs) to be used in the FIRST Scorecard (five for each of the perspectives) will be drawn from a larger list of performance indicators. These indicators will be both simple and measureable and capable of being applied to all the organisation levels (hierarchy) of Transocean.

Until the planned Business Warehouse is implemented the KPI's will be reported through the Arivu™ software platform that will also be supporting the risk-based maintenance models. As the AR project progresses, the KPI's will be updated to reflect the current activities and the maturity of the AR program.

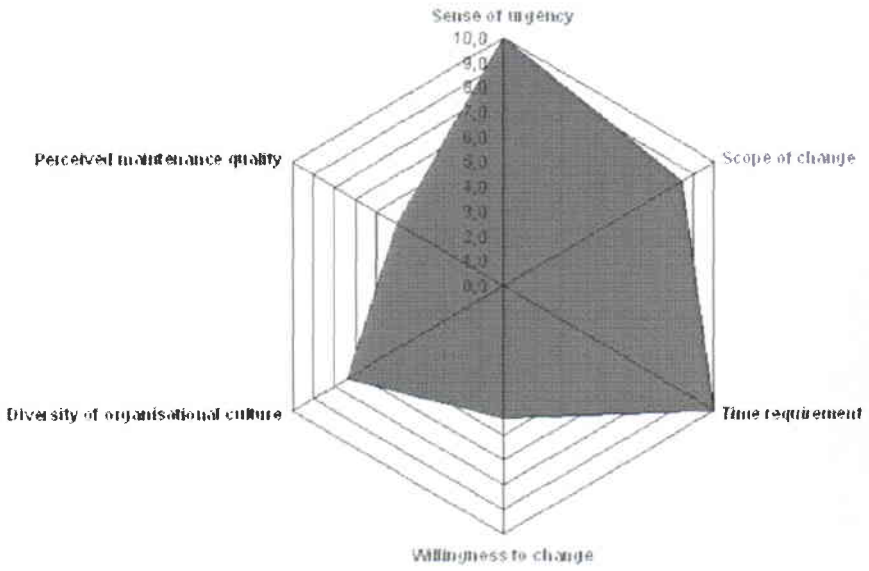
Financial	Customer
➢ Value of AR Savings Identified ➢ Value of AR Savings Realized ➢ TOI Maintenance Cost ➢ Cost of Spares - Inventory ➢ Ratio PM to CM - Cost	➢ Rig NPT ➢ SQA - Performance of Equipment ➢ SQA - Reliability of Equipment ➢ SQA - Maintenance of Equipment
Innovation & Learning	**Operational**
➢ % Assets Utilizing Risk-based Maintenance ➢ Maintenance Task Man-hour Reduction ➢ Number of Improvement Suggestions to Drive AR ➢ Number of AR Training Sessions Given ➢ Number of Supplier AR initiatives ➢ Training Compliance - Training Matrix Changes Implemented	➢ Maintenance Serious Near Hits and Potential Severity ➢ Overdue Maintenance on Critical Items (over 30 days) ➢ Total Recordable Incident Rate ➢ Expired Certificates ➢ Critical Equipment Failures ➢ RCA Criticality Rating

7 Change Management

To learn about Transocean's culture and attitude to change, 28 change management interviews were conducted in Phase I at HQS and EAU. The result of the interview is illustrated below.

As a result, key success factors for the change induced by Asset Reliability were identified:

- Strong and ongoing executive involvement and visibility throughout the project
- Alignment with and based on FIRST core values
- Delivery of clear value proposition
- Broad stakeholder management and continuous expectation management
- Simple, transparent and clear communication ("talk rig")



Change Management Interview Result

- Consistent approach with adaptability to different contexts (cultures, legacy companies, BU's, organizational levels etc.)
- Engagement of AR promoters in middle management (on-shore) and on rig level (off-shore)
- Alignment of training, compensation and benefit scheme(s) to AR objectives

The key success factors were used in developing a Change Management Framework for the AR Project. The objective of the CM Framework is to enable Transocean to successfully implement AR and to achieve sustainable organizational change, through achieving the following objectives:

- Engage a high level of management support and leadership
- Create an appreciative and supportive change climate, based on FIRST core values
- Mobilize the Transocean people (talents, experience, knowledge, drive, etc.)
- Develop the capability and willingness to change to the desired performance level
- Change of patterns of perception, attitude and behaviour
- Leverage and enhance existing change capabilities within Transocean

The CM Framework provides a structured and scalable approach to ensure coherent change management activities on the AR Project, allowing for adaptation to specific objectives and dynamics of the project. Section 6 and Appendix 4 of the Report contain more detail.

8 Financial Justification

The Asset Reliability Program (AR) will deliver significant benefits for Transocean in five primary ways:

- Drive behavioural change towards accountability and compliance across the organisation as the risk driven approach is embedded.
- Reduce the risk (probability and consequence) of unanticipated equipment failures and thus NPT.
- The long term cost structure to asset maintenance will be optimised, using a rational risk-based approach.
- Provide a basis to safely extend the life of critical assets.
- A key collateral benefit will be the reduction in HSE related incidents and their associated costs.

Method

The financial model has been built up from historical and forecast Transocean data obtained directly from Transocean systems and reports. Where information has not been available, varied from system to system or lacked accuracy / detail the core data has been calculated using the best information available.

All data has been produced quarterly on a rig by rig basis (2009 to 2019) and summarised by rig class. The data and results have also been summarised on a 1 year, 3 Year, 5 Year and 10 Year basis.

The Model focuses on five main improvement categories:

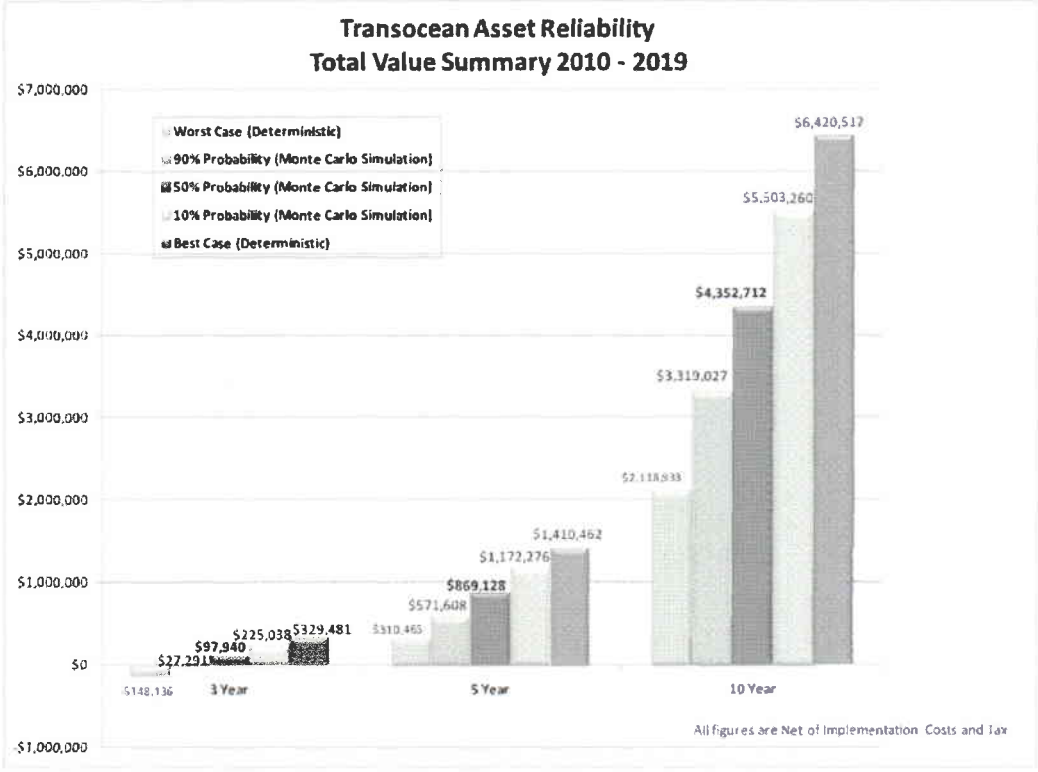
- Revenue Improvements Achieved by reduction in Downtime attributable to maintenance
- Increased revenue due to extending the time between shipyard
- Reduction in Preventative and Corrective Maintenance together with Freight and Customs costs.
- Reduction / Dual skilling of Maintenance Labour
- Reduction in Inventory (cash and capital)

Implementation costs and taxation have been deducted to arrive at the Net Cash Improvements.

The model builds up the existing cost bases for each category to produce a core data set. Using past experience and Lloyds Register industry knowledge, percentage savings have been applied to the core data set to calculate a Base, Best and Worst case outcome. The impact of the savings has been phased to represent the timeline and complexity in achieving each objective.

A highly conservative approach of the potential savings has been taken throughout the model. A Monte Carlo Simulation using 5,000 iterations for each improvement category has been run to identify the distribution and probability of the outcomes. For a list of assumptions used in the model please refer to Section 8 of the report.

Financial Model Results



Total Value Summary Projection for 2010 – 2019

The chart shows the results of the Monte Carlo simulation, with the Worst and Best Case deterministic results, showing the following results over 10 years:

- The minimum return will be $2.1bn
- There is a 90% possibility the project will achieve after tax saving of more than $3.3bn
- There is a 50% possibility of achieving a benefit of at least $4.4bn
- There is a 10% possibility of achieving a benefit of $5.5bn
- The Maximum return will be $6.4bn

There is a high level of confidence that the project will deliver in excess of $5bn over a 10 year period.

9 Project Scope, Schedule and Staffing

The work scope for Phases II and III has been structured to address Organisation and System weaknesses and associated practice / behavioural issues, and the need to reduce non-productive time by addressing the business processes, technology and people associated with Asset Reliability. Following are brief descriptions of the defined Phases on the project.

9.1 Phase I: Discovery and Definition

Phase I is to establish a baseline for existing asset management and reliability activity, providing recommendations for implementation in subsequent Phases. From Phase I, existing maintenance and reliability practice has been reviewed and compared with 'best in class' activity, identifying best practice and opportunities for improvement. This has resulted in projects and tasks designed to develop, implement and create ownership of a robust risk based approach to asset availability, with the need to effect behavioural change across the organisation – this is the focus of Phase II activity.

9.2 Phase II: Detailed Design

Phase II is scheduled for a 21 month period to April 2011, during which time the recommendations from Phase I will be prioritised to close the largest gaps in the current asset reliability efforts. The scope and schedule of each task will be developed, and best practice teams established to develop risk models. The Phase II Schedule and Staffing, are shown below:

- **May 2009 - Planned Project approval**
- **June 2009 - Phase II Start**
  - June 2009 - Core team (includes Change Management, Communications, Project Control, Knowledge Management and Competency / Training)
    - Houston and other locations
  - September 2009 - Five best practice technical teams – Vendors to be included
    - Team A – Marine Integrity, Sub Sea & other risk based model development
      - Houston
    - Team B – Power Systems, Top Drives, Draw Works & other risk based model development
      - Houston
    - Team C – Cranes, Mud Pumps & other risk based model development
      - Kuala Lumpur (proposed)
    - Team D – Risk Based Spares

        - Houston
    - Team E – Maintenance task review
        - Houston
  - January 2011 - Pilot TBD
- March 2011 - Phase II Complete

9.3 Phase III: Implementation

Phase III is designed to fully implement all Phase II projects and tasks, establishing and institutionalising a fully revised Maintenance Management System, concentrating on changing the practice and behaviour across the maintenance function. At this time, the first set of risk models on critical assets will be implemented.

- **April 2011 - Phase III – Implementation Start**
  - Implementation modelled after Next Step program, phased implementation
    - April 2011 - BU 1
    - August 2011 - BU 2
    - November 2011 – BU 3
  - 3 Implementation Teams per BU
  - Lloyds Register steps back to support the TOI lead implementation teams
- December 2012 - Phase III Complete

9.4 Phase IV: Measurement and Continuous Improvement

The Lloyd's Register Team will transition out of the Project with full responsibility and ownership taken on by Transocean personnel. By this time, Asset Reliability practice will be fully functional and auditable.

- **January 2013 - Phase IV – Continuous Improvements**
  - On-going training
  - October 2013 - AR review by Lloyds Register
    - Measure the improvement

9.5 Staffing

The following is proposed Phase II Best Practice Teams. Staffing is contingent upon Team formation – please refer to the Phase II Schedule and resource document. The equipment type chosen represents a significant contribution to current NPT statistics.

Equipment Type	Best Practice Teams
Marine Integrity BOP/Sub sea	1. Establish Phase II Best Practice Team A and develop risk model

Power Systems Top Drive / Draw Works	2. Establish Phase II Best Practice Team B and develop risk model
Mechanical Equipment Cranes Mud Pumps	3. Establish Phase II Best Practice Team C and develop risk model
Equipment Type	**Best Practice Teams**
Spares	4. Establish Phase II Best Practice Team D and develop risk model
AR Planned Maintenance Review	5. Establish Phase II Best Practice Team E and update maintenance tasks for risk models

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1. Introduction

1.1 Background Information

The development and implementation of a risk driven Asset Reliability Program (AR) is designed to address the fundamental risks associated with both operational excellence and asset integrity, lifting Transocean to 'best in class' across the maintenance function. It is vitally important to address and mitigate the internal risks that impact asset availability and return on investment. The AR initiative will:

- compliment and build on Transocean's FIRST Core Values and Mission and the company's Next Step initiative
- deliver integrated and effective asset risk management that positively impacts and sustains asset availability
- further compliment the progress that has been made in process re-design to embrace the new company wide ERP system, PeopleSoft, with RMS and ICS as the offshore tools.

The AR Project will be implemented in four phases, with Phase I designed to establish a baseline of existing asset management and maintenance activity. The performance of key rigs has been investigated and a comprehensive study of existing maintenance practices undertaken. Existing practice has been identified and compared with 'best in class' activity, providing a base for Phase II and 3 activity designed to develop, implement and create ownership of a robust risk based approach to asset availability, effecting behavioural change across the organisation.

1.2 Phase I: Discovery & Definition - Objectives

The primary objectives of the Phase I Discovery and Definition activity are:

- To determine the current status of the Transocean Maintenance Management System, covering all aspects of maintenance, safety, reliability, inspection etc.
- To establish whether the current procedures and practice are in line with the management system adopted by Transocean, and are adequate to maintain continuing integrity and reliability of the Rigs
- To identify limitations, areas of improvement, and opportunities to further enhance the current practices and systems

1.3 Phase I: Project Scope

The Project Phase I work Scope is as follows:

Review:

- Rig Condition Assessment & Maintenance data
- Current Asset Reliability practices: HQ/Divisions/Rigs

- Asset Reliability manuals, procedures & related documentation
- Current Knowledge Management & Work practices
- Software architecture: RMS

Develop:

- Functional Spec. for RMS – Arivu interface
- Change Management Strategy (CMS) requirements
- Communications Plan to support CMS implementation
- KPI's to support/sustain measurement, management and reporting activity in the risk-driven environment
- A financial model to determine value generated from implementing the AR Project
- Vision, Scope of Work and schedule for subsequent project phases

The Expected Benefits and values to be derived from the implementation of a risk-driven asset reliability program compliment Transocean's FIRST Core Values and Mission, further reinforcing the company's Quality Policy Statement.

The principal benefits of an optimised asset reliability program include:

- Operational Excellence in Asset Performance & Reliability
- A risk driven approach to asset inspection and maintenance activity
- Improved risk management and corporate governance across the asset lifecycle
- Improved planning & scheduling thereby improving charter related revenue.
- Improved health, safety and environmental performance
- Enhanced reputation that will impact shareholder value and customer satisfaction
- The ability to demonstrate best value-for-money within a constrained funding regime
- Controlled and systematic processes demonstrating legal, regulatory and statutory compliance
- Security of the operating license through assured compliance
- Confidence that Transocean supply chain is managed to be safe, responsible and sustainable.

1.4 Phase II – Detailed Design

Scheduled for a 21 month period starting in June 2009, running to April 2011, during which time the recommendations from Phase I will be prioritised to close the largest gaps in the current asset reliability efforts and focus on delivering the most value in the shortest period of time. The scope and schedule of each task will be developed, and best practice teams established to develop discipline and asset specific solutions.

1.5 Phase III – Implementation

Scheduled from May 2011 and through the end of 2012. It is designed to fully implement all Phase II projects and tasks, creating a 4th Generation Maintenance System. The implementation will deliver appropriate technology and business processes while concentrating on changing the practices and behaviours across the maintenance function.

1.6 Phase IV – Measurement & Continuous Improvement

Scheduled to commence in January 2013, Phase IV will measure the improvement in maintenance practice and ensure continuous improvement of systems through audits and associated activity.

1.7 Background to Asset Reliability

As a guiding statement for Phase I activity, the following definition is used to describe a risk-driven Asset Reliability System:

> "... a process to generate maximum value from a physical asset base - for the business and for society - by balancing the operational performance of the asset against the asset life-cycle cost and its risk profile for all relevant stakeholders."

A Best Practice Asset Reliability Management System, therefore, focuses on understanding and managing the risks associated with the physical assets. The managed risk includes HSE, Operations, and Maintenance threats, and is dependent on asset knowledge across the lifecycle.

Knowledge – The collection of concepts, relationships, rules, facts and data used for decision making. Risk is a key part of the knowledge required to make the highest value decisions.

Culture - The company culture, core values, and related actions that affect the extent to which equipment and processes exhibit integrity and reliability.

Value – The reward for making an investment as measured by:

- Return on investment (NPV)
- Payback period
- Risk reduction
- Reduction in the cost of unreliability
- Improved availability

The highest value decisions – across the asset lifecycle - can only be made based on knowledge.

Life Cycle steps – the progression of the asset from "Cradle to Grave"

- Conceptual Design
- Detailed Design
- Procurement
- Construction/Installation
- Commissioning and Start-up
- Operations/Maintenance/Engineering/Risk and Reliability Management
- Decommissioning/Abandonment

In order to work effectively, an Asset Reliability Management System requires that work processes, people, and technology all work together to support the reliability of the equipment. If any of the three

do not support asset integrity, the result may be unsafe operations and a significant cost to Transocean.

2. The ARP Framework – Review Findings

2.1 AR Ranking

2.1.1 Scoring Mechanism

The formal portion of the Asset Reliability Framework Review focused on the current managing system, procedures and practices as they directly relate to and impact the asset reliability activity. Formal scoring based on the review assessment used a 0-10 scoring methodology which characterised the level of maturity and progress towards Asset Reliability in the Maintenance Management System, and the robustness of procedures and related practices to support the level of System maturity.

2.1.2 Asset Reliability Review Score

The overall scoring resulting from the Asset Reliability Framework Review Protocol is shown in Figure 2.1 below. The composite score for Transocean is 4.3 out of a possible 10. Based on the scoring system this represents the following level of maturity:

- Many of the Elements of an Asset Reliability System are in place but the System is not yet formalised
- Procedures have been written, several elements are not complete, control is being instituted
- Practice usually exists, procedures being followed but not being managed well, training in place but effective competencies not adequately controlled.
- Risk driven maintenance has been recognised but it is still dependent on consequence assessment only
- There are signs of emerging asset reliability management but it is far from robust

From Figure 2.1 the five elements of the Framework showing the largest gaps ranked by score are:

1. Asset Reliability Leadership
2. Measurement & Continuous Improvement
3. Quality Management System (QMS)
4. Asset Reliability Policy & Strategy
5. Procurement

Leadership specific to Asset Reliability is closely linked to the elements that measure AR Policy & Strategy and AR Organisation & Communications and Measurement & Continuous Improvement. The four elements together point to the need to formulate a strong AR Policy, Strategy, Objectives, KPI's, Functional Structure, and Regional Leadership specific to asset reliability. For AR Review recommendations see Section 5.

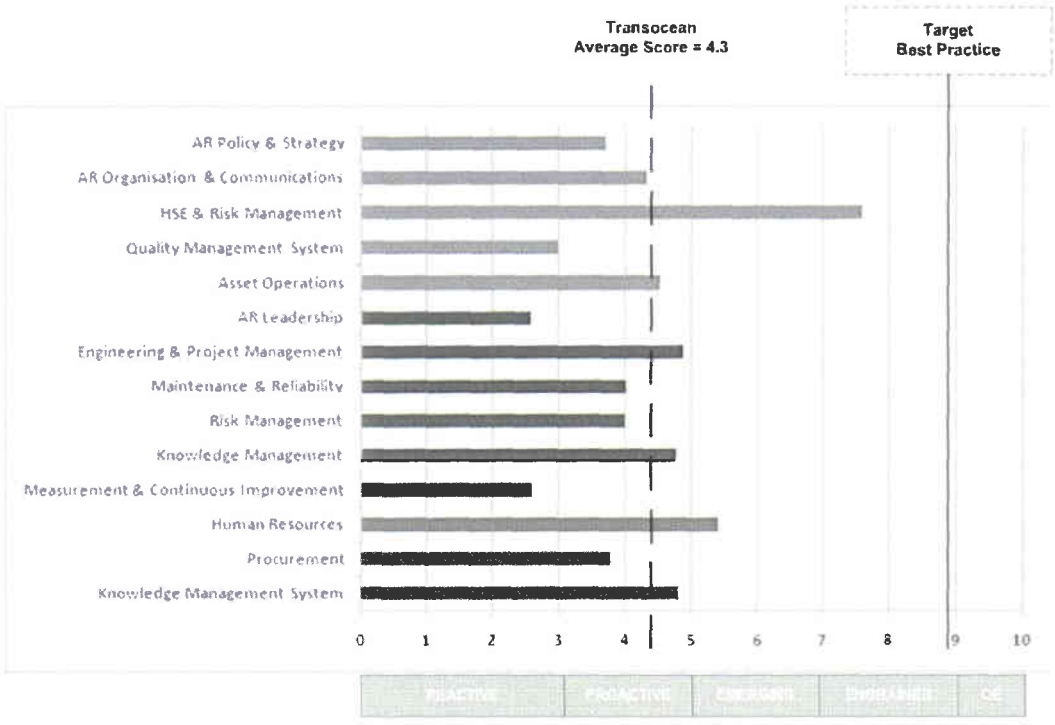

Figure 2.1: Asset Reliability: Review Ranking

In order to achieve a score of 9 on the scale, considered to be Transocean's desired five year target, the AR Review findings would need to evidence the following:

- Near 'best in class' system is in place with the no more than one Element missing; the system is regularly audited and has been institutionalised
- Procedures are fully developed, fully controlled and sufficiently detailed to facilitate maintenance tasks
- Practice is fully in place with all tasks being performed effectively; personnel are trained and understand the reasoning for effective task completion; practice is never bypassed
- Risk driven maintenance is fully functional and effective

See Section 2.2 for more detail on Operational Excellence. For an overview of scoring of each of the AR Elements shown in Figure 2.1, please see Appendix 1.

All recommendations that flow from the AR Review results of Sections 2.4, 2.5 and 2.6 are to be found in Section 5 of this report.

2.2 Desired State: Operational Excellence

For Transocean it is realistic to plan for a move from the current state to a 'best in class' state in the five year window to 2014. This is the nature of the recommendations and related planning activity that has gone into scoping Project Phase II and Phase III activity – see Section 6. Best in class at that time would be considered to be 'Operational Excellence', defined as follows.

Operational Excellence

Operational Excellence is the term used to describe the highest level of organisational achievement in the Asset Reliability Review. At this level of achievement, the organisation is focused on safely achieving stretched operational goals at the lowest possible cost. Operations is predictably sustained at up to 98%.

The maintenance focus shifts toward eliminating non-value-added work activities and toward improving the efficiency and effectiveness of the organisation. Life cycle costs are being used to make decisions. Unexpected failures are being eliminated and emergency work occurs much less frequently. At the same time, the risk associated with the operations of the assets is understood and is managed. People understand the tangible value of their job functions and are recognised and rewarded appropriately.

Risk is used to improve routine decision making. Root Cause Failure Analysis (RCFA) is practiced at all levels of the organisation. Operations are tracking, prioritising and stewarding:

- Available capacity and operations
- Capacity shortfalls and causes
- NPT

KPI's are cascaded down from the top of the organisation and are managed while stretch targets are being met. Well defined systems are in place. They are fully institutionalised, fully functional, audited regularly, and continuous improvement is demonstrated.

2.3 The 4-step Approach

The Asset Reliability Team established a four-step approach to determine the level of good practice in current activity that supports the achievement of 'Best in Class' Asset Reliability Management. The process is illustrated in Figure 2.2 below. The 'Statements of Best Practice' were structured as an interview protocol designed to address asset reliability issues at the Corporate, Business Unit, Divisional and Rig levels, examining the managing system, associated procedures and actual practice at each level.

Step 1: Review current Transocean Asset Reliability activities against a set of Statements of Best Practice, and determine how Transocean compares with those statements

The AR Review consisted of 772 statements of Best Practices. All – or a combination - of the questions were posed to each of the chosen Transocean Offices or Rigs, with about 200 repeated at each offshore facility. During the six week exercise of assessing Transocean current practices, 250 personnel responses were obtained from Transocean personnel.

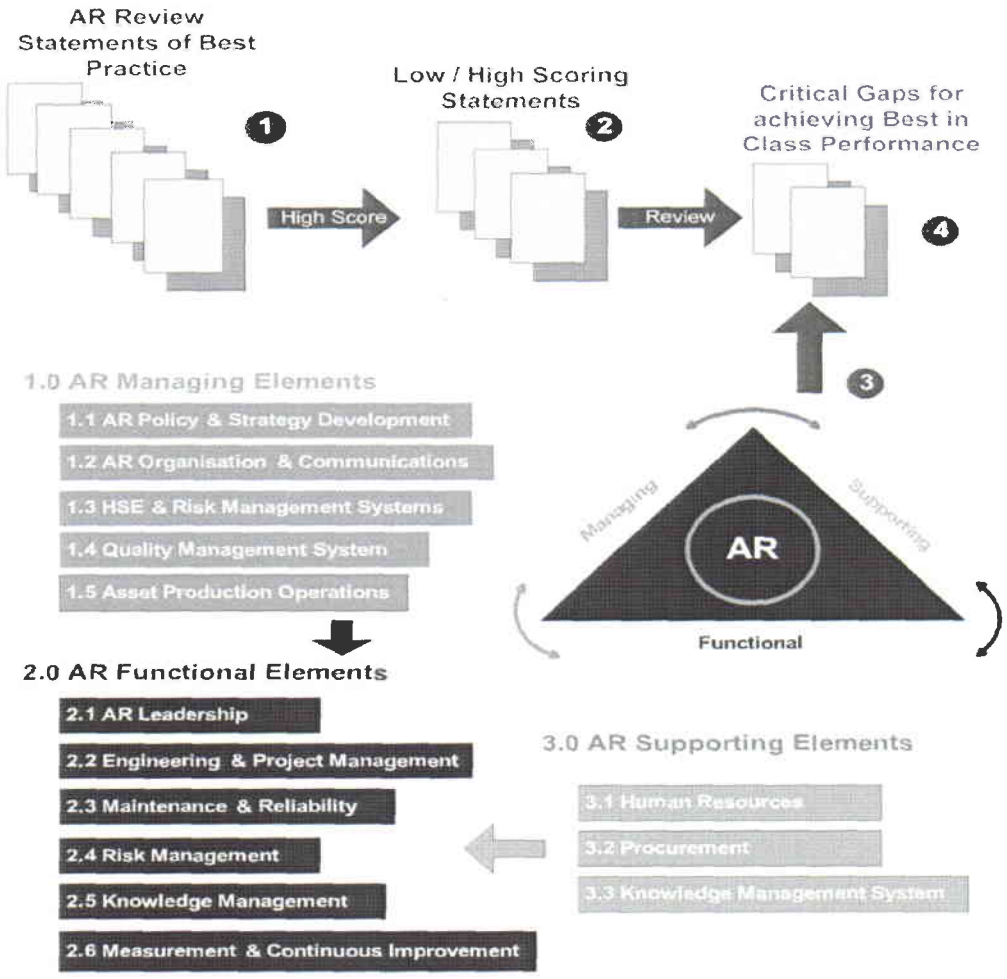

Figure 2.2: The Asset Reliability Framework

The detailed Review produced a clear picture of the current state of Transocean practices with respect to Asset Reliability at the HQS, Business Unit, Divisional and Rig levels. The details of the Review are reported in this Section, with recommendations for improvement in Systems, Procedures and Practices detailed in Section 5.

Step 2a: Identify and filtering low scoring statements

After applying the scoring guidelines each statement received a score ranging from 0 to 10, with 0 being the lowest and 10 the highest. All of the scores from all of the visits were assessed and combined into a single dataset, and any statement which scored less than 5 was flagged for review by the Team (362 Statements). In particular, the intent was to identify weaknesses in existing practices – areas where Transocean was doing poorly, and thus below the threshold composite score. The areas of poor - or weak - practice are highlighted in Sections2.4, 2.5 and 2.6 of this report, providing opportunities for improvement.

Step 2b: Identify and filter high scoring statements

At Step 2a - all of the scores from all of the visits were combined into a single dataset, and any statement which scored higher than 5 was flagged for review. This time, the Team were looking to identify good practice and thus strengths in the organisation – areas where Transocean was doing well, and thus above the threshold composite score. These areas of good practices are highlighted in Sections 2.4, 2.5 and 2.6 of this report and are considered current strengths.

Step 3: Compare the remaining low-rated statements against the AR Framework.

This task was conducted with input from the AR Team. For the final step of the analysis, the Team conducted a Review session, in which the low-scoring statements were consolidated and compared against the AR Framework to produce a meaningful list of opportunities for improvement in systems, procedures and practices.

Step 4: Produce a concise list of improvement opportunities

The Team reviewed the list of deficiencies to produce a list of improvement opportunities. These critical gaps are areas in which there is a significant barrier to 'Best in Class' Asset Reliability in Transocean.

The analysis is presented in the following section. It follows the elements of the AR Framework shown in Figure 2.2. A significant amount of information was captured pertaining to the current state of Asset Reliability activity within Transocean.

- Include a commitment to comply with all applicable legislation and statutory requirements
- Include a commitment to continual improvement
- Be documented, implemented and maintained
- Remain relevant through review

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
AR Policy • **In Norway clients and regulations drive the philosophy of taking a risk based approach to maintenance management** • Personnel commented that they had seen a real change in philosophy regarding maintenance since 2006. This corresponded with the formation of the RCM Team and the work in reliability centred maintenance.	• 9 Maintenance related Policies for Transocean were found in the Maintenance Manual but there was no clear over-arching AR policy established
AR Strategy • Transocean has recognised the requirement to properly manage its Assets • Several people interviewed at a Division level stated that the Strategy to reach "our" goals focuses on the 14 points from the Asset and Performance Operations Expectations spelled out by the Executive VP's of Assets and Performance. The message has hit home with some personnel	• The majority of personnel at the Division or BU level stated that there was no real strategy to implement the Policies of the organization. • The Division drives the maintenance philosophy and strategy in Norway not EAU or corporate. • Personnel at a Division level stated that "we often have such a focus on saving money in the short term it affects the philosophy of looking after our equipment and following our policies". • Rig personnel have not received any specific guidance on what is run to failure
AR Objectives Determination • Nothing of note	• Personnel stated that the accountability process within Transocean was weak. Accountability is one of the core principles of the company but according to many, it was not being enforced. • Formulation of AR Objectives focused on optimising risk and costs across the asset lifecycle is currently not available
AR Communication • Personnel on rigs were widely aware of the Maintenance Manual which housed the 9 Maintenance related policies.	• There is no definitive communication plan established for communicating AR philosophy, strategy and objectives

	• Personnel on the rig had not read the Asset Management Handbook which outlined some of the new philosophical approaches on how the organization intends to manage maintenance
AR Implementation • Transocean's management system for implementing maintenance and maintenance practices is outlined in the Maintenance Manual (HQS-OPS-PR-01). • **The Norwegian Division has formed an RCM Team as a result of Non-conformance being found against them by the Petroleum Safety Authority Norway. This group has devoted some 25,000 man hours of labour toward the RCM initiative.**	• An Asset Reliability Leadership Team has not been formed within the company • While RCM may be a valuable tool in the AR Program, it tends to be very time consuming and does not provide the full picture.
AR Measurement & Feedback • PMAA's (audits) are performed on a 30 month basis providing some input into the workings of the management system within MTS	• KPI's are limited. Focus mostly on downtime, overdue maintenance and money spent • No evidence of audit being performed on Maintenance Department other than the overall PMAA's that occur every 30 months on the rigs. Corporate, Business Units and Divisions as a whole are not scrutinized in PMAA's. This is a significant deficiency. • Inexperienced maintenance personnel interviewed were not aware of the KPI's of the organization. • AR Success Criteria and appropriate KPI's and expected outcomes are missing • AR related audit criteria and program/audit schedule aligned with other Corporate programs is missing

Although there are policy statements embedded in the Maintenance Manual (HQS-OPS-PR-01: Rig Condition; Asset Management; Maintenance Standardisation etc.), the policies do not specifically address asset reliability, nor reflect a detailed commitment to asset reliability by management. The Asset Management Handbook (HQS-OPS-HB-06), available since September 2008 is a reasonable document, outlining management's commitment to an asset management philosophy but lacks detail in how asset reliability – as part of an integrated asset management regime – should be achieved. There was also a lack of awareness of the document's existence.

Implementation of existing maintenance policies was found to be inconsistent both in terms of understanding and application. This is partly due to the fact that they are considered generic in nature, do not yet contain effective criteria or KPI's to measure successful implementation and continuous learning, nor include a level of analysis that can provide lifecycle costs.

Similarly the maintenance Strategy, which precedes Policies in the manual, fails to address the service requirements, risk assessment and condition of the asset or asset system. Lacking in specific objectives, targets, timescales and plans, the Strategy does not define a desire to manage assets on the basis of through-life costs to maximise availability and reliability.

The weaknesses of Policy, Strategy and Objectives definition with respect to asset reliability further points to issues around asset planning - the need for effective planning to optimise cost across the lifecycle.

There is no mention of a risk driven approach to Asset management. A robust Asset Reliability policy will drive excellence in the area of asset management and reliability in the same way that HSE policies – particularly Transocean's HSE policy – drives excellence in that area. There is a strong need to do this in parallel with the findings of Elements 1.2 (see sub-section 2.2.2) and 1.6 (see sub-section 2.3.1).

> "We are starting to get to grips with maintenance but a clear strategy is not there"
> OIM, GoM

2.4.2 AR Organisation & Communications (Element 1.2)

Key enablers of the Asset Reliability Program are the maintenance organisation structure, and the two-way flow of communications and data from the Rig floor to HQS. The assessment within this element focuses on the functional structure, and the roles and responsibilities of key groups – the Leadership Teams - and individuals tasked with planning, communicating, implementing and evaluating Asset Reliability.

To be effective, the following shall be available in the AR Organisation & Communications element:

- Asset Reliability Functional Organisation - robust structure
- Asset Reliability Corporate Steering Team
- Asset Reliability Leadership Teams (geographic)
- Clearly defined roles with accountability, responsibility and authority
- A Communications Plan: specific to AR activities
- A Professional Maintenance Culture

For a geographically dispersed organisation, the elements above should be in place to help define ownership of Asset Reliability activity across the matrix, and the degree of interaction between operations and maintenance.

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
AR Functional Organization • Asset Management Handbook provides high level overview of responsibilities. • Maintenance & Technical Support moving to improve equipment reliability on Assets • Rig Manager position split to RM-Performance and RM-Asset - most personnel interviewed felt splitting the Rig Manager role into 2 positions was a positive move. • **Job descriptions were completed for all positions on the Norwegian rig (reviewed by Team) in both English and Norwegian** • **At an EAU Level an initiative to conduct Condition Monitoring is occurring and being driven by a well qualified enthusiastic individual. Have implemented Oil Analysis and looking to implement Thermographic Monitoring and Vibration Monitoring - lacking an Administrator for RMS**	• The current organisation set up is for the Asset (Rig) but not specifically for Asset Reliability • The Maintenance Functional Organization is weakened by having no effective link to Regional/Divisional maintenance activity • Terms of Reference (Job Descriptions) for maintenance positions are available, but not sufficient for AR • There is no Corporate AR Steering Team with clearly defined responsibilities • The absence of an HQ AR Leadership Team to drive AR issues and activities is a weakness • Up to date succession plans were not always available • There are no processes/procedures to guide interaction with all AR stakeholders • There are a number of inexperienced personnel in Asset Manager positions who self admittedly are still learning the ropes and thus are not as competent as the organization or they would wish
AR Corporate / Regional / Facility Leadership Teams • **The Norwegian Division has formed an RCM Team as a result of Non-conformance by the Petroleum Safety Authority Norway. (This group has devoted some 25,000 man hours of labour toward the RCM initiative)**	• There are no Leadership Teams - BU/Division/Rig - providing day-to-day direction and coordination of maintenance activity • Current Team members are not always fully cognisant of responsibilities and authority. • There is a need to maximise Regional Team interaction – no team building training was available
AR Teams Team and Individual Responsibilities • The structure (teams and responsibilities) is set up and documented in Maintenance Manual (HQS-OPS-PR-01) and Asset Management Handbook (HQS-OPS-HB-06)	• There is a need to better define (and enforce) individual AR roles, responsibilities, authority, accountability, reporting lines, goals, KPIs, etc. • The mechanism to capture and share learning is weak
AR Communications Plan • There are general principles of communication and procedures in Company Management System (HQS-CMS-GOV) and Maintenance Manual (HQS-OPS-	• Clear communication channels between teams and team members is lacking • There is no communications plan to support AR. Some AR information has been disseminated but not well

PR-01) • Open communications channels were in evidence on most rigs • There are regular meetings on the rigs that can facilitate AR communication • Emergency communication processes are in place and well organized.	communicated. • Communications Plan to communicate AR message, plans, progress, successes, benefits, KPIs, etc. lacking ○ Current bulletin board approach has no area set aside for AR. Recent AR notices if posted were quickly covered up and forgotten ○ Transocean tends to be "silo oriented." Staff work well up and down the organization but find it difficult to working across department lines. • Maintenance-Performance communication is not sufficiently formalised / effective. This is critical to AR success. • There is a lack of Supplier communication.

Whilst MTS owns the Maintenance System, implementation of the System is owned by the BU's. This is acceptable provided the level of interaction is high, and communication across the matrix structure is effective; the results indicate the opposite to be the case, with maintenance activity viewed as a cost, adding little value to Transocean.

The absence of Asset Reliability Leadership Teams is a significant weakness in the current structure. A key axis in this regard at the Divisional level is the 'team' comprising Rig Manager Assets, Rig Manager Performance, the OIM and his department heads onboard the rig. The success of this grouping is highly dependent on the personality, experience and leadership skills of the individuals, but interaction and trust has yet to be established on a team basis.

It is recognised that the role of Rig Manager Assets is relatively new and training continues to be rolled out however, the experience and competency of this individual is fundamental to a strong Asset Reliability team dynamic - where lacking or absent, the team is weakened.

There is a need to define a functional organisation structure for asset reliability activity that has clearly defined roles, responsibilities, levels of authority and competencies. There needs to be a central HQ Leadership Team travelling, interacting with and 'directing' Regional and Divisional Leadership Teams, with clearly defined forums for sharing information and best practice.

2.4.3 HSE & Risk Management System (Element 1.3)

In a 'best in class' organisation, Health, Safety, Environment and related Risk Management activity is well defined, well organised and a well managed system. Functions and requirements of the system are defined as they affect Asset Reliability.

HSE

The HSE function is designed to protect persons and the environment. Normally the highest priority is placed on protecting the general population, followed very closely by protecting employees and the environment. The following functions should be in place in an HSE element:

Statutory requirements	Safe Work Practices	Permit to Work	Job Hazard Analysis

Process Hazard Analysis	Safety Training	Incident Investigation	Emergency Planning
Management of Change	Asset Integrity	HSE KPI's	Hazardous Material Control

Risk Management

A complementary Risk Management function is intended to identify, assess and manage the risks associated with a particular operating environment – in this case, offshore drilling activity. The following functions need to be in place in the Risk Management element:

- Consistent matrix and definitions for both HSE and business risk
- Risk assessment methodologies
- HAZOP, Fault Tree, QRA and other more complex methods
- Developing and updating risk studies, e.g. Safety Case and Quantified Risk Assessment (QRA)
- Level of Risk and Level of Authority
- Management of Change for risk above acceptable levels
- Risk Management KPI's

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
Statutory Obligations • Health & Safety Policies and Procedures Manual (HQS-HSE-PP-01) and HQS-HSE-PP-02 (Environmental Management System Manual) are in place and very good. They cover Safety Policies, Procedures and Documentation, Risk Management, programs/processes such as THINK, START, and FOCUS • Excellent HSE related communications Program in place	• Nothing of note
Risk Assessment & Control • Good Risk Tools in use and controlled for HSE issues • THINK, START, MOC, etc. engrained into culture on rigs • THINK training came from Mentors and OJT (Norway) • Training is effective • Job related hazards have been identified and mitigation has been applied as appropriate	• Asset Reliability not included in risk assessment • Unlike HSE, Criticality measurement for maintenance only considers the consequence of failure but not the probability of failure • FOCUS is not consistently used within the organization. Individuals often use a variety of spreadsheets, etc rather than FOCUS • There had been no direct training in THINK, with Plans not always completed as per the standard

Permit to Work System • Works well. Followed on the rigs	• PTW is not aligned with AR objective • In addition to PTW there is a process to utilize an Isolation Certificate for all jobs where isolation of power was to occur (i.e. electrical, pressure, etc.) • For clarity, there is a need to separate hot and cold work permits
Job Hazard Analysis • The THINK methodology is employed for each task. • THINK is adjusted as required based on the complexity of the task • Totally engrained in rig culture	• There is no use of Probability of Failure to define risk/Criticality • There is no standardise formats to display risk between HSE, AR, Business, etc. • PM tasks do not contain all safety considerations
Safety Training • Very strong and continues to be developed further	• Asset Reliability is not incorporated in safety programs. • Asset Reliability considerations are not contained in HSE documentation
Contractor HSE Management • Contractors and clients follow Transocean Safety Programs • Requirements are clear to Contractors and employees	• Insufficient auditing of Contractor compliance
Incident Investigation • The Company approved incident investigation methodology is Kelvin TOP-SET. All incidents must be investigated using this methodology • Both incidents and "near misses" are fully investigated and reported • Roles and responsibilities are clearly defined	• Lessons Learned processes are not sufficiently streamlined for effectiveness • Not all incidents have a defined schedule for investigation and reporting close-out
Prevention Emergency Response • Strong program documented in Health & Safety Policies and Procedures Manual (HQS-HSE-PP-01) and Corporate Emergency Response Plan (HOU-HSE-PR-1)	• Nothing of note
AR: Values / Cultures / Benefits • Excellent HSE culture found throughout	• Nothing of note

HSE

Transocean has an appropriately strong focus on HSE throughout the organization. The HSE manual, HQS HSE PP 01 dated January 2009, clearly describes the managing system for Health, Safety, and Environmental Management. There is a clear HSE policy in place and KPI's have been established - the HSE and related Risk Management System was one of the highest scoring Elements in the Transocean AR review.

There is a well defined and distinctive HSE culture designed to empower individuals to stop operations in the event that a significant uncontrolled HSE hazard(s).

Scoring is consistently high demonstrating an exceptional system. Procedures are robust and practice across the organisation is generally strong. In an isolated case, the HSE manual, which is available onboard in non-controlled hardcopy, was noted to be two revisions (one year) out of date

Norway Division – Best Practice

- A clear and communicated HSE Policy was found in the H&S Manual and was posted conspicuously on the rig and Division Offices.
- The Norway Division had developed a document that bridged all applicable legislation to the TRANSOCEAN Management System.
- Pre-job Meetings were occurring daily and Safety Meetings were occurring on a weekly basis thus allowing personnel the opportunity raise HSE issues.
- The HSE Manual was available to personnel on the rig in electronic and hard copy form
- A program for rewriting 106 Standard Operating Procedures was being undertaken at an EAU level. The SOP's were being rewritten into a Task Specific Think Plan (TSTP) format. There were representatives from Rigs, Division and BU on the Multidisciplinary Team that was looking after the rewrite. Results of the TSTP will be housed on line
- Maintenance Manual is available to personnel to access high level procedures
- The START program is utilised by personnel to monitor acts and conditions in the workplace. It was a requirement for personnel to complete 1 card per shift. The RSTC was reviewing all cards each day to look for items to follow-up on.
- MSDS were checked on the rig and viewed as being up-to-date
- A well developed mentoring program was implemented on the rig
- The Norway Rig was achieving 98% compliance with the required HSE training
- For major investigations involving the Division or the Rig, a well qualified Quality Management subject matter expert would be called in to lead the investigation

The Permit to Work system – Transocean system - is a robust mechanism for ensuring safe working onboard. Unlike the GSF system, the Transocean system does not readily allow for separate permits for hot and cold working; this being identified onboard by a colour coding of red and blue. At first glance, it is not always clear how many permits of each type are open.

2.4.4 Quality Management System (Element 1.4)

A Quality Management System drives defined work process, roles and responsibilities; an understanding of supplier/customer requirements and responsibilities; measurement and process control; and

continuous improvement through the organisation. Such a system is designed, documented and managed to provide measurable value to the organisation.

The following elements need to be in place in the Quality Management System:

- Quality Policy
- Management Commitment
- Education & Training
- Quality Process Modelling
- Process Measurement & Control
- Cost of Quality
- Quality Assurance and Quality Control
- Supplier Quality Management
- Corrective Action including Tracking until Completion
- Management Review
- Continuous Improvement
- Quality Management KPI's

A QMS System should allow for and facilitate proactive assessment of the Asset Reliability system.

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
Leadership Commitment to Quality • There are some quality processes in place but they appear to be spread to functional groups • Quality is included in Company Management System (CMS) - HQS-CMS-GOV • Corporate Quality Group develops management systems and processes. They are not responsible for developing quality performance measures for reliability or other maintenance functions, costs, projects, competencies, etc. They are responsible to see that the above are documented. The focus is on continuous improvement, internal audits, client assessments HQS-Quality Appraisal, etc. • A quality Policy Statement has been developed in line with ISO requirements	• Transocean is not an ISO-9001 certified company • There is no Corporate Quality Manual to specify quality processes/procedures. Coverage of AR issues spread to several references • Traditional quality roles/responsibilities are split out to the different management groups.
Quality Process Model • Some KPIs are defined for AR issues – Downtime, Budget, Inventory, etc.	• All these are lagging KPIs. • The Quality Policy Statement was not seen as high profile or as well known as the Corporate Health & Safety and Corporate Environmental Policy Statements.

Measure & Control AR Activities & Processes • Many AR work process have been defined and are being implemented with defined measurements associated.	• There is a lack of leading and lagging indicators to ensure a balanced overview of performance • AR activities and related work processes to collect the right data are weak. • All required PM/CM data is not input into RMS. • There is no formal process to review all activities, processes, KPI's, etc on a periodic basis. • FOCUS was not commonly used on the rigs visited. • RCAs and Class inspection deficiencies are not tracked in a standard manner. e.g. At one rig some items were tracked in RMS, some on the safety dash board, and the remainder on a written spreadsheet.
Corrective & Preventative Actions • THINK, Start, Incident reporting, etc are well established to report deficiencies • The Quality Function is the owner of the FOCUS Improvement Process, Transocean's approved method for developing and tracking corrective and improvement action plans, and capturing lessons learned to improve Company performance. FOCUS provides a means to improve performance by planning, resourcing, communicating, executing the plan, and summarizing the results and lessons learned. • Rig Condition Assessments (RCAs) are completed periodically	• The SCAT Methodology was effective in systematic failures although the system failures were linked to DNV's model of a management system and not Transocean's. • For documenting and tracking corrective and preventative actions Norway utilises TOFUS and not the company required methodology of FOCUS. • There are also pockets of personnel utilizing excel spreadsheets and not FOCUS, making monitoring of the process extremely challenging.
Quality Assurance & Quality Control • Procurement policies and procedures exist in GLOBAL SUPPLY CHAIN PROCEDURES (HQS-OPS-PR-02) • Factory/vendor acceptance testing is being done	• Procurement procedures need to be modified to enhance AR issues – standardization, equipment documentation etc.
AR Performance Assessment • Performance Monitoring Audit and Assessment (PMAA) are done to verify compliance and evaluate performance • THINK and START are embedded	• Asset Reliability Function is not involved in quality procedures and practices.

The absence of a distinct Corporate Quality Management System is a limiting factor in establishing good practice with respect to quality issues. 'Best in class' asset reliability is driven by the quality cycle of plan, perform, evaluate and update. At Transocean, the evaluate and update functions for asset reliability are lacking and need to be improved.

> "We really don't have a QMS anymore. Each Division is left on their own; I feel as if we are mid-merger – the structure is there but there is no direction"
>
> Q&V Manager, EAU

During the Review activity, only Norway (Stavanger) and UK (Aberdeen) identified any stand alone quality documents. In general a lack of focus was found regarding:

- Documenting the work process that relate to asset reliability
- Clear stakeholder requirements surrounding asset reliability
- Finding and eliminating the causes of failure
- Using procedures to verify work quality
- Quantitative measures of the price of non-conformance

The implementation of the cascading quality management system was in not always effective. Personnel interviewed stated that due to the recent merger each Division was on their own and thus were operating in silos. The CMS is set up to require all levels of the company to be operating together with a particular driving force from corporate. One level of documentation depends on the other as well as communication and implementation of the requirements. This is not occurring and there are situations whereby the UK Division would be in jeopardy of losing their ISO-9001 certification if an audit was to occur today.

- There was a lack of specific requirements on when investigations were to occur for service quality and/or maintenance investigations thus there was no investigation occurring on minor maintenance non-conformances which could have high potential consequences
- Maintenance investigations as a whole were not being conducted with the same vigour or resourcing as an HSE investigation. The capabilities are there - it was just not being investigated.
- It was universally agreed upon that Corrective and Preventative Action plans were not being monitored or followed up effectively.
- There was no evidence of audits being performed on the Maintenance Department other than the overall PMAA's that occur every 30 months on the rigs. Departments, Corporate, Business Units and Divisions as a whole are not scrutinized in PMAA's. This is a significant deficiency as auditing provides assurances that a management system has been communicated and is being implemented effectively. The lack of auditing in the MTS department is a distinct deficiency.
- Personnel interviewed were not completely familiar with the content of the SVA's thus presenting the possibility the SVA would be completed incorrectly. This stems from a lack of true understanding of the CMS itself. This is a significant finding as the CMS is the expectation of how the company desires all business activity to be managed.

Norway – Best Practice

- A well developed Level 2 Quality Manual is available for the Norway Division
- The Norwegian Division was viewed by clients to be conformant with ISO-9001

- Rigs in the UK Division had recently achieved ISO 9001 re-certification
- The UK Division was currently holding ISO certification in ISO-9001

2.4.5 Asset Operations (Element 1.5)

Asset Operations in the context of Asset Reliability concerns the combination of activities that come together to provide knowledge of the asset condition as Operations and Maintenance functions interact.

The following functions - or an adequate combination thereof to provide confidence of the asset condition - shall be in place in the Asset Operations element:

- Asset based organisation
- Operational Excellence system with a strong, supportive maintenance function
- Clear asset ownership & accountability
- Clearly defined communication processes across Assets and Performance
- Operations, Maintenance Safety Training
- Risk Management
- Multi-discipline teams focused on continuous improvement of asset reliability and performance
- Anticipating and preventing mis-operations
- Measurement and continuous improvement using AR specific KPI's
- Functional description of equipment
- Operating procedures
- Consequence of failure understood & documented
- Integrated planning & scheduling
- Management of Change
- Long term Asset Reference Plan
- Rig Crew fatigue issues & working patterns

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
Asset Integrity • **Individual rigs have developed tools to improve implementation of best practice (i.e. Troubleshooting guidelines for electronics and subsea work on DD1; Subsea detailed work plans and guidelines on Nautilus) These should be examined as well as others to promote good practice through the fleet** • **Isolated good practice RCM activity in Norway and Aberdeen**	• There is no process to determine the optimum (risk/cost balance) level of integrity as affected by equipment operating philosophy, design and operating envelopes, costs, condition and remaining life. • PMs and other maintenance procedures are considered too generic – lacking in detail • There is insufficient appreciation of the effect that Rig design (e.g. Dual action rig vs. single) has on integrity and maintenance practices • There is no training program for both maintenance and operations personnel on the

	process of establishing asset integrity • KPIs and processes to monitor the effectiveness of the asset integrity process are not available
Knowledge of Asset Condition • Nothing of Note	• Asset registers/lists are incomplete. Fairly good information is normally available for drilling floor equipment but support equipment is often looked on at a system level in current asset lists. • There are limited equipment files other than the manufacturer manuals. • There is obsolete equipment on rigs. Some in use with a struggle to find parts and service (eBay even used). Often obsolescence is only discovered when trying to repair or replace an item. Other obsolete equipment has been abandoned in place and not removed.
Coordination of AR Program & Activities with Drilling Operations • Activities requiring driller/maintenance support have been identified.	• Wide range of relationships from very cooperative, proactive to hostile "Performance rules" was observed. • Impact and levels of acceptable risk have not been defined in many cases. Gut feel is used for planning. • There is no process to determine and communicate the value of AR activities • There is a lack of process with measurable KPIs to analyse results and recommend improvements regarding coordination between AR and Drilling Operations
Communication Processes • There are numerous opportunities to communicate if desired – AM supervisors meeting, pre-tour meetings, etc • **At division offices in EAU Rig Manager Assets and Rig Manager Performance physically sit in proximity and thus the organization has set the benchmark for successful communication. This replicated in APU and AMU (Gulf) with varying degrees of success**	• There is no formal Communications Plan in evidence. Communications is dictated by the strength of leadership and culture on board. This can lead to inconsistent and sometime very poor communications. • Communication is often dependent on key individuals on shifts.
Technical Solutions • REAs and Tech Support options are available • Communications between rigs with similar equipment is occurring	• Newer rigs less likely to use HQ Tech Support due to slow response and limited knowledge of the newer equipment • An effective process to develop practices and

	procedures as well as resolve specific technical questions is lacking.
Integrated Planning / Scheduling of All AR Activities • Maintenance activities that require close integration with operations have been identified and prioritized • PMs are reviewed when request for changes are submitted.	• Identification and priority based on COF only. • Integration with Performance is informal – varies by rig crew. • Currently deferring PMs does not necessarily require MOC. • There are no separate planning coordinators. Much is done on an informal basis by supervisors. • Changes to PMs discouraged due to slow response to request for change (MoC) and limited feedback
Acquisition & Divestment Considerations Nothing of note	• There is insufficient AR input driving asset acquisition decisions
Fatigue • Rig Crew fatigue is recognized as an issue and managed well (Hours restricted for crew). Supervisors are less controlled but also can compensate easier. [See also Appendix 5 for a review of Human Factor issues that affect working hours]	• Shift related 'lifestyle' training is not available

- Asset Register – Should be held in RMS, but not always complete or up to date
- Formal processes to achieve optimum asset integrity were not found although the RCM team is working on this situation.
- Costs, service life, service capabilities and asset condition are factors considered to obtain optimum operation but there was no distinct process for determining level of integrity of equipment.
- Maintenance orders from EMPAC were general in nature and thus the program generated occasional work orders that did not apply to the Rig. Personnel stated that this can effect commitment to strictly following the MMS.
- For Subsea, generally able to get 'outside the company' technical issues resolved however some technical issues on large items are held up at the 3rd party level - vendors have not supported the operation and management appear unable to address the issue due to lack of resources.
- Most – if not all – Rigs have time built into the contract for maintenance that would intrude on operations – Sales & Marketing need to be aware of AR requirements in this regard
- MOC is not strictly being followed. Personnel stated that crews would get together when there was a significant change to procedures but at a higher level MOC was not being followed. For example, when new equipment was brought on board there was not always an MOC initiated.

- Subsea personnel on the rig often work extended hours and were feeling the effects of this activity. This was witnessed on the Norwegian rig by the Review Team - the situation should be closely monitored by the Management Team
- There was no training for personnel that advised them how to physically manage the 24 hour lifestyle that they were required to live. For every 2 week period of work one of those weeks would involve working from 7:00 PM to 7:00 AM and thus were having to quickly adapt to working at night.
- There were noise issues on the rig visited in Norway. Transocean had findings from the Petroleum Safety Authority, Norway - this will affect sleep patterns and thus concentration levels with personnel until fully resolved.

> "Over time we have somehow lost respect for the Asset itself"
> Coatings Manager, EAU

Norway - Best Practice

- Maintenance passes information regarding the condition of equipment on to operations and end users are informed of any problems that could affect operation of the equipment. Both Maintenance and Operational personnel have access to Maintenance files
- Efforts are made to ensure obsolete equipment is identified, expect RMS to help
- For Subsea, updated and complete equipment files are maintained for the subsea equipment with all current information available to the maintenance and operations departments
- At the time of the visit a Maintenance Supervisor was conducting a program of ridding the Norway Rig of obsolete spare parts
- Maintenance that affects the drilling operation is well identified via the Maintenance Stop Program for Norwegian Rigs. 20 hours per week is built into the contract. Utilizing the Maintenance Stop program it is planned 1 week in advance and is communicated to the company man in a meeting that takes place each week
- In Norway rig crew fatigue strictly from an "hours" standpoint is well managed due to the legislation situation in the country. Most employees are working 12 hour shifts although it was not uncommon for Department Heads on the Winner to be working 14+ hour days.

2.5 AR Functional Elements – Review Findings

The Functional Elements of the Asset Reliability Framework are designed to examine activities that impact or influence asset performance at the Engineering level. There are six main elements in this set looking principally at the hard issues that surround asset reliability and engineering integrity:

- **Asset Reliability Leadership**
  - examines the nature and effectiveness of management commitment to asset reliability, the degree of organisational alignment that is present and the interaction between the AR Function and the respective Stakeholders

- **Engineering & Project Management**
  - examines the degree to which asset reliability requirements are dealt with at the design stage and in engineering projects, looking at good practice and information flow, and the level of support to the Assets

- **Maintenance & Reliability**
  - examines the maintenance management system and its implementation, and the degree to which reliability has been analysed and improved

- **Risk Management**
  - examines the way in which risk is addressed and quantified and how this relates to prioritising asset reliability activity, including work selection, training, spare parts identification and management of change

- **Knowledge Management**
  - examines the way in which all data and information is managed and controlled – from the asset register to the equipment excellence manuals, procedures and related software

- **Measurement & Continuous Improvement**
  - examines the nature and effectiveness of KPI's used to control asset reliability activity, including leading & lagging indicators, trend analysis and benchmarking for continuous improvement

Figure 2.4 provides an overview of the review findings across the Functional Elements. There are many opportunities for improvement in this area - the following sub-sections provide additional detail.

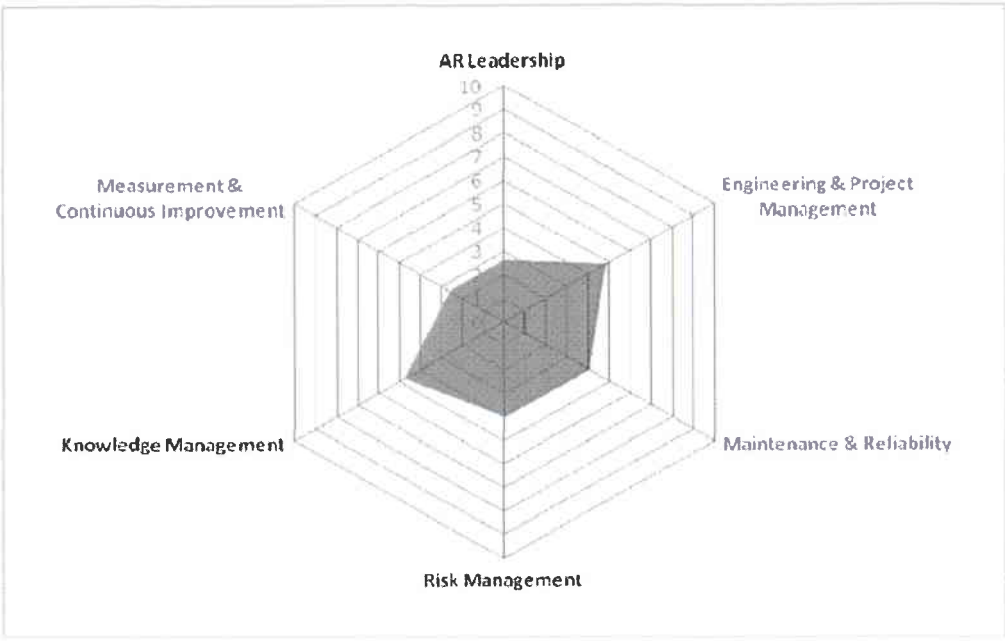

Figure 2.4 Asset Reliability: Functional Elements

2.5.1 AR Leadership (Element 1.6)

The overall success of Asset Reliability depends on the degree of commitment and leadership from the Senior Executive level and other key directors and managers across the maintenance function. AR Leadership must originate at the highest level of the organisation and then be cascaded down to all levels in Transocean. The senior management must demonstrate commitment to Asset Reliability by providing the necessary resource and direction to develop, implement, sustain and maintain the Asset Reliability system in such a way as to assure that the strategic objectives are always achieved.

The Asset Reliability Leadership element must have the following functions in place to assure a successful AR system:

- Active, visible sponsorship of the Asset Reliability program
- Senior executives to lead and encourage the necessary culture changes
- A corporate AR Leadership Team in place with capability, enthusiasm, responsibility and authority to achieve the desired results
- Sanctioned organisational change to achieve the defined Asset Reliability Strategy and Objectives
- Asset 'Owners' held accountable for achieving all strategic objectives
- Asset Reliability achievements communicated throughout the organisation
- Development and measurement of appropriate KPI's and targets
- A mechanism to measure the success of the overall AR implementation activity
- A process to recognise and reward performance

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
Sustained Management Commitment • The AR Phase I project was initiated with Management support • Management's Asset and Performance Operations Expectations were distributed and published in the 2/2008 **FIRST** Monthly	• AR stakeholder and senior management meetings to set AR objectives and strategic direction is not happening • A strong and respected AR Leadership Team is not available to provide direction and coordination of AR for all levels of the organization • Training and related funding to promote and direct the AR program is not readily available • Specific AR training is lacking and should be made available to all personnel including support staff. AR awareness and work practices need to be included in training matrices and OJT modules • AR responsibilities on rigs is not clearly delineated. • Stakeholders are not held accountable for achieving AR requirements and goals
Organizational Alignment • Nothing of note	• The AR functional organization from corporate to rig level is not effective • Skilled and competent staff with proper authority, responsibilities and accountability is not always in place. • KPIs to monitor staffing and competency levels are not effective

Stakeholder Requirements
• A limited set of stakeholders has been identified - Asset Management Handbook (HQS-OPS-HB-06).
• Virtually all rig employees thought that the new Rig manager organization was a positive change.
	• Stakeholders only peripherally involved in AR issues
	• Stakeholder requirements need to be clearly defined with KPIs to determine how effective AR is meeting stakeholder needs
	• Among the Key stakeholders are the Rig Managers - Performance and Asset.
	  ○ Issues
	  ▪ "Performance Managers still have the idea that they own the rigs"
	  ▪ Many personnel changes for RM-Assets position
	  ▪ RM-Assets tend to be junior to RM-Performance
	  ▪ RM-Assets are not yet sufficiently

	trained to do their job to the defined profile ▪ There seemed to be some confusion as to the RM-Assets responsibilities and authority. There is evidence that there are conflicting roles (e.g. many people are being copied on rig morning reports resulting in a number of inquiries and conflicting directions. This is time consuming and results in a loss of focus and inconsistent behaviour. • Critical strategic and tactical issues as well as constraints are not fully defined and resolved • There is no communications processes to keep stakeholders fully informed and actively involved in AR • Currently lessons learned tend to highlight the negative – failures, near misses, etc.
Strategic Objectives for AR • Nothing of note with respect to AR	• There is a lack of AR Strategy and Objectives etc that are aligned with Corporate policies, objectives, strategies, and related Corporate activity • Processes and procedures to review and update AR Strategic Objectives and the AR Strategic Plan are not available
AR Performance Assessment • Nothing of note	• Expectations not fully communicated to all parties • Effective leading and lagging KPIs are not developed or in place • Personal KPIs don't reflect AR requirements directly i.e. Lack of accountability • Audits are rare and corrective actions are tracked in a single location • Management reviews are very limited • Results are not well use to proactively promote continuous improvement • Benchmarking is not being done

The absence of an effective Asset Reliability Policy and Asset Reliability Steering / Leadership Teams makes it impossible for Senior Management to set the strategic direction for asset reliability activity to achieve sustained and continuous improvement. A consequence of this is multiple overlapping

initiatives around maintenance that are not effectively coordinated or integrated, leading to disconnected or inefficient systems, guidelines, procedures and practice.

The resulting AR Review score in this element, when viewed with the scores of Section 2.4.1 and Section 2.4.2, demonstrates that Transocean is currently below the level that would reflect an integrated asset reliability system.

The roles of the various Stakeholder groups on asset reliability have not been clearly defined. There is a need for a revised set of key performance indicators, defined and cascaded from the Transocean Corporate business objectives with realistic annual goals that inspire high performance, to capture stakeholder requirements and expectations. The KPI's should be part of a balanced scorecard approach.

Given the lack of AR Policy and Strategy objectives, another area that represents an opportunity for improvement is that of asset reliability performance assessment. Individual performance contracts, annual appraisal activity, asset reliability audit protocols and implementation schedules, and corrective action plans, will all aid continuous improvement and corporate learning activity.

Specifically:

- No AR Leadership Team has been formed at a Corporate or Business Unit level
- Asset Managers interviewed in UK, Norway and Malaysia stated that they were not getting out to the Rigs as much as they had planned. This lack of visibility leads to insufficient monitoring and demonstration of commitment and leadership.
- The Executive VP's of Assets and Performance set out 14 Executive Imperatives (objectives) for the respective groups. The objectives are not extraordinary in nature but rather expectations from the current CMS for the organization - there was no specific strategy on how the organization would ensure implementation of the 14 strategic objectives (outside of what is already include in the CMS).
- Accountability is clearly outlined in the CMS Manual (Section 4, Subsection 2); however personnel interviewed were adamant that the accountability principle was not being implemented effectively in the organization.
- Management has not developed a requirement for or implemented an audit program for the MTS department
- KPI's are limited. Focus is primarily on downtime, overdue maintenance and money spent
- Personnel interviewed stated that they generally receive the appropriate budget to implement the current MMS.

Norway – Best Practice

- Although forced in to action with the Petroleum Safety Authority of Norway Management in Norway has devoted 25,000 hours to the work of the RCM team thus showing commitment to the initiative of asset reliability and leading the organization in this area.
- Succession plans were in place for Maintenance personnel in the Norway Division.

2.5.2 Engineering & Project Management (Element 1.7)

Asset Reliability starts at the design stage. This is true for both small and large projects. Engineering and project management need to ensure that Asset Reliability considerations are properly addressed for all assets. A good design ensures high integrity, reliability, and availability of an asset. As much as 70% of an equipment item's reliability is fixed during the design phase. Attention to asset integrity in the design leads to fewer maintenance and logistics problems later in the equipment's life cycle.

The following Asset Reliability functions are required to be in place in the Engineering and Project Management element:

- AR related Data and Information captured during:
  - Conceptual Engineering
  - Detailed design
  - Procurement
  - Construction / Installation / Commissioning
- AR related Project Management to
- Good Engineering Practice
- Lifecycle & design life data informing new design/construction activity
- KPI's to measure and ensure effectiveness

Operation and maintenance costs can often exceed twenty times the capital expenditure over the life of an asset, and an equipment failure can cause a business impact ten times the cost to repair or replace the equipment.

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
Asset Reliability in Project Phases	
• Asset Management Handbook (HQS-OPS-HB-06) provides authority and responsibilities	• Cost and schedule are major drivers and the document is not widely known/utilised. • Visible, tangible support for the AR is not directly evident. Some of the elements are in place. • While the Asset Management Handbook (HQS-OPS-HB-06) directs looking at "Whole Life Business Impact of costs, performance and risk exposures", Life Cycle costing is not done. ○ "Equipment service varies widely - environment, type of use, etc. There may be a way to calculate this but it is very complex and likely to constantly change. There is no real data to support it" ○ Attempts were made on top drives but data was insufficient (What was done during major overhaul? What parts were

	changed out? What were their condition?, etc) The initiative was dropped • No AR KPIs or goals are evident. KPIs revolve around the project management (schedule and cost) • HAZOPs, Corrosion Control, FMEAs, etc are covered but Life Cycle costing, RAM, etc are not. • AR is reportedly considered by the project team but not formalized
Availability of AR Related Information • Data is available via the shipyard information system but not well utilized. • Standards are written for equipment where no substitutes are acceptable (e.g. wire rope). • A Detailed functional spec is used to develop the final shipyard scope. Shipyards select equipment from an acceptable vendor listing found in the spec. • The specs. do require at least intra-rig standardization	• "Information is there, but not in the format desired. The data must be accessed." • Data to support AR is not provided as a formatted deliverable as part of projects. It is reportedly all available on the shipyard database. The database is not formatted for AR purposes or use in RMS • Standard formats for datasheets is not provided • Currently, AR data is being collected after shipyard completion. Staff prioritise equipment systems to get the most critical data first before sea trials. Some data is not collected for up to a year after operation • There does not appear to be significant standardisation of equipment or conventions either intra-rig or across the fleet unless it is to the ship yard's and capital cost benefit. For example: ○ On several of the rigs visited fittings standardisation is a problem. There are at least 12 different conventions (metric, imperial, Wentworth, etc) on a rig requiring extra time to research exactly what is currently installed prior to a task being done. This leads to errors, much more time and need for a large assortment of spares and tools • Detailed equipment files are not provided - only OEM manuals are provided.
Good Engineering Practices • People performing engineering and project tasks are properly trained • Design is based on an Asset life of 35 years • Contractors and vendors are audited for quality assurance • Factory testing is done by 3rd party representatives	• There does not appear to be an effective process to confirm competency • The project does not provide asset data nor inspection work plans • Life cycle analysis feedback is not collected or used

Application of New Technology
 	
• Multi-disciplined teams are involve in review of new technology
• Stage gated project process is used. Project schedules are properly design for reviews
  ○ This is particularly true for the upgrade and repair projects where significant cost and utilization decisions must be made by Management
  ○ New Builds are generally never built on speculation but only with a Client already contracting its services. Concept and justification steps are not needed
• Risk and hazard analyses are being completed as required. Outside consultants are utilized as required
• Interfacing with vendors/Contractors is good for improvements
	• Reliability issues are not as key as cost and delivery in discussions with vendors/contractors
	• Spare part inventories are primarily based on vendor recommendations and some project team input.
	• Vendor/ Contractor relationships not contributing to reliability and never for life cycle costing.

Engineering Support for AR Issues
 	
• There are processes to facilitate communication between engineering and Asset operations and maintenance such as Design Bulletins, Alerts, etc
• SMEs are available based on approved REAs (Requests for Engineering Assistance)
• Lessons Learned on projects is documented and available
	• There is currently no accountability to meet AR needs
	• Lessons learned from AR support or maintenance is not disseminated well. In most cases, only problems or incidents are set down, positives and "best practices" are not.
	• The impression on the rigs is that all feedback is ignored.
	• While input to projects is done via operations and maintenance representatives on the project team - there is the impression in the fleet that recommendations or issues in design are neither encouraged nor wanted.
	  ○ Attempts to provide suggestions tend to be greeted by Engineering as "too late" and the inputs are ignored.
	  ○ Project is collecting much of this from recruited team members but the message isn't getting back.
	  ○ Once the spec. and shipyard negotiations are complete, it is difficult to make changes

Equipment Design • Composition of the project teams and task forces helps capture end user requirements • Specifications appear well written.	• Best Practice Teams are not used to develop and disseminate best practices fleet wide. • Specifications do not detail reliability requirements

- Management provides Leadership in Design (however it is not tied to an AR approach)
- The Engineering Department has set KPI's for 2009. There are 3 Goals:

1. Efficiency & Process Improvement
2. Asset Strategy
3. People Development.

> "There are too many surprises when we get into the Yard – the Maintenance people do not know their equipment and the condition of it"
> Project Management Personnel

Each of the Goals have Objectives attached (4 for Goal #1, 5 for Goal 2 and 4 for Goal 3). Performance Measures are set for each of the Objectives.

- FMECA's are a major part of the Engineering process during Projects. The Engineering Department has a representative of the multidisciplinary teams that perform the studies. DNV will facilitate and lead the FMECA's.
- Engineering standards are found on MTS's web site. Controlled by MTS Department.
- Knowledge being captured and communicated in Alerts, Advisories, Tech Bulletins, Product Info., Recommended Practices & Equipment Standards - found on the MTS website. Rigs find some to be incomplete and unclear
- Project Close- out Report helps to communicate lessons learned when New Build Projects wrap-up
- Competency Levels are not set for the Engineering Department. Engineers when they arrive are thought to be qualified. The company supplies training but training needs identified on an ad-hoc basis or requested by individual.
- There is a great deal of information available in the shipyard but it is not fed back into the MMS. There is ineffective interfacing between the MTS Department and Projects to ensure this information is captured in the MMS – format & feedback is not adequately specified in contracts
- Project personnel at a Business Unit Level stated that there are too many surprises when the rigs get into the shipyard for an SPS. These individuals stated that Maintenance people do not know their equipment and the condition of it. In particular they see problems with Thrusters, Choke & Kill Manifold and general Condition of Equipment.
- A discussion with coatings personnel stated that often coating needs determine how long they are in the yard. This supports the thought that there should be more painting being conducted while at sea.
- The organization is looking at utilizing new technologies to reach certain goals. Engineering Manager gave example of Environmental Footprint reduction, new oils, etc.
- When SPS occurs in EAU the yard hosting the inspection and maintenance is audited (example of Polar Pioneer) – safety focused audit only.

activities • EMPAC being phased out in favour of a single system - RMS	• Many overdue PMs are generally due to lack of access to equipment or awaiting spare parts
Maintenance & Reliability Improvement • There are processes to facilitate root cause analysis • There is a process to manage Task Related changes	• Data for reliability analysis is collected but analyses are weak. • Results of reliability analyses and RCAs are not shared widely • Use of Task Change requests varies from rig to rig and does not effectively make use of the Management of Change process • Forums to discuss new items and problems have been deferred
Critical Equipment, Spare Parts & Activities Identification Management • In general, critical spare parts are available as needed • Spare parts philosophies consider location, OEM and Transocean experience and restocking time	• Criticality is only based on COF • Life cycle considerations are not included • Critical spare parts identification is based on the equipment's criticality ranking but not on the criticality of the spares themselves. Not all spares for a critical piece of equipment are also critical. • Optimum levels of risk have not been established for equipment • Other spares or CM parts that are needed to complete outstanding work orders are a problem, often deferring maintenance for over a year.
Maintenance Deferral • There are procedures for deferring PMs. [See maintenance deferral stats below for the seven rigs visited, including tasks awaiting parts]	• Deferral procedures are not always followed and need to be revised and trained • MOCs are used only for the higher, perceived risk items. • Procedures do not provide consistent criteria to permit a deferred activity and include responsibilities and accountability. • Risk assessment training is not available to support the MOC process • An audit process is needed to review effectiveness of the deferral process • Data in RMS/EMPAC suggest that many PMs are deferred due to "Awaiting Parts"
Reporting Using Failure Codes • Nothing of note – codes not used	• Failure Codes are not used

Fitness for Service Assessments • Some rig maintenance personnel were aware and used Fitness for Service (FFS) assessments when defects are found during inspection. Services were done by the inspection contractor employed	• No process exists to provide reliability and performance results back to the design function. • MOC processes are not always used to assess the impact of change of condition • Effective in house FFS capabilities were not evident.
Systematic Resolution for Problematic Equipment • Nothing of note	• A formal "bad actor" identification program does not exist. However, experienced maintenance personnel can readily identify them on their rigs. A systematic program to ID bad actors will promote correction and good practice. • REA can be issued for help but this does not seem to be well used
Contractor Management • Expected to comply with Transocean process /procedures	• Interviews with personnel stated that there is little review of contractor and supplier performance. This type of scrutiny is performed on an ad-hoc basis.

- There is a need to improve onboard and online detailed documentation of all equipment to include data sheets, specifications, drawings, etc not found in equipment manuals.
- For each major class of equipment (i.e. Machinery, Static Equipment, Instrument and Control Systems, Electrical Equipment, Pipelines, and Structures) an Equipment Excellence Manual will describe the specific details for carrying out the ARP for that particular class of equipment. This will include the details of the risk assessment, specific industry and Transocean standards for inspecting, testing and maintaining the equipment, and the risk-based maintenance strategies that will provide the business rules that describe how to select the proper level of maintenance activities based on the criticality of the equipment.
- Personnel interviewed stated that a few more people cleaning and painting would greatly assist in the general upkeep of the rig.

> "Maintenance is whatever the system throws at us"
> RMA, Malaysia

	Built	PM Tasks	PM %	CM Task	CM %	Planned Man/hrs	Planned %	Unplanned Man/hrs	Unplan'd %	Total Man hours
GSF Con II	2000	9408	74%	3254	26%					??
Trident II	1977/ 85	2727	73%	1027	27%	7,484	80%	1,891	20%	**9,375**
Nautilus	1999	6733	68%	3166	32%	59,907	70%	26,278	30%	**86,185**
Key Gibraltar	1984?	5824	88%	768	12%					??
GSF DD I	2004	14178	72%	5504	28%					??
TOI Marianas	1979 /98	5352	64%	3023	36%	23,130	61%	14,644	39%	**37,774**
TOI Winner	1983	4761	65%	2543	35%	17,795	60%	11,755	40%	**29,550**
Average		**6997**	**72%**	**2755**	**28%**					

Maintenance statistics for the seven rigs visited (last 12 months)

Where there are blanks in the Table, no data was available.

	Tasks Awaiting Parts				
Rigs	0-90 Days	90-180 Days	180-365 Days	>365 Days	Total
GSF Con II	94	68	27		189
Trident II	66	16	8	4	94
Nautilus	109	31	4	1	145
Key Gibraltar	22	25	2	68	117
GSF DD I	286	157	195	2170	2808
TRANSOCEAN Marianas	75	6	1	0	82
TRANSOCEAN Winner	34	6	2	0	42

Maintenance tasks awaiting parts (last 12 months)

Numbers sourced from RMS - the figure of 2170 for DD1 is considered anomalous.

2.5.4 Risk Management (Element 1.9)

Risk identification, assessment and control are fundamental to effective asset reliability management, and should be appropriate to control the level of risk under consideration. Risk is a function of both the probability of an event occurring and the consequence of the event. Risk management should therefore be carried out in a systematic and controlled way to determine the criticality associated with the level of risk and to understand the level of impact to the business as a whole.

The Risk Management sub-element is designed to understand the risks associated with the physical assets within the Maintenance Management System and how those risks vary, or might vary, based on the decisions and actions taken onboard the Rig. For example, if maintenance activity is deferred, AR risk management should be able to assess the increased risk to the business using a what-if scenario. Based on the anticipated change in risk, an informed (Knowledge Based) decision can then be made to support the proper action.

Risk Management will help in the selection of appropriate maintenance and inspection tasks and intervals (using Risk Based maintenance strategies), and must be used to prioritise the scheduling of maintenance backlog.

The following functions need to be in place in the Risk Management element:

- Risk based work selection
- Risk based inspection (RBI)
- Reliability Centred Maintenance (RCM)
- Reliability, Availability, and Maintainability (RAM)
- Risk based identification of critical spare parts
- Risk based maintenance strategies
- Risk based work selection processes
- Management of Change: documented/controlled/effective

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
Common Risk Metric	
• A written Risk Management Policy is in the Health and Safety Policies and Procedures Manual (HQS-HSE-PP-01) Section: 4, Subsection: 2.1 ○ POLICY: A suitable plan with a risk assessment and appropriate controls must be confirmed in place, prior to all tasks. • THINK, START and FOCUS provide good tools to identify risk and enact mitigation. They are successfully used extensively on the rigs • Personnel are familiar with the concepts of using Criticality to assist in making maintenance decisions. [Currently they are only using Consequence of Failure (COF) for this determination]	• The basic Risk Management Policies are strictly HSE; reliability is not considered • Risk should be consistently measured and displayed throughout the organization for HSE, Reliability and Business. ○ The Risk Metric is documented within the HSE manual (5X6 Matrix with lower than expected consequence values). HSE matrix covers safety, Loss of Containment and Property Damage using both COF and POF. The scale of both POF and COF should be reviewed and adjusted as required. ○ Both TO & legacy GSF use a COF based evaluation for determining equipment risk/criticality and setting maintenance practices. Transocean is very prescriptive based on asset type alone and not its environment in general. GSF uses a combination of Safety, Environmental impact, loss of revenue, and Repair Costs for each asset. • Use of Criticality (**COF only**) in maintenance planning. The Probability of Failure (POF) is not

	used in the Criticality calculation • Although utilized for HSE the risk matrix was not referenced in Maintenance related manuals and was not being implemented for assessing risk in MTS.
Risk Based Maintenance Strategies • Generic PMs have been developed. • On the rigs, PMs are followed in most respects. There is "a do-no-more, do-no-less approach." • Noncritical equipment (based on COF) tends to be maintained at the lowest effective cost.	• PMs are lacking in detail and need to be reviewed and updated. Some are vague, redundant, etc and need to be improved. Inspection frequencies are based on Criticality **(strictly COF)** • Feedback has been requested but response time was reported to be very slow and that discouraged further feedback • A structured methodology for developing PMs is not available. Some RCM work has been done. • A procedure to review and validate the effectiveness of the risk-based PMs and their strategies is not available and to update as needed. • Additional condition monitoring options are not being explored • Condition monitoring criteria has not been established for each application. • No equipment excellence manuals exist
Risk Based Work Selection & Prioritization Processes • Compliance to statutory requirements is up to date and documented	• Equipment operating, inspection and maintenance history is rarely used to plan maintenance work. This is sometimes done by knowledgeable individuals for special cases • While PMs are done and documented, use of the data for analysis, evaluation and revisions to maintenance practices and strategies is not consistently done
Risk Based Identification of Spare Parts • Spare parts for equipment deemed "critical" via current practices have been identified	• Spare part criticality is based solely on the criticality of the equipment item but not the criticality of that spare to equipment. Some spares for critical equipment will also be critical; other spares for that same equipment item may not be critical. This is recognized by some but there is no process in place to formalize and document the decisions. • The risk based spare parts management process does not utilize criticality based on both POF and COF ○ Audits/reviews are not completed and documented on a regular basis to evaluate

	selection criteria, storage location, stocking quantities, obsolescence,etc
Risk Assessment Training • Some of the basic risk assessment concepts are taught (THINK, hazard identification, etc) but primarily from an HSE standpoint	• There is a lack of training programs that include refresher training and effectiveness evaluations for risk assessments to include AR activities. Personnel need to not only understand "How" but also "Why".
Management of Change • MOC is defined in Company Management System (HQS-CMS-GOV), and Health and Safety Policies and Procedures Manual (HQS-HSE-PP-01). It is referenced in the Asset Management Handbook (HQS-OPS-HB-06).	• The MoC process is inadequate for controlling asset risk and is not fully used across all functions. • The MoC process does not cover monitoring of temporary vs. permanent change, etc. • While FOCUS is a tool in place to monitor and track issues, it is not consistently being used. • MOC process is not referenced in the Maintenance Manual (HQS-OPS-PR-01) • Training/refresher training on the use and application of the MOC process is lacking. The Maintenance Manual, although referring to managing task related change, does not reference the specific MOC Policy/Process in the CMS and the HSE Manuals. • Although Task related change was seen to be implemented at a craft level, higher level MOC's were not being completed effectively • The MoC procedure does not embrace asset specific risk assessment using PoF & CoF
Critical Task Identification • Critical tasks are identified including human error risks, THINK and START programs are utilized to identify and mitigate serious issues that have not been previously recognised • **EAU has identified 106 Critical Tasks. These tasks were assessed by multi-discipline teams with and THINK Specific Task Procedures developed.**	• Critical Task identification is not based on a robust, integrated risk measure

Management of Change

The Transocean MoC process is documented in Manuals HQS-CMS-GOV and HQS-HSE-PP-01, making use of THINK and START plans, but not referenced in the Maintenance Manual, which only deals with task related change via the Task Change Request Form. The MoC process itself does not sufficiently

recognise changes in risk above acceptable levels as asset condition deteriorates. This is a significant weakness that must be corrected in order to achieve 'best in class'.

For example, inspection and maintenance tasks are frequently overdue (see table in 2.5.2) and this can negatively influence risk by increasing uncertainty of the condition of the equipment. This is in effect an unmanaged change to a pre-established plan – not all PM/CM related change is picked up via the Task Change Request mechanism because it too is not used effectively in a risk management capacity.

Given the need to revise the MoC process to more effectively embrace asset risk, there is also a need to revise the authority levels associated with the process to ensure that risk is being measured, is being escalated to an appropriate level, and those signing off are qualified to make decisions based on the risk criteria.

Risk Management

With the desire to manage health and safety risks, Risk Management within Transocean currently focuses on Consequence of Failure (CoF) only, and does not embrace the use of Probability of Failure (PoF) in the assessment of Criticality at the Asset level. This has led to a fairly static Criticality Number used to not only define Critical Equipment, but to also identify and drive the Critical Spares Policy and Critical Task identification.

- A risk matrix (6 x 5) was developed for the organization and utilized for HSE practices only
- Probability of Failure (POF) was not taken into consideration when generating risk based maintenance tasks. Severity / outcome (COF) were the only variables considered
- Although the organization has identified critical equipment there is no true definition of what a Critical Spare is and how the Critical Spare Parts processes should be managed
- A well structured and explained MoC Policy has been defined in the CMS Health and Safety Policies and Procedures Manual but it is not used effectively.

Effective Asset Reliability management requires a dynamic criticality number based on the product of likelihood of failure (PoF) and the consequence of that failure to effectively identify risks to the business. The Criticality will change over time as assets age and maintenance activities are undertaken, influencing the probability of failure. The AR Review findings point to the following weaknesses:

- No Asset specific Risk Management Policy embracing Probability and Consequence of failure
- No truly risk-driven spares strategy
- Infrequent use of RAM and FMEA analysis
- A lack of risk-based maintenance and reliability

2.5.5 Knowledge Management (Element 1.10)

Within the Asset Reliability functional elements, Knowledge Management consists of three main components:

- Documents controlled within the Maintenance Management System

- Data and information flowing into and out of the Maintenance Management System
- Software systems controlled within the Maintenance Management System

The following functions need to be in place in the Knowledge Management element:

- Asset Reliability Manual and related Software
- Knowledge based task procedures
- Equipment specific maintenance procedures
- Proper data into Knowledge Management System
- Performance Data (inspection, test, surveillance and overhaul) from reports
- Maintenance plans and schedules
- Risk and Reliability Analysis Procedures and Software
- Condition Monitoring and Trending Software
- Condition Analysis Software

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
Asset Reliability Program Manual • Maintenance Manual, a Level 1B document has been developed for the organization and spells out the MMS for the organization. • The Maintenance Manual contains some (but limited) aspects of AR and is available to personnel • The Maintenance Manual and the Asset Management Manual are controlled documents and were housed electronically on E-Docs on the company intranet	• Personnel interviewed were not familiar with the Asset Management Handbook. The existence and communication of the handbook has not been effective.
Document Management System • Document management processes are good	• E-Docs can be cumbersome and it is not always apparent how to find documents. As a result personnel print out documents for use but do not replace them or know that updates have been published - one incidence of the HSE Manual being 1 year out of date, and a Procurement manual one revision out of date.
Asset Register • Capability exists to keep a detailed asset registry with acceptable AR taxonomy within RMS	• A process is needed to periodically review and update the asset register. ○ The register for the Marianas shows that it is equipped with thrusters. As a result of the hurricane, thrusters are no longer in place.

	• While the equipment on the drilling floor is generally broken down per an established hierarchy, other equipment may be grouped only as systems or not identified at all.
Procedures for AR Activities • Written procedures for AR related activities including safety critical tasks have been developed • Procedures and policies are communicated to key staff at all levels of the organization • **Task Specific Think Procedures (TSTP) are being developed by a Multi-disciplinary team at EAU level. The team is made up of personnel from Rigs, Divisions and Business Unit level. The team has updated 106 SOP's into a TSTP format.**	• There is no process to periodically review/audit AR related activities to verify accuracy and completeness or update areas based on the results for continuous improvement • Activity results are not audited to promote compliance. Activities are not always completed as intended. • While feedback from the rigs may be used to update procedures, this process is perceived as very slow by the rig personnel.
Documenting AR Activities • RMS contains the majority of information and is a good tool	• Supervisors interviewed stated that 1 in 2 employees did not record sufficient data or detail into the RMS after performing the work. • Could find no evidence that there was a QA process for checking on data inputted into the MMS.
Equipment Files • AR activities requiring documentation have been identified	• Guidelines for equipment files not available - to include content, control, and review/update requirements
Equipment Excellence Manuals • None exist	• None exist
Quality of AR Data • Basic data requirements have been developed for RMS/EMPAC	• Data gathering requirements and procedures are poor. Detailed requirements and procedures to meet the risk model and planning needs are not available
Shared Learning Mechanisms • Personal interaction between rigs (particularly those with similar equipment is occurring	• There is a lack of formalisation of information sharing • Follow-up on lessons learned was not performed well. The follow-up requirement was missing from the management of lessons learned function

AR Related Software • RMS training is completed or at least scheduled • Transition to RMS from EMPAC is underway	• On some rigs, RMS access was limited to high level staff only
Flow of Information & Communications – Organization Wide • Boundaries and issues associated with multi-national, multi-functional or geographically diverse organization are recognized and dealt with.	• Rigs can only see their own information on RMS and cannot take advantage of other rigs' experience • There are no implementation best practice teams available

Using a defined structure, effective Knowledge Management is the 'glue' that binds and enhances AR performance. The KM review has shown that that although procedures are considered generic, the availability of maintenance related documents is generally good. However, the compliance with procedures and the quality and recording of asset data is poor.

There is a lack of effective maintenance of the asset register and the use of defined asset condition grades to assist condition assessment. In addition, there is no common method for categorising or recording asset failures nor performance and utilisation information. For example:

- Visual inspection, surveillance, and other maintenance events are being performed without gaining adequate knowledge of equipment condition.
- Collecting, categorising, analysing, storing, and reporting equipment failure data is not effective
- The absence of failure codes is a contributor, as is insufficient data being returned to the system following PM/CM close-out.

2.5.6 Measurement & Continuous Improvement (Element 1.11)

The purpose of the Measurement & Continuous Improvement element is to:

- Establish the appropriate KPI's aligned with corporate goals
    - HSE & Risk Management
    - Quality Management
    - Asset Operations
- Set annual, challenging targets for each KPI
- Measure and manage the targets
- Drive Continuous Improvement in processes, procedures and organisation

Leading and Lagging KPI's should be available. Leading indicators will focus on management of work process elements and the lagging indicators will focus on the results of the processes. The combination will drive both efficiency and effectiveness in Asset Reliability.

The following functions need to be in place in the Measurement & Continuous Improvement element:

- Annual targets for each of the KPIs established from the Managing Elements
- Self-check procedures for each of the Asset Reliability work processes
- Management reviews and audits of the elements of the AR system
- Benchmarking within and outside the organisation
- Best Practice Teams with responsibility to identify or develop Best Practices to share throughout Transocean
- Effective processes to capture Lessons Learned and share them with all stakeholders within the organisation

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses

Key Performance Indicators
• Personnel interviewed stated that KPI's are developed for the organization in such areas as:
  ○ Downtime
  ○ Budgeting
  ○ Overdue Maintenance
	• The CMS provides expectations for the development of KPI's however MTS has not put together specific processes and procedures for how the department will develop KPI's and how they will manage the KPI process.

Transparency of KPIs • Personnel interviewed had awareness of Downtime and Overdue Maintenance KPI's that were developed. Effective communication of the available KPI's was occurring. • **Scorecards relating to performance were readily available on the Norwegian rig.**	• KPI's are limited and not formatted as a scorecard
KPIs to Improve Success • Nothing of note	• Suitable KPI's are not available
Management Reviews & Audits • A few key KPIs (Safety, Downtime, Budget) exist and are monitored	• Personnel interviewed stated that often corrective actions are closed out before the noted issue is

	actually solved. • The MTS group has not has not been audited in accordance with CMS requirements.
Benchmarking • Nothing of note	• There is a need to identify benchmarking opportunities within TRANSOCEAN and the industry

Norway – Best Practice

- In addition to Transocean's Performance being tracked, the Norwegian rig's Asset performance was being tracked by the client and benchmarked against all the rigs being operated by that client.

> "We have very poor general KPI's"
> Operations Manager, GoM

EAU - Best Practice

- PMAA's were scheduled to be conducted on all EAU rigs in 2009. Audits are typically scheduled every 30 months but due to the merger and other activity, management made a decision to audit all rigs in the coming year.
- EAU completes a scorecard which tracks such items as Maintenance Overdue and Downtime. This scorecard is updated on a monthly basis and is utilized for Monthly Management Reviews

The continuous improvement process within TRANSOCEAN requires attention. Findings in this area included:

- Norway utilizing TOFUS not FOCUS
- Management personnel personally maintaining Excel spreadsheets to track their action items
- Not identifying root causes and management system improvements when incidents occur
- Closing out actions when they have not actually been completed

2.6 AR Supporting Elements – Review Findings

The Supporting Elements of the Asset Reliability Framework are designed to examine activities that impact or influence asset performance from the corporate level, specifically in the area of related support activity to both the Managing Elements and the Functional Elements. There are three main elements in this set looking principally at the softer issues that surround asset reliability:

- **Human Resources**
  - examines the nature and effectiveness of resourcing, training and selection for criteria as they impact asset reliability, as well as the nature of performance assessment and remuneration, and competence assessment and deployment
- **Procurement**
  - examines the nature of procurement activity and management of the supply chain, warehousing and the degree of interaction and auditing of vendors and key suppliers
- **Knowledge Management System**
  - examines the nature and level of – and access to - IT systems that support the Maintenance Function

Figure 2.5 provides an overview of the review findings across the Supporting Elements. The following sub-sections provide additional detail.

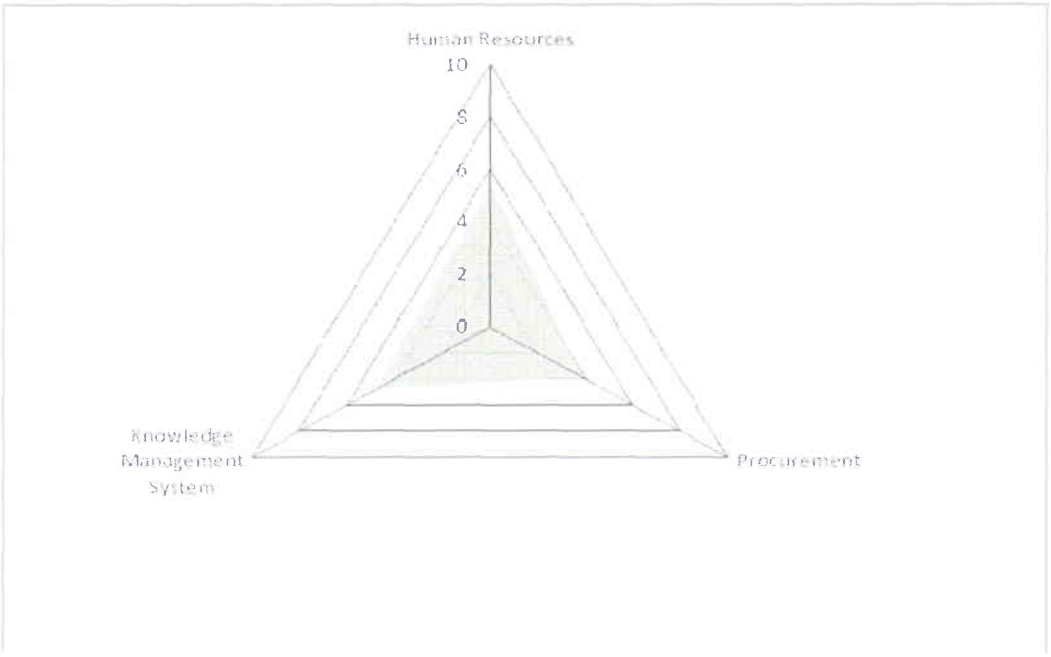

Figure 2.5: Asset Reliability: Supporting Elements

2.6.1 Human Resources (Element 1.12)

The Human Resources element supports Asset Reliability by hiring, training, motivating and retaining the necessary staff to manage and implement the Asset Reliability system. The following functions need to be in place in the Human Resources element:

- Hiring Practices
- Training Program Management
- Professional Skill Development and Progression
- Managing of Change associated with moving, replacing, or reassignment of staff
- Establishing remuneration and benefits
- Job descriptions, appraisal system, succession planning
- Rewarding excellent performance
- Helping maintain labour contracts
- Creating a work environment that is humane, fair and demanding
- Developing and enforcing company policy and regulatory requirements

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
Recruiting & Hiring Practices • **Recruitment practice in Norway & Egypt (see below)**	• There is insufficient input from Maintenance and Performance to ensure recruitment is aligned with AR competency requirements
Training • Training matrix and OJT developed to meet competency issues • Safety Training is robust • Personnel interviewed stated they could enrol in outside training if there was a just cause established. [see below for additional comments]	• The Training Matrix is not a Competency Matrix and should be revised to align with AR needs • A number of the OJT programs need review and upgrading with input solicited from the fleet • Training matrix is rigid without regard for individual experience or real needs of the rig • Internal training classes have very limited space and may require scheduling out 1 year (e.g. Well Control). Additional classes are needed. • Multiple systems to track training at rig and division level – leads to errors and wasted time
Personnel Selection & Job Requirements • Job requirements and descriptions have been completed for all positions	• Rigs are not given a choice or appropriate information on recruits to fill vacancies. This is needed to judge competency, adjust OJT and

	Mentoring programs • The links between job appraisal, career progression and succession planning require strengthening • Development of personal Key Performance Indicators is not occurring • Audits on the HR Department are not occurring. • Could not find any evidence to suggest that Continuing Professional Development is recognized and encouraged
Handover & Work Succession • Handover between shifts and tours is documented and thorough	• Nothing of note
Manpower • Staffing levels were generally good • Issues are covered expeditiously	• Some rigs are experiencing higher turnover due to attrition and New Build requirements • To fill needs some individuals are promoted early resulting in some competency issues • Succession planning is not robust in all areas.

- There is insufficient linkage between the appraisal, rewards, succession planning and career progression activity.
- Minimum training requirements for personnel are developed at a Corporate and Division level and a training matrix for both onshore and offshore personnel is utilized to track training activity.
- Training for Materials and Supply Chain personnel was seen to be lacking.
- Rig Manager Asset training has been developed and is being rolled out in 2009
- Training and Competency are key issues: due to turnover and rate of growth management have had to advance personnel too quickly and competency was now a concern. This lack of competency was evident at the Rig Manager Asset's level. It is thought that the generic nature of procedures has contributed to the decline in competencies
- Job Descriptions and the OJT modules have set some competency levels but an overall competency based training program has not been developed for the organization.
- The Company Management System requires formal shift handovers. Interviews with personnel on the rigs confirmed the handovers were taking place on a shift basis and Crew Change out. Crew handover was more often than not verbal but Department Head's handovers were written. Records of these handovers were maintained on the rig

Training & Competence

The relationship between training and competence is not linear – training does not lead to competence and then stop. Rather, there is a continuous, circular relationship, in that training leads to the development of competencies, and both the need to maintain the competencies and the outcomes of competency assessment influence the provision of further training. With this in mind, the following opportunities for improvement relating to personnel selection, training, and competencies were identified:

- Safety training is prioritised and asset reliability considerations are secondary.
- Vacancy management and succession planning is not effective. This is contributing to the poor availability of staff to fulfil certain roles in the organisation.
- There is a reported lack of availability of people for external recruitment. There are exceptions in certain locations but this is a widespread issue.
- Internal promotion for senior rig roles is occurring before staff are ready. This has a knock-on effect from the problems in vacancy management and recruitment.
- Competencies are defined in terms of technical training matrices which only consider technical skills and knowledge. There are several other categories of skill, knowledge and attributes which are required for job roles on the rigs. These factors are not considered in the selection, training, appraisal and promotion of staff.
- The majority of training is performed by the On Job Training (OJT) modules. There is not sufficient detail on the pass and fail criteria which is applied to the area within these modules. A lack of clarity increase the risk of staff passing modules before the correct level of competence has been attained.
- A large portion of training modules do not require refresher training once staff have completed them. Knowledge degradation over time will reduce the likelihood of compliance with best practice operating methods.
- Some training courses have been reported to be outdated and staff are not clear on the procedures for updates.
- Some training courses have extraneous content, thereby increasing training costs and reducing effectiveness.
- Supervisors have responsibility for training aspects on the rigs. However there are no systems in place to demonstrate that Supervisors have the level of competence necessary to work as a trainer. Additionally, reviews of Supervisors' technical competencies are not required which increases the risk that poor working practices are being shared.
- Training budgets are not visible to the (Rig Safety Training Coordinator) RSTC. This is reducing the capability to plan and deliver training.

Strengths	Weaknesses
AR Compliance for Contracting, Purchasing • Procurement Manual and qualified buyers • ICS linked to RMS	• Standardization of parts is lacking due to procurement and design practices. • Procurement personnel are not trained in AR issues • All Supply Chain risks have not been fully documented
Special Arrangements for Acquisition of Equipment, Spare Parts, Materials etc. • Nothing of note	• Revised Criticality analyses may change the criteria • Equipment data is not always provided • Procedures to review and update spare part strategies on a periodic basis are not available
Warehousing & Inventory Control • Generally, rig stores were very well organized and clean	• Obsolete items are not easily and consistently purged. • Due to vendors modifying OEM part numbers, identical spares (e.g. PLC boards) may have >5 part numbers causing inventories to be artificially expanded.
AR Conformance – Acquisitioning / Decommissioning • Nothing of note	• AR requirements are not embedded in the asset acquisition and decommissioning process
Alliances with Qualified Contractors • Nothing of note	• There is a need to leverage Transocean buying power and Asset Reliability requirements into Vendor partnerships • Vendor QA Audit program is weak
AR Data Input • Nothing of note	• Vendor data formats not well defined and managed, not always compatible with RMS, and not always returned to system for new assets • The primary data source is in the OEM manuals.

	These are rarely updated as equipment is updated or corrections to the manual/ procedures/ part numbers are made.

There is much to be done to leverage Transocean's buying power into effective Vendor partnerships. In all Vendor relationships, the security, quality and timeliness of supply, allied to high quality data, is key to ensure continuous operation.

2.6.3 Knowledge Management System (Element 1.14)

The Knowledge Management System elements cover the Transocean wide information management system, documents and data that support the Asset Reliability system.

The following functions need to be in place in the Knowledge Management System element:

- Document control process to manage documents
- Data security and backup as part of KM Policy
- Nature and functionality of a CMMS
- Structure of and access to the IT System that supports AR Knowledge Management
- Reliable access to information systems and documents by all users, including offshore, at acceptable speeds
- Training on use of the systems

The AR Review found the following Strengths and Weaknesses: where Strengths are highlighted in bold text they are considered to represent Best Practice.

Strengths	Weaknesses
AR Information Systems & Integration • RMS & E-Docs for online document availability	• The AR Function is lacking a related Knowledge Management Policy that embraces IT Systems • E-Docs structure is not user friendly
Access to IT • Access is good throughout	• Speed and reliability is an issue on the rigs • IT service and support is slow and unresponsive. There are generally no IT techs on the rigs and very limited if any administrative rights on the rigs. This results in wasted time and energy to do simple things (e.g. Hook up a printer)

IT Equipment • Available as needed • Client server technology & backup capability	• Nothing of note
Collaboration Software • RMS linkage to other systems is ongoing	• Nothing of note
AR Supporting Documents • Nothing of note	• AR related information requirements, supporting policies and procedures – should be mapped and fully aligned

The highest scoring sub-elements in the Knowledge Management Systems (KMS) Element pointed to the availability of integrated IT, information systems and access to these by staff across the world. Where the KMS Element is weaker is in the area of supporting documentation for asset reliability in particular. Regarding 'collaboration software' it is known that RMS is under review and in the process of being aligned with other corporate systems.

2.7 Overlapping Initiatives

The AR Review Team identified six current major initiatives underway with overlap or synergy with asset reliability. They are listed below. It is important for Phase II and Phase III AR activities to be carefully integrated with these and other, similar initiatives.

Enterprise Resource Planning (ERP)

This project is a broad initiative across Transocean designed to improve core business processes and management information. It includes initiatives that impact RMS, ICS and the development of an Asset Planning Tool (APT), scheduled for roll-out in2010, and further integration to one tool in 2011.

Global Management System (GMS)

The system – part of ERP activity - is focused on harmonising legacy management systems.

Reliability Centred Maintenance (RCM)

RCM activity is ongoing in Norway focusing on procedure revisions to ensure compatibility with RMS. The activity does not include equipment condition and related failure mechanisms. The activity is local and lacks critical resource to progress to an integrated conclusion and move beyond the Division.

Condition Monitoring (CM)

An initiative to conduct condition monitoring is underway in EAU. To date fluid and oil analysis has been implemented and there are plans to extend the activity to thermographic and vibration monitoring.

Offshore Harmonisation Project (OHP)

The OHP is an initiative to harmonise operational policies, procedures and practices, including maintenance practices with one CMMS (RMS), and is set to conclude at the end of 2009.

Operational Integrity Case (OIC)

There is currently an initiative to develop Operational Integrity Cases for each asset. Within each there will be a need to identify equipment operating philosophy, safety critical equipment, lifecycle costs and asset condition and reliability factors, all of which will be influenced by the implementation of the Asset Reliability program.

2.8 Regional Variations

2.8.1 Safety Management

Because of the Statutory regime in the North Sea, driven by Safety Case requirements, one area which shows consistent scoring across the rigs – represented by one in each Region of operation – and points directly to the strong Safety Culture across Transocean, is the HSE and Risk Management Element. This is shown as the first of the radar plots.

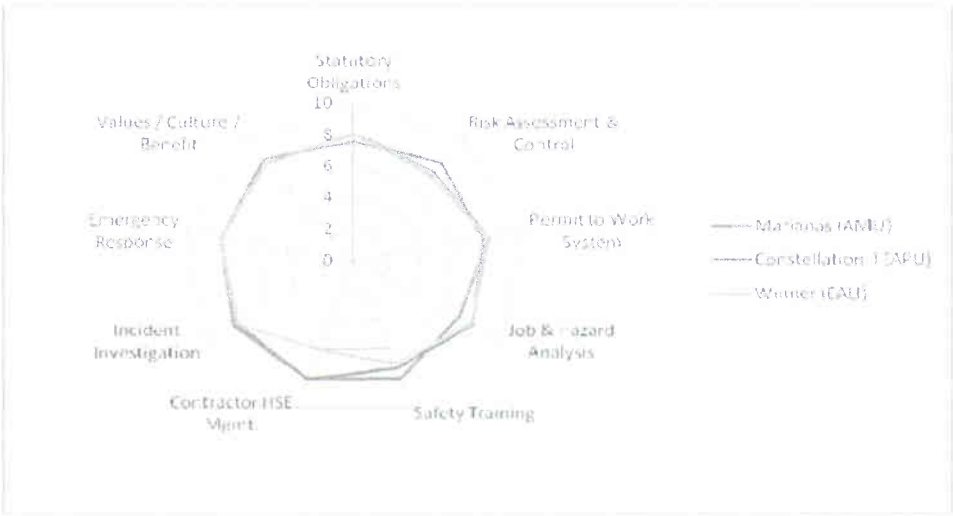

Figure 2.6: Asset Reliability: HSE & Risk Management – one Rig in each Region

In addition to comparing the safety culture on the three Rigs it was important to take this one step further and compare the safety statistics across the BU's and by Division. Figure 2.7 shows the breakdown of safety statistics or lagging indicators for Transocean by Business Unit and by Division for the year-to-date 2008 (as of Oct 31st).

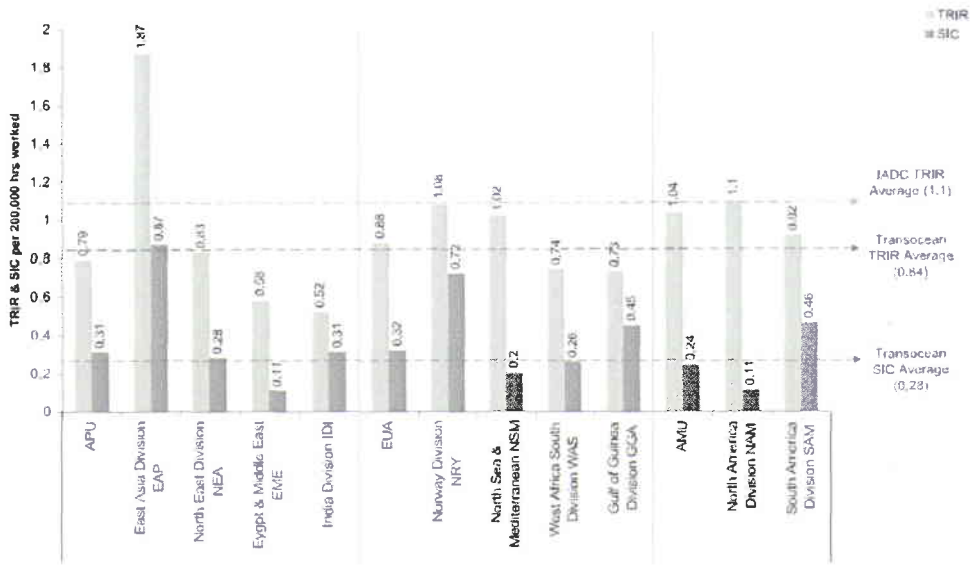

Figure 2.7: Breakdown of Transocean safety indicators by BU & Division for YTD Oct 31 2008

The key point to note from this breakdown is that whilst there is little difference in the safety indicators between Business Units in 2008, there are significant differences between both the TRIR and SIC for different Divisions. This points to differences in the management of safety and strength of safety culture in the different Divisions.

> **"BUs are like different companies within the company"**
> Quote form HQ Change Management Interviews

2.8.2 Mechanical Downtime

Plotting the percentage of mechanical downtime[3] per Division and per Business Unit against Transocean's safety indicators shows that in the Asia Pacific Business Unit and associated Divisions safety performance and mechanical downtime are strongly correlated. This correlation is less apparent in the Europe & Africa and Americas Business Units – see Figure 2.8 below.

[3] The mechanical downtime figures come from Lloyd's Register's analysis of rig-by-rig non-productive time data for Transocean.

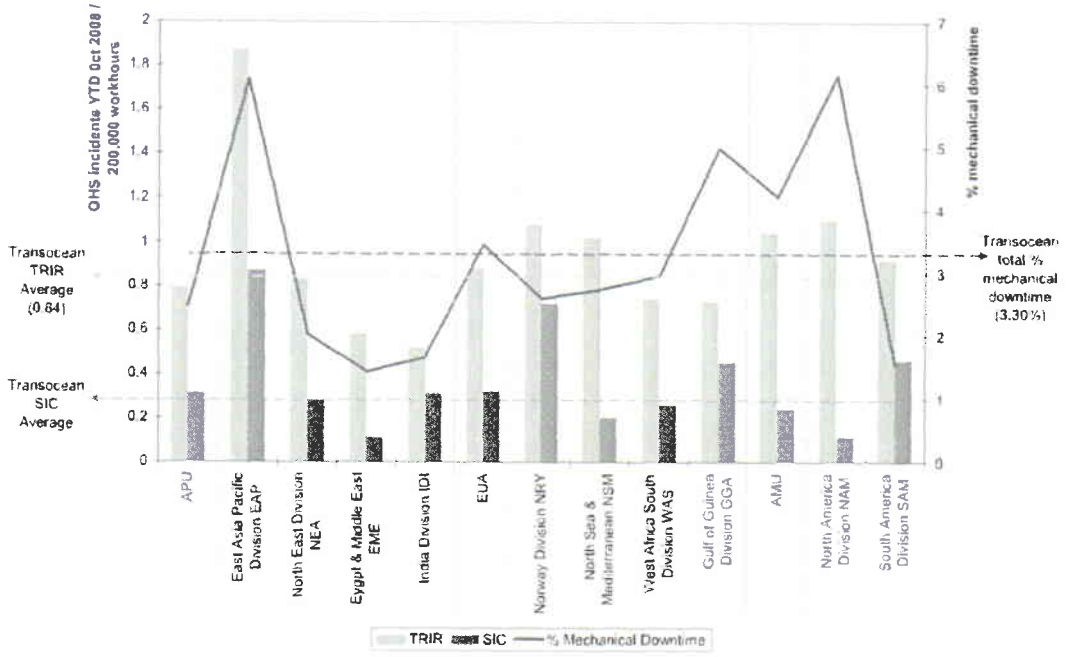

Figure 2.8: Comparison of Safety Indicators & % Mechanical Breakdown per BU and Division

TRIR = Total Recordable Incident Reports

SIC = Serious Injury Case (equivalent to Lost Time Incidents in other industries)

The Divisions that have the highest percentage of mechanical breakdown are:

- North America Division – 6.15%
- East Asia Pacific Division – 6.07%
- Gulf of Guinea Division – 4.99%

In summary:

- The safety indicators for the whole offshore drilling industry have been improving over the past 10 years.
- Transocean's safety indicators have improved in-line with the industries.
- Transocean's safety indicators overall and regionally are better (or lower) than the industry average.
- Across the Business Units Transocean's safety indicators appear to show little difference, indicating a uniform management of safety and safety culture. However, between Divisions there are significant differences in safety indicators. This suggests there may be disparity in the management of safety and safety culture between Divisions and this is likely to also be the case between rigs and even possibly between rig crews.

- There appears to be a relationship between how well a Division performs in terms of safety and how well they perform in terms of mechanical reliability. Therefore, there may be some advantage to 'piggy-backing' asset reliability and safety initiatives, as the cultures required to drive performance improvement in both are related.

The same statistics are available by Rig and are summarised in Figure 2.9 below for Rig Type.

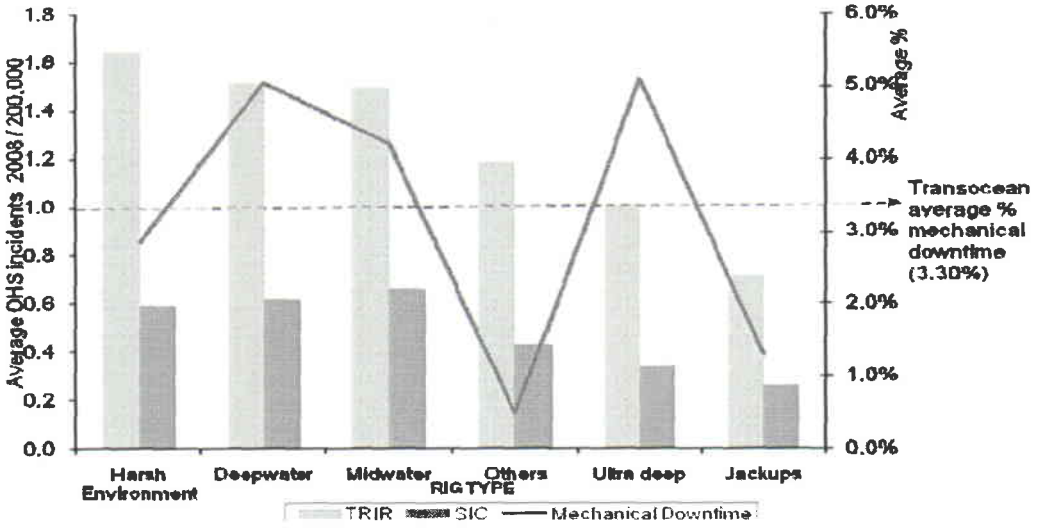

Figure 2.9: Comparison of Safety Indicators and Percentage Mechanical Breakdown by Rig Type

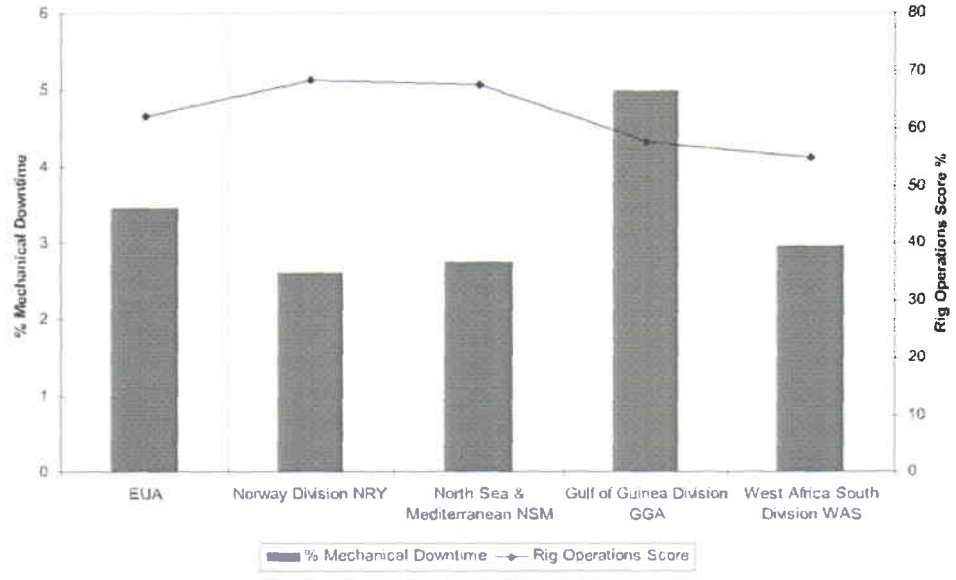

Figure 2.10: Comparison % Mechanical Breakdown & Rig Ops. Score for EAU and Divisions

Figure 2.10 shows that as the rig operations score goes down the percentage mechanical downtime goes up, so there appears to be an inverse relationship - which is what is expected.

2.8.2 Maintenance & Reliability

Again, comparing the same three Rigs with respect to Maintenance & Reliability practice, there are similarities and variations in scoring across the three Rigs.

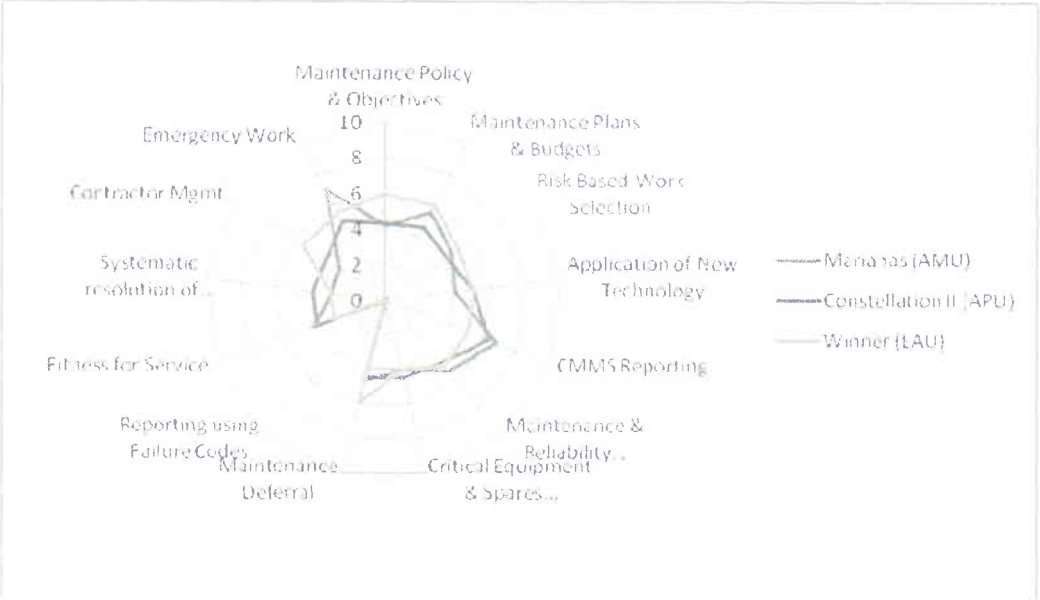

Figure 2.11: Asset Reliability: Maintenance & Reliability – one Rig in each Region

The management of Critical Spares, Maintenance & Reliability Improvement and Risk Based Work Selection (based on RMS) is similar on each Rig showing consistent application of RMS and current critical equipment risk ranking practice. However, there are variations in the application of Maintenance Policy, Budget control, Emergency Work and Contractor Management, pointing to different management styles and cultural differences. Of the three Rigs, only the Winner (operating in Norway) scores consistently above the average.

2.8.3 Quality Management – Norway Division

Figure 2.12 contrasts the level of quality management activity in Norway with the level of QM across Transocean as a whole. Although short of Operational Excellence in the Quality Management System generally, Norway represents reasonably good practice with respect to commitment, QA/QC and the measurement and control of activities. With a stand-alone Management System Manual and Quality Management System – mandated by the local regulatory regime - the Division can be considered an exemplar in this regard.

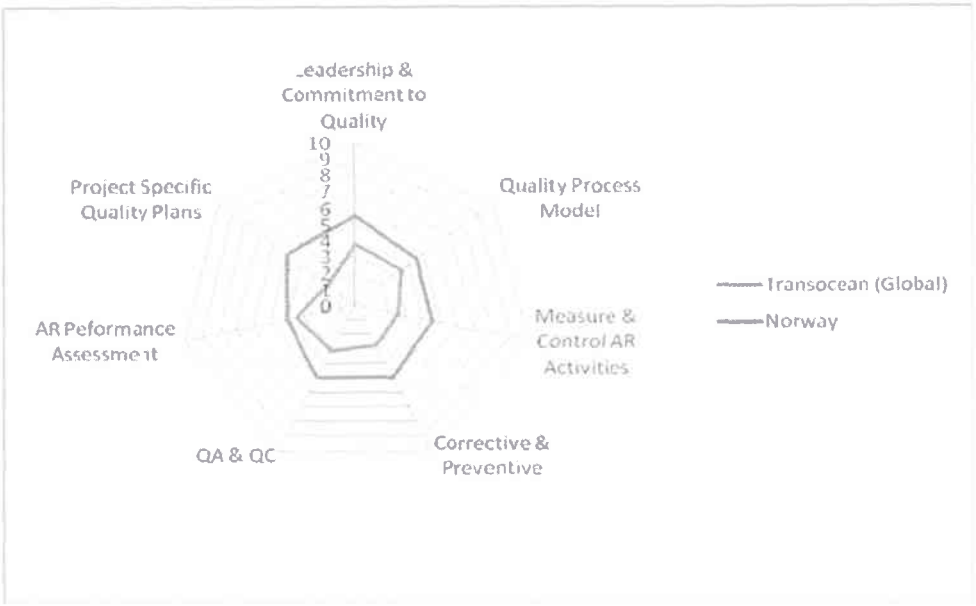

Figure 2.12: Quality Management System – Norway v Transocean (Global)

3. Risk Management

3.1 Introduction

An unexpected event, such as an equipment failure, a safety incident, an environmental disaster, the loss of a key client, supply chain interruptions, changes in tax laws, or rapid changes in the price of oil are examples of a host of threats that can occur anytime and have the potential to seriously affect the continuity of a business, tarnish a company's image in the marketplace, and impact shareholder value. These are all different facets of business risk.

Starting with a common definition of risk is important. A simple but effective definition is:

- **Risk** is a measure of the likelihood and consequence of an undesired event

To be most useful, risk must be understood to be dynamic. As the parameters that affect risk are constantly changing, so is the risk. Risk can be thought of as a still picture captured from a streaming video. It needs a location, time and date stamp to be meaningful.

In today's business environment, key stakeholders inside and outside of an organization are expecting more accountability from senior management to properly manage all aspects of business risk. This cannot happen until there is a clear understanding of the different types of risk that could impact the company as well as their potential consequence and frequency. Some risks take the form of small but frequent losses; others are infrequent but potentially catastrophic. Managing business risks effectively requires a holistic approach.

Businesses today are facing increasing and increasingly complex risks. The accelerated pace of business, globalization, rapid changes in the business environment, increased regulations, and advances in technology are all contributing to this change. It is reasonable to expect that this trend will continue at an increasing rate.

Risk is not something that happens to an organization, it is an attribute of the organization and how it is being managed. Understanding risk provides the basis for a proven, powerful tool to improve decision-making, and will be used extensively in the Asset Reliability (AR) System.

3.2 Enterprise Risk

It is useful to recognize that business risks take many forms but they can be characterized into three broad categories. Figure 4.1 provides a view on the three categories of risk, which are detailed below:

Strategic Risks (External Threats) are those threats to the enterprise that are outside of the control of the organization. Some examples that affect strategic risks might include:

- Regulations
- Price of Oil
- Weather

- Cost of Capital

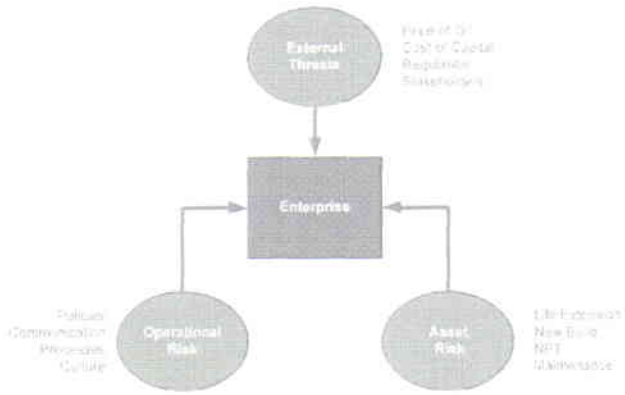

Figure 3.1 Business Risk

Operational Risks are those threats to the enterprise that are directly related to how the business is being managed. Some examples that might affect operational risks include:

- Business Processes
- Operational Performance
- HSE Management
- Asset Availability
- Training and Competencies

Asset Risks are those threats to the enterprise that are directly related to how the physical assets perform. Some examples that will affect asset risks might include:

- Maintenance activities
- Aging Assets
- Life Extension
- Asset Lifecycle
- New build and major upgrades

The Asset Reliability System will focus primarily on Operational and Asset Risks. Even though the AR System is not intended to manage Strategic Risk, some of those risks will be analyzed and mitigated by the application of an effective Asset Reliability program. As an example, AR will not set regulations, but it will ensure that all regulations that apply to the scope of the AR System are met. It will also be able to understand the impact of those regulations on the risk (and cost) of compliance. Although AR does not directly manage strategic risk, it will provide risk knowledge to company executives to help make more informed decisions regarding many of the strategic risks that affect the organization.

3.3 Risk Management

Transocean, like many other operating companies, has embraced the concept of Operational Excellence. Each company has slightly different definitions of what operational excellence means, but generally the concepts are similar. A typical objective of Operational Excellence is for the organization to be focused on safely achieving stretched operational goals within acceptable risk, at the lowest possible cost.

There is a growing realization in forward looking companies that managing risk creates value. Avoiding equipment failures by properly understanding and managing the condition of the equipment is a creation of value. Knowing when to transfer risk with external insurance based on intimate knowledge of the risk associated with the operation of a particular asset creates value. Asset Reliability will focus on value creation and time-to-value based on properly managing risk.

We have defined risk as a point-in-time function of many variables, including:

- **The inherent risk of the operation**
  – by definition, a more valuable asset also carries a higher consequence if it fails.
- **What a failure can impact**
  – as an example, drilling in an environmentally sensitive area implies a higher consequence for the effect of a failure with environmental consequences.
- **Potential lost production**
  – which is also affected by many things including operating rates, unit operating value, asset condition, and time to restore function.
- **The degree of management control over the risks**
  – one of the key objectives of management systems is to understand and manage risks. The effectiveness of the management systems is a key component of risk.
- **The potential failure modes**
  – Understanding how a failure will occur and how that failure will manifest itself is another important facet of risk.
- **The effectiveness of the current Condition Monitoring (inspection / maintenance / auditing) Programs** – once a failure mode is understood, the uncertainty in the condition of the equipment or the ability of the management system to control that specific failure mode is determined by the effectiveness of the "Condition Monitoring" program.

Achieving Operational Excellence centres on the ability of a company to correctly recognize and successfully manage the risks associated with its operations. Addressing operational and asset risks is difficult for many companies, including Transocean. Insufficient or inaccurate data, the lack of established methods for measuring risk, the fact that there are many different types of operational risks

with multiple or undefined owners, and an unclear cause and effect of risk and actual loss events are some of the challenges to managing risk.

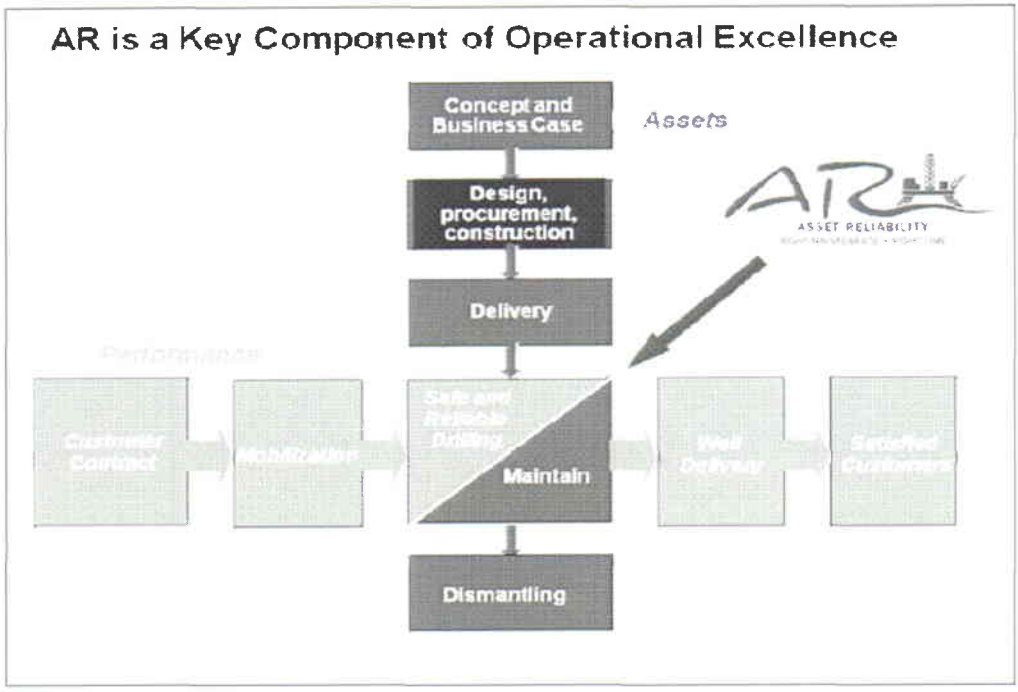

Figure 3.2 Operational Excellence

In its simplest form, the operational part of a capital-intensive enterprise such as Transocean can be viewed as an Asset Management (maintenance) organization supporting an Asset Performance (production / operations) organization. This model is shown in Figure 3.2. The care of the physical assets is normally the responsibility of the maintenance (asset) organization. The operation of the physical assets is normally the responsibility of the operations (performance) organization. There are a set of business processes, technology and people on both sides of the organizational model.

An Asset Reliability Program will guide the organization into making and executing the highest value decisions regarding the assets during each step of the life cycle. "Best Practice" AR systems, therefore, focus on understanding and managing the risks associated with the physical assets. The managed risks include both HSE and operations threats.

The keys to managing the risk to the operation of the business are:

- Get the **people** working as a single team with common objectives around the performance of the physical assets
- Integrate both sets of **business processes**

- Understand the condition of the **physical assets** and how that condition translates into "risk" to the performance of the assets.
- Development and use of proper **technology** as an enabler to achieve the business objectives

The **Asset Reliability** program will deliver a risk-based approach to improving the performance of the physical assets by focusing on the interfaces of the two sides of the business to develop high performance work teams that will ensure:

- Capability of the human resources to provide the level of care necessary for the physical assets to achieve the desired performance
- Integrated business processes with clear accountability and responsibility
- Application of technology to enable delivery the desired results

A strategic element of Asset Reliability is an understanding of the risks associated with the physical assets within the AR System and how those risks vary, or might vary, based on the decisions and actions that are taken or not taken. As an example, if a major maintenance event on a rig is deferred, AR Risk Management should be able to assess the increased risk to the business using a what-if scenario. Based on the anticipated change in risk, an informed decision can be made at the appropriate level in the organization to support the proper action, including the use of alternate maintenance or condition monitoring events to manage the risk to an acceptable level prior to the major maintenance event being performed.

Risk management will help in the selection of appropriate maintenance and inspection tasks and intervals (Risk-Based Maintenance Strategies), and will be used to prioritize the scheduling of maintenance backlog.

The Asset Reliability solutions will provide new technology and improvements in business processes and people performance. The results will be higher confidence in managing risk while sustaining and continuously improving business performance.

3.4 Risk Management in Transocean

With the desire to manage health and safety risks, Risk Management in Transocean currently focuses on Consequence of Failure only, and does not embrace the use of Probability of Failure (PoF) in the assessment of Criticality at the Asset level – see Figure 3.3 below. This has led to a fairly static Criticality Number used to not only define Critical Equipment, but to also identify and drive the Critical Spares Policy. The AR Review findings point to the following weaknesses:

- No Asset specific Risk Management Policy embracing Probability and Consequence of failure
- Management of Change not linked to risk thresholds
- No truly risk-driven spares strategy
- Infrequent use of RAM and FMEA analysis

- A lack of risk-based equipment strategies to adjust intervals and tasks
- Root Cause Analysis being under-utilised across the Maintenance Function
- There is no effective identification and management of a formal Bad Actor list
- Remaining useful life for major equipment is not being estimated effectively

Effective Asset Reliability management requires a dynamic criticality number based on the product of likelihood of failure (PoF) and the consequence of that failure to effectively identify risks to the business. The Criticality will change over time as maintenance activity is undertaken, thereby influencing the condition of the asset and the probability of failure. The major weakness inherent in the figure below is that it is not applied to asset specific risks, only to the tasks being undertaken by Rig crews.

Figure A, Levels Of Risk Management

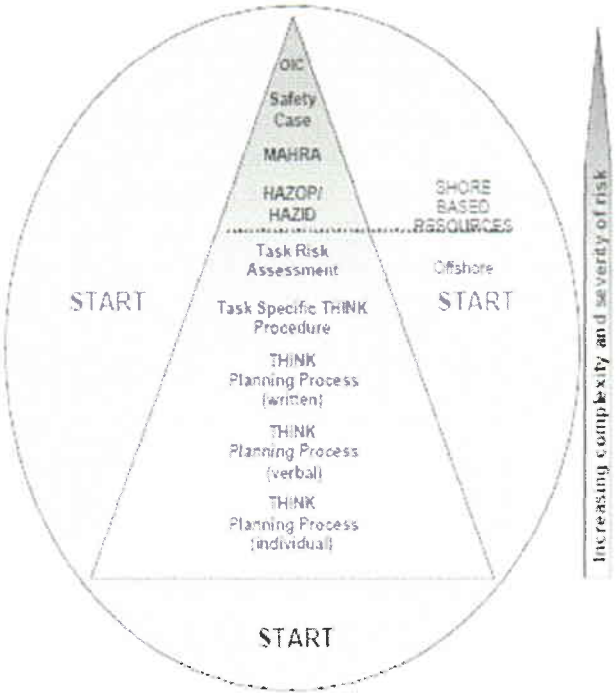

Figure 3.3 Levels of Risk Management in Transocean
(extracted from Transocean Manual HQS HSE PP 01)

The 5x6 matrix of Figure 3.4 is used in Transocean to assess Probability and Severity with respect to "Task Risk Assessment and provides a more detailed risk assessment to demonstrate that risks related to specific task steps are as low as reasonably practicable." The matrix again does not apply to asset risk but only to Task risk, and the probability measure is subjective and not quantitative.

The Task Risk Assessment is available to provide a higher level risk assessment of the critical task steps listed in Task Specific THINK Procedures or written THINK plans.

Figure B. Risk Matrix

Severity (consequence) Rating			
	Personnel	Loss of Containment	Property Damage
A	First Aid Case	Contained Onboard	< $1,000
B	Medical Treatment Case	< 0.5 bbl	$1000 >= $20,000
C	Restricted Work Case	0.5 bbl >= 1 bbl	$20,000 >= $50,000
D	Serious Injury Case – duration < 3 months	1 bbl >= 5 bbl OR < 1 ton	$50,000 >= $500,000
E	Serious Injury Case – duration > 3 months	5 bbl >= 100 bbl OR 1 ton >= 20 tons	$500,000 >= $1M
F	Fatality	> 100 bbl OR > 20 tons	> $1M

Probability (likelihood) Rating	
5	Likely - The team has knowledge of a similar event in a similar situation
4	Possible - Not certain to happen but an additional change may result in an incident
3	Conceivable - Would require failures of multiple systems and controls
2	Rare - A combination of unanticipated changes would be required
1	Not credible - The team has no knowledge of the event occurring in similar situations

NOTE To rank Probabilities and Severities, assume existing controls/safeguards (policies, procedures, work practices, supervision) are in place and functioning effectively.

RISK CLASSIFICATION MATRIX

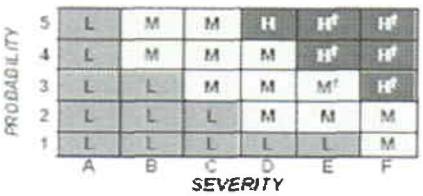

Figure 3.4 Transocean Risk Classification Matrix
(extracted from Transocean Manual HQS HSE PP 01)

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4. Asset Reliability: Life Cycle Management

It is important for Asset Reliability to be embraced as a through-life approach to managing assets, and to be capable of optimising risk and life cycle costs. The Life Cycle Model in Figure 4.1 illustrates the stages in the life of facility equipment. The basic purpose of this model is to illustrate the "cradle to grave" progression for equipment. The stages of the model apply whether the scope is a major capital project, executed by a multi-discipline team, or a smaller facility project replacing a piece of equipment, initiated by the Rig or Technical Field Support Team.

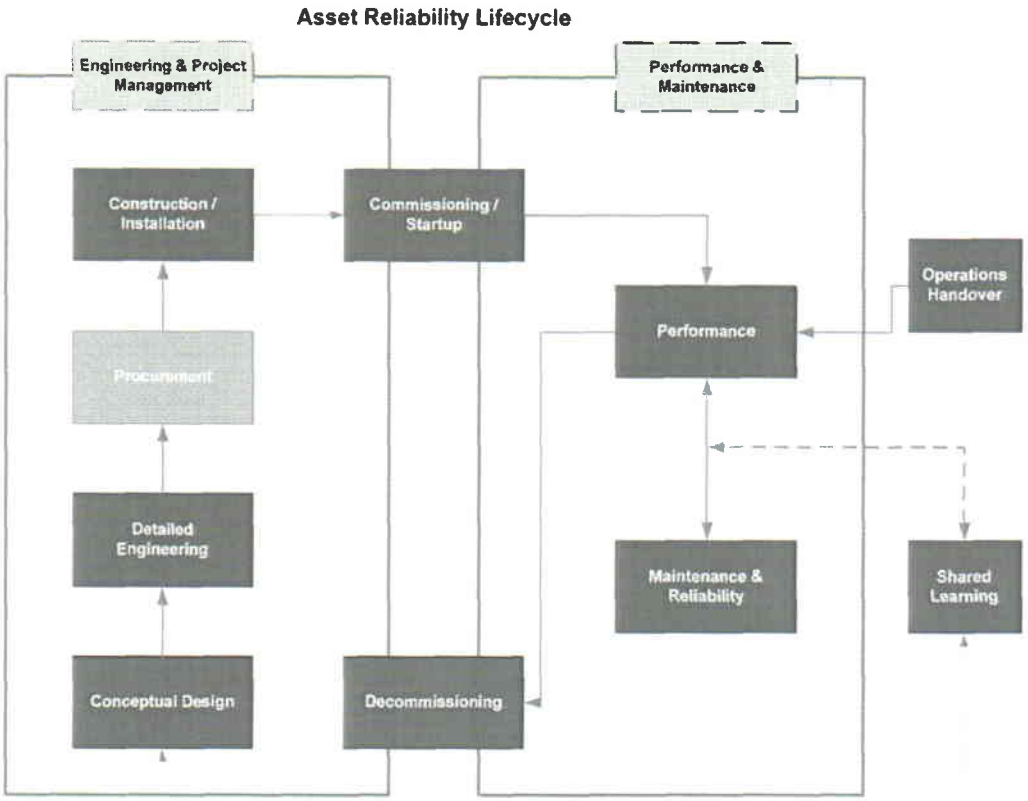

Figure 4.1: Asset Reliability: Life Cycle Model

Based on this model, the requirements for Asset Reliability are defined by each of the Life Cycle Stages, as outlined below.

4.1 Conceptual Design

Historically, much of the challenge of improving the reliability of operating facilities has been overcoming deficiencies that originated from the facility's design and construction. During the Conceptual Design stage, performance needs are identified and a design basis is established. An Asset

or major upgrade project should have a Philosophy Statement that sets the goals for the project. Such goals would typically include:

The investment goal: minimal investment cost; lowest life cycle cost; pre-investment for growth, etc.

Schedule goals: resulting in a fast-track or normal schedule project

Reliability, availability, or service factor goals: based on business needs.

These goals should strongly influence decision-making along the way and translate to maintenance cost targets and ultimately operational reliability and safety. The concept of understanding the total cost of ownership of equipment (life cycle cost) is a key management goal in today's business climate.

The foundation of facility reliability is established during Conceptual Design. It requires that Risk and Maintenance/Reliability Management Systems be in place and broadly deployed in the organization. The management of risk, reliability, and maintainability starts in the Conceptual Design Stage of the Life Cycle.

4.2 Detailed Engineering

The design basis is translated into specific plans for hardware and software during the Detailed Engineering Stage. The engineering design must address operability, human factors, risk assessment, reliability, and maintainability. During this phase, the reliability goals developed in the Conceptual Design are translated into specifications for procurement. The equipment needs established during the Conceptual Design are reviewed to ensure the equipment needs are valid and appropriate redundancy is considered.

The periodic reliability and maintainability reviews of the design are started, including the implications of Asset start-ups, shutdowns, moves, etc. The maintainability studies should include shutdown maintenance and access for maintenance tasks. The Asset staff (operations/maintenance) should be involved with the reviews as appropriate.

Where there is a need or justification for the use of new technology, it should be assessed. Testing requirements for specialized equipment should be developed during this stage. New, non-standard, or unique equipment, especially, should be investigated to confirm its reliability, operability, and maintainability. Discipline engineers and subject matter experts (SME) should identify the unique equipment and identify test requirements. This evaluation may result in special shop or field-testing. The Asset or Performance Team should be appropriately involved with the project team to develop the Asset Reliability Program. The corporate technology groups should be involved with this activity.

4.3 Procurement

To facilitate the procurement process, a common practice with many organizations is to standardize on certain manufacturers or types of equipment. Supplier Quality Partners, supplier alliances, approved vendor lists, approved material lists, etc., are common approaches, allowing companies to make equipment procurement more straightforward and less expensive and time-consuming. The potential

engineering and construction contractors' reliability and maintainability programs and capabilities should be evaluated before the final selection of the shipyard / contractor.

4.4 Construction/Installation

To ensure that the Assets are constructed properly and components are installed as designed, the shipyard/contractor must be selected with the same level of care as the engineering contractor, or alliance supplier, during procurement.

Since many details of Asset construction may not appear in the engineering specifications and documents, the shipyard/contractor will use classification requirements and its own standards and practices when company standards are not required (as in skid assembly). In many cases, the shipyard/contractor will also supply common construction materials, including piping, tubing, valves, etc. Quality control of these materials and activities is a key function for all parties. Below-standard construction introduces the potential for reduced reliability, higher risks, and increased costs.

Since it is not economical to define all aspects of construction, the shipyard/contractor will frequently decide the most expedient manner to incorporate these aspects. In most cases, such decisions are best left to the shipyard/contractors. However, the owner or third person contractors need to provide the audit function to ensure that substandard practices do not introduce risk, unreliability, or human factors issues into the facility.

During construction, issues will arise and be resolved in ways that may make the original design drawings obsolete. Documentation should be updated in collaboration with the design, performance, and maintenance practitioners.

4.5 Commissioning/Start-up

The Commissioning and Start up stage begins the transfer of equipment ownership from the construction organization to the operating and maintaining organizations, as the equipment is placed into service. Performance and maintenance staff need a complete list of hardware, with the associated datasheets and vendor information.

At this point, performance and maintenance forces should have completed the appropriate training. Documentation for drilling and maintaining tasks, procedures, and testing, etc., should have been developed and delivered. The Computerized Maintenance Management System (RMS) should be loaded with the asset data and maintenance strategies and be fully functional.

Reliability issues may consist of equipment infant mortality and *discoverables* (undetected errors from the design and construction stages). As during the earlier stages, all documentation should be corrected and updated through a collaborative process.

Handover should be seamless. The equipment should be fully functional and all critical operational spares should be identified, procured, and in stock. Data requirements and format should be clearly defined in the shipyard / construction contract and responsibility for delivery placed on the manufacturer /shipyard.

4.6 Operation

The Operation and Maintenance stage defines the service life of equipment. It is in the Operation Stage where the equipment is expected to perform its intended function for its intended service life. The operations, maintenance, and reliability functions must interact to improve asset integrity and reliability. This requires a team approach, instead of a work-group mentality. A systematic view is essential to making performance and maintenance decisions, particularly when a decision in one area may have implications in the other for maintaining asset and operational integrity. Changing unit operations will have a major influence on Asset and equipment availability and integrity.

4.7 Maintenance/Reliability

A Maintenance/Reliability Management System focuses resources (performance, maintenance, engineering, and shipyard/contractors) on all equipment in ways that will maximize efficient operation and optimize maintenance expenditures, while reducing and mitigating failures, especially high probability—high consequence (high risk) failures. A reliability program, committed to Continuous Improvement, can effectively make Assets more reliable, efficient and safer.

4.8 Decommissioning

Decommissioning of equipment generally occurs when it no longer meets its reliability requirements (end of useful life), when spare parts become unavailable, or when technology advances have made cost-effective upgrades unavailable (obsolescence). Advances in technology generally make more capability available at a lower relative cost. Obsolescence, particularly in electronics and control systems, is sometimes planned by the equipment supplier, as they respond to the market pressure by discontinuing parts and support in favour of newer versions.

Care must be taken during the decommissioning and removal of equipment on an operating Asset to minimize the adverse effects on performance. Management of Change is important to prevent increases in risk.

4.9 Asset Acquisition

In addition to designing and constructing new Assets, they may be acquired by Transocean from another operator. At the time of the acquisition, the Assets may be near the end of their design life, the profitability of the operation may be declining, and the condition of the equipment may have deteriorated. Bringing such Assets into the Asset Reliability Program will often challenge the performance and maintenance/reliability stage of the life cycle since both performance and knowledge about the assets may be lacking.

A clear business strategy, tempered by the capability of the Asset, will result in the annual rig work plan and budget being revised. From that point, the Asset maintenance and reliability plan will begin the process of driving the equipment to the desired state of reliability at optimum cost.

5. Recommendations

5.1 Introduction

The set of recommendations that result from the AR Review and associated activity – Change Management; Safety Initiatives/Training Review; Human Factors Review; Dry Docking Review; Communications Review- impact the following Transocean guiding principles:

- Management Principles (as laid out in the Transocean CMS Manual)
- FIRST Core Values
- Transocean's Executive Imperatives - distributed in 2008,
- Asset & Performance Operations Expectations

The Recommendations are structured to show the inter-dependencies across the AR Review Framework and the degree of impact to the Transocean CMS (see 5.13).

5.2 Asset Reliability Policy & Strategy

AR Framework Element (ranking)	Recommendations
1.1 AR Policy & Strategy (4)	• Define and write a new risk-driven Asset Reliability Policy and Strategy aligned with Corporate objectives
1.6 AR Leadership (1)	• Assure alignment with existing policies that will impact the AR area – HR / Training / Procurement etc.
1.9 Risk Management (6)	• Revise the Risk Management Policy to be Asset (Rig & Equipment) focused & include Probability of Failure (PoF) for Criticality assessment • Rewrite the Management of Change Policy and Procedure to include risk assessment, acceptable risk thresholds and revised authorities
1.10 Knowledge Management (10)	• Write a Knowledge Management Policy to cover all AR documents and systems • Map and align all AR related information requirements and supporting policies • Include AR data related data security and backup requirements in Policy document
1.11 Measurement & Communications (2)	• Write a new Communications Policy for AR related activity

1.13 Procurement (5)	• Write a risk based inventory Management Procedure (based on revised Risk Management Policy)

5.3 Vision, Mission and Objectives

AR Framework Element (ranking)	Recommendations
1.1 AR Policy & Strategy (4)	• Define a new Mission and Vision Statement for the AR Function and related activity that complements corporate policy and Transocean FIRST Core Values

5.4 Effective Functional Management

AR Framework Element (ranking)	Recommendations
1.2 AR Organisation & Communications (8)	• Redesign the Maintenance functional organisation to better reflect/underpin AR objectives (see Appendix 10) • Establish AR Steering Team in HQ & Leadership Teams across Transocean BU's & Divisions
1.5 Asset Operations (9)	• Change the global structure of Technical Field Support to provide proactive AR maintenance support
1.6 AR Leadership (1)	• Define & Implement AR Leadership Team accountability, responsibilities & levels of authority to ensure empowerment of Teams and individuals and establish meeting forum, agenda and reporting requirements • Get Stakeholder input to the Vision and direction of the AR Program • Identify and resolve key strategic and tactical issues and constraints

5.5 Defining & Measuring Objectives

AR Framework Element (ranking)	Recommendations
1.2 AR Policy & Strategy (4)	• Formulate a new set of Objectives focused on optimising risk and costs across the asset lifecycle • Assign revised responsibilities and accountability for AR Objective achievement • Define AR audit criteria and establish audit program aligned with Corporate requirements

1.4 Quality Management System (3)	• Consider company-wide independent ,external third party QMS Certification to ISO 9001-2008
1.11 Measurement & Continuous Improvement (2)	• Develop a set of Key Performance Indicators (KPI's) to measure performance against objective using a balanced scorecard • Establish fully auditable QMS Program • Ensure KPI transparency, and defined reporting schedule • Benchmark AR performance inside and outside the Drilling Industry
1.13 Procurement (5)	• Revise and strengthen the Vendor QA Audit program • Establish and leverage Transocean buying power into new AR related Vendor Partnerships and link to audit program • Ensure Partnerships understand and embrace the new Critical Spares regime

5.6 Training & Competency

AR Framework Element (ranking)	Recommendations
1.6 AR Leadership (1)	• Develop & implement an AR Training program – all levels including Senior Management
1.9 Risk Management (6)	• Develop Training material / activity to cover Risk Management, Management of Change, and Maintenance Deferral activity
1.10 Knowledge Management (10)	• Develop Training material / activity to cover Data Collection justification and requirements, • Develop a procedure to audit data input to RMS
1.12 Human Resources (12)	• Develop & implement AR requirements training for the HR Function • Develop an AR related Competency Matrix • Enhance the OJT and mentoring programs
1.13 Procurement (5)	• Develop & implement AR requirements training for the Procurement Function

5.7 Remuneration & Incentivisation Policy

AR Framework Element (ranking)	Recommendations
1.12 Human Resources (12)	• There is a need to realign staff remuneration and incentives – they should be revised and brought in to line with the new AR Strategy & Objectives, and linked

	to annual appraisals, succession planning and career progression

5.8 HR Harmonisation with Asset Reliability

AR Framework Element (ranking)	Recommendations
1.2 AR Organisation & Communications (8)	• Ensure Job Descriptions and related roles are aligned with AR requirements
1.12 Human Resources (12)	• Revise HR recruitment practice to align with the needs of AR Function – skills / competency, compensation, interaction with key Divisional and Regional staff • Revise the appraisal process for AR staff, link to remuneration, succession planning and career progression with active reviews

5.9 Knowledge Management: Documents, Data, Systems

AR Framework Element (ranking)	Recommendations
1.3 HSE & Risk Management (14)	• Ensure risk ranking in HSE activity is benchmarked using industry data • Re-examine Permit to Work system and separate permits into Hot and Cold
1.4 Quality Management System (3)	• Write a new stand alone Corporate Quality Manual
1.7 Engineering & Project Management (12)	• Write and implement a procedure to align AR requirements with asset/equipment acquisition (design & construction) and divestment (decommissioning)
1.8 Maintenance & Reliability (7)	• Define and implement Failure Codes to capture actual failure categories • Write & implement 'Bad Actor' Program to manage problematic equipment • Write and implement a robust Fitness for Service procedure for defective equipment • Define AR Data requirements to satisfy RMS and Arivu • Revise and audit the Management of Change procedure to more effectively use risk assessment in the maintenance processes • Develop Risk Models by equipment type to standardise maintenance planning • Ensure best use of Well Timeline to assist in maintenance planning
1.10 Knowledge Management (10)	• Rewrite Maintenance Procedures and bring in to line

	with AR requirements • Write procedure to govern Equipment Files and establish Files for each piece of equipment • Equipment Excellence Manuals - begin writing Manuals, prioritised based on Critical Equipment
1.13 Procurement (5)	• Assess key Supply Chain Risks • Establish equipment & AR data requirements and formats & embed in Vendor/Yard contracts for return to RMS

5.10 Communication

AR Framework Element (ranking)	Recommendations
1.1 AR Policy & Strategy (4)	• Develop and implement a Communications program for the new AR Policy, Strategy and Objectives
1.6 Asset Operations (9)	• Introduce a formal communication procedure for Drilling & Maintenance onboard rigs
1.10 Knowledge Management (11)	• Ensure the Communications Program contains detail on communication flow up and down the new Functional structure • Ensure 'lessons learned' are effectively communicated in line with Bulletins and Alerts

5.11 Safety & Training

• The Asset Reliability Project will benefit from a clear and concise vision statement that can then be consistently and continuously communicated within Transocean.
• The tools and training approaches used for the Asset Reliability Program will work best if fully integrated into existing material, tools and techniques (e.g., START, THINK, TOFS, and FOCUS).
• Any training developed for the Asset Reliability Project should involve high engagement methods, with behavioural modelling, facilitated feedback and two-way dialogue.
• An effective safety training technique currently used by Transocean is the facilitated class-room training, backed up by on-the-job reinforcement. The current approach should be leveraged to ensure the effectiveness of an Asset Reliability training approach.
• Asset Reliability initiatives or training content shall address the needs and motivations of the audience. For employees, the content will stress the direct relationship between improved reliability and compliance with planned maintenance and inspection regimes, and also the fact that compliance does not slow down task completion. At the supervisory and managerial level, a key component will be the requirement for positive reinforcement, praise and reward for individual initiative shown by team members.

5.12 Human Factors – Organisation Integrity

• Process maps - the method of laying out the various inputs, outputs and interrelation of maintenance tasks in the overall rig system - should be developed and used to influence the training staff members receive on the rig.
• Contingency planning procedures should be reviewed and updated to ensure coverage of abnormal or degraded operating scenarios - applies to any operational risks.
• Conduct a review of how processes and procedures are managed (created, recorded, made available) - include a mapping exercise to determine the full extent of the gaps
• Examine how feedback is used to modify, enhance and replace processes and procedures to improve performance; link to the MoC review process
• Establish a framework to relate processes and procedures to safety and operational performance, with particular interest in: ▪ Minimising the difference between "procedures-as-written" and "procedures-as practised" ▪ Ensuring that the benefits of repeatability and optimisation through use of procedures is appropriately balanced against the ability to exercise discretion/ expert judgement, to overcome unique problems or adapt to particular circumstances in the performance of skilled activities
• Ensure that feedback mechanisms in place to improve tasks are sensitive to performance issues as well as safety issues; they must be appropriate to the level of risk

5.13 AR Recommendations: Likely Impact to Transocean CMS

For clarity, Figure 5.1 provides an overview of the likely impact Asset Reliability implementation activity will have on the Transocean Management Principles section of the CMS Manual (HQS CMS GOV).

- Policies and procedures are heavily impacted with the need to re-write or align existing documents.
- Evaluation and Improvement is also heavily impacted with the need for a robust, integrated set of KPI's
- Training & Competence is also heavily impacted as there is a need to redevelop the competence matrix, and to provide training specific to AR requirements.

Asset Reliability Framework: Main Elements	Transocean Company Management System							
	Leadership in Management	Policies & Procedure	Organisation, Resources & Responsibilities	Planning & Risk Management	Execution & Monitoring	Evaluation & Improvement	Training & Competence	Communications
AR Policy & Strategy		x	x	x	x	x		x
AR Organisation & Communications	x		x				x	x
HSE & Risk Ranking				x			x	
Quality Management System	x	x				x	x	
Asset Operations		x	x	x				x
AR Leadership	x		x		x	x	x	
Engineering & Project Management	x	x	x			x		
Maintenance & Reliability	x	x	x	x	x	x	x	x
Risk Management	x	x	x	x	x	x	x	
Knowledge Management	x	x	x			x	x	x
Measurement & Continuous Improvement		x			x	x		
Human Resources		x	x	x		x	x	x
Procurement		x		x	x	x	x	
Knowledge Management Systems		x						

Figure 5.1 AR Framework: Impact to Transocean CMS

It is recommended that following the implementation of Phases 2 and 3 of the AR Project, the AR Best Practice Statements are revisited in a second series of Interviews to determine the extent of improvement in the System, Procedures and Practices.

5.14 Phase II Teams

The following Teams should be set up to drive Asset Reliability Phase II activity – to include Best Practice Teams

- Project Core Team
- Vision & Strategy Definition Team
- Knowledge Management Team
- Change Management Team
- Project Control Team
- Training Team

In addition, Best Practice Teams will address risk model development by equipment type, prioritised on the basis of impact to NPT. The following teams will be set up:

Equipment Type	Best Practice Teams
Marine Integrity BOP/Sub sea	Establish Phase II Best Practice Team A and develop risk model (see Phase II detail)
Power Systems	Establish Phase II Best Practice Team B and

Top Drive / Draw Works	develop risk model (see Phase II detail)
Cranes Mud Pumps	Establish Phase II Best Practice Team C and develop risk model (see Phase II detail)
Spares	Establish Phase II Best Practice Team D and develop risk model (see Phase II detail)
Planned Maintenance Review	Establish Phase II Best Practice Team E to review and update maintenance documents(see Phase II detail)

6. Change Management Framework

6.1 Phase I Activities and Results

In addition to the AR-related interviews in Transocean's Headquarters (HQS), the Business Units, Divisions and on the selected rigs, Lloyd's Register conducted Change Management Introductory interviews with 19 employees in HQS as well as 9 employees in EAU (Aberdeen and Paris offices).

The interviews indicate that the AR project is perceived to result in a significant change to the culture and strategy for maintenance within Transocean. While change per se is perceived to be a common factor at Transocean's (95% HQS; 100% EAU), the AR project is considered to be *"huge" (Operations Manager, EAU)*, the *"biggest change the company has ever seen" (Maintenance Manager, HQS)*: Asked to rate the **magnitude** of the AR change for Transocean on a scale of 1 to 10, responses averaged a score of 8.4 in HQS and 8.5 in EAU. The perceived magnitude of change reflects that AR will have significant impact on for example:

- the way asset performance is defined and measured
- the processes of the organization
- the competencies required by employees
- the rules and routines that guide behaviour
- the values and culture of the organization

Consequently, in regard to organizational structure, it is estimated that the impact of AR will go beyond the Asset Management and Maintenance departments and will have significant effect on Performance, Technical Field Support, Procurement as well as HR and Training. Similarly **stakeholders** of the AR effort stretch far beyond Maintenance and Asset Management and include Performance, Executive Management, HR as well as vendors and customers. Comprehensive stakeholder management is thus perceived one of the key success factors to bring about the AR change.

Asked about the adequacy of employee's **competencies** to bring about the change, respondents judged rig level competencies just above average (HQS = 5.4; EAU= 5.0) with HQS and BU competencies rated slightly higher (HQS = 6.1; EAU = 7.0), clearly indicating that *"more competency training is needed" (Director Performance, HQS)*. This need for **training** is highlighted by the fact that less than half the respondents would consider themselves to be familiar with the 4th generation risk-based maintenance approach which is the very foundation of the AR program (HQS = 47%; EAU = 38%).

Similarly, respondents see need for action in regard to Transocean's **reward system**. While it is considered to be quite adequate for HQS and BU level (HQS = 6.9, EAU = 8.0), it is only rated on medium scores for rig level (HQS = 5.6; EAU = 6.0): *"They don't have the right mix yet to trigger the exact*

behaviour" (EVP, HQS). The alignment of rewards and benefits will thus be an important factor to trigger and reinforce the behavioural changes required for the successful implementation of AR.

Respondents are fully aware that the implementation of a change project of such a magnitude at Transocean will take considerable time. In the interviews, Transocean is often compared to large animals such as lions, gorillas and elephants, which, while being strong, might also be *"so big that sometimes it has trouble moving" (Director Engineering, HQS)*, are *"slow moving" (Asset Integrity Manager, EAU)* and *"difficult to steer around" (Operations Manager, EAU).* Consequently, interviewees estimate that the successful implementation of AR will take around five years (average estimated **duration** HQS = 4.7 yrs; EAU = 5.9 yrs).

Despite the change AR will bring about, respondents are very optimistic in regard to employee's **willingness** to participate in and support the change. Overall, this willingness is rated above average, with respondents in EAU being more optimistic than respondents in HQS (HQS = 0.5; EAU =3.6). However, when respondents made distinctions in regard to organizational level, it becomes clear that higher **resistance** will have to be expected on rig level (HQS = -0.5): *"Off-shore there will be high resistance, because changes always brought more work" (Operations Manager, EAU).* Given the prevalence of change at Transocean, employees might demonstrate a certain change fatigue in the sense of *"yet another corporate initiative" (Maintenance Specialist, HQS).*

The interviews indicate that one key success factor in proactively dealing with this potential resistance is to provide a clear **value proposition** to rig crews and off-shore rig managers . On a high-level, this value proposition could be related to the performance of Transocean and the satisfaction of clients, but also to the fact that AR represents best-in-class approach to maintenance. Respondents especially in HQS strongly identify with Transocean being the market leader as well as having technological leadership in the industry. In the interviews, Transocean is mostly compared successful car brands such as Mercedes-Benz, which are perceived to be *"high-end, reliable"(Manager, HQS), "very solid" (Operations Manager, EAU),* with a *"good reputation" (Incentive contracts manager, EAU)* and *"steady performance" (Operations Manager, EAU).* However, such an overall value proposition will have to be tailored and customized to a clear value proposition to rig crews (*"rig talk"*), in the sense of *"What's in for me?"*. In this context, **change promoters** on rig-level and middle management as well as a clear, consistent **communication** are perceived to be the main enablers for change.

An overview of communication requirements is contained in Appendix 8.

The interviews do also show that in the past Transocean has been very successful in bringing about corporate wide change, especially in regard to the FIRST core values and safety issues. All respondents were fully aware of the FIRST values and consider them an integral part of their work at Transocean. Alignment of the AR initiative with the core values will thus be absolutely necessary and will help to gain acceptance.

Finally, the interviews high-lighted two factors which are important with respect to the design of the change process, and the people involved. First, respondents both in HQS as well as in EAU strongly agree that Transocean's executive team is the main driver for large-scale cultural changes within the company

(HQS = 74%; EAU = 57%). Strong **executive involvement**, e.g. in the role of change sponsors, will thus be one of the key success factors for successfully implementing AR. Second, despite the strong internalisation of the core values, respondents both in HQS as well as in EAU agree that Transocean still is characterized by several organisational cultures, which are coined by functional silos (performance vs. asset vs. supply chain), by BU's, or by legacy companies. While providing a consistent approach to implementing the AR change, the Change Management Framework will thus have to be sufficiently adaptable to the varying contexts.

To summarize, the following key success factors for Change Management in the AR project have been identified:

- Strong and ongoing executive involvement and visibility throughout the project
- Alignment with and based on FIRST core values
- Delivery of clear value proposition
- Broad stakeholder management and continuous expectation management
- Simple, transparent and clear communication ("talk rig")
- Consistent approach with adaptability to different contexts (cultures, legacy companies, BU's, organizational levels etc.)
- Engagement of AR promoters in middle management (on-shore) and on rig level (off-shore)
- Alignment of training, compensation and benefit scheme(s) to AR objectives

These key success factors are an important basis for involving the change affected employees in the process and for customizing the Change Management Framework to Transocean's needs and requirements.

6.2 AR Change Management Framework

6.2.1 Overview

Transocean's proven ability to deal with changes proactively and constructively has to be systematically leveraged within the AR project. Based on the above insights gathered in Phase I, a customized Change Management Framework that specifically caters to the needs and requirements of the AR project and to the characteristics of Transocean is proposed. The objective of the Change Management Framework is to enable Transocean to successfully implement AR and to achieve sustainable organizational change. More specifically, the Change Management Framework aims to achieve the following objectives:

- Creation of an appreciative and supportive change climate, based on FIRST core values
- Mobilization of Transocean people (talents, experience, knowledge, drive, etc.)

- Mobilization of capability and willingness to change to the desired performance level, developed within the AR-project
- If/where required change of patterns of perception, attitude and behaviour
- Leverage and enhance existing change capabilities ("active learning") within Transocean
- If/where required enhancement of leadership perception and skills

To this end, the Change Management Framework is designed to address three distinct, yet closely linked aspects:

1. **Timing**: Where are we in the project, e.g. what stage of the change are we in?
2. **Objectives**: Given the stage we are in, what are the current change-related objectives?
3. **Activities**: What are the appropriate activities/methods to achieve these objectives?

Departing from the question of timing, the proposed Change Management Framework is designed along four distinct yet strongly interrelated stages of change processes:

1. Set course
2. Prepare & move
3. Execute
4. Safeguard & sustain

Terminology and structure of the change-stages have been deliberately oriented along the value chain of the drilling industry/Transocean, i.e. the stages a particular rig follows to perform a drilling project for a client. From a change management perspective, such a denomination enables the employees to relate the project to Transocean's core activities, facilitating their identification with and understanding for the project as well as for the challenges it may contain.

While the four stages can generally be conceived as sequential steps that build on each other to prepare, enable and sustain the change, this design is by no means to be considered as fixed or rigid. Depending on the dynamics of the project, a return to the previous stage and its respective activities may be required and is a common characteristic of change processes.

During all four stages Change Management needs to ensure consistent and timely communication towards and between the selected target groups. Therefore close and continuous interfacing with the communication stream of the overall project is a prerequisite for successful change implementation.

The following Figure 6.1 provides an overview on the Change Management Framework, its stages, as well as the overall objectives, key activities and deliverables within each stage:

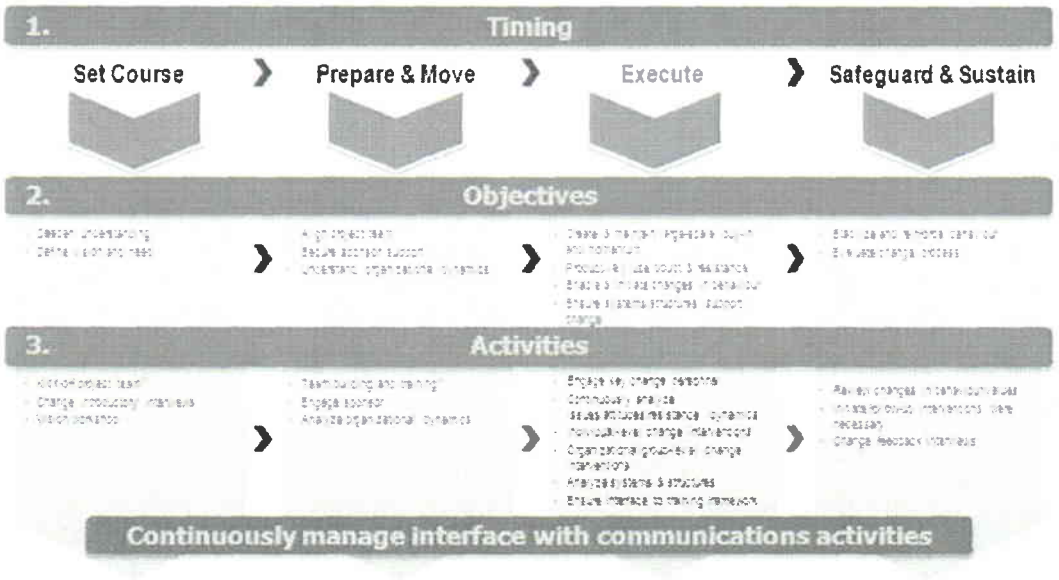

Figure 6.1: Change Management Framework

The overall objectives and key activities are performed within a variety of different settings (e g. group settings, one-to-one meetings) and by using a variety of suitable tools and methods. Both will be detailed in the following sections of this report.

The above depicted Change Management Framework provides a structured and scalable framework that ensures a coherent approach to the change management activities on the AR program. Yet, while it proactively guides and structures all the change management activities associated with the AR program, it allows for situational adaption to specific contexts and the dynamics of the project. When bringing the change management framework into action, activities and methods will be adapted to the specific needs and requirements of the respective organizational levels and cultural contexts as well as the audiences targeted.

In this context, two levels of change management activities can be distinguished for Phase II of the AR program:

- First, the level of Best-Practice-Teams and projects.
- Second, the corporate level.

Phase II of the AR program aims to implement AR concepts and models within specific, defined Best-Practice-Projects (e.g. top drive, mud pumps ...). On an abstract level, these projects will proceed in the following generic steps:

1. Identify/select an area for improvement

2. Measure current performance
3. Benchmark performance (internal/external)
4. Develop improvement strategy
5. Train how to improve
6. Implement best practice approach
7. Measure and monitor

The above depicted Change Management Framework will support and guide the Best-Practice-Teams throughout Phase II. More specifically, the stages of the Change Management Framework and the Best-Practice-Steps can be aligned as shown in the following Figure 6.2:

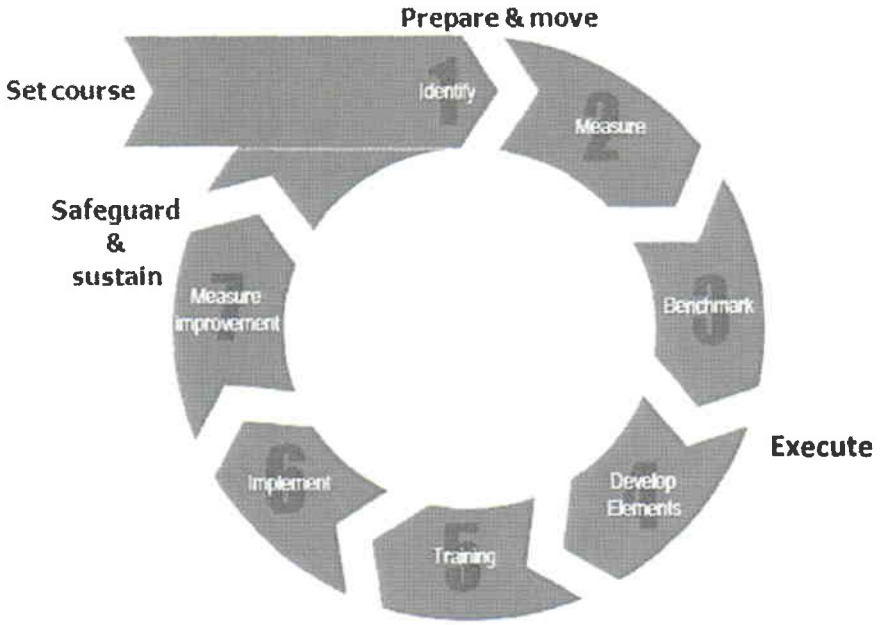

Figure 6.2 Best Practice Team change approach

The change management activities supporting the Best –Practice-Teams will be specifically addressing the stakeholders and employee groups directly affected by the respective best practice projects. In addition, given the high change impact of the AR project on Transocean's activities, the change management activities on the specific project level will have to be accompanied by overarching change management engagements on the corporate level, especially targeting senior executives and major stakeholders of the AR program. These overarching activities set the stage for the change interventions on the project level, e.g. by developing an overall vision for the project ("Set course") and engaging an overall, Transocean-wide lead sponsor ("Prepare & move"). Consequently, while they are still required,

"Set course" and "Prepare & move" stages on the project level will be more compact and draw on the input provided by the activities. Figure 6.3 illustrates the interplay of corporate and project level activities:

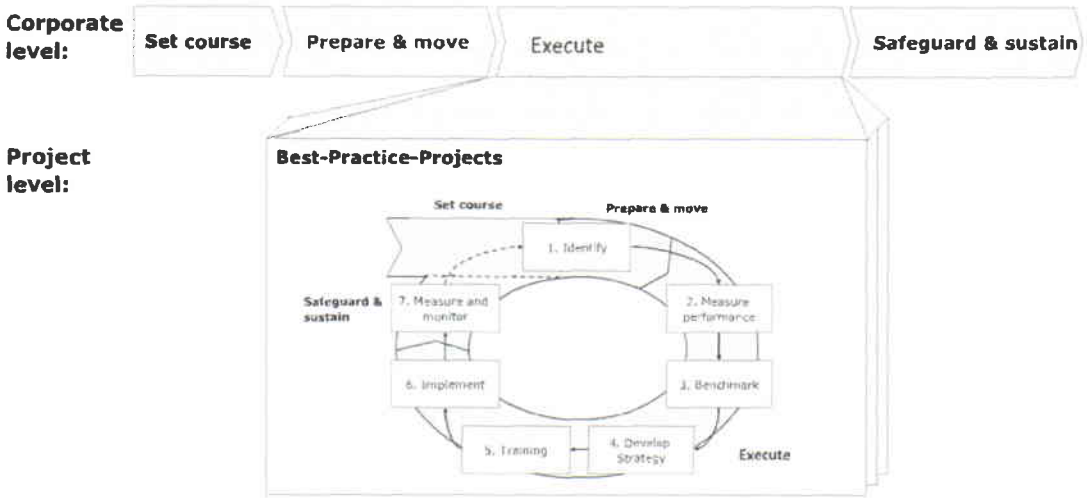

Figure 6.3 Levels of Change Management Framework

Following the general logic of the Change Framework, on an abstract level the change management activities on the corporate and project level will be similar. However, in the course of working the framework, the activities, tools and methods will be adapted to the specific requirements of the target groups and organizational settings.

Appendix 4 of this report provides a general description of the activities, tools and methods that could be applied within the project.

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7 The Asset Reliability Implementation Route

7.1 Introduction

The Asset Reliability Implementation Route provides guidance and direction about transitioning Transocean from the current position in Maintenance Management to the desired state of Operational Excellence or 'best in class' Asset Reliability, with all of the derived benefits. It is designed to achieve the desired state in a practical timeframe while focusing on the highest value with the lowest barrier objectives addressed first. The purpose of the Implementation Route is to define a path that will strategically change how AR is being developed and managed within Transocean and institutionalise those changes.

7.2 Basis of Prioritisation

The AR Implementation Route will provide cost savings in a number of different areas that will affect the operating expenses of Transocean. The basis of prioritising and selecting the projects to address during the early stages of implementation is their cost-saving potential through the reduction of NPT. Significant reductions in direct maintenance costs will also be realised because of both improvements in efficiency (doing things the right way) and effectiveness (doing the right things at the right time).

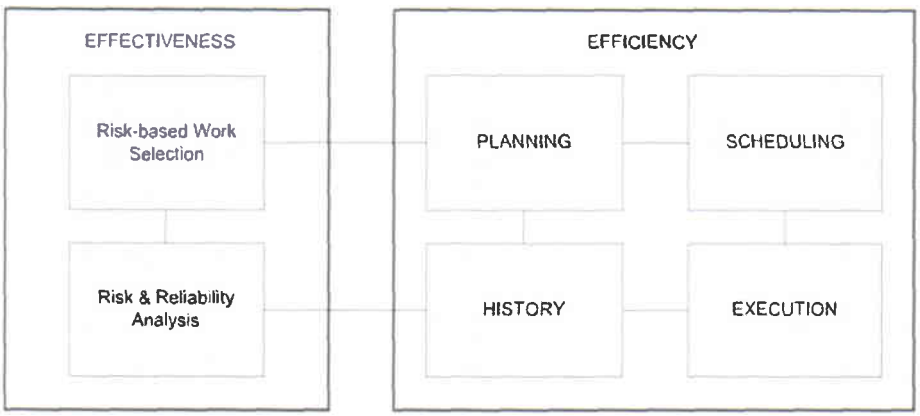

Figure 7.1: Maintenance Efficiency and Effectiveness

7.3 Critical Success Factors

As a result the key success factors for the change induced by asset reliability can be clearly identified:

- Strong and ongoing executive involvement and visibility throughout the project
- Alignment with and based on FIRST core values
- Delivery of clear value proposition

- Broad stakeholder management and continuous expectation management
- Simple, transparent and clear communication ("talk rig")
- Consistent approach with adaptability to different contexts (cultures, legacy companies, BU's, organizational levels etc.)
- Engagement of AR promoters in middle management (on-shore) and on rig level (off-shore)
- Alignment of training, compensation and benefit scheme(s) to AR objectives

These key success factors are an important basis for involving the change affected employees in the process and for customizing the Change Management Framework to Transocean's needs and requirements.

7.3 'FIRST' Balance Scorecard

A set of leading and lagging Asset Reliability key performance indicators (KPIs) will be developed that measure both current base line and changing performance at the Corporate, Business Unit, Division and Rig levels. The indicators can then be used to track progress and effectiveness of AR implementation activity, interventions and training in driving Asset Reliability performance. The KPIs will be developed to create a balanced scorecard aligned around Transocean's FIRST core values.

By focusing not only on financial outcomes but also on the operational, market and developmental inputs that affect financial performance, the balanced scorecard helps provide a more comprehensive view of the business. For example, measurements could include process performance, market share / penetration, long term learning and skills development, and so on. Four perspectives are used to help the assignment and development of appropriate performance measures:

1 Financial perspective
2 Customer perspective
3 Operational process perspective
4 Innovation and learning perspective

The measures or Key Performance Indicators (KPIs) to be used in the FIRST Scorecard (five for each of the perspectives) will be drawn from a larger list of performance indicators. These indicators will all be both simple and measureable and capable of being applied to all the organisation levels (hierarchy) of Transocean.

Until the planned Business Warehouse is implemented these will be reported through the Arivu™ software platform that will also be supporting the risk-based maintenance models. As the AR project progresses, the KPI's will be updated to reflect the current activities and the maturity of the AR program as it becomes embedded within Transocean.

Financial	Customer
➢ Value of AR Savings Identified ➢ Value of AR Savings Realized ➢ TOI Maintenance Cost ➢ Cost of Spares - Inventory ➢ Ratio PM to CM - Cost	➢ Rig NPT ➢ SQA - Performance of Equipment ➢ SQA - Reliability of Equipment ➢ SQA - Maintenance of Equipment
Innovation & Learning	**Operational**
➢ % Assets Utilizing Risk-based Maintenance ➢ Maintenance Task Man-hour Reduction ➢ Number of Improvement Suggestions to Drive AR ➢ Number of AR Training Sessions Given ➢ Number of Supplier AR initiatives ➢ Training Compliance - Training Matrix Changes Implemented	➢ Maintenance Serious Near Hits and Potential Severity ➢ Overdue Maintenance on Critical Items (over 30 days) ➢ Total Recordable Incident Rate ➢ Expired Certificates ➢ Critical Equipment Failures ➢ RCA Criticality Rating

7.4 Asset Reliability - Phase II: Implementation Priorities

The implementation priorities of Phase II are contained in the work flow of the Phase II Gantt Chart - see Appendix 9.

7.5 Asset Reliability - Phase II: Implementation Schedule

The implementation schedule for all Phase II activity is contained in the Phase II Gantt Chart - see Appendix 9.

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8 Value & Cost /Benefit Analysis

8.1 Value Delivery

The Asset Reliability Program (AR) will deliver significant benefits for Transocean in five primary ways:

- Drive behavioural change towards accountability and compliance across the organisation as the risk driven approach is embedded.
- Reduce the risk (probability and consequence) of unanticipated equipment failures and thus NPT.
- The long term cost structure to asset maintenance will be optimised.
- Provide a basis to safely extend the life of critical assets.
- A key collateral benefit will be the reduction in HSE related incidents and their associated costs.

8.1 Methodology

The financial model has been built up from historical and forecast Transocean data obtained directly from Transocean systems and reports. Where information has not been available, varied from system to system or lacked accuracy / detail the core data has been calculated using the best information available.

All data has been produced quarterly on a Rig by Rig basis (2009 to 2019) and summarised by rig class. The data and results have also been summarised on an annual, 3 Year, 5 Year and 10 Year basis.

The Model focuses on five main improvement categories:

- Revenue Improvements Achieved by reduction in Downtime attributable to maintenance
- Increased revenue due to extending the time between shipyard
- Reduction in Preventative and Corrective Maintenance together with Freight and Customs costs.
- Reduction / Dual skilling of Maintenance Labour
- Reduction in Inventory (cash and capital)

Implementation Costs and Taxation have been deducted to arrive at the Net Cash Improvements.

The model builds up the existing cost bases for each category to produce a core data set. Using past experience and Lloyds Register industry knowledge, percentage savings have been applied to the core data set to calculate a Base, Best and Worst case outcome. The impact of the savings has been phased to represent the timeline and complexity in achieving each objective.

A conservative approach of the potential savings has been taken throughout the model.

A Monte Carlo Simulation using 5,000 iterations for each improvement category has been run over the deterministic results to identify the distribution and probability of the outcomes.

8.2 Assumptions

Revenue

- Revenue Strips have been provided by the planning team.
- All rigs will continue in service when they reach 100% depreciation and the revenue strips have been amended to represent this assumption.
- Stacked Type III Jack-ups that will not be reactivated.
- Revenue lost due to maintenance related down time is based on the 'HQS Performance Dept' tracking of 2008 Downtime taken from invoice sheets.
- 30% of procedural errors are maintenance related from weekly review of incidents where PM is in place to prevent incident.
- PM is included in Equipment DT total from revenue invoices
- All rigs show a maintenance lost revenue gap less than the 2008 efficiency data produced by the Transocean accounting department. Averaged class of rig figures are closer to those produced by accounting.
- 2008 full year performance is used on a class-wise basis and the base from which to improve.
- The calculated percentage of revenue lost by rig class has been applied to Revenue strips to arrive at the $ value of NPT due to maintenance.
- If the revenue predictions show zero revenue for a period, i.e. the rig is stacked, in shipyard or new build the model assumes zero revenue loss due to downtime.

Maintenance

- Maintenance costs are based on Transocean 2009 GPS Forecasts.
- A data set of all 2008 Maintenance transactions across a sample of 24 rigs was obtained from PeopleSoft.
- The dataset was used to identify the percentage split of Preventative, Corrective and Upgrade Maintenance by rig class.
- The percentages were applied to the 2009 GPS Forecast for Extra-Ordinary and Ordinary maintenance to calculate the total for Preventative, Corrective and Upgrade maintenance.
- Shipyard costs that are included in maintenance within the GPS Forecast have been assumed from the '2009 GPS Forecast Project information' and RAPS. These costs were then backed out of 2009 maintenance costs.
- Freight and Customs / Duties obtained from 2009 GPS Forecasts
- All Maintenance costs have been mapped to the revenue strips, so that the model assumes that there is zero maintenance or savings when a rig is stacked, in shipyard or new build.
- Due to inconsistencies in the use of the business systems and the lack of systems integration, data for some rigs is missing or appears inaccurate. Where this is the case a quarterly average by rig class has been calculated.
- Inflation projections have been provided by the Planning Group and have been applied to the costs.

Spares / Inventory

- Inventory levels are taken from the Feb 2009 Inventory Review produced by the Global Supply Chain Group.

- The committed stock levels has been obtained from EMPAC and deducted from the total Inventory figure. Where a rig is not in EMPAC an average by rig class has been applied.
- It has been assumed that of the uncommitted Inventory 20% is Rotating Inventory, 80% is Emergency Spares and 20% is Obsolete.
- The following savings have been assumed:
    0. Emergency Spares: Reduced by 30%. 10% can be sold at $0.40 / $
    1. Rotating Inventory: 20% reduction in holding.
    2. Obsolete: No benefit derived.
- The Base Case shows a positive Cash flow of $58m over the first five years and a total reduction in Inventory of $91m (22%).

Labour

- Salary and burden information compiled by HR. Detailed information obtained from each region.
- An average maintenance salary cost was calculated by rig class.
- Average Maintenance salary multiplied by the number of rigs in each class to arrive at a total maintenance salary figure.
- The anticipated target saving was then applied to the total maintenance salary by rig class

Mobilisation / Demobilisation. (SPS/ SY)

- Assumes moving SPS/SY from 5 to 6 years.
- Average quarterly revenue per rig calculated from revenue strips 2009 to 2019.
- Base Model assumes one month's additional revenue for each rig between 2015 and 2019, allocated equally on a quarterly basis. Worst case assumes no benefit and Best Case assumes 2 months additional revenue, this includes savings from reduced tasks required due to improved maintenance regimes.
- A discount has been applied to the results. 2015 - 75%, 2016 – 50%, 2017 – 25%

Other

- The following were provided by the Planning Group:
    - 20% Tax Rate
    - 8% to 3% Inflation
    - 10% Cost of money

8.3 Financial Model Results

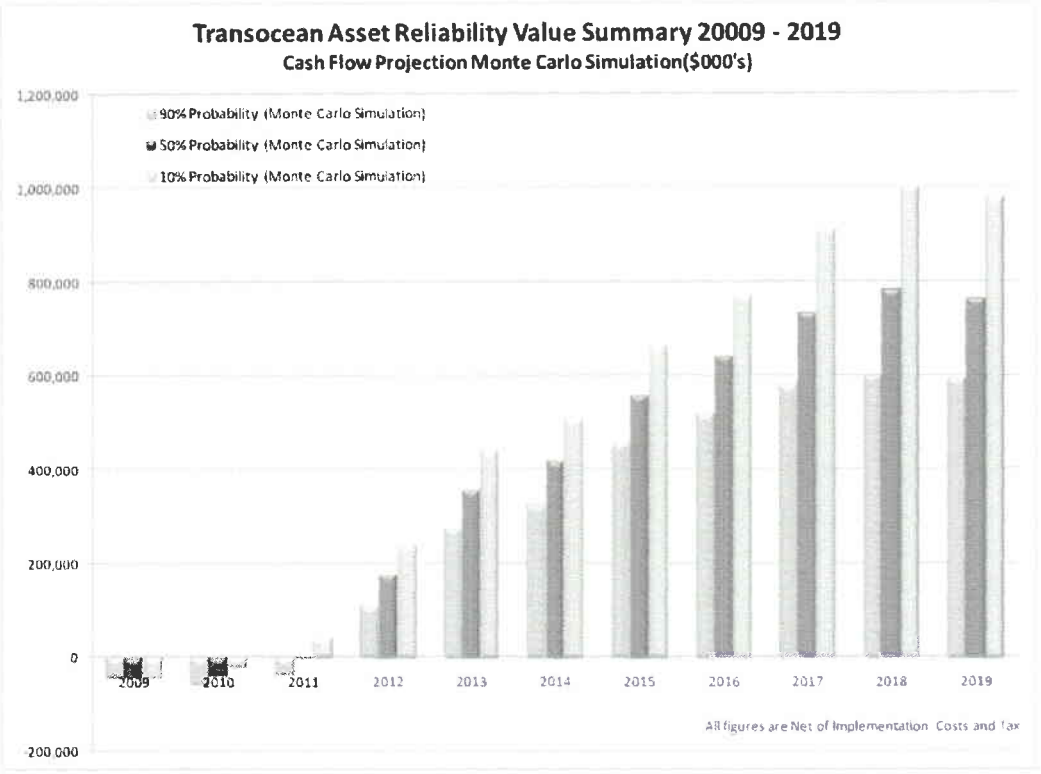

Figure 8.1: Monte Carlo Cash Flow Projection 2009 - 2019

Figure 8.1 shows the annualised impact of the Asset Reliability programme. The three cases are derived from the results of the Monte Carlo Simulation.

Achievable savings lag the implementation costs and consequently, years 2009 and 2010 are expected to show a small cash negative position. In all but the "Worst" case the model shows an annual cash positive position by 2011 and will be cash positive on a cumulative basis in 2012 across all scenarios.

The programme predicts an annual "Base" case saving approaching $800m and "Best" case of in excess of $1bn per annum.

Figure 8.2 below shows the results of the Monte Carlo simulation, with the Worst and Best Case deterministic results

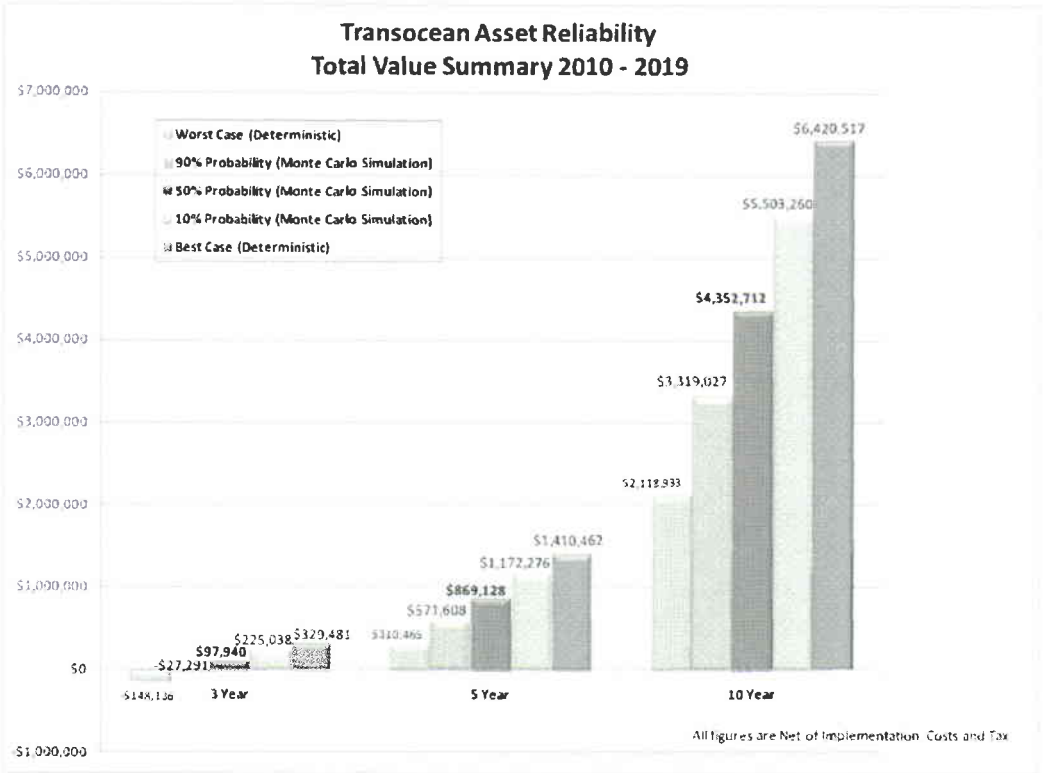

Figure 8.2: 3, 5 & 10 Year Value Summary 2010 - 2019

The chart shows the following results over 10 years:

- The minimum return will be $2.1bn
- There is a 90% possibility the project will achieve after tax saving of more than $3.3bn
- There is a 50% possibility of achieving a benefit of at least $4.4bn
- There is a 10% possibility of achieving a benefit of $5.5bn
- The Maximum return will be $6.4bn

There is a high level of confidence that the project will deliver in excess of $5bn over a 10 year period.

Figure 8.3 shows the Net Present Value (NPV) cash flow of the three deterministic cases (Base, Best & Worst). A discounted rate of 10% has been applied over a 10 year period.

The worst case scenario indicates that after 3 years there is a potential negative NPV cash flow of $50m, however, over the next two years this would become a positive cash flow of $253m

Over a 10 year period the most likely outcome is a positive NPV cash flow of $2.3bn with a best case of $3.4bn

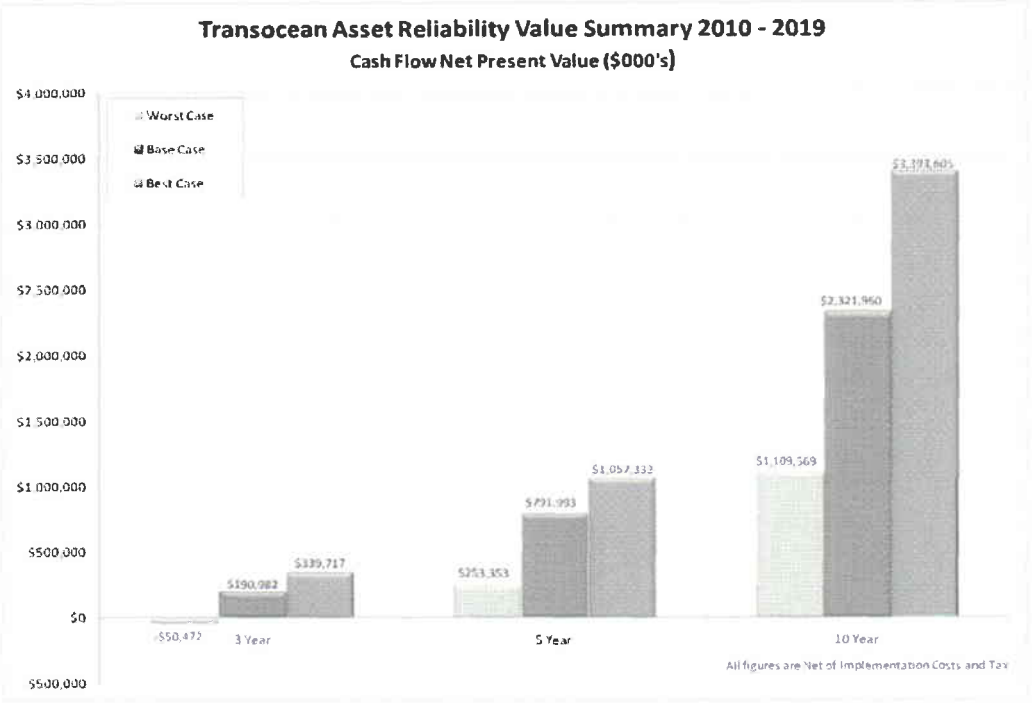

Figure 8.3: Net Present Value Cash Flows 2010 – 2019

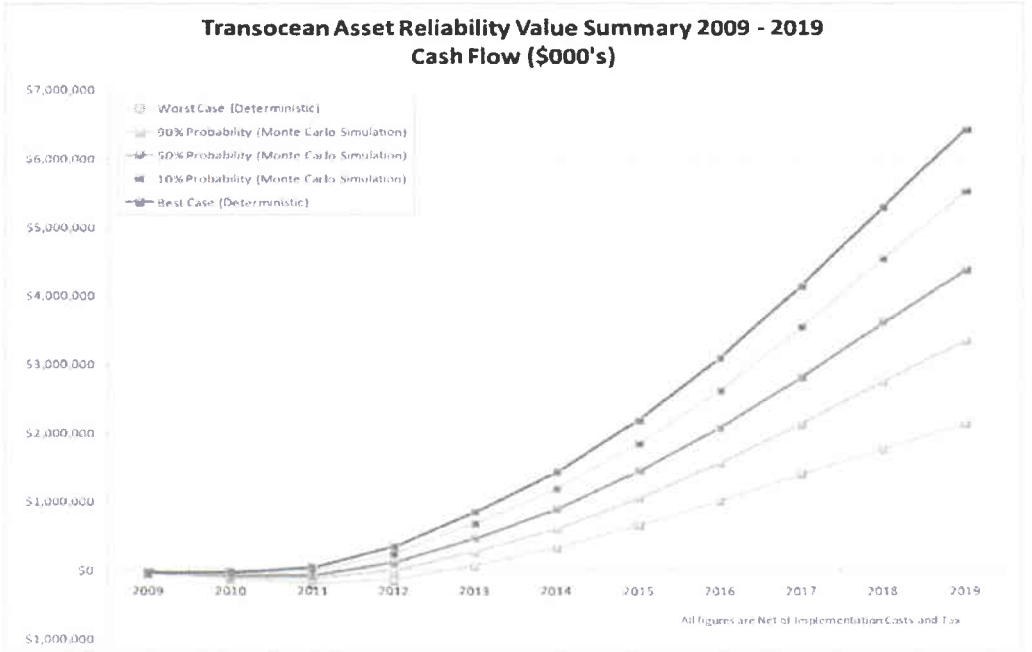

Figure 8.4: Cumulative Cash Flows 2009 - 2019

Figure 8.4 shows the cumulative cash flows between 2009 and 20019 for the Worst and Best Case and Monte Carlo Simulations.

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GLOSSARY OF TERMS

AM	Asset Management
AMU	Americas Business Unit
APT	Asset Planning Tool
APU	Asia Pacific Business Unit
AR	Asset Reliability
ARIVU™	LR proprietary software program
Bad Actor	Problematic equipment
BOP	Blow Out Preventer
CM	Corrective Maintenance
CMMS	Computerised Maintenance Management System
CMS	Transocean's Company Management System (being phased out in favour of RMS)
CoF	Consequence of Failure
EAU	Europe & Africa Business Unit
EMPAC	Transocean CMMS
ERP	Enterprise Resource Planning
FIRST	Transocean core values: Financial, Integrity & Honesty, Respect for Employees, Customers & Suppliers, Safety, Technical Leadership
FMEA	Failure Modes and Effects Analysis
FOCUS	Formulate, Organize, Communicate, Undertake, Summarize
GMS	Global Management System
GSF	Global Santa Fe
HAZOP	Hazard and Operability Study
HSE	Health Safety Environment
ICS	Inventory Control System
KM	Knowledge Management
KPI	Key Performance Indicator(s)
LR	Lloyd's Register
MMS	Maintenance Management System
MOC	Management of Change
MSDS	Material Safety Data Sheet
MTS	Maintenance & Technical Services Dept.
NPT	Non Productive Time
NPV	Net Present Value
OEM	Original Equipment Manufacturer
OHP	Offshore Harmonisation Project
OIC	Operation Integrity Case
OIM	Offshore Installation Manager
OJT	On Job Training

PM	Preventive Maintenance
PMAA	Performance Monitoring Audit & Assessment
PoF	Probability of Failure
PTW	Permit to Work
RAM	Reliability, Availability, Maintainability
RBI	Risk Based Inspection
RCA	Rig Condition Assessment
RCFA	Root Cause Failure Analysis
RCM	Reliability Centred Maintenance
REA	Request for Engineering Assistance
RMA	Rig Manager Assets
RMP	Rig Manager Performance
RMS	Rig Maintenance System
RSTC	Rig Safety & Training Coordinator
SMART	System Management & Review Team
SOP	Standard Operating Procedure
SPS	Special Survey
SQA	Service Quality Audit
START	See: Think: Act: Reinforce: Track
SY	Shipyard
THINK	Transocean Planning Process
TopSet	Kelvin **TOP-SET®** : industrial incident and accident investigation tool
TSTP	Task Specific THINK Plan

Appendix 1: Asset Reliability Review – Element Summaries

1.1 AR Policy & Strategy

Description and Expectation

Asset Reliability Policy and Strategy focuses on Transocean's ability to develop and deliver effective asset reliability maintenance policies, and to have the policies translated to strategy and objectives. The intent of the sub-elements is to determine the efficiency of strategy development, the way it is translated to strategic objectives, communicated across the asset reliability function, and implemented at the Rig level. The final sub-element examines the measurement and feedback loop required to keep the strategy implementation on track and effective.

To be effective, the Asset Reliability Policy and related Strategy shall:

- Be derived from and consistent with Corporate Policy and related Strategies
- Be appropriate to the scale of Transocean's business and asset base
- Be consistent with other Organisational Policies
- Be consistent with Transocean's overall Risk Management Framework
- Provide the framework for asset reliability strategies, objectives and plans to be implemented
- Include a commitment to comply with all applicable legislation and statutory requirements
- Include a commitment to continual improvement
- Be documented, implemented and maintained
- Remain relevant through review

Findings

Strengths

1 The existing Maintenance Policy is consistent with Transocean's current risk management framework

Recommendations

1 Write a new risk-driven Asset Reliability Policy and Strategy aligned with Corporate objectives

3 Develop an implementation and communication program for the new AR Objectives

5 Define AR success criteria, appropriate KPI's and expected outcomes

1.2 AR Organisation & Communications

Description and Expectation

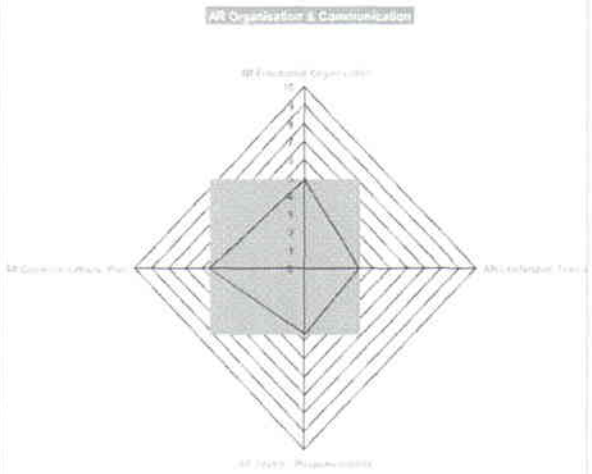
Key enablers of the Asset Reliability Policy and Strategy is the maintenance organisation structure, and the two-way flow of communications and data from the Rig floor to Head Office. The assessment within this sub-element focuses on the functional structure, and the roles and responsibilities of key groups – the Leadership Teams - and individuals tasked with planning, communicating, implementing and evaluating asset management policy and strategy.

To be effective, the following shall be available in the AR Organisation & Communications element:

- Asset Reliability Functional Organisation - robust structure
- Asset Reliability Corporate Steering Team
- Asset Reliability Leadership Teams (geographic)
- Clearly defined roles with accountability, responsibility and authority
- A Communications Policy: specific to AR activities
- A Professional Maintenance Culture

For a geographically dispersed organisation , the elements above should be in place to help define ownership of Asset Reliability activity across the matrix, and the degree of interaction between operations and maintenance.

Findings



Strengths

1 A defined Maintenance Organisation

3 There are open comms. channels to eliminate uncertainty

Recommendations

1 Redesign the Maintenance functional organisation to better reflect AR Strategy and Objectives

3 Define AR Leadership Team accountability, responsibilities &levels of authority to ensure empowerment of Teams and individuals

5 Ensure job descriptions and related role assessments are aligned with structural needs

1.3 HSE and Risk Management

Description and Expectation

In a 'best in class' organisation, Health, Safety, Environment and related Risk Management activity is well defined, well organised and well managed system. Functions and requirements of the system are defined as they affect Asset Reliability.

HSE
The HSE functions are designed to protect persons and the environment. Normally the highest priority is placed on protecting the general population, followed very closely by protecting employees and the environment. The following functions should be in place in an HSE element:

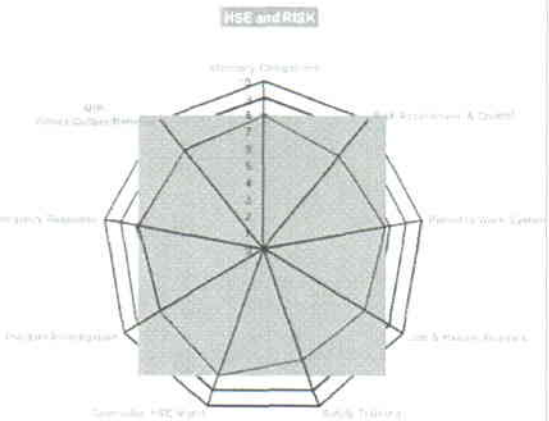
Statutory requirements	Safe Work Practices	Permit to Work	Job Hazard Analysis
Process Hazard Analysis	Safety Training	Incident Investigation	Emergency Planning
Management of Change	HSE KPI's	Asset Integrity	Hazardous Material Control

Risk Management
A complementary Risk Management function is intended to identify, assess and manage the risks associated with a particular operating environment – in this case, offshore drilling activity. The following functions need to be in place in the Risk Management element:

- Consistent matrix and definitions for both HSE and business risk
- Hazop, Fault Tree, QRA and other more complex methods
- Risk assessment methodologies
- Developing an updating risk studies, eg Safety Case and Quantified Risk Assessment (QRA)
- Decisions concerning Level of Risk and Level of Authority
- Management of Change (movements in risk)
- Risk Management KPI's

(see also 1.9 Risk Management)

Findings



Strengths

1 Robust and well managed HSE system is in place

3 THINK, START and Permit to Work systems are understood, implemented and managed effectively

5 Emergency Response preparedness is effective and regularly tested

6 Statutory obligations are embraced and compliance mandated

Recommendations

1 Strengthen Risk Analysis activity using industry wide benchmarking and risk ranking

3 Implement an effective feedback loop to ensure HSE activity is captured by the Training function

1.4 Quality Management System

Description and Expectation

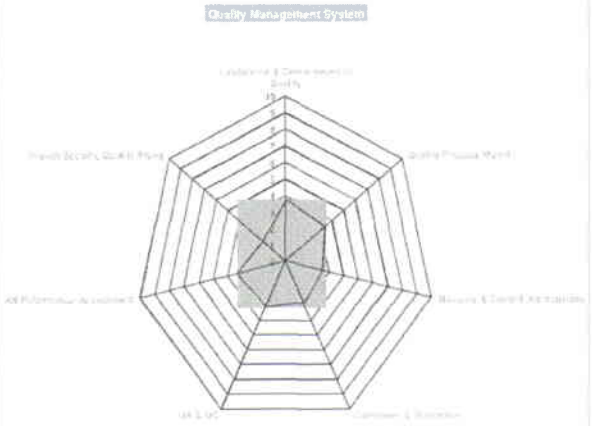
A Quality Management System drives defined work process, roles and responsibilities; an understanding of supplier/customer requirements and responsibilities; measurement and process control; and continuous improvement through the organisation. Such a system is designed, documented and managed to provide measurable value to the organisation.

The following functions need to be in place in the Quality Management System:

- Quality Policy
- Management Commitment
- Education & Training
- Quality Process Modelling
- Process Measurement & Control
- Cost of Quality
- Quality Assurance and Quality Control
- Supplier Quality Management
- Corrective Action including Tracking until Completion
- Management Review
- Continuous Improvement
- Quality Management KPI's

The QMS System should allow for and facilitate proactive assessment of the Asset Reliability system.

Findings



Strengths

1 The Norwegian Quality Management System Manual

Recommendations

1 Provide a 'stand alone' Corporate QMS Manual

3 Consider independent external third party certification to ISO 9001:2008

5 Define and implement quality related KPI's

7 Management of Change process review and update

1.5 Asset Operations

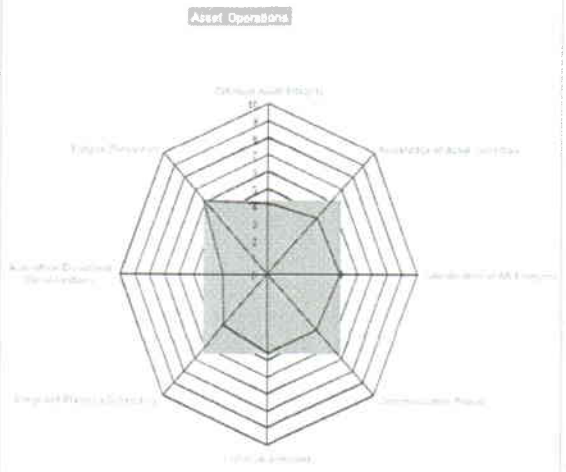
Description and Expectation

Asset Operations in the context of Asset Reliability concerns the combination of activities that comes together to provide knowledge of the asset condition as Operations and Maintenance functions interact.

The following functions - or an adequate combination thereof to provide confidence of the asset condition - shall be in place in the Asset Operations element:

- Operational Excellence system with a strong, supportive maintenance function
- Clear Asset ownership & accountability/responsibilities
- Clearly defined communication processes across Assets and Performance
- Operations, Maintenance Safety Training
- Risk Management
- Multi-discipline, asset led teams focused on continuous improvement of asset reliability and performance
- Measurement and continuous improvement using AR specific KPI's
- Functional description of equipment
- Operating procedures manual
- Consequence of failure
- Integrated planning and scheduling
- Management of Change
- A Policy or Procedure defining asset reliability requirements for equipment acquisition/divestment
- Long term Asset Reference Plan
- Fatigue issues & Working patterns (personnel related)

Findings



Strengths

1 RMS captures all maintenance activity – assets and performance (ops)

3 Drilling and Maintenance communicate informally regarding maintenance activity

5 Some Rigs and a Division have developed tools to improve AR

Recommendations

1 Introduce a controlled, formal communication procedure for drilling and maintenance

3 A procedure is required to align asset reliability requirements with acquisition and divestment activity

5 Review, update, improve and expand PM procedures to meet required integrity levels

1.6 Asset Reliability Leadership

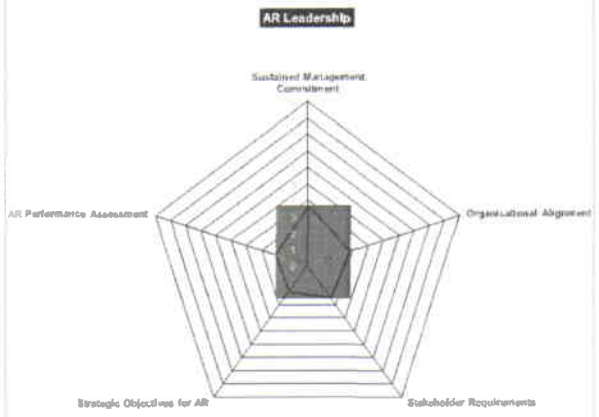
Description and Expectation

The overall success of Asset Reliability depends on the degree of commitment and leadership from the Senior Executive level and other key directors and managers across the maintenance function. AR Leadership must originate at the highest level of the organisation and then be propagated down to all levels in Transocean. The senior management must demonstrate commitment to Asset Reliability by providing the necessary resource and direction to develop, implement, sustain and maintain the Asset Reliability system in such a way as to assure that the strategic objectives are always achieved.

The Asset Reliability Leadership element must have the following functions in place to assure a successful AR system:

- Active, visible sponsorship of the Asset Reliability roadmap
- Senior executives to lead and encourage the necessary culture changes
- A corporate AR Leadership Team in place with capability, enthusiasm, responsibility and authority to achieve the desired results
- Sanctioned organisational change to achieve the defined Asset Reliability Strategy and Objectives
- 'Owners' held accountable for achieving all strategic objectives
- Asset Reliability achievements communicated throughout the organisation
- Requires the development and measurement of appropriate KPI's and targets
- A mechanism to measure the success of the AR implementation activity
- A mechanism to reward performance

Findings



Strengths

1 Senior Management's desire to move *maintenance to 'best in class'*

3 RMA and RMP positions as a key axis for Asset Reliability engagement with OIM and Department heads

Recommendations

1 Develop and implement Asset Reliability training program – all staff levels

3 Identify & resolve key stakeholder and related tactical issues and constraints around AR activity

5 Formalise AR responsibilities on Rigs

See also 1 1 AR Policy & Strategy and 1 2 Organisation & Communications for related recommendations

1.7 Engineering & Project Management

Description and Expectation

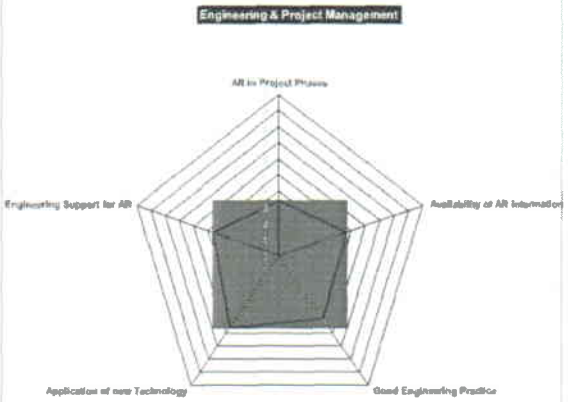
Asset Reliability starts at the design stage. This is true for both small and large projects. Engineering and project management need to ensure that Asset Reliability considerations are properly addressed for all assets. A good design ensures high integrity, reliability, and optimum utilisation of an asset. It is a commonly held belief that as much as 70% of an equipment item's reliability is fixed during the design phase. Attention to asset integrity in the design leads to fewer maintenance and logistics problems later in the equipment's life cycle

The following Asset Reliability functions are required to be in place in the Engineering and Project Management element:

- AR related Data and Information in:
  - Conceptual Engineering
  - Detailed design
  - Procurement
  - Construction / Installation / Commissioning
- AR related Project Management
- Good Engineering Practice
- Lifecycle & design life data informing new design/construction activity
- KPI's to measure and ensure effectiveness

(see also Section 2.6 of the Report for more detail)

Findings



Strengths

1 Project Related QA/QC activity

3 Use of appropriate Engineering Standards/Specs

Recommendations

1 Define all AR project related data requirements

3 Ensure AR KPI's are aligned across Engineering Function

5 Redefine the self-learning mechanism for AR across Engineering / Performance / Assets – capture best practice

7 Implement use of lifecycle costing in Specification development

1.8 Maintenance & Reliability

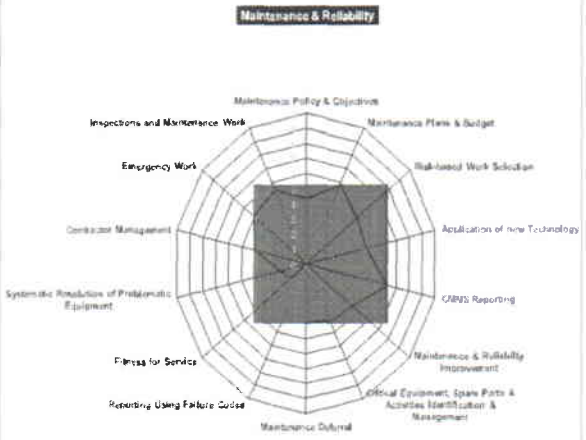
Description and Expectation

Maintenance and Reliability activity is at the core of Asset Reliability and a key element in the AR Framework. At the core of this element is a risk based maintenance system providing an integrated set of processes procedures developed to achieve 'best in class' costs, lower risks, and higher availability for all classes of assets. By focusing on doing the right maintenance at the right time, the risk based model will drive effectiveness, efficiency and continuous improvement.

To do this, the following functions need to be in place in the Maintenance & Reliability element:

- A Maintenance Management System
- Planning and Scheduling
- Job task analysis
- Job safety analysis
- Efficient and effective data entry
- Results analysis
- Operations, task, competency and safety training
- Critical spare parts identification and management
- Maintenance event recording: repairs; breakdown; overhaul
- Reporting / Failure Codes
- Lessons Learned are being captured and shared
- Effective Management of Change (MoC)
- Fitness for Service assessments
- Remaining useful life assessments
- Problematic equipment assessments
- Contract Management
- Maintenance and reliability troubleshooting and support

Findings



Strengths

1 The existing Transocean Maintenance Management System & Personnel

3 Willingness to change – organisation wide – and embrace a move to 'best in class' asset management

5 Control of activity on the Rig

Recommendations

1 AR Policy – as flagged in Element 1.1

3 Risk models by asset type to facilitate / streamline maintenance tasks

5 Establish robust Fitness for Service procedure for defect evaluation

7 Make better use of MoC for maintenance deferral activity

9 Spares Strategy using risk based approach

1.9 Risk Management

Description and Expectation

A key strategic element of Asset Reliability is an understanding of the risks associated with the physical assets within the Maintenance Management System and how those risks vary, or might vary, based on the decisions and actions taken onboard the Rig. For example, if maintenance activity is deferred, asset reliability risk management should be able to assess the increased risk to the business using a what-if scenario. Based on the anticipated change in risk, an informed (Knowledge Based) decision can then be made to support the proper action.

Risk Management will help in the selection of appropriate maintenance and inspection tasks and intervals (Risk Based maintenance strategies), and must be used to prioritise the scheduling of maintenance activities and backlog.

The following functions need to be in place in the Risk Management element:

- A common – business wide – Risk Metric
- Risk based maintenance tasks and procedures
- Risk based work selection
- Risk based equipment ranking
- Risk driven critical spares strategy
- Risk based work selection processes
- Reliability, Availability, and Maintainability (RAM)
- Management of Change: documented/controlled/effective

Findings

Strengths

1 Critical equipment determination and related Task selection

3 Equipment with low risk is allowed to run to failure

5 Compliance with Statutory requirements is documented

Recommendations

1 Revise the risk management policy and procedure to be more Asset focused & include Probability of Failure

3 Develop and implement a Asset Reliability based Risk Management training program

5 Revise and audit the MoC procedure to introduce risk assessment and make it more effective and less time consuming to use - enforce use

1.10 Knowledge Management

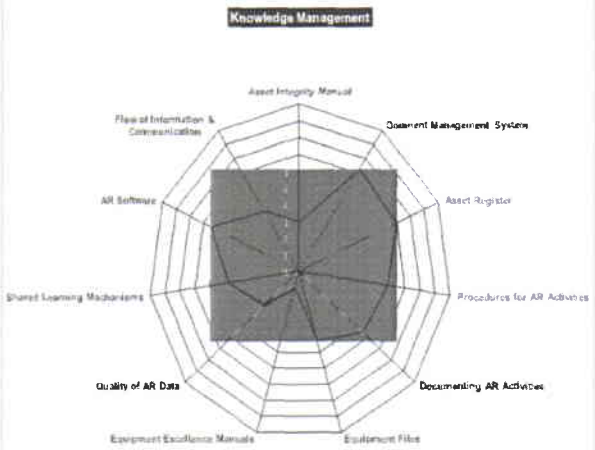
Description and Expectation

Within the Asset Reliability functional elements, Knowledge Management consists of three main components:
- Documents controlled within the Maintenance Management System
- Data and information flowing into and out of the Maintenance Management System
- Software systems controlled within the Maintenance Management System

The following functions need to be in place in the Knowledge Management element:

- Asset Register
- Asset Reliability Manual and related CMMS Software
- Knowledge based task procedures
- Equipment Excellence Manuals
- Equipment specific maintenance procedures
- Fully defined & controlled data to the Knowledge Management System
- Data (inspection, test, surveillance and overhaul) from reports
- Planned and Scheduled maintenance activity
- Performance Data Reports
- Risk and Reliability Analysis Procedure & Tools
- Shared Learning, MoC and Action Tracking
- Defined Information Flow & Communications

Findings



Strengths

1 Document Management System

3 Critical Equipment assessment

5 Procedure ownership

Recommendations

1 Write a new Knowledge Management Policy

3 Write procecure & implement Equipment Files

5 Improve Data collection – type / quality / training

7 Develop communication mechanism to ensure flow of critical AR information across the AR Function

1.11 Measurement & Continuous Improvement

Description and Expectation

The purpose of the Measurement & Continuous Improvement element is to:

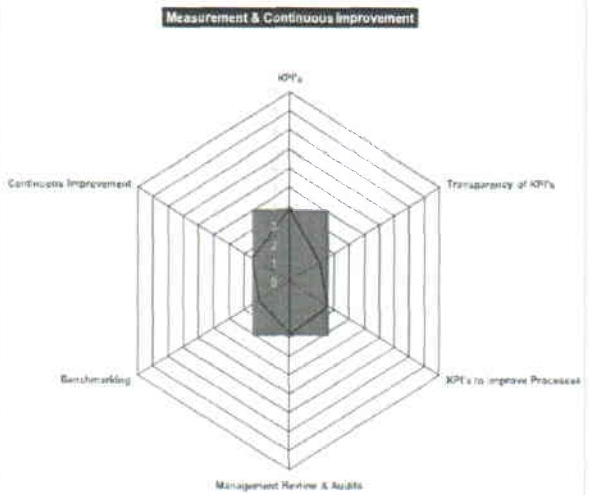
- Establish the appropriate KPI's aligned with corporate goals:
- HSE & Risk Management
- Quality Management
- Asset Operations
- Set annual challenging targets for each KPI
- Measure and manage the targets
- Drive Continuous Improvement in processes, procedures and organisation

Leading and Lagging KPI's should be available. Leading indicators will focus on management of work process elements and the lagging indicators will focus on the results of the processes. The combination will drive both efficiency and effectiveness in Asset Reliability.

The following functions need to be in place in the Measurement & Continuous Improvement element:

- Annual targets for each of the KPIs established from the Managing Elements
- Self-check procedures for each of the Asset Reliability work processes
- Management reviews and audits of the elements of the AR system
- Benchmarking within and outside the organisation
- Best Practice Teams with responsibility to identify or develop Best Practices to share throughout Transocean
- Effective processes to capture Lessons Learned and share them with all stakeholders within the organisation

Findings



Strengths

1 KPI's used to measure downtime & budget performance

Recommendations

1 Develop a revised set of KPI's (with responsibilities) to measure AR activity

3 AR KPI deviations to have associated corrective action

5 Ensure KPI's are evaluated annually for effectiveness and use

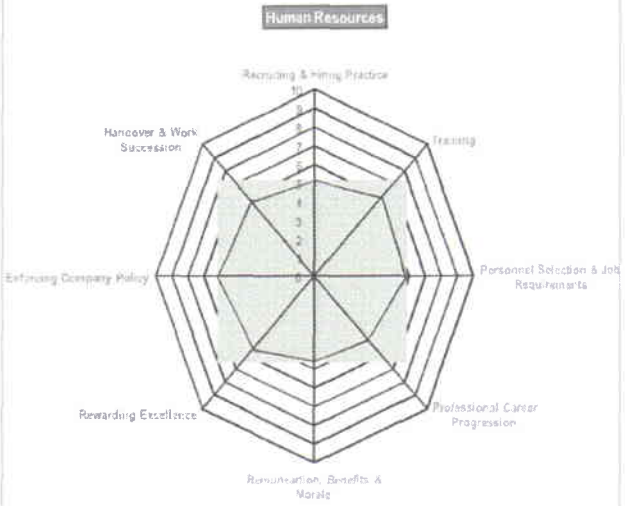
1.12 Human Resources

Description and Expectation

The Human Resources element supports Asset Reliability by hiring, training, motivating and retaining the necessary staff to manage and implement the Asset Reliability system. The following functions need to be in place in the Human Resources element:

- Hiring Practices
- Training Program Management
- Professional Skill Development and Progression
- Managing of Change associated with moving, replac ng, or reassignment of staff
- Establishing remuneration and benefits
- Job descriptions, appraisal system, succession planning
- Rewarding excellent performance
- Helping maintain labour contracts
- Creating a work environment that is humane, fair and demanding
- Developing and enforcing company policy and regulatory requirements

Findings



Strengths

1 Enforcing Transocean HSE & related Policy

3 Safety Training in particular

5 HR Policy & Statutory requirements for recruitment

7 Working environment defined and controlled

9 Personnel records

Recommendations

1 AR Function relationship with HR – skills / competency requirements & compensation

3 Improve / strengthen the links between job appraisal, rewards, succession planning & career progression

5 Review/update/revise OJT programs

1.13 Procurement

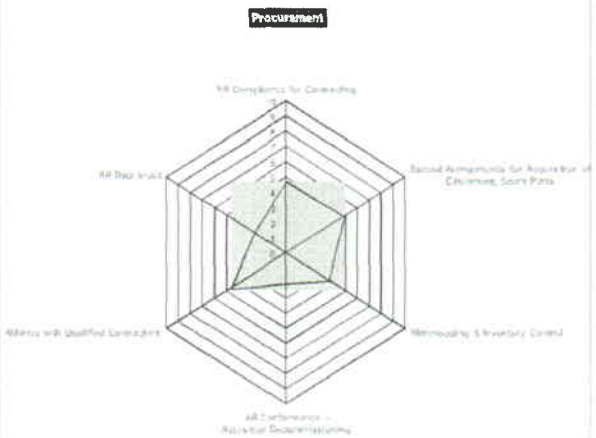
Description and Expectation

The Procurement element supports Asset Reliability by arranging for new or replacement equipment and maintenance material, and ensuring that spare parts are available at the time and of the quality required by the Asset Reliability activity. In addition, this element will be involved with logistics and contracts.

The following functions need to be in place in the Procurement element:

- Availability and quality of maintenance materials and spare parts
- Availability and quality of new or replacement equipment
- Managing warehousing and inventory control
- Managing and supplying logistics
- Executing contracts
- Alliance suppliers and approved vendor lists
- Established KPI's that are both business and asset reliability focused.

Findings



Strengths

1 Procurement Manual & qualified/trained buyers

3 OEM parts used in critical equipment

5 ICS linked to RMS

Recommendations

1 Assess & document all Supply Chain Risks

3 Revise Vendor QA audit program

5 Ensure Procurement Staff trained in AR needs

7 Leverage buying power into Vendor partnerships and share data

1.14 Knowledge Management System

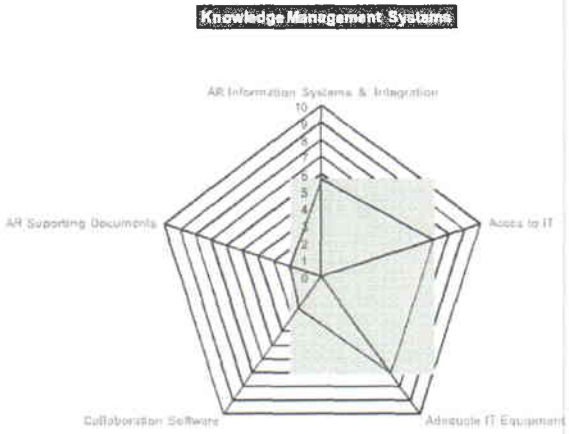
Description and Expectation

The Knowledge Management System elements cover the Transocean wide information management system, documents and data that support the Asset Reliability system.

The following functions need to be in place in the Knowledge Management System element:

- A Asset Reliability specific Knowledge Management Policy
- Document control process to manage documents
- Disaster Recovery plan as part of KM Policy
- Nature and functionality of a CMMS
- Structure of and access to the IT System that supports AR Knowledge Management
- Reliable access to information systems and documents by all users, including offshore, at acceptable speeds
- Training on use of the IT systems

Findings



Strengths

1 RMS - functionality with controlled access

3 RMS training activity

5 Access to IT equipment across Transocean

Recommendations

1 Streamline IT service & support

3 RMS linkage to other systems

Appendix 2: ARIVU / RMS Functional Spec.

See stand alone report

Title: Software Requirements Specification for the Integration of RMS & ARIVU
Date: April 2009
Author: **Josephine Coronado / Art Harris**
Software Consultants
LR KBM

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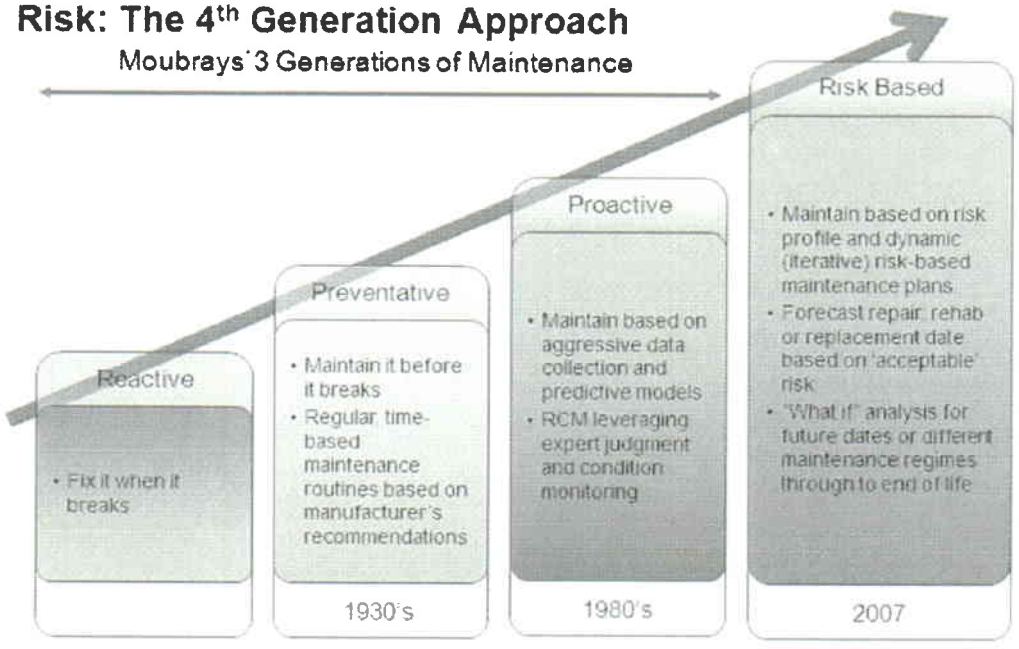
Appendix 3: Asset Reliability - 4th Generation Maintenance

1 Introduction

Historically, maintenance has evolved through three generations. The Asset Reliability (AR) System being developed for Transocean will represent the next (Fourth) generation of maintenance performance.



First Generation

The **first** generation of maintenance (Reactive Maintenance) covers roughly the historic period prior to the mid-1930's. During that period the following were characteristics of the equipment and maintenance practices:

- Equipment was simpler and often over-designed
- Maintenance was a necessary negative to business
- Maintenance activities were normally based on "fixing it when it breaks"
- Continuous operations were the exception
- Downtime was expected

Second Generation

The **second** generation of maintenance (Preventative Maintenance) was coincident with World War II. The military became mechanized and much more vulnerable to loss of availability of critical equipment. The following were characteristics of the equipment and maintenance practices:

- Equipment became more complex
- Equipment availability became more important
- Maintenance became viewed as a cost of doing business
- It was understood that proper maintenance could improve availability
- The concept of Preventative Maintenance was introduced
- Maintenance activities focused on time or event based tasks
- Maintenance planning and control systems were developed

Third Generation

The **third** generation of maintenance (Predictive Maintenance) came in the mid to late Seventies. Pressures on businesses from low-cost foreign competition, regulations, quality requirements, and safety and environmental concerns caused recognition that improved maintenance was the most significant remaining opportunity to improve business performance. The lead sector for the third generation of maintenance was civilian aircraft. The following are characteristics of the equipment and maintenance practices being used:

- Equipment reliability concepts were developed
- Reliability and maintainability are increasingly important
- Failure modes and maintenance activities were coupled
- The concepts of Reliability Centred Maintenance were developed
- Equipment criticality was defined
- Dependence on Computerized Maintenance Management Systems
- Condition monitoring technology was developed and deployed
- The concepts of Predictive Maintenance were introduced

Fourth Generation

The **fourth** generation of maintenance (Risk Based Maintenance) is currently being introduced. The thought leaders for the latest approaches to maintenance have primarily come from the energy sector with the genesis in nuclear power in the 1990's. The primary characteristics of the fourth generation of maintenance are:

- Society has become more aware and less tolerant of catastrophic events
- Risk management has become policy in hazardous industries
- Aging assets need to be safely operated beyond their design life
- Higher availability and performance is expected from physical assets
- Computers became fast, powerful and cheap

- Risk concepts for physical equipment were developed
  - Probability and consequence of failure were assessed independently
  - Increasing probability of failure translates into higher risk for aging assets
  - Uncertainty in equipment condition could be understood as increased risk
  - A small percentage of the physical equipment comprise the majority of the risk to a business
- Focusing the right maintenance activities on the critical few high risk equipment can significantly reduce the risk
- Reducing or eliminating maintenance activities that don't reduce risk will create cost reductions

Lloyd's Register staff has been involved for almost 20 years in the development of the concepts and technology of Risk Based Maintenance in the energy and marine sectors. These concepts are consolidated into a "Product" (a package of technology and services) that is internally called Asset Performance Management (APM). This technology and business processes are being designed into the Transocean AR System.

Following is a brief description of the key elements that explain how AR will take the Fourth Generation of Maintenance to the next level.

2 Value Creation

The application of the Asset Reliability program will generate value for Transocean in a number of ways. However, all of the value generated with AR can generally be divided into three broad categories:

- Cost Reduction
- Reduction in Risk (including the business risk of lost production)
- Better Decision Making

Cost reductions are generally the easiest of the three to quantify and measure, but understanding and properly managing the risk reduction and improved decision making generally provides greater value. Risk reduction is often considered a "soft" number, and if an equipment failure is prevented it is difficult to take credit for the risk reduction. It is even more difficult to quantify the value of better decision making, but it may be the most important component of the value creation.

Section 8 of the main report describes in further detail the cost / benefit analysis of implementing the AR System. It describes how value is expected to be created and how it will be measured during the implementation and sustaining of the process. An analysis tool has been built that will allow the value to be predicted at the start of the implementation process and tracked during implementation and sustaining stages.

The Asset Reliability implementation will use "time-to-value" as one of the key selection criteria to establish priorities for activities.

3 Asset Performance Management

Asset Performance Management (APM) is a systematic process for factoring risk into decisions concerning how, where, and when to inspect, test and maintain a set of physical assets. The intent of APM is to focus maintenance resources on critical equipment in ways which will prevent unanticipated failures, particularly catastrophic ones. It is a process that can help make assets safer and more reliable in a cost effective way.

Compared with a typical maintenance program, the application of an effective APM program can simultaneously reduce the risk on a drilling rig as well as reduce the total cost of the maintenance effort. In any portfolio of assets, a relatively large percentage of the risk is associated with a small percentage of the equipment items. Asset Performance Management causes a shift of maintenance resources to provide a more significant effort concentrated on the higher risk items and an appropriate level of effort directed toward the lower risk equipment.

Figure A3.1 provides a model of the Asset Performance Management process as it is used to construct risk models. Overlaying the risk management process are the three key elements described in Section 2 and used as the basis of the AR Interview Protocol:

- Technology
- Business Processes
- People

These three key elements represent the integrated solution between Asset Performance and Asset Management. They were assessed during the Asset Reliability Phase I interviews. The key objective of transforming and integrating these three elements is to achieve the desired level of performance of the physical assets in order to meet the business objectives of the organization.

The technology and one of the key business processes (Risk Based Asset Management) are illustrated in the figure.

The Criticality Analysis is a data-driven model by class of equipment that will estimate the risk of failure of each piece of equipment based on specific risk models. The risk is dynamic, changing with time and events and crediting maintenance tasks with appropriate reductions in the probability of failure.

The risk result (Equipment Criticality) will be used as an input to aid in the selection the proper maintenance activity and schedule.

Maintenance strategies will be defined to assure global consistency in the selection of the proper maintenance activities, based on class of equipment, equipment criticality, failure modes, and regulatory requirements.

Staff competency will be managed through appropriate human resource management and training to make sure the maintenance people are properly trained on appropriate procedures and work processes to assure the capability of the system.

The system will assure the equipment is fit for ongoing service, continually monitor end of life (major overhaul or repair, or replacement) and the value being created against a baseline of maintenance activities and risk.

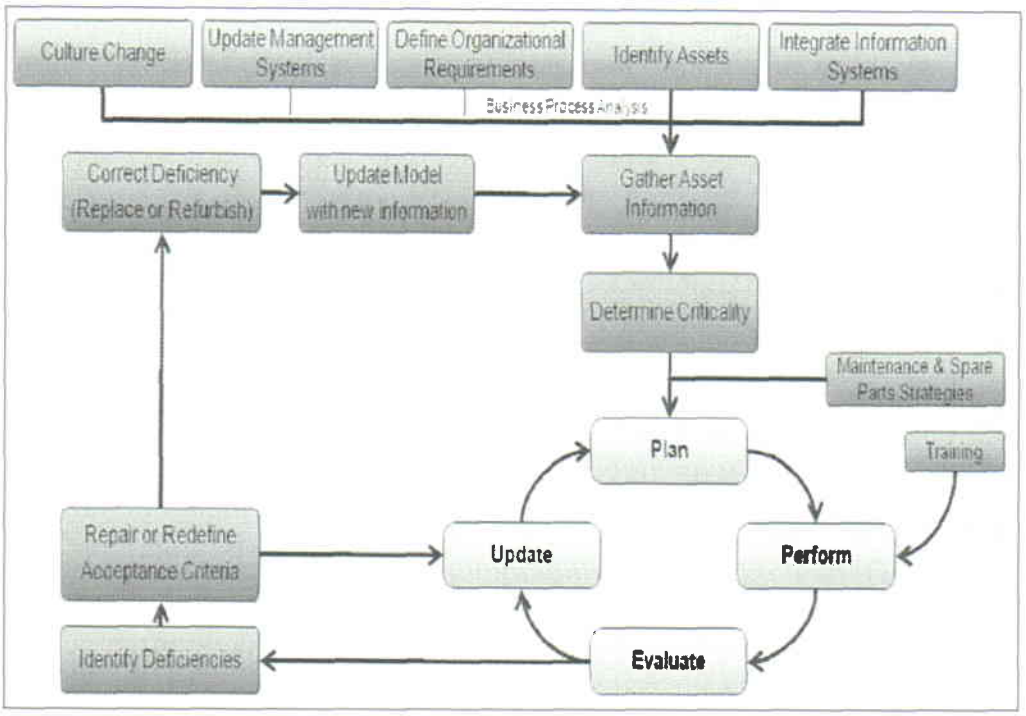


Figure A3.1 – Asset Reliability: Risk Model Construction

Continuous improvement is built into the system using a closed-loop feedback process that will create a natural evaluation and updating process. Learning's will be taken for unanticipated failures and future failures of a similar nature will be eliminated.

Maintenance plans will be reviewed and updated on a regular basis based on actual condition of the equipment and its resultant threat to operations.

The system will become a repository of knowledge about the physical assets, promoting improved performance and better decision making. Appropriate Key Performance Indicators will be available to all stakeholders on an as-needed basis.

The system will also affect the "soft" elements of improvement by driving cultural change across the organisation as the change is managed and communicated, the business processes are developed and embedded, people are trained and the technology is delivered.

It is important to recognize that the cultural change in the organization will not be easy, quick or simple. There is an element of fire fighting in the organization that rewards people who are good at fixing problems rather than preventing them.

Appendix 4: Change Management

Stage 1 – Set course

The overall objectives for the "Set course" stage are to deepen the project teams understanding for the scope of the change to be brought about within the affected part of the organization as well as the change-relevant characteristics of this organizational part. Further, this stage is designed to define the vision and the need of the change effort to be undertaken.

A clear understanding of the change to be brought about, its need and a vision to go forward are a prerequisite for delivering a clear value proposition to stakeholders and affected employee groups – one of the key success factors identified (see above). The initial start of the project in Phase II will require the definition of a broad overall vision for the entire project and the entire Transocean organization. In the course of the project, this vision will have to be drilled down and translated into a clear value proposition and clear statement of desired behaviour to fit the respective organizational levels and employee groups. Similarly, a short and precise vision statement is an important component of initial change related communication

At the end of Phase I, the following deliverables are generated:

- Joint LR/TRANSOCEAN project team structure, roles and responsibilities
- High-level change profile
- Vision/mission statement

To deliver the above mentioned deliverables, three distinct activities are to be conducted:

- Joint LR and TRANSOCEAN project-team kick-off
- Change Management introductory interviews for AR Phase II
- Vision and needs workshop

The three main activities are specified in the following table:

Activity	Participants	Objectives	Tools & Methods
Kick-off	AR project team (LR & TRANSOCEAN)	• Start project with a formal kick-off • Set up and organize the project team (define roles & responsibilities)	• Team competency assessment • General project management tools such as action plans, timelines, org. charts

		• Clarify questions • Select interviewees for introductory interviews • Define, agree on and communicate next steps and project outline	etc. • Various questioning and facilitation techniques
Introductory Change Interviews	LR Change managers & selected interviewees	• Assess and scope the change • Assess the organization (or part of it) • Engage interviewees for change project and manage expectations • Stimulate reflection on organization and change • Build relationships and trust	• More detailed/focused than AR Phase I interviews • Semi-structured questionnaire employing scaling questions, open questions, associative questions and circular questions • Questionnaire topics: organizational culture & values, change magnitude and impact, stakeholders, readiness for change, attitude towards change etc.
Vision workshop	AR project team (LR & TRANSOCEAN)	• Clarify the need for and scale of change • Define detail desired performance level • Assess risks and opportunities for the project • Establish clear direction for project team	• Combination of a variety of facilitation techniques, e.g. ▫ Envisioning ▫ Risk/opportunity-matrix ▫ Future-State definition ▫ 1-sentence vision statement

The following table details those tools and methods most specific to the change management stream in Phase I:

Tool/Method	Description
Team Competency	• Objective is to define team roles and responsibilities and make

Assessment	the best possible use of resources and competencies available • Define the competencies required to successfully deliver the project (roles as well as in-person competencies) • Assess potential team members in regard to these competencies (gap analysis) • Select team members • Define training needs as required per gap analysis (see also Stage 2 - Prepare & Move)
Envisioning	• Objective is to expand the horizon of thinking and to gain a vast pool of ideas and solutions about the project by considering extreme positions/developments; prepares • 3 participants or three sub-groups assume three distinct roles: the dreamer/visionary, the realist, the critique/pessimist • Employing a flip chart and cards/post its, each group develops a vision of the project according to their role ○ Stage 1: The "dreamer" develops ideas about the ideal performance level, the best case development of the project, its opportunities and why it is needed ○ Stage 2: The "critique" challenges the dream-vision by describing the worst case impact of the change project, the risks associated with the project and why it might not be that necessary at all ○ Stage 3: The "realist" tries to synthesize the two positions into a realistic scenario and addresses questions like "What needs to be done?", "What is needed?" etc. • Results may be documented using a flip-chart in three distinct scenarios or consolidated into a risk/opportunity matrix and may serve as input to the 1-sentence-vision statement (see below) • Results also serve to prepare the project team for sensitive issues that might turn up in the course of the project and to proactively address these
Risk/Opportunity Matrix	• Objective is a structured and transparent framework for future work and thinking; enables the project team to pro • Simple yet powerful tool to document the results of the Envisioning-session or other visionary/creative methods • Using a 2x2 matrix prepared on a flip-chart, the statements generated during the Envisioning-Session are sorted according to long/short-term risks and opportunities of the project

	• Results form the basis to develop measures proactively address issues
Future-State Definition (general)	• Objective is to arrive at a common vision and to lay open differences • Employing a flip chart and post-its/cards, participants are asked to describe the desired performance level in terms of observable characteristics or behaviour (more of/less of) • Each participant develops on his own at least one statement per category • The facilitator collects the cards and arranges them on the flipchart; results may be further consolidated or aggregated
Future-State Definition (stakeholder specific)	• Objective is to define the concrete behaviours various stakeholders/constituencies/employee groups should show in the performance level • This exercise builds on the general definition of the performance level/vision as defined above • Step 1: On a flip-chart, prepare a template-table consisting of three columns: Stakeholders/constituency/employee group, a scale of 1 to 10, desired behaviour • Step 2: List the various stakeholders etc. and, building on the general future-definition, describe their desired behaviour • Step 3: On a scale of 1 to 10, evaluate to which extent the desired behaviour is displayed (this serves as a basis of comparison during later stages of the project)
1-Sentence Vision Statement	• Objective is to develop a strong and memorizing vision statement • This exercise can build on both the Envisioning-exercise and the Future-state definition • Using a flip-chart and working individually or in pairs, participants define a 1-sentence vision statement for the project • The outputs of the sub-groups are collected and put up against a wall for comparison • Working in the entire group and comparing the different statements, the strongest words/phrases are consolidated into one powerful vision statement • The vision statement supports and focuses the efforts of the project team and the change promoters and is the basis for a clear, transparent and target-group oriented communication

Stage 2 – Prepare and move

The overall objectives for the "Prepare & move" stage are to align and prepare the project team for the upcoming change effort and to secure necessary support and engagement from project sponsors. Further, this stage is designed to advance the teams understanding of the existing organizational dynamics.

The AR project aims to deliver a significant change effort over a time span of up to five years. In order to uphold and sustain this effort over the full duration of the project it is crucial to sufficiently prepare and align the joint TRANSOCEAN/LR project team. Similarly, effective sponsorship by senior executives was identified to be one of the key success factors for the delivery of the AR project. Employees want to see and hear the executives visibly committing to and participating in the project throughout its entire duration. This especially holds true for Transocean were the change management interviews indicated that the executive team is perceived to be the main driver of culture. Generally, executive sponsors provide the authorization, backing and funding for the project to move forward. They play an important role in communicating the change, building and maintaining momentum and overcoming doubt and resistance as well as managing and influencing key stakeholders (for detailed description of the role of the change sponsor see section 1.3 Roles and Responsibilities). It is therefore important to match the hierarchical level and degree of sponsorship involvement to the magnitude of the desired change. Given the magnitude of change that will be delivered by the AR project, it is suggested Transocean's COO Stephen Newman take the overall sponsorship lead for the entire project.

At the end of Stage 2, the following deliverables will have been generated:

- Aligned and skilled project team, incl. change sponsors
- Sponsor agreement and sponsor plan
- Stakeholder map
- Stakeholder constellation

To this end, the following distinct activities are to be conducted during the "Prepare & move" stage:

- Project team building and training
- Sponsor engagement
- Organizational dynamics analysis

These activities are specified in the following table:

Activity	Participants	Objectives	Tools & Methods
Team-building	AR project team	• Alignment of the project	• Team-building workshop

and training	(LR & TRANSOCEAN)	team to drive the change effort • Provide the project team with the necessary competencies to drive the change effort	• Training • Sociogram • Further specific trainings as required per gap analysis of Phase I
Sponsor engagement	Change lead & AR project lead	• Secure executive support for the project • Define role, responsibilities and involvement of sponsor	• Sponsor selection & approach • Sponsor agreement • Sponsor plan
Organizational dynamics analysis	AR project team (LR & TRANSOCEAN)	• Identify key stakeholders to the project and their attitudes toward the project • Identify relationships between key stake-holders • Define measures for focused stakeholder management	• Stakeholder analysis • Stakeholder map

The following table details the above mentioned tools and methods:

Tool/Method	Description
Team-Building workshop	• Objective is to improve the performance and cooperation within the project team by means of accessible personality tests (e.g. Colours, MBTI) • An understanding of one's own as well as others personality types can offer tangible support in a variety of project management related tasks, e.g. communication, expectation management • The training will include: ○ Definition of personality type ○ Explanation of Personality-Model and basic implications ○ Explanation of type dynamics ○ ...

Sociogram	• Objective is to gain a better understanding of someone's characteristics and competences and their perception by peers within a group/unit • At the outset, the change management facilitator establishes feedback rules and explains the procedure; an appreciative environment is especially necessary for this team building exercise • One after the other, the team members then give a brief statement about themselves by answering three simple questions, for example: ○ What are your strengths'? ○ For which skills do others seek your support? ○ What is your leadership motto? • In the second step the other team member offer their perception in regard to the individuals characteristics targeted by the questions • Both perceptions can be documented on a flip-chart, allowing for a clear comparison of self-perception and peer-perception • Based on these findings the group can work out the best roles/responsibilities for each individual in a given environment/for a given task
Sponsor Agreement	• Objective is to ensure commitment and transparency of role and responsibility • Written agreement between the sponsor and the project lead defining ○ the sponsors key role on the project ○ the sponsors key responsibilities ○ the sponsors time commitment to the project ○ the sponsors objectives for the project/project team • The sponsor agreement and his/her commitment to the project should be reviewed and updated on a regular basis following questions such as: ○ Does the sponsor put in the time he/she committed? ○ How does he/she show his/her support for the project? ○ What could he/she do to increase his/her support for the project?
Sponsor Plan	• Objective is to obtain a visible and agreed action plan

	• An action plan defining date and time of sponsor activities with/related to/targeting the project team, executives, stakeholders, change promoters and employees • The sponsor plan will continuously be updated in the course of the project
Stakeholder Map	• Objective is to gain a better understanding of the stakeholders involved • A useful tool to identify key stakeholders, evaluate their attitude towards the project and discuss stakeholder management activities • Step 1: Facilitated by the change manager, the project team collects the names/position of potential stakeholders/ constituencies to the project and documents them on post-its • Step 2. Depending on the number of stakeholders identified, they are grouped into clusters with high, medium, and low influence and puts them accordingly on an evaluation tableau prepared on a flip-chart/whiteboard • Step 3: Beginning with the highly influential cluster, the project team describes the stakeholder issues and concerns and evaluates their "As-is" attitude toward the project: hostile, uncooperative, indifferent, help it work, enthusiastic. • Step 4: Having evaluated the "As is"-attitude, the participants then discuss of "Should be"-attitude of each stakeholder • Step 5: For those stakeholders showing a gap between "As-is" and "should-be"-attitude, further steps for a focused stakeholder management are discussed • The stakeholder analysis can be updated/repeated at later stages of the project to provide new input for stakeholder management, but also to analyze the effectiveness of stakeholder management measures
Stakeholder constellation	• Objective is to gain a better understanding of system dynamics • Simple yet powerful tool to analyse the relationship certain players and/or organizational units have with each other, nicely complementing the stakeholder analysis • A client representative identifies those players/organizational units relevant to a certain question/issue at hand • He then uses post-its (or any other material/figures) for each player and positions them on table according to their perceived

	relationship • The resulting constellation/picture which results allows interesting conclusions on the state certain players are in (e.g. at the centre of activity vs. without relevance to the activity) and the relationship they have to each other (e.g. close interaction vs. out of sight) and who influences whom • The findings can be used for an effective planning of focused stakeholder management activities • The stakeholder map can be updated/repeated at later stages of the project to provide new input for stakeholder management, but also to analyze the effectiveness of stakeholder management measures and changes in relationships

Stage 3 – Execute

The overall objectives for the "Execute" stage are to create and maintain a large scale buy-in and momentum for the AR change, to make productive use of doubt and resistance and to initiate the desired changes in behaviour. To this end, it must also be ensured that systems and structures support the desired change.

Engagement of on-shore rig-managers and off-shore OIMs was identified to be one of the key success factors for implementing the AR program. Middle managers and supervisors directly facing the employees affected by the change are indeed the primary drivers of change. They are in direct contact with the employees and can bring about the change in one-to-one (individual interventions) and one-to-many interactions (organizational/group level interventions). The external change managers support and enable these primary change promoters by means of training, coaching/supervision and advice on how to approach specific change situations. Change managers will also directly engage in change activities by facilitating group-level interventions. It is however important to note that while middle managers and supervisors are influential 'multiplicators' of change, they themselves are heavily affected by the change and might show strong resistance. A key success factor for the change therefore is to secure their buy-in and support in the early stages by means of senior executive sponsor involvement, clear value proposition and provision of required support and training.

Resistance is a common reaction to change and has to be expected in change efforts. While usually discussed in negative terms, resistance is an expression of and an outlet for a variety of change related dynamics, for example

- A request for attention and appreciation
- A need for clarification of – for example - objectives, roles and responsibilities
- A lack of competence and motivation

However, it can ultimately be reframed as a demand for or offer for cooperation. Consequently, it is a large and important, yet often under-utilized and non-appreciated resource in change processes. Hence, the productive use of resistance is a key success factor for change management. Starting points for productive use of resistance are for example exploring the root causes and motives of resistance and providing room to release pressure, e.g. by means of questions, listening, demonstration of interest and appreciation. The creation of such an appreciative environment for change, based on the FIRST core values is a general guideline for the activities performed by change managers, sponsors, and change promoters.

Finally, systems and structures need to be aligned to support the change, being especially valid for reward and performance management systems. Change management introductory interviews indicated that especially reward systems for employees on rig level might not be adequate to support the AR change. Therefore, one of the objectives of this stage is to look deeper into this issue and to initiate changes where necessary.

While these are the main objectives and topics of the change project stream in change Stage 3, communication and training are further key success factors for enabling and driving the change in this stage. The change activities will therefore be closely aligned and coordinated with the communication and training frameworks. For details on the proposed activities/approaches please refer to the respective sections of this report.

The actual final deliverable of Stage 3 is the delivery of the intended change. For this, the following change-specific deliverables are provided and regularly updated during the process to guide the journey to its final destination:

- Updated sponsor plan (see above)
- Updated stakeholder tableau and map (see above)
- Organizational and individual level intervention plans
- Training plan (see Training & Competency Framework)
- Communication plan (see Communication Framework)

To this end, the following distinct activities are to be conducted during the "Execute" stage:

- Engage change promoters
- Analyze issues/attitudes/resistance/dynamics
- Employ individual-level and organizational/group-level change interventions (where needed)
- Analyse systems and structures
- Ensure interface to training and communication framework

These activities are specified in the following table:

Activity	Participants	Objectives	Tools & Methods
Engage change promoters	AR change managers, AR project lead and project sponsor, HR Transocean	• Win multiplicators to drive the change effort • Define role, responsibilities and involvement of promoters • Provide change promoters with necessary competencies and support throughout the project	• Change promoter readiness assessment • Change promoter agreement • Change promoter plan • Change-specific training • Change promoter forum • Coaching/Supervision • Sponsor involvement
Analyze issues/ attitudes/ resistance/ dynamics	AR project team, change promoters, further TRANSOCEAN employees depending on method chosen	• Monitoring of and reflection upon change dynamics • Design of appropriate change interventions	• Force-Field analysis • ADKAR-analysis • Stakeholder analysis • Stakeholder map
Individual-level change interventions	Change managers, change sponsor, change promoters	• Overcome resistance and doubt • Support change promoters	• Intervention plan • Coaching/Supervision of change promoters • Training
Organizational-level change interventions	Change managers, change sponsor, change promoters	• Overcome resistance and doubt • Reconcile potential conflicts • Support change promoters	• Intervention plan • Coaching/supervision of change promoters • Conflict management (e.g. "fair fight"; confrontation meeting) • Team building
Align systems and structures	Change managers, TRANSOCEAN department specialists	• Identify issues inhibiting the change • Initiate corrective action	• Analysis of tasks, responsibilities, interfaces and reporting lines • Analysis of incentive and reward systems

The following table details the above mentioned tools and methods:

Tool/Method	Description
Change Promoter Readiness Assessment	• Objective is to select the most suited change promoters • A useful tool to identify change promoters, evaluate their readiness to take the role of change promoters and to discuss necessary interventions by change managers or project sponsors • Step 1: Drawing on an organizational chart and the specific knowledge of client team members and using a flip-chart/whiteboard, compile a long-list of potential candidates for the role of change promoters. Assign a code/number for each individual • Step 2: Drawing on the client team members knowledge and judgment assess the candidates readiness for the role of change promoters on two dimensions, both scaled from -5 to +5: ○ Competency to lead the change (-5 = low, +5 = high): interpersonal skills, communication skills, facilitation skills, influencing skills, organization skills, change experience) ○ Attitude towards change (-5 = unsupportive, +5 = supportive) • Step 3: Using a flip-chart, draw a 2x2 matrix/grid to visually the two dimensions of competency and attitude. Plot the individuals on the matrix/grid according to the score they received • Step 4: Discuss implications and next steps to further engage the resulting clusters ○ High/positive: Ready to assume role ○ High/negative: Suitable candidates, further analysis of resistance required (e.g. ADKAR-analysis), individual intervention by change managers/sponsor ○ Low/Positive: Motivated for change yet lacking competence; change specific-training required ○ Low/Low: Currently not ideal candidate/barrier to change, reconsider involvement and if necessary both define coaching/training needed
Change Promoter Agreement	• Objective is to ensure commitment and transparency of role and responsibility • Written agreement between the project lead (and sponsor) and the change promoter defining ○ the change promoters key role on the project

	○ the change promoters key responsibilities ○ the change promoters time commitment to the project ○ the support the change promoter can expect • The sponsor agreement and his/her commitment to the project should be reviewed and updated on a regular basis following questions such as: ○ Does the sponsor put in the time he/she committed? ○ Is he/she satisfied with the amount of support he/she gets from the project team/change team ○ ...
Change Promoter Plan	• Objective is to obtain a visible and agreed action plan • Action plan defining date and time of change promoter activities: What? Who? How? • The sponsor plan will continuously be updated in the course of the project
Change Promoter Forum	• Objective is to provide support and to continuously improve the change process • Regular group meeting/group coaching session of change promoters facilitated by change managers, either in person or via telecommunication (e. g. conference calls, WebEx sessions ...) • Forum to collect feedback on progress of change activity, issues and resistance encountered and changes in attitude, provide peer-to-peer feedback and support as well as change manager input on development of strategies on how to overcome encountered problems and strategies • A variety of more concrete tools like Stakeholder Analysis, Force Field Analysis and ADKAR Analysis can be used to gain a better understanding of a particular issue
Coaching/Supervision	• Objective is to provide individual support to change promoters • One-to-one coaching session where the change manager/coach supports a change promoter to deal with a certain situation/issue by using a variety of question techniques, e.g. scaling questions, circular questions, constructive questions etc. • Coaching is designed as an offer to change promoters – frequency and duration of coaching intervention depends on need and demand by change promoters • Sessions are characterized by an appreciative mindset and focus

	on resources and solutions • General sample outline of coaching session: ○ Step 1: Clarify the objective/topic of the session ○ Step 2: Analyze the situation focusing on actual, observable behaviour and less on perceptions and interpretations ○ Step 3: Develop solutions on how to improve the situations and resources required ○ Step 4: Define tasks and strategies to move forward
Force-Field Analysis	• Objective is to develop an understanding of the current status of the change process with a focus on driving and opposing forces • Framework to analyse driving and opposing forces on the organizational/structural level that influence the change project. The basic idea is that driving forces must outweigh opposing forces for change to go forward. • It can for example be used within the project team or as part of a change promoter forum. • The analysis can either be conducted solely relying on input/creativity of participants or the facilitator can pre-structure potential forces along classic dimensions of organizational analysis: strategy, structure, systems, values, skills, people, leadership • Step 1: The facilitator prepares a flipchart template that has the focal change project depicted on a vertical line; driving and opposing forces are arranged to the left and right of this line • Step 2: Using the pre-defined structure or open brainstorming, the participants discuss forces that currently support or oppose the change acctivity. The facilitator arranges the idea on the prepared flipchart by means of post-its. • Step 3: The participants develop strategies on how to reduce opposing forces and increase driving forces
ADKAR-Analysis	• Objective is to develop an understanding of the current status of the change process with a focus on the degree of involvement of people/staff • ADKAR is a framework to analyze and diagnose the current state of the change process, the progress in achieving the change as well as resistance and obstacles • It helps to structure the various factors driving or inhibiting the change and provides the basis for developing individual- or

	organizational/group level intervention strategies • The Framework can be applied to individuals, groups and whole organizations • The basic idea is that for change to happen, an individual/group/organization must progress through five sequential stages: ○ Awareness of the need to change ○ Desire to participate in and support the change ○ Knowledge of how to change ○ Ability to implement the required behaviours ○ Reinforcement to sustain the change • The current state of the change process can be diagnosed by means of standardized set of items by which the achievement of issues related to the above stages is rated on a scale of 1 to 5 • Such a rating process can be performed in settings of focus groups, large scale questionnaires to employees or third-party evaluation by change promoters
Intervention Plan	• Objective is to ensure coherence and visibility of change activities • Action plan structuring and integrating the different change activities of change managers, change promoters, and change sponsors • In doing so the intervention plan synthesizes the activities of the sponsor plan and change promoter plan • Starting with the issues identified by means of promoter forums, stakeholder analysis, Force Field analysis and ADKAR analysis, the action plant defines the What, the Who, the How and When of the different efforts and interventions that are required to advance the change • Provides an overview on activities and timeline and helps to plan and structure resource deployment
Fair Fight (Conflict Management Technique)	• Objective is to solve conflicts between individuals • Individual (pairs) or group-level intervention designed to ease a severe conflict between two parties. • Very structured and solution-oriented approach. • Step 1: Change Manager sets the stage and allows each party to articulate their irritation/concern in a given time limit. Initially, the other party is only allowed to listen but will subsequently

	repeat what was said to him/her in his/her own words (without explanations or accusations etc.). Attention is paid to short and precise phrases. • Step 2: Both parties are asked to bring forward several suggestions as to how to deal with the issue in future – these suggestions will most probably respect the interests of both parties. Each party might seek support/consult itself with others. • Step 3: Allowing for enough discussions on pros and cons, potential risks and future scenarios both parties are coached to arrive at a solution to the conflict. • The core objective of the approach is to teach respect for opposing opinions and to enable the parties to jointly find a solution and ensure future cooperative work.
Confrontation Meeting (*Conflict Management Technique*)	• Objective is to solve conflicts between groups • Group-level intervention designed to identify and address existing conflicts between two groups in order to improve cooperation between the parties and reduce prejudices • At the outset, the change management facilitator establishes feedback rules and explains the procedure • Step 1: Using flip-charts, both groups separately work out answers to the following three questions: What is our perception of our group? What is our opinion of the other group? What do we think is the other's group perception of us? • Step 2: Both groups present their results to the plenum. In a subsequent, respectful discussion the core problems are identified and solutions are worked out (resulting in a detailed action plan including activities, responsibilities, timeline etc.). • The core value of the approach is to disclose prejudices and misunderstandings and create mutual understanding.
Team Building	• Objective is to improve the performance of a group • Group-level intervention designed to improve the cooperation and performance within one group • Variety of approaches/techniques possible (see above MBTI-based Team-building), the approach outlined here is accessible and can be used on a variety of levels of the organization • The change manager prepares an Excel-based questionnaire containing a variety of team-performance relevant dimensions, e.g. trust, communication, conflict management, competency

	etc. • Step 1: Team members separately rate the performance of their team on each of the above dimensions on a scale of 1 to 10. This can either be done electronically up-front or paper based during the session • Step 2: The changer manager/facilitator combines the ratings to calculate an average group score for each dimension as well as to calculate spread of scores • Step 3: Facilitated by the change manager, the group discusses the evaluations, especially trying to achieve a common understanding of areas with a high spread of scores and focusing on solutions improve weak areas (e.g. average score lower than 5)

Stage 4 – Safeguard and sustain

The overall objectives of the "Safeguard and sustain"-Stage are to stabilize and reinforce the new (changed) behaviour and to evaluate the success of the change process.

The basic step towards the first objective has already been taken in the previous stage by aligning systems and structures to the desired future behaviour. However, in the final stage of the change framework, we step back and review whether the intended change in behaviour and values has actually taken place. If that is not the case, a feedback loop to the previous stages is initiated and corrective interventions are put into place.

Both the achievement of the business objectives, as well as the achievement of desired changes in behaviour/values, are an essential component in evaluating the success of the change process. Applying the change management principles to the AR Change Management Framework itself, it is however also important to collect the feedback of stakeholders in regard to their satisfaction with the process.

Consequently, Stage 4 results in two main deliverables:

- An evaluation of the success of the change process with regard to intended changes in behaviour/values
- An evaluation of the success of the change process with regard to the satisfaction of stakeholders

To this end, two distinct activities are performed in Stage 4:

- Review changes in behaviour/values
- Conduct change feedback interviews

These activities are specified in the following table:

Activity	Participants	Objectives	Tools & Methods
Review changes in behaviour/ values	AR project team, change promoters, further participants depending on method	• Evaluate the success of the change process by comparing the "as-is" behaviour against desired "to-be" behaviour • Analyse discrepancies • Initiate corrective actions/follow-up interventions	• Qualitative behavioural change analysis • Large-scale core value analysis
Change feedback interviews	LR Change managers & selected interviewees/ stakeholders	• Evaluate the satisfaction with the change process • Collect feedback	• Semi-structured questionnaire employing scaling questions, open questions, associative questions and circular questions

The following table details the above mentioned tools and methods:

Tool/Method	Description
Behavioural change analysis	• Objective is to qualitatively assess the achievement of the desired changes in behaviour • Can be done in various settings, e.g. the project team, a change promoter forum etc. • Step 1: On a flip-chart, prepare a template-table consisting of three columns: Stakeholders/constituency/employee group, a scale of 1 to 10, desired behaviour • Step 2: List the various stakeholders etc. and describe their desired behaviour • Step 3: On a scale of 1 to 10, evaluate the extent to which the desired behaviour has been achieved and describe the behaviour you relate to that score • Step 4: Drawing on previous evaluations, also note the previous score of desired behaviour and compare scores • Step 4: Discuss corrective actions/solutions for stakeholders with a total score below five, for those who have made insignificant progress or have even deteriorated; initiate more detailed analysis were necessary

Core value analysis	• Objective is to evaluate the adoption of desired values by means of a large-scale quantitative assessment • Stage 1: Select a representative sample of employees. Conduct short interviewees to indentify core values by means of means-end-questions: Describe how you perform a main activity of your job? Why do you perform it this way? Why is that important to you? • Stage 2: Construct a value map and successively narrow down values to 20 or 30 • Stage 3: Prepare a questionnaire containing items to assess the means-end-relationship between the identified values as well as to assess the importance of the values • Stage 4: Send-out questionnaire to large sample of employees • Stage 5: Conduct analysis and document results • Stage 6: Construct Core Value Statement

Communication

For the best possible support of the change management effort, the communication stream needs to address the following questions:

- Why do we need to communicate?
- To whom do we communicate?
- What do we communicate?
- How do we communicate?
- Who is communicating?
- How do we measure the effectiveness of the communication?

[An overview of Communication Requirements is contained in Appendix 6]

WHY?

To answer this first question, we need to establish communicational goals. To achieve the organisational engagement needed for Asset Reliability, there are four phased goals of the Communications Plan:

1. Create general awareness
   Generate initial awareness, interest and enthusiasm and maintain momentum

2. Build deeper understanding
   Move Asset Reliability from the abstract into the realm of reality for all relevant target groups

3. Inspire personal commitment
   Ensure acceptance, understanding and mastery of the new Asset Reliability concepts

4. Drive high performance
   Instill Asset Reliability as a way of life at Transocean

These phases of the communicational process will have to take place on several levels simultaneously: the overall project until final implementation of Asset reliability as well as for any project stream within that overall project during Phases 2 and 3 (and maybe even beyond).

TO WHOM?

Secondly, we need to understand our audience(s). The final target groups for communication will only come out as the result of the stakeholder analysis in the Change Management Framework at the beginning of Phase II, but potentially the following – internal and external - entities might be included:

- Senior management (headquartered in Geneva)
- Senior management (headquartered in Houston)
- Other Asset/Performance management at corporate level
- Asset/Performance management at regional/divisional level (on-shore)
- Rig supervisory staff (off-shore)
- Rig crews (off-shore)
- Supply Chain Management Transocean
- Vendors
- Customers
- Shareholders

It awaits to be discussed further whether each of these entities can be treated as a homogeneous target group or whether we need to further differentiate for successful communication (e. g. to cater for regional and/or cultural differences and/or "Colors").

To adequately communicate critical information to employees based around the world and increase understanding and participation, key materials will be translated from English into a core set of additional languages:

- Norwegian

- Portuguese
- Hindi
- Malay

With this set of languages we will best reach the majority of employees for whom English is not the first language.

WHAT?

Once the target groups have been defined, communication needs to generate the key messages. Most probably, some of the key messages will be applicable to all target groups, but there will be a considerable portion of communication which requires customising to each of the different target groups.

These key messages are oriented towards the four communicational goals and change accordingly with the respective project phases. For the best results of communication, quality and consistency of these messages are crucial as well as the adequate frequency. Plus all of the messaging needs to be in line with Transocean's FIRST Core values as well as corporate communication guidelines.

The crafting of the key messages builds on the following generic framework:

> "Here is ***what*** we need to accomplish. We have made the following decisions. This is ***how*** we propose to proceed. We will keep you informed of results. Here is ***why*** we are pursuing this particular strategy. This is ***why*** it is so important to our success. Here is ***why*** you should care. Here is ***what*** we expect of you if we are to achieve our collective goals."

It is the telling and retelling of the *what* connected with the *why*, the *how* and the expectations of individuals that makes the story and line of sight come alive for all recipients.

HOW?

To most effectively transport the key messages to the selected target audiences, the right combination of communication channel (transport mechanism of the message) and communication tactic (material and/or approach) gets defined for each target group. Possible communication channels comprise:

- Personal communication (staff meetings, presentations, workshops, trainings ...)
- Telecommunication (telephone(conferences), web sessions, videoconferences ...)
- Electronic communication ("Asset Reliability" section on Rig Central (intranet), "FIRST News" (Bulletins/updates from corporate departments), "FIRST online" (news section on Rig Central), E-mail, TVs in common areas of rigs and offices, Podcasts, ...)
- Print communication ("Beacon" employee newsletter (formerly "First monthly"), department newsletters, posters in common areas of rigs and offices, ...)

Looking into the responses from the change management interviews personal communication is attributed the highest success factor of all channels. A corporate communications survey published in FIRST monthly in November 2008 showed the following preferences of employees for receiving information (in order of preference):

1. Rig Central (intranet)
2. "FIRST Monthly" (now "Beacon")
3. "FIRST News"/Personal interfacing with managers and supervisors/"FIRST Online" (employee communication website accessed through Rig Central)

To avoid unwanted information the aim is to build opt-in options wherever applicable. Plus, we need to create channels for any feedback to the Asset reliability project.

WHO?

We cannot help but communicating all the time, so non-communication is not even an option. The first thing to realise is that all members of the AR project team as well as all other Transocean employees involved in or concerned with asset reliability will be seen as ambassadors of the cause. We need to use and direct all of these people for the benefit of the project to ensure consistent and timely communication instead of leaving it up to the rumour mill.

Plus there will be full-time communications manager on the project, supported by a part-time assistant in close alignment with the corporate communication staff from Transocean. The responsibilities of this role include:

- Execute the communications strategy
- Understand the Transocean organization and the strategic direction of AR to advance the business priorities while ensuring alignment with corporate vision and messages
- Collaborate with counterparts within Transocean, helping ensure communications are flowing up, down and across the organization
- Manage content of the AR section on Rig Central (employee intranet)
- Initiate and drive activities – meeting regularly with AR project team leaders, making recommendations, looking for opportunities, listening for problems that could be solved with better communication, monitoring and adjusting activities
- Develop compelling content, applying professional techniques for writing and editing.
- Continually monitor channels and tactics, making adjustments/corrections to the communication plan

- Benchmark and research best practices in communication and adopt and adapt them to suit the organization's needs and culture.
- Measure success at key intervals, identifying communication-related gaps and adjusting the communication plan accordingly.

It is considered essential for the AR Communication team to visit a sample rig and sample regional office to develop an understanding of the people with whom we are communicating.

Once the project goes into the business units, regional points of contact for communication should also be established.

HOW TO MEASURE?

A key element of the communications plan is a measurement strategy to assess how well the plan is meeting its goals during each stage of the plan. Measurement data can depict where a strategy is creating success and illustrate where it may be stalling and in need of a course change. The feedback from the target groups is the backbone of a good communication strategy because it supports or changes the proposed approaches.

Measurement will be about the following three areas:

1. Communication activities (message content, channels/tactics used, frequencies)
2. Audience perceptions (Messages received, channels used, messages remembered, messages believed, messages considered relevant)
3. Audience actions (more of/less of in relation to targeted behaviour, behaviourial differences, feedback provisions)

Insights, issues and ideas will be leveraged from the feedback received through all of the measurement tools to enhance the communication strategy and tactics – expanding tools and programs that are working and dropping those that are not.

Roles and responsibilities

Bringing forward the change intended by the AR project requires the combination of a variety of resources – both on the side of LR as well as on the side of Transocean. Given the global scope of the AR project, one of the main challenges will be to tailor the Change Management Framework to the specific cultural contexts. Experience from similar project shows that this can be best achieved by combining the following two measures:

1. Providing LR change experts that have experience with working in multicultural contexts and are familiar with the specifics of the respective region

2. Assigning dedicated regional Transocean Change management contacts to complement and support the LR Change experts with first-hand knowledge of local/regional Transocean specifics

Consequently, and as noted in the description of the various activities, there are five distinct roles which need to be performed to bring the Change Management Framework into action:

1. LR Change Lead
2. TRANSOCEAN Lead Change Sponsor
3. LR Regional Change Management Teams
4. TRANSOCEAN Regional Change Management Contacts
5. TRANSOCEAN Change Promoters
6. LR/TRANSOCEAN Project Team

The responsibilities of these roles and required competencies are detailed in the following table:

Role	Responsibilities	Competencies
LR Change Lead	• Overall responsibility for AR Change Management • Decide on and align framework • Coordinate activities within change team and across entire AR program • Represent Change Management in steering committee • Main face-off for TRANSOCEAN Lead Change Sponsor	• Senior professional with proven track record • International change management experience in corporate environment • Proven leadership skills • Excellent communication, facilitation and influencing skills
TRANSOCEAN Lead Change Sponsor	• Provide senior executive backing for the entire duration of the project • Participate actively and visibly throughout the project • Communicate to employees • Engage in change interventions where required • Ensure resources	• Respected leader and communicator • Strong relationships with key stakeholder • Access to/control over financial resources for project • Responsible for people/ organizational units affected by change
LR Regional Change	• Bring the Change Management	• Change management or training

Management Teams	Framework into action • Manage the "soft" side of change: attitudes, doubt, resistance etc. • Facilitate individual level and organizational/group-level interventions • Coach and support TRANSOCEAN Change Promoters • Coach and support the Project Team	experience • Familiar with change management tools and methods • Sensitivity of organizational dynamics • Excellent communication, facilitation and influencing skills
TRANSOCEAN Regional Change Management Contacts	• Support Change Management Teams in bringing the Framework to action • Provide Change Management Team with local contacts • Support Change Management Team in customizing the Framework to local/regional cultural requirements	• HR/Training background • Familiarity with local/regional specifics • Good Transocean-internal network and relationships • Good communication skills
TRANSOCEAN Change Promoters	• Primary drivers of change by means of one-to-one and one-to-many interactions with employees • Communicates and "sells" the change initiative to employees • Helps employees to achieve the change • Provides feedback to Change Management Team and Project Team	• Direct responsibility for employees affected by the change • Experience with change processes • Proven interpersonal skills, communication skills, facilitation skills,influencing skills, organization skills
LR/TRANSOCEAN Project Team	• Design and implement the AR "content" • Provide effective program and project management and manage the "hard" side of change • Provide input to Change Management Teams were required	• N/A

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Appendix 5: Operational Organisation - Human Element Report

See stand alone report

Title: Operational Organisation Report
Date: March 2009
Author: **Barnaby Annan**
Senior Consultant
Human Engineering Ltd.

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Appendix 6: Safety Initiatives / Training Review

See stand alone report

Title: Safety Initiatives / Training Review
Date: 26th March 2009
Author: **Megan J Brown**
Principal Consultant
Lloyd's Register

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Appendix 7: Rig Condition Assessment & Dry Docking

See stand alone report

Title: Rig Condition Assessment & Dry Docking
Date: March 2009
Author: **Robert Headley**
Marine Consultant

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Appendix 8: Communication Plan

See stand alone report

Title: Communication Plan
Date: March 2009
Author: Lori Malone

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Appendix 9: Phase II & 3 Implementation Schedule