

## Woodside Petroleum 'Tool Time' Optimisation Project – Karratha Gas Plant

Improve maintenance tool time and planning efficiency



“Renoir brought structure to the problem, and showed us the need for a strong plan, and that we need to stick to the plan”

**Gregoire Fifis**  
*Production Excellence Manager*

### Key Results

Increase in Tool Time of 27%

Improved Active Supervision  
from 5% to 37%

Resource utilisation  
increased by 37%

Balanced suite of maintenance KPIs developed to drive sustainable Tool Time performance

Improved Work-Order standards and quality

Integrated Management Control System developed to manage resource loading and more accurate job estimation and resourcing

- Improved reliability from more punctual equipment maintenance and reduced return-to-service time

With an investment of more than A\$29.5 billion, the Woodside-operated North West Shelf (NWS) facilities constitute Australia's largest oil and gas resource development and currently account for more than one third of Australia's oil and gas production. The NWS facilities include the Karratha Gas Plant (KGP), one of the most advanced integrated gas production systems in the world, producing LNG, domestic gas, condensate and LPG.

Located north of Perth, and covering approximately 200 hectares, the KGP facilities include five LNG processing trains with a total capacity of 20.7 million tonnes per year, two domestic gas trains, six condensate stabilisation units, three LPG fractionation units as well as storage and loading facilities. NWS facilities also include the North Rankin Complex consisting of two offshore production platforms.

### PROJECT OBJECTIVES

The main objective was to increase tool time performance of the maintenance crew at the Karratha Gas Plant by at least 10%. As part of this objective, Woodside were keen to understand current levels of performance, the opportunity available and the how to close the gap in a sustainable way. In addition, it was important to develop an agreed definition of 'tool time', such that KPIs and targets could be set, and performance continually improved over the longer term.

### PROJECT APPROACH

With the agreement of Woodside, the project approach followed the Renoir Focus Process<sup>®</sup> with three phases – Definition (or Discovery), Development and Installation.

The assignment ran as a 45 week programme – the first phase piloted changes in trains 4 and 5 (as a 'Proof of Concept'), with the subsequent roll-out to the remaining trains (1,2 and 3) in a second phase.

The full-time Task Force consisted of two Renoir consultants and four Woodside staff. Overview by Woodside was provided by the Steering Committee (consisting of senior Woodside and Renoir personnel) and the Management Action Team (MAT). The latter consisted of Woodside personnel on a part-time basis who were tasked with delivering the results in their own area of responsibility.

### DEFINITION & DEVELOPMENT

As part of the Definition or Discovery Stage, 26 shop floor observations of staff in their role, 4 fully critiqued 'Brown Papers', process maps and a comprehensive suite of desktop based analysis yielded in excess of 800 issues. 35 of these were deemed as critical and were selected for resolution. Capacity and bottleneck analyses of the Planning and Permitting process were also conducted.

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“...we are now doing more work than we have ever done...”

**KGP Maintenance Technician**

The following actions were identified, planned and executed:

- Install a suite of integrated, balanced KPIs, to drive sustainable Tool Time performance.
- Develop and install a Tool Time capture and measurement system to support the management reporting system.
- Install a management control system to focus attention on process drivers and manage variance out.
- Enhance the planning process and behaviours to drive increased resource loading and more accurate job estimation and resourcing.
- Improve delivery of work to the scheduled day by installing Plan-Do-Review (PDR) meetings to provide greater visibility.
- Increase maintenance/operations engagement and communication to improve work execution.
- Install a Visual Management system to drive engagement and process status and visibility.
- Reduce the churn and burden on the Integrated Safe System of Work (ISSoW) to release latent capacity to better load maintenance schedules.
- Install a Short Interval Control supervisory system to better control the work at the point of execution.
- Install “Standard Days” for supervisory and planning roles.

#### INSTALLATION

The opportunities related to multiple contributing issues, each of which required resolution through an integrated solution. The development of the Management Control System (MCS) allowed these issues to be addressed in a consistent and coordinated way.

#### SOLUTIONS IMPLEMENTED

- Management Control & Reporting systems that drive required behaviours.
- Information Management system that centralises data and converts it into operational information.
- Standardised operational rates to optimise planning and set expectations.
- Supporting Management behaviours.
- Scheduling and Planning processes that optimise resources.
- Variance management systems that identify and eliminate the underlying cause of deviation to plan.
- Minimised the burden on the Integrated Safe System of Work (ISSoW).
- Provide visibility to the technicians and control task allocation.

#### RESULTS

As well as the Key Results, a step change improvement in Tool Time has led to greater job satisfaction – “supervisors are now supervising, and planners are now planning”. The success of the approach led to further assignments to increase Tool Time for the North Rankin Complex and to improve the efficiency of the Integrated Safe System of Work.

The Tool Time Project has fostered a better understanding, at all levels, in measuring their success and addressing the root causes of variances. It also crystallised the need for better definition of roles within the operational functions. This in turn has allowed Woodside to develop a firm foundation to achieve the next level of performance.

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