The oil and gas industry is facing an uncertain and difficult future. The breakneck speed of the recent oil price crash has taken the industry by surprise and if the media reports are to be believed, close to collapse. The effect of the oil price crash has been dramatic, with much of the industry still coming to terms with the effects of a five-year low continuing to decimate budget and investment forecasts. This crisis couldn’t have come at a worse time. The cumulative effect of year-on-year cost inflation, poor production output and falling reserves is forcing many operators to take unprecedented action.

At an operational level, costs are being heavily challenged, contractor rates squeezed and there is an ongoing threat of widespread job losses – some commentators have suggested that redundancies could rise to 37,000 in the UKCS alone. OPEX is not the only area being squeezed, with a number of high-profile investments already shelved for the time being.

If the doomsayers are to be believed, few projects sanctioned in the North Sea are profitable below $60/barrel. Even the once mighty Nordic region is not able to escape the effects of the downturn, with high profile exploration activity in Artic waters no longer economically viable. This is likely to leave upwards of 1B barrels undeveloped for the foreseeable future.

Quick wins may help short-term but are wholly inadequate for dealing with the enormity of this challenge.

Of course the industry needs to look outwards and lobby governments to relax fiscal regimes, however it also needs to look inward at what can and must be improved at an operational level.

The situation calls for better stewardship of assets. Inefficiencies that have remained largely hidden and below the surface are being increasingly exposed as more of the cost and operational inefficiency iceberg comes into view.

Many high-cost areas are the result of known and longstanding challenges which have been deemed too difficult to tackle in the past. By their very nature, they call for innovation and a fundamental shift in mindset together with new approaches. Adjusting processes and developing new tools won’t be sufficient.

“We want small changes, work on your behavior; if you want quantum leap changes, work on your paradigms.”

- Dr Stephen Covey

- Oil price at a five-year low
- Operating costs at an all-time high
- Few investment projects viable at current price
- An opportunity for radical change and reform

What is needed is innovation and creativity on an industrial scale.

Those who emerge from this storm fitter and more agile will be those who openly embrace new paradigms and possibilities and are prepared to work through the challenges and complexities that will inevitably arise.

Paradigms – barriers or opportunities?
- Performance is often limited by beliefs about what is and isn’t possible
- Performance is also limited by differences in opinion about what is or isn’t important
- Behavior is often bound up in custom and practice
- Expertise can become a barrier
- Paradigms set a functional limit on attainable levels of performance
- Higher performance can be accessed through adoption of new paradigms
Engaging and energizing

In times of crisis, speed and a sense of urgency are critical. So too is the ability to convert urgency into focused action in a way that keeps individuals engaged, motivated and energized. Traditional approaches involving lengthy and complex analysis can have the opposite effect and inadvertently demotivate. The emphasis needs to create new possibilities rather than dwelling on what isn’t working or hasn’t worked in the past.

Rapid, high-intensity, results-oriented approaches have been shown to produce more innovative and creative solutions, allowing existing operating models and paradigms to be challenged and new ones to emerge. Lastly and importantly, this exercise is about delivering rapid improvement, which means that the organization needs to see evidence of bottomline impact quickly.

Hitachi Consulting has developed an approach which will deliver a 100-day-plan detailing the specific actions and timing of actions to achieve the overall objective.

Getting started

Starting the process means getting focused and in our experience focusing on four specific areas can yield significant short-term improvements. These four focus areas are opportunity targets where Hitachi Consulting has experience and a track record in delivering significant benefits for its clients.

The Rapid Cost Optimization (RCO) process is designed to deliver benefits quickly and effectively. It is designed to be flexible enough to accommodate different client needs ranging from a comprehensive review of the OPEX budget to preselected and more focused areas of potential business benefits. The outcome remains the same – fast-paced, bottomline impact.

1 Desktop assessment and challenge workshops

The purpose of the desktop assessment is to understand the cost structure and major buckets of spend. Understanding historic trends can also point to potential problem areas and loss of control. Based on our experience and benchmarking data, we are able to identify possible areas of opportunity where further analysis would be beneficial.

In parallel, we conduct a series of challenge workshops. The purpose of these workshops is to engage and involve stakeholders in the process. Buy-in is key, so we encourage early involvement of influencers and stakeholders. Workshops focus on what might be possible and to agree the conditions that would be necessary to move from possibility to implementation. The process encourages individuals to surface concerns as well as practical barriers that would need to be addressed before any changes could be made.

2 Discreet impact areas

Discreet areas of impact are either the result of a desktop assessment or may have been preselected by the client through internal efforts. Either way, the purpose of the exercise is to conduct a deep dive to better understand both the underlying cause as well as the scale of the opportunity. In common with the desktop exercise the objective here is to use a combination of traditional levers together with an emphasis on changing and stretching thinking to increase the size of the potential benefits pot.

The Rapid Cost Optimization Focus Areas

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Key Areas</th>
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</thead>
<tbody>
<tr>
<td>Organizational Effectiveness</td>
<td>• Offshore rota patterns</td>
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<tr>
<td></td>
<td>• Lean support functions, multi-tasking and productivity</td>
</tr>
<tr>
<td></td>
<td>• Third-party support, outsourced services and IT infrastructure</td>
</tr>
<tr>
<td>Inventory and SupplyChain</td>
<td>• Inventory management policies</td>
</tr>
<tr>
<td></td>
<td>• Spares, obsolescence and redundancy</td>
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<tr>
<td></td>
<td>• Warehousing, logistics and vendor management</td>
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<tr>
<td>Contractor Service Delivery</td>
<td>• Standard setting, leadership and integration</td>
</tr>
<tr>
<td></td>
<td>• Preparation, planning and communications</td>
</tr>
<tr>
<td></td>
<td>• Activity execution, service levels and cost effectiveness</td>
</tr>
<tr>
<td>Labor Productivity (Wrenchtime)</td>
<td>• Supervisory capability and capacity</td>
</tr>
<tr>
<td></td>
<td>• Permitting, material availability and contingencies</td>
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<tr>
<td></td>
<td>• Working practices, expectation setting and waste elimination</td>
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</tbody>
</table>

The Rapid Cost Optimization Process

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand OPEX</td>
<td>OPEX / CAPEX</td>
<td>Design Challenge</td>
</tr>
<tr>
<td>Circumstances</td>
<td>Assessment</td>
<td>Workshops</td>
</tr>
<tr>
<td>and P&amp;Ps</td>
<td></td>
<td>Validated &amp;</td>
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<tr>
<td></td>
<td></td>
<td>Prioritized Business</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cases</td>
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<tr>
<td></td>
<td></td>
<td>100 Day</td>
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<tr>
<td></td>
<td></td>
<td>Implementation Planning</td>
</tr>
</tbody>
</table>

For the ‘discreet impact area’, the process collapses into 2 weeks overall.
Rapid and impactful change calls for innovative thinking and challenging paradigms

Paradigms are often the limiting factor in positioning the business for the future. Adopting new paradigms can provide access to previously unattainable performance levels. For example, Kanban transformed the way in which manufacturing industry managed inventory. Onshore Operations Centers are another example of how the operations paradigm in the Oil and Gas industry has changed in recent years.

The success of any cost challenge program is dependent on reserving judgement, working opportunities thoroughly and resisting the temptation to close any down too early. Facilitation plays a key role, providing challenge and structure, testing and probing different perspectives as each idea progresses through the opportunity hopper.

Inputs into the rapid cost optimization process

Hitachi Consulting has supported over 200 change programs in E&P – from fully integrated super-majors to small but growing independents, from the North Sea to the North Slope. During this time we have built a best practice repository against which we can benchmark your current performance and provide the know-how and support to take your performance to the next level.

Our approach facilitates rapid identification of possible cost optimization opportunities through a combination of internal business knowledge, external performance comparisons and by encouraging individuals and teams to think creatively.

Typically, we find that a war room environment is the right setting and catalyst for change and quickly becomes the hub for collecting and reviewing data and ideas. As well as formal analysis and review, we adopt an open door approach and encourage individuals to share ideas informally.

Creative thought cannot be forced but needs to be nurtured and ideas can sometimes take time to mature. When conditions are right, the process quickly gathers pace and momentum.

Options are evaluated from the perspectives of financial and practical viability, taking into consideration any risks and requirements for risk mitigation. As opportunities move through the hopper they are either accepted or rejected. If accepted and signed off, they are categorized and ranked. Each opportunity has its own business case providing insight into the nature and detail of the proposal.

Opportunities that make it all the way through the process enter the 100-day phase for detailed planning and scheduling. At the same time, the process calls on rigorous stakeholder management and communications to ensure continued involvement and engagement.
Business case example

The business case example shown below illustrates both the simplicity and rigor of the process. The purpose is to avoid burdening the organization with excessive administrative tasks and paperwork and to provide a clean and simple framework to aid and facilitate quick and effective decision making. This minimizes the time it takes to move from idea to implementation and realization of benefits.

1. Subject and total yearly saving

Turn off platform gas turbines when not required - potential average yearly saving of £274,000 and increase in revenue of £2.37m.

2. Background

The maximum power generation and consumption components of the platform are as follows:

<table>
<thead>
<tr>
<th>Generation</th>
<th>MW</th>
<th>Consumption</th>
<th>MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Lopper</td>
<td>6.0</td>
<td>Oil Export</td>
<td>6</td>
</tr>
<tr>
<td>GT1</td>
<td>23.5</td>
<td>Gas Export</td>
<td>14</td>
</tr>
<tr>
<td>GT2</td>
<td>23.5</td>
<td>Flash Gas compression</td>
<td>5</td>
</tr>
<tr>
<td>GT3</td>
<td>23.5</td>
<td>AGI</td>
<td>10</td>
</tr>
<tr>
<td>Water Injection</td>
<td>21</td>
<td>Platform Support</td>
<td>5</td>
</tr>
<tr>
<td>Drilling</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>76.5</td>
<td></td>
<td>66</td>
</tr>
</tbody>
</table>

The platform therefore has a considerable excess in generating capacity, even if AGI is included. In 12 months, water injection capacity will reduce by the equivalent of one pump (7MW) and one gas export compressor (7MW) will not be required. If drilling also ceases the total power demand will fall to 47MW.

Under normal running conditions, one of the RB211 gas turbines will not therefore be required.

3. Proposal

Shut down one of the gas turbines whenever the spinning reserve indicates it is not required. Depending on the spinning reserve this would be either the Peak Lopper or an RB211.

4. Financial benefits

By the end of the year, at any particular time, one RB211 should not be required. A GT changeout is normally done every 24,000 hours and costs £750,000. (An experiment is in progress to determine whether this can be extended to 30-32,000 hours.) This gives an equivalent cost in excess of £20 per hour or £274,000 per year.

An RB211 burns 5 mmscf per day of gas with a value of £1,300 per mmscf. The increase in revenue by selling this gas instead of burning it would be £2.37m per year.

Currently the Peak Lopper is not required providing three RB211’s are available. If the Peak Lopper is run continuously the average yearly maintenance cost is £135,000 and fuel cost is £964,000.

The revenue increase would be immediate whilst the maintenance saving would be realised by being able to avoid a changeout at some point in the future.

5. Cost of implementing the change

None

6. Implementation environment

The savings and increased revenue could occur once one gas export compressor and one water injector pump are shut down. If drilling is also stopped, then the platform will once again have excess generating capacity.

7. Risks

7.1. HS&E

No safety systems would be affected by the proposal.

7.2. Business and Operations

If the generating output of the platform only just matches the consumption and one of the remaining gas turbines breaks down a number of systems would be lost.

The shutdown hierarchy is as follows:

- Water Injection
- AGI
- Flash Gas Compression
- Gas Export
- Oil Export
- Platform Support

With the Peak Lopper and one RB211 running all systems except Water Injection and AGI could be supported.

7.3. Human Resources

No effect

8. Training and support requirements

Control Room Technicians would need to be aware of the need to balance generating capacity with demand. A simple KPI system could be introduced to measure how well this is achieved.

Approved by: A. Jones
A world of possibility

Compared to more traditional methods, Rapid Cost Optimization has been shown to generate superior results. The reason for this is quite simple – traditional methods focus purely on gaps and try to find ways of improving the way things currently work. Rapid Cost Optimization, on the other-hand, removes the boundaries that often constrain out of the box thinking and limit an organization’s ability to consider what might be possible and what could be done differently. Clients are often surprised by how ingenious and inventive their people can be when they are given the opportunity and the tools to do so.

About Hitachi Consulting

Hitachi Consulting is the global solutions and professional services organization within Hitachi Ltd., a global innovation leader in industrial and information technology solutions and an early pioneer of the Internet of Things. Hitachi Consulting is a business integrator for the IoT era and a catalyst for digital transformation. Using our deep domain knowledge, we strategically collaborate with our clients to help them innovate faster, maximize operational efficiency and realize measurable, sustainable business and societal value. As a consulting-led solutions company, we can help you leverage data as a strategic asset to drive competitive differentiation, customer loyalty and growth. To learn more, visit www.hitachiconsulting.com.