

# OIL & GAS PORTFOLIO 16/17

Committed to solving the problems that really matter for global competitiveness through technology integration

[www.novasystems.com](http://www.novasystems.com)

A photograph of an oil and gas refinery at night. The scene is illuminated by artificial lights, highlighting the complex network of pipes, metal structures, and large storage tanks. In the foreground, there are several large, white, cylindrical storage tanks with corrugated metal siding. Behind them, a dense array of industrial equipment, including tall distillation columns and smaller processing units, is visible. The sky is a deep twilight blue. A semi-transparent white arrow graphic points from the top left towards the center of the image.

# OIL & GAS



## AUSTRALIA & NEW ZEALAND

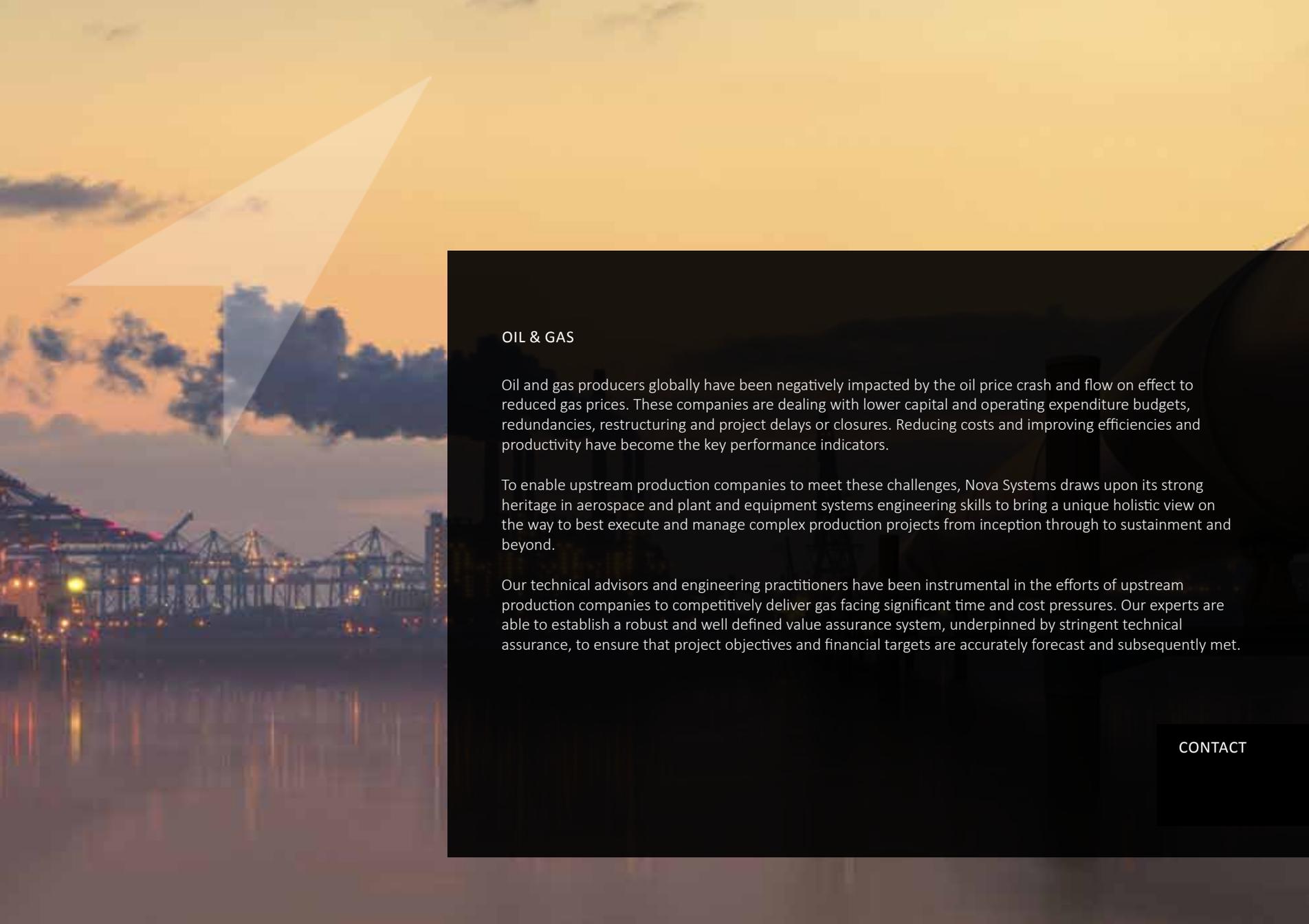


Energy and Resources companies globally continue to face significant challenges ranging from: the volatile nature of commodity prices; shareholder pressures to meet their return on investment objectives; and, the need to integrate new technologies within complex operating environments. In addition, there is continued and growing pressure from regulators to control rising costs while meeting customer and safety requirements. Reducing costs and safely improving efficiencies and productivity have become the key performance indicators.

To enable our clients to meet these challenges, Nova Systems draws upon its strong heritage in oil and gas, aerospace, defence, power, water and rail industries and complex systems engineering. We bring a unique and holistic view of the way complex systems interact, assuring the execution of complex capital, technology integration and asset management projects while meeting productivity, statutory standard and safety requirements.

Our people combine operating experience with highly developed system engineering skills, to enable our clients to gain the most value from their assets across the whole life-cycle. We work as part of integrated project teams to reliably and consistently develop and deliver projects on time, within budget and to required level of quality. We have a strong focus on early stakeholder engagement and achieving high client service standards.

Tim Anderson  
Program Manager- Energy & Resources  
[tim.anderson@novasystems.com](mailto:tim.anderson@novasystems.com)



## OIL & GAS

Oil and gas producers globally have been negatively impacted by the oil price crash and flow on effect to reduced gas prices. These companies are dealing with lower capital and operating expenditure budgets, redundancies, restructuring and project delays or closures. Reducing costs and improving efficiencies and productivity have become the key performance indicators.

To enable upstream production companies to meet these challenges, Nova Systems draws upon its strong heritage in aerospace and plant and equipment systems engineering skills to bring a unique holistic view on the way to best execute and manage complex production projects from inception through to sustainment and beyond.

Our technical advisors and engineering practitioners have been instrumental in the efforts of upstream production companies to competitively deliver gas facing significant time and cost pressures. Our experts are able to establish a robust and well defined value assurance system, underpinned by stringent technical assurance, to ensure that project objectives and financial targets are accurately forecast and subsequently met.

[CONTACT](#)

## CAPABILITIES

- Operational resilience analysis, reviews and recommendations
- Power use and power cost reduction analysis, reviews, recommendations and initiatives implementation
- Asset data and engineering management frameworks
- Completions, commissioning and handover process delivery and optimisation
- Safety-critical communications
- Field operations telecommunications engineering
- Capital project management systems development and implementation
- Unmanned aerial vehicles feasibility studies, trials, and operations management
- Independent project engineering risk advisory
- Complex problem solving

**Tim Anderson**

Program Manager- Energy & Resources  
tim.anderson@novasystems.com

## OPERATIONAL RESILIENCE POWER USE & COST REDUCTION



**Highlights** Nova Systems was engaged to analyse, review and make recommendations regarding a major Australian upstream gas producer's power solution, particularly relating to the safer, reliable and long-term production of gas. Nova Systems also assessed the gas producer's Operational Resilience with respect to power and the security of electricity supply over the life of its production asset.

Nova Systems drew upon its detailed experience in numerous complex industries and applied its proven analysis and problem-solving approach to provide a fresh perspective to the power cost problem. The Nova Systems power solution team was co-located with our client and considered internal and external environment factors.

The outcome was a collaboratively prepared power vision for the gas producer with a supporting power roadmap, detailing the recommended power solution development path.

## APLNG UPSTREAM GAS INTEGRATION ADVISORY AND SUPPORT



**Highlights** Nova Systems was engaged by Origin Energy to develop a common understanding of the integration need, and then to provide a plan and toolset to start to manage the integration risk. The Nova Systems integration Process Model provided a basis for assessing the integration risk and filling gaps on the development project. Nova Systems systems engineering specialists conducted a gap analysis, which included an integral risk assessment. The risk assessment was to be used to confirm and address the main risks first, as well as inform the client of the risk they face.

Following the first recommendation, Nova Systems developed an Integration Strategy for the project with the integration objective being to effectively manage the staged connection of assets and services to ramp-up gas production and yield the APLNG production capability, with an acceptable level of risk.



# KEY EXPERIENCE

## UNMANNED AERIAL VEHICLES (UAV) FEASIBILITY STUDY



**Highlights** To improve efficiencies, Origin Energy decided to investigate the feasibility of using Unmanned Aerial Vehicle (UAV) Technologies to cost-effectively replace or enhance current practices in LNG activities.

Nova Systems was engaged to undertake this study and undertook a multi-phased approach to the UAV Feasibility Study. Nova Systems collaboratively engaged with Origin stakeholders to understand Origin's business needs and to identify a range of key objectives for assessing the value of UAVs to Origin. Nova Systems then engaged with stakeholders across the Upstream LNG business, to identify where potential existed for UAVs to replace or enhance existing processes. The results of this phase were captured in a Business Needs Analysis Report.

## INTEGRATED HSE & RISK MANAGEMENT FOR POWER GENERATION PROJECTS



### Highlights

Power generation related projects are subject to a myriad of HSE and Risk Management requirements throughout the system life-cycle, and for a range of project types. Projects involving outages are subject to tight seasonal time window constraints with little room for error.

The challenge was to provide Project Managers with an integrated, easy to follow yet scalable approach to HSE and Risk Management that fits their project delivery methodology, and is scalable to different projects.

Our client engaged Nova Systems, based on its experience in safety-critical systems, risk management, and project management. The first objective of this engagement was to perform a gap-analysis to provide solution options, and the second objective was to develop the client preferred solution.

Using a basic set of solution requirements was effective in resolving needs early in the development.

## UPSTREAM GAS FIELD FACILITIES COMPLETIONS & HANDOVER



### Highlights

Construction of the Upstream Gas Processing Facilities was conducted by two different construction contractors with our client as the Owner/Operator as well as performing the engineering, procurement and management aspects of the project. Lack of a standard, suitable Completions, Commissioning and Handover (CC&HO) process led to delays in completing the first gas compression train, putting at risk the critical first gas milestone for the Upstream project.

The challenge was to establish a CC&HO process that would allow the safe transfer of the first gas compression train from construction to commissioning, protect client interests as the Owner/Operator, and enable repetition across the remaining gas trains – all whilst keeping the project delivery schedule intact.

The problem was divided into two activities: an immediate, short-term solution to enable the safe transfer of Train 1 into commissioning; followed by an overhaul of the CC&HO process to enable the efficient delivery of all remaining gas compression trains.

## CAPITAL PROJECTS MANAGEMENT SYSTEM



### Highlights

After the peak of the CSG Upstream development, our client was aware they needed an integrated, company-wide Capital Project Management System (CPMS) to improve credibility through better meeting business objectives, making projects consistent, and further enhancing certainty in delivery. The client had sourced a basic CPMS solution, and the adaptation project initiative was sponsored by the client's executive suite.

The challenge was adapting the sourced solution to the client's requirements, integrating local processes, and rolling the solution out; all in concert with an ongoing business transformation that included business unit mergers, cost-reduction programs, and the downsizing of the organisation after the peak of CSG Upstream development.

As part of our advisory role to the Engineering Authority, Nova Systems was initially engaged to provide a first appraisal on the suitability of the base CPMS use for Engineering.



**KEY EXPERIENC**

## ADVANCED TELECOMMUNICATIONS ADVISORY AND SUPPORT



### Highlights

The Cooper Basin operations of one of Australia's leading independent oil and gas producers is undergoing a major technological transformation with the implementation of a private 4G broadband wireless network and a new generation digital mobile radio network. These networks will be a major enabler for a future intelligent oil and gas field that will deliver significant improvements in production and productivity, as well as Health Safety & Environment (HSE).

Nova Systems was engaged from the outset to develop the technology strategy and provide key input into the development of the supporting business case and technology integration. The technology strategy included the identification of an appropriate technology roadmap for replacing the existing narrowband radio telemetry system and analogue mobile radio systems

The expertise and knowledge provided by Nova Systems has helped reduced the risks associated with such a significant technology investment and helped keep the projects on track to deliver significant future benefits.

## UPSTREAM ASSET DATA MANAGEMENT



### Highlights

The challenge was to provide and roll-out a mechanism for managing the development of asset documentation and data in concert with asset certification steps, at the same time as full-scale asset development was taking place in the field.

The need to improve data and document delivery was a key recommendation from another Nova Systems task; a Scoping Study on Asset Configuration Management. And Nova Systems was tasked with addressing the asset data management problem. After a more detailed review of the status quo, Nova Systems developed two key solutions:

- Configuration Management Philosophy – this set the standard for CSG asset data management and control
- Technical Information Management Plan – in accordance with the philosophy, prescribe the staged development of asset data, synchronized with the certification stages, and focused on roles and responsibilities.

## FIELD DEVELOPMENT OPTIMISATION PROJECT



### Highlights

The challenge was to create a “right-sized” process that could support the well delivery rate and costs whilst maintaining safety, technical and quality standards. The revised process needed to be developed and implemented over an 8-10 week timeframe.

Nova Systems was engaged to apply its Gas Field Facilities completions and handover experience, in concert with our systems engineering problem-solving skills, to the wells and gathering problem. This began by challenging those areas of the existing process that contributed most of the inefficiency – the “sacred cows”. From this work two key principles were identified to drive the new process:

- Adopt a manufacturing-style acceptance process that leverages the repeatable nature of CSG wells rather than asset-by-asset acceptance; and,
- Change to a system-based field expansion method (well clusters) that delivers the fastest gas-to-plant process path, rather than the ad-hoc geographical method based on land access.





## ABOUT NOVA SYSTEMS

Nova Systems was formed in 2000, rapidly becoming one of the pre-eminent providers of specialist engineering services to the defence sector.

Today, Nova Systems employs more than 450 specialist consultants across Australia, New Zealand, the UK and Singapore, collaborating with its blue chip clients across industry sectors including oil and gas, utilities, aerospace, government, mining and rail.

We provide industry and government with world class, independent expertise. We work not just as consultants, but as trusted partners, as committed to your success as you are.

Our size and extensive network allows us to resource project teams tailored to specifically meet client needs and objectives, yet we remain nimble and flexible. We apply innovation and ingenuity, drawing on the talents and expertise of our people, applying cross-sector thinking, national as well as global perspectives and emerging best practice initiatives.

### Specialist services

- Commissioning and test
- Capability development and delivery
- Project development and delivery
- Specialist engineering design
- Certification and design approvals
- Operational and systems safety
- Asset management and logistics
- Training (registered RTO)

[www.novasystems.com](http://www.novasystems.com)



