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The Chairman  
Economics & Standing Committee  
Western Australia Legislative Assembly  
Parliament House  
Perth  
Western Australia 6000

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

26/08/2013

Dear Sir,

## **Committee Inquiry into the Economic Implications of Floating Liquefied Natural Gas Operations**

Further to the 22nd June 2013 advertisement in "The West Australian" and the letter addressed to me and dated 16th July 2013, I am pleased to inform you that Atkins would be very pleased to offer support to the Legislative Assembly of Western Australia in the subject area of Floating Liquefied Natural Gas (fLNG).

### **Introduction**

Atkins is one of the world's leading design, engineering and project management consultancies. Originally founded in 1938 in the UK, Atkins now employs circa 18,000 highly skilled staff across the globe.

Within the Oil & Gas sector, Atkins has provided unrivalled technical expertise and support for more than three decades. Our highly skilled teams are leading technical developments across the globe via regional hubs in Australia, Canada, Denmark, Middle East, Norway, UK and the USA.

Our work enables clients to make informed decisions about the projected success of a project from a technical, economic, legal and environmental perspective over the life cycle of a constructed asset. We also identify the risks and contractual liabilities and offer advice on mitigation measures. By working with us, our clients can benefit from our specialist knowledge of both risk and cost, and our broad technical spectrum of expertise. This results in a clear view of the "bankability" of a bid, project or acquisition, together with full visibility of the associated risks and options for risk mitigation.

Here in Perth, Atkins has been actively providing services to the Western Australia Oil & Gas Industry for the past 18 years.

### **Relevant Experience**

Atkins has a long history of working on onshore LNG liquefaction plants, and has now recently brought these skills to bear on FLNG projects. The range of engineering challenges that are presented by

FLNG technology are new for the offshore oil & gas industry and they demand best-of-class multi-disciplinary engineering in order to provide practical and credible solutions. Atkins is ideally placed to provide those skills, and is proud to be supporting this exciting new development in the industry. Atkins has been involved in over 90 FPSOs, in 23 countries. We have also been intimately involved in the development of the world's first FLNG projects.

I attach two relevant capability studies: -

- Floating Production Systems Capability Statement
- LNG & Gas Processing Capability Statement

Atkins recently presented to the Institute of Engineers Australia (IEAust) on the subject "Challenges of Managing Safety of FLNG on a Huge Scale". We are Gold sponsors of the LNG World conference that is being held in Perth 23rd to 25th September where we are both chairing and presenting the session on fLNG.

## How can Atkins help?

Our broad range of expertise and experience within the domain of Floating Systems and LNG production makes Atkins an ideal partner to both business and government. We provide independent advice on complex business problems at senior levels in the public and private sectors. We take a hands-on role to ensure solutions are not only conceived, but also delivered with genuine benefits. Atkins has been and continues to be one of the key providers of Engineering Safety and related services to Shell on their Prelude fLNG project.

As an independent Engineering Consultancy, Atkins is able to offer complete impartiality. We have no ties to particular technologies or approaches. It is this ability to offer a high quality Engineering perspective into this complex space that has enabled Atkins to become one of only a handful of global suppliers to Shell.

We have been offering Consultancy services within the area of fLNG for the past six years; given the naissance of the fLNG technology this puts Atkins in a unique position. With this experience in mind, our Consultancy Services would seem to be very well placed to support your requirements with particular emphasis within the identified area of "Engineering and Design".

I hope that this letter and the accompanying capability statements demonstrate to you that Atkins is very well placed to provide support to the Legislative Assembly of Western Australia. I await your confirmation of this and your instruction as to how we can proceed together.

Yours sincerely



Nick Wells  
Operations Director  
Atkins Australasia Pty. Ltd.



**Project: Ormen Lange UK Gas Reception Terminal,  
Client: BP**

Atkins undertook the concept design of two new Pipeline Reception Facilities (PRF) at the terminal. We generated the PRF designs, developed robust cost estimates and identified options for optimising the process scheme during pre-FEED. Subsequently Atkins carried out concept development and process optimisation studies for the UK Gas Reception Facilities, preparation of FEED tender technical package and ongoing support through FEED as independent adviser.

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**Project: Varanus Island, Australia  
Client: Apache**

In order to support the continued operation of the John Brookes hot oil circuit on Varanus Island, post installation of the Mars cooler and the waste heat recovery unit, a 5 MW trim cooler was design and installed.

Atkins was awarded the multi-discipline concept and detailed design for the tie-ins of the Mars trim cooler. The work package included procurement support and a safety and risk assessment of the new installation and its impact on the existing plant.

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**Project: Gorgon LNG, Australia  
Client: Chevron**

Atkins provided a rigorous steady state and transient analysis of the flowlines and export flowline, confirming slugcatcher sizing for various operating scenarios and identifying areas of optimisation with respect to both availability and cost such as pipeline insulation, MEG storage and MEG injection. Atkins provided process engineering expertise for the conceptual design of the subsea production system, flowline network and receiving facilities (slugcatcher and MEG regeneration system). Atkins has also provided extensive and comprehensive QRA studies throughout the Project lifecycle.

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**Project: Singapore LNG Terminal, Singapore  
Client: Singapore LNG Corporation Pte Ltd**

To meet the growing demand for electricity and enhance Singapore's energy security, Singapore has embarked on the development of a S\$1.5 billion Government funded LNG terminal facility. When completed, it will be Asia's first open-access multi-user terminal, capable of importing and re-exporting LNG from multiple suppliers. Atkins provided Technical Advisory Services during the pre- EPC phases; LNG Vapourisation Technology Review; LNG Terminal EPC ITT Preparation and Evaluation; Secondary Berth Concept and multidisciplinary Front End Engineering Design (FEED).

**To find out more  
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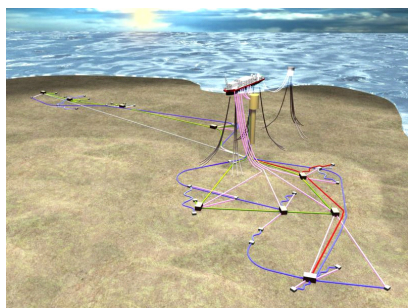
# Capability statement

## Floating production systems

**Atkins provides design, consultancy and assurance services for all floating offshore field development options.**

Our reputation for technical excellence is second to none and recognised globally through numerous past projects for major international oil companies and contractors. We provide independent services in both consulting and design, from seabed to export, with particular strengths in:

- Concept studies for complete floating systems
- Front End and Multi-disciplined Engineering Design
- Third party technical review and verification
- Specialist design analysis, including mooring and riser systems
- Transport, float-over and installation studies
- Design for structural integrity and through life asset management
- Operational Support



In support of these general capabilities, we have specialists providing support in:

- Naval architecture and hydrodynamics
- Structural analysis and system dynamics
- Subsea engineering design and analysis

- Process engineering and design
- Safety and reliability engineering
- Project management support



We are experienced in the design of the complete range of offshore systems, from wellhead to a facility's export flange, including topsides process systems. Our floating facility capabilities span:

- Spars, Tension Leg Platforms (TLP)
- Semi-submersibles
- Floating Production Storage and Offloading (FPSO) vessels
- Floating Production Units (FPU)
- Floating Storage and Offloading (FSO) vessels

Atkins has been involved in over 90 FPSOs, in 23 countries. We have also been intimately involved in the development of the world's first FLNG projects.

Typically, our involvement in a project begins with providing input into concept screening studies, to determine the optimal solution for a development. We maintain a world-class database of the world's FPSO fleet to assist the economic evaluation of all offshore field development options.

Our customers are assured of an unbiased, independent assessment of the best development solution for their project.

The capabilities of Atkins enable the following services to be provided:

- Hull – new-build design or acquisition, or converted acquisition assistance

(specification development, tender and procurement assistance, conversion candidate vessel inspection, plan approval and construction/conversion supervision)

- Topsides - process system design, long-lead item identification, equipment specification, tender and procurement assistance, plan approval, construction/conversion supervision and installation and commissioning
- Mooring - system selection, design, long-lead item identification, specification, tender and procurement assistance, plan approval, construction/conversion supervision and installation and commissioning
- Design Verification and Technical Due Diligence;
- Asset and Operational Support including design modification verification, integrity management, process optimisation and debottlenecking, trouble shooting and maintenance strategy development;
- High-end Consultancy including environmental, safety and reliability engineering, human factors engineering, advanced fluid mechanics analysis, dynamic process simulation, hydraulic surge analysis and advanced structural analysis..



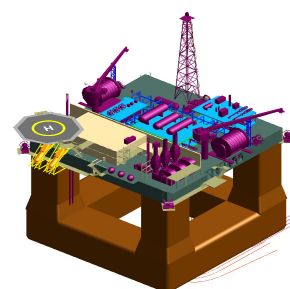


**Project: Captain, UKCS**  
**Client: Texaco**

Concept design for the modifications, outside of the Gas Export Compression Package, to increase the overall Captain gas export capacity. Identification and assessment of options to provide fuel to generation over the life of the field. Feasibility study aimed at improving fuel gas usage and power generation and an economic assessment of alternatives. Provision of offshore operational support to identify operational improvements and provide operator training as required. Dynamic process simulation of topsides facilities.

**Project: FPS<sup>3</sup> Concept, UKCS**  
**Client: Antrim Oil**

Concept Design of a Semi Submersible with Oil Storage Pontoons for stranded marginal fields with a maximum production of 20,000 bpd. Included Naval Architecture, Process, Piping, Structural, Safety and Environmental disciplines. As part of the commission Atkins carried out an Inherent Safety Workshop, Offloading Tanker Collision Risk Analysis, Stability Analysis and Sea Transportation Analysis, Mooring Analysis & Design for proof of concept.



**Project: Prelude FLNG, Australia**  
**Client: Shell / Technip**

Atkins has provided comprehensive quantitative risk assessment (QRA); Extensive, probabilistic CFD based explosion risk assessment (ERA); Detailed, non-linear finite element analysis (FEA) of the response of key piping systems to explosion loads; Assessment of the risks from the cryogenic releases, including the hazards to personnel and structure/equipment; CFD based assessment of the dispersion of vapour, liquid and smoke, throughout the topsides; Fire risk assessment (FRA and other typical safety studies, including: emergency, escape and rescue analysis (EERA); vent plume dispersion studies; ship collision and dropped object studies.

**Project: Marlim Sul, Brazil**  
**Client: SBM**

Atkins has been engaged by SBM to provide safety and risk consultancy services to over 25 of their FPSOs. These services have included formal safety assessments, QRAs, CFD based gas dispersion, fire loading and explosion analysis, Safety Case, HAZID/HAZOP facilitation.

We have also supplied dynamic process simulation analysis investigating start-up and shutdown sequences, compressor surge and other mal-operation scenarios for Mondo, Saxi-Batuque, OSX2, Cidade de Paraty, Gbaran Ubie, Marlim Sul, Schiehallion & Espirito Santo.



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