DNV press release

25 September 2012

DNV leads on global standard for shale gas risk management

London: DNV has launched a recommended practice (RP) for the entire life cycle of shale gas extraction, based on risk management principles. The recommended practice provides a reference document for the independent verification of shale gas projects. The objective is for the RP to form the basis for a globally recognised standard for safe and sustainable shale gas extraction.

DNV's recommended practice applies risk management principles, to ensure that threats related to shale gas activities are effectively and efficiently managed in an accurate, balanced, transparent and traceable way.

"The overall objective of this Recommended Practice is to establish guidelines and recommendations for the processes required to protect the safety of people and the environment during all phases of shale gas field development and operations," says Remi Eriksen, CEO of DNV Maritime and Oil & Gas.

The company further recommends that shale gas operations are monitored and publicly reported. This will establish proper points of reference and consistent monitoring prior to, during and after operations, it advises carrying out extensive baseline surveys prior to the commencement of any shale gas activities. The information gathered should be openly disclosed to all stakeholders, including the general public.

"There is great public concern about the consequences of shale gas operations. Our recommended practice will contribute to increase the trust and confidence among the general public by implementing operational best practices and making the industry document how its activities are being executed in a safe and responsible manner," says Eriksen.

A game changer

Shale gas is a game changer in the global energy market. The North American shale gas revolution has made shale gas an increasingly important source of natural gas and awoken other potential shale gas nations across the globe, including the UK, Poland and China.

The industry is facing a variety of challenges in managing the safety, health and environmental risks involved, and a global standard for safe and sustainable shale gas extraction is yet to be established.

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Although several stakeholders have developed documents and guidelines covering parts of the activities involved, a complete risk management framework has, up to now, been lacking. The Recommended Practice focuses on the following aspects: management systems; safety, health, and the environment; well integrity; management of water and energy; infrastructure and logistics; public engagement; stakeholder communication; and permits. It has been developed following consultation with European and US authorities, oil and gas companies, NGOs and other industry bodies.

Representatives of the industry and regulators are now invited to engage in a discussion on the first version of the Recommended Practice for managing risks of shale gas operations as an initial step in creating a new international standard. Following this, a revised document will be made available.

About DNV:

DNV is a global provider of knowledge for managing risk. Today, safe and responsible business conduct is both a license to operate and a competitive advantage. Our core competence is to identify, assess, and advise on risk management, and so, turn risks into rewards for our customers. From our leading position in certification, classification, verification, advisory and training, we develop and apply standards and best practices. This helps our customers to safely and responsibly improve their business performance.

Our technology expertise, industry knowledge, and risk management approach, has been used to successfully manage numerous high-profile and high-impact projects around the world. Through discussion and engagement with oil and gas companies, equipment suppliers, regulators and other industry stakeholders, the company has developed a range of recommended practices, guidelines and standards covering the entire value chain.

DNV is an independent organisation with dedicated risk professionals. Our purpose is to safeguard life, property and the environment. DNV serves a range of industries, with a special focus on the energy and maritime sectors. Since 1864, DNV has balanced the needs of business and society based on our independence and integrity. Today, we have a global presence with a network of 300 offices in over 100 countries, with headquarters in Oslo, Norway.

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Shale Gas
Recommended Practice Summary

London, September 2012

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MANAGING RISK

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Background

Shale gas is a game changer in the global energy market. The North American shale gas revolution has made shale gas an increasingly important source of natural gas and awoken potential shale gas nations across the globe, including the UK, Poland and China. The industry is facing a variety of challenges in managing the safety, health and environmental risks involved, and a global standard for safe and sustainable shale gas extraction is yet to be established.

Although several stakeholders have developed documents and guidelines covering parts of the activities involved, a complete risk management framework is lacking. A globally acknowledged framework would level the playing field across shale gas companies and nations.
The shale gas industry is at the centre of political debates across Europe and public opinion remains polarized. The industry can only gain public acceptance by implementing operational best practices, and documenting that the activities can be executed in a safe and responsible manner. DNV has taken the initiative to develop a recommended practice that addresses the safety, health and environmental impacts of shale gas activities.

Objective

The overall objective of this Recommended Practice is to establish guidelines and recommendations for the processes required to protect the safety of people and the environment during all phases of shale gas field development and operations. Through its Recommended Practice, DNV aims to raise the overall awareness of risks from shale gas activities and how to best manage these risks.

DNV believes that establishing a consistent and uniform understanding of work processes, tools and methods is essential for the shale gas industry to efficiently manage its safety, health and environmental risks. It is the intention that the Recommended Practice may serve as a reference document for independent assessment or verification, and form the basis for a globally recognised standard for shale gas extraction.

Summary

DNV's Recommended Practice applies *risk management principles* to ensure that threats related to shale gas activities are effectively managed in an accurate, balanced, transparent and traceable way. The Recommended Practice focuses on the following aspects: management systems; safety, health,

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and the environment; well integrity; management of waste, resources, water and energy; infrastructure and logistics; public engagement; stakeholder communication; and permits.

DNV recommends that the management processes and procedures of shale gas projects comply with ISO 31000 or an equivalent standard and take into account specific considerations for shale gas activities.

DNV recommends that shale gas operations are *monitored and publicly reported*. To establish proper points of reference and consistent monitoring prior to, during and after operations, DNV advises carrying out extensive baseline surveys prior to the commencement of any shale gas activities. The information gathered should be openly disclosed to all stakeholders, including the general public.

Most of the *health and safety aspects* of shale gas activities are not unique, but common to most oil and gas extraction activities. DNV's Recommended Practice addresses the health and safety risks in a broad context, including those specific to the shale gas industry. DNV recommends tools and processes to safeguard employees on site as well as people in areas that are directly and indirectly affected by shale gas operations.

Another public concern is the *environmental impact* of shale gas extraction. DNV suggests practices for minimising this impact both on site and in areas that are indirectly affected. The company calls for a pre-evaluation of the project site and its surroundings carried out by an independent environmental expert, along with careful environmental monitoring throughout the exploration, production and abandonment phases.

A key environmental aspect is the handling of *water and energy resources* required for drilling and fracturing of shale gas wells. The DNV Recommended Practice identifies and suggests practices to minimise environmental and social impacts. The handling of water resources, in particular is a key issue in the public shale gas debate. This involves, among other things, municipal water supplies, chemicals, additives and ground water issues. Waste management and disposal, as well as the optimisation of consumption of energy resources, are addressed.

DNV has studied a range of established practices for shale gas *well integrity* in order to establish common best practices. Its Recommended Practice includes guidelines for the design, construction, stimulation, operation and abandonment of wells. Special attention is paid to key features that can be decisive in providing overall shale gas well integrity.

Shale gas operations involve the considerable development of *infrastructure and logistics*. Operators are encouraged to plan and document that the development, operation and abandonment of infrastructure and logistics to minimise the project's negative footprints, taking into consideration such issues as land use and interdependency risks.

Public acceptance is paramount to the successful permitting and operation of shale gas projects. This is especially true in areas where shale gas production is not an established industry. Project developers

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hence need to actively engage and educate the general public early, frequently, consistently and truthfully in order for their projects to succeed. A systematic and knowledge-based approach to the public is needed to gain acceptance.

Legal and regulatory environments, as well as political attitudes and public awareness, differ across nations. Effective and efficient legislation for shale gas activities may not be in place, and project operators may have to relate to regulatory regimes developed with other purposes in mind. It is important that project operators are clear in communicating their needs as well as taking an active role in understanding the regulatory requirements including permit documentation. The project operator may have to help build competence amongst the regulators.

The way forward

DNV has been involved in the oil and gas industry since the late 60s. Through discussion and engagement with oil and gas companies, equipment suppliers and regulators, the company has developed a range of recommended practices, guidelines and standards covering the entire value chain. One example is DNV's standard for offshore pipelines, which by virtue of its approach, depth and quality, has become a globally recognised and preferred reference document among leading oil and gas companies and regulators. Today 65% of all new pipeline projects worldwide are designed according to DNV's standard for offshore pipelines.

The shale gas industry needs a standard for the independent assessment and verification of shale gas extraction to ensure that projects are carried out in a safe and sustainable manner. DNV's ambition for its shale gas guideline is to create a foundation for a future globally recognised standard, based on wide industry involvement.

Representatives of the industry and regulators are now invited to engage in a discussion on the first version of the Recommended Practice for managing risks of shale gas operations as a first step in creating a new, international standard. Following this, a revised document will be made available.

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