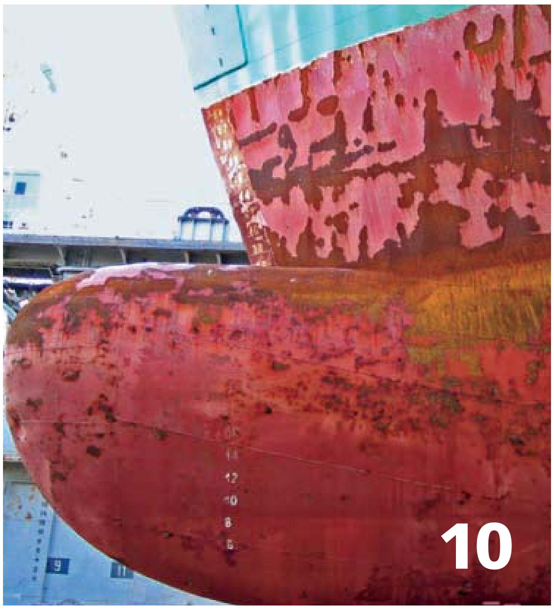

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▸ In Focus
Business offshore conference

Offshore & Marine Technology

Ship Operation

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Regulars

Interdisciplinary networking for efficient and sustainable offshore operations

RECAP The first Business Offshore Conference 2011 in Hamburg was a big success. Held on December 8th and 9th at the Hotel Hafen Hamburg under the auspices of the DVV Media Group's maritime magazines Ship&Offshore and Schiff&Hafen, the inaugural event enabled some 130 participants to acquaint themselves with general conditions, current developments and business opportunities in the growing offshore market.

Dr Silke Sadowski, editor in chief of Ship&Offshore and Schiff&Hafen, at the opening of the inaugural Business Offshore Conference

At the conference, organised in cooperation with the German Association for Marine Technology (GMT) and the German Engineering Federation (VDMA), experts from some of the world's leading offshore and energy companies gave an overview of current and prospective global activities in the three major offshore segments oil and gas, ocean mining and renewables. The segments' technological but principally business aspects were examined.

In particular, the distinctive features of the various market segments and projects – along with their specific challenges – were elaborated. A major emphasis was placed on identifying synergies among them, and consequently solutions for efficient and sustainable offshore operations. So conference participants were able to gain unique insider knowledge of potential business areas and contacts in the interest of facilitating their market access. A VIP dinner in the evening provided a further opportunity to establish and intensify contacts.

Prospects, challenges and chances in the growing offshore market

After a brief welcoming address and introduction by Dr Silke Sadowski, editor in chief of Ship&Offshore and Schiff&Hafen, Steve Robertson, director of UK-based energy business advisors Douglas-Westwood, opened the conference presentations with the keynote address. Titled "The offshore business – Prospects, challenges and chances", it gave an overview of the current status and expected developments in the offshore segments oil and gas, ocean mining and renewable energies.

Robertson underscored the growing significance of offshore and deep-water oil exploration and drilling in meeting global energy demand. Douglas-Westwood predicts that 13% of global oil production will be in deep waters by 2020 (compared with 2% in 2000 and 9% in 2010). Robertson said he saw liquefied natural gas (LNG) as an important resource but still very expensive to transport. In his view, the importance of deep-water gas, LNG and floating liquefied natural gas (FLNG) will increase substantially in the coming years.

Robertson mentioned the world's first FLNG production facility in this regard, planned by Royal Dutch Shell for the Prelude gas field offshore Western Australia. Scheduled to begin operations in 2017, it is expected to produce 3.6 mt/year of LNG, 1.3 mt/year of LPG (liquefied petroleum gas) and 400,000 mt/year of condensate. The storage capacity for LNG will be 220,000m³. Shell has already placed orders for several FLNG production ▶

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Steve Robertson

Keynote speaker Steve Robertson talked about prospects, challenges and chances of the offshore market. Managers from ABS, Gazprom Neft Shelf and Aker Solutions then reported on offshore exploration of oil and gas under deep sea and arctic conditions


John Gallagher


Alexander Mandel


Henrik Hannus

facilities, each of which will cost about USD 3 billion.

In the deep-water market, Douglas-Westwood forecasts a growth in capital expenditure of 179%, to USD 205 billion, over the next five years. It also foresees a total of 134 floating production installations during this period, representing a global capital expenditure of USD 68 billion.

The company expects growth in capital expenditure and the scale of projects for the renewable energies wind and tides as well. In the UK market, for example, it sees capital expenditure for offshore wind power rising to GBP 10.6 billion in 2015 from GBP 3.1 billion in 2010. The main risks to further development of the three offshore segments, Robertson said, are an economic recession and bank crisis along with supply and delivery bottlenecks. On the whole, though, he assessed prospects for growth in the offshore industry as solid.

Offshore oil and gas exploration under deep sea and arctic conditions

Following the keynote address, Dr Walter Kuehnlein, managing director of the Hamburg-based consulting company SEA2ICE and chairman of GMT's board of directors, took the podium to chair the first section of the conference. He welcomed the first speaker, John Gallagher, director of Offshore Technology and Business Development for the Europe Division of ABS, headquartered in London.

In his presentation titled "Experiences, demands and requirements for sustainable oil and gas production under deep sea conditions", Gallagher described the current design of deep-water drilling and production units as well as technological trends in developing deep-water fields in locations such as Brazil, the Gulf of Mexico and West Africa. Over the past five years, more than half of the discoveries of oil deposits worldwide have been in deep waters, he said, adding that additional supply chain capacity was needed to exploit these reserves.

In Brazil, for example, the state-controlled oil giant Petrobas expects to double the number of its oil fields by 2020. To exploit them all, the company needs a total of 65 drillships for water depths above 2,000m; 94 floating production, storage and offloading units (FPSO); 568 support vessels and 83 jackets and tension-leg platforms (TLPs).

Gallagher named three kinds of drilling units for the exploitation of deep sea oil and gas deposits:

- ships and barges,
- semi-submersibles,
- spar platforms.

Gallagher also presented the latest drillship designs: the Ulstein SOS XDS3600 and Jurong LMG. Both are scheduled to be delivered in 2013.

Summing up, Gallagher reiterated that the importance of deep-water oil and gas exploration would continue to grow in the coming years in an effort to meet energy demand. For this purpose, innovative technologies are now being developed for compactly designed drillships, FPSOs, deep-water pipelines and plants to liquefy offshore gas.

The next speaker was Alexander Mandel, director general of Gazprom Neft Shelf, an oil unit of Russia's OAO Gazprom. He outlined developments in Gazprom's key operation areas, principally on Russia's Far East shelf. His presentation, titled "Hydrocarbon deposits of the Russian shelf: Development status and prospects", dealt in particular with the production facilities and infrastructure required for the Shtokman gas field and Prirazlomnoye oil field.

Discovered in 1988 in Russia's Arctic region, the Shtokman field has estimated reserves of 3.9 trillion m^3. Extensive production and infrastructure facilities are needed to ensure optimal extraction from the field. This includes ice-resistant platforms; LNG plants; compressor, measuring and distribution stations; fibreglass communication lines and supply relay stations. Workers' living quarters and offices as well as an adequate power supply are also required.

Mandel noted the following challenges at the Prirazlomnoye oil field, discovered in 1989 in Russia's Arctic region:

- high ice loads with solid ice cover,
- poor industrial infrastructure,
- no analogous prototype worldwide for the exploitation of such a field.

To exploit the oil field, the following technical solutions have been worked out:

- The wells will be drilled from a single, ice-resistant platform placed on the seafloor.
- There will be simultaneous drilling and production.
- Double-hole wells will be drilled.
- All wells will be equipped at the seafloor with high-performance, submersible electric pumps to deliver the fluids from the well to the platform.

The panel discussion following the first section was chaired by Dr Walter Kuehnlein (middle). In addition to the three speakers, Jürgen Wilhelm Ruge (far right), vice president of Oil & Gas Germany at Germanischer Lloyd, joined the expert team

In conclusion, Mandel touched on basic measures that will be taken to protect the environment. They include the injection of drilling and production waste into special injection wells or waste collection in containers for transport to shore.

The third presentation of the conference's first section looked at deep sea and arctic oil and gas exploration from the perspective of Norway-based Aker Solutions, a major provider of engineering services and technologies for the oil and gas industry. Henrik Hannus, a vice president at the company, introduced an innovative spar buoy concept for drilling and production operations in ice-covered waters.

As of today, Hannus said, installations have been based on bottom-founded structures. For deeper waters, however, a major challenge lies in the design of floating structures in ice. The units must meet the following requirements:

- closed working areas with improved air conditioning, heating and ventilation (winterisation),
- optimised direction-variable propulsion plants combined with a mooring system,
- heating of certain exterior areas,
- large storage space for fuel, fluids, supplies and equipment,
- a second redundant blowout preventer,
- safe and environmentally friendly ways to disconnect the risers and other joints to the seafloor.

And finally, Hannus said, successful development of the technologies necessary for the exploitation of arctic regions will require adoption of an environmental database along with verification measures for the relevant design standards.

Deep sea mining

The second section of the conference, on deep sea mining, was chaired by Michael Jarowinsky, managing director of MC Marketing Consulting in Kiel, Germany. Jan Willem van Bloois, manager of Deep Sea Dredging & Mining at Netherlands-based IHC Merwede, made the first presentation. He discussed deep sea mining technologies and pointed to further demands being placed on the industry. Reasons for the rising importance of marine mining included continued population growth and the increasing scarcity of metallic minerals worldwide, he said. According to a United Nations forecast, demand for raw materials and commodities will expand threefold by 2050 compared with today.

Successful mining of deep sea deposits depends heavily on the right choice of equipment, van Bloois said. The most viable deep sea mining concept, in his view, consists of three major components: a seafloor mining tool, vertical transport system and mining support vessel. All of these components must be applicable to different depths, different types of materials and various production rates.

Van Bloois remarked that available marine mining ▶

Participants of the Business Offshore Conference took advantage of the many opportunities for networking


Jan Willem van Bloois


The panel discussion following section two, on deep sea mining, was chaired by Michael Jarowinsky (middle)

Julien Denegre

systems had benefited in recent years not least from the strong development of offshore technologies. To advance the sector further, he said, appropriate guidelines, among other things, now needed to be devised. It is expected, van Bloois concluded, that a significant deep sea mining industry will have established itself by 2018.

The last presentation on the conference's first day was by Julien Denegre, business development manager at France-based Technip. Like van Bloois, Denegre noted that existing technologies for traditional offshore oil and gas extraction were the basis for deep sea mining technology. For the most part, he said, modifications, adjustments and enhancements of equipment will have to be made in the course of specific projects.

Denegre said that he saw enormous potential for the young industrial sector, particularly in countering the dwindling supply of metals onshore as well as price fluctuations in the market. Deep sea mining projects are at the feasibility or development stage at present, most of them being oriented to seafloor massive sulphide (SMS) deposits of copper, gold, nickel and zinc, he pointed out.

As a medium-term goal towards further progress in deep sea mining, Denegre named the elaboration of holistic technical and economic concepts. In addition, he said, rock types, erosion and current models must still be extensively studied and analysed. This can only be accomplished by means of close cooperation among customers, government agencies and suppliers in connection with existing deep sea oil and gas technologies.

Energy storage solutions for offshore renewables

The conference's third section, on the second day of the event, was devoted to renewable energies and chaired by Andreas Wagner, managing director of the German Offshore Wind Energy Foundation. The opening address, titled "Offshore renewables – Prospects, challenges and chances", was held by Dr Andrew Garrad, president of the UK-based renewable energy consultancy GL Garrad Hassan.

Garrad first gave a broad-brush review of what is happening in the offshore wind sector both in Europe and elsewhere, after which he pointed to various solutions for the construction of offshore wind farm foundations. Besides the currently leading construction types – monopile, gravity-based structures (GBS), jackets/tripods and triples – he presented such alternatives as battered pile, suction bucket and deep spar buoy. The last named option is suitable for deep-water installations only.

At present, turbines with a combined output of about 1 GW are installed annually, a figure Garrad said would increase to 5 GW in the future. This roughly equals the power requirements of:

- 250-1,000 turbines per year,
- export cable at a length of 150-700km,
- four to 18 ships for the installation of foundations,
- three to 12 ships for the installation of turbines,
- one to eight ships for turbine repair and maintenance.

Garrad described the offshore wind industry as a dynamic, fast-growing business field that is steadily becoming more attractive. As regards development and installation, it could benefit somewhat from know-how in the traditional oil and gas sector, he said. An increasing number of financially strong companies and investors are now getting involved in the industry's further development.

At the end of his presentation, Garrad came to a number of conclusions, including the following:

- There will be heightened competition in the offshore wind industry's supply chain.
- Wind energy plants' durability and reliability are of central importance.
- The need for specialised ships will grow.
- Job opportunities in this industrial sector will grow, too, possibly resulting in a shortage of skilled workers.

Dr Cornelius Pieper, principal at The Boston Consulting Group, followed with a presentation titled "Renewable energy and resulting future requirements for new energy storage solutions". Pieper emphasised that complete integration into the power grid had to take centre stage in a discussion of offshore wind energy.

Fluctuations of wind strength as a powerful energy source can be predicted in part but not influenced, he said.

Compensatory power can be generated by three different kinds of storage:

- conventional backup,
- interregional compensation,
- decoupling power supply and demand by controlling demand and centralised/decentralised power storage.

A combination of various systems will most likely cover future energy storage needs, Pieper said. Among the electricity storage technologies are different kinds of batteries, (mobile) hydrogen tanks, capacitors, kinetic storage systems, molten salt and hot-water systems.

All in all, electricity storage can be seen as a basic prerequisite for the wide-scale integration of renewable energies in power grids. Compressed-air energy storage plants situated on the coast are a particularly interesting option, Pieper said. Technology providers have shown strong interest in the various storage options.

In the next presentation, titled "Multi-megawatt wind turbines in deeper waters – Initial stage for solutions and experiences", Norbert Giese, vice president of Offshore Development at Germany-based REpower Systems, addressed the challenges posed by installing offshore wind farms in deeper waters.

Within the coming four years, offshore wind farms with a total output of 12 GW will be built in Europe, a third of them in Great Britain, another third in Germany and the rest elsewhere on the continent, Giese noted. Financing has already been secured for two-thirds of the projects.

Giese named three categories for the installation of offshore wind farms:

- near shore in relatively shallow waters, for which traditional onshore turbines with an output of 2-3 MW are mainly used,
- further from shore in deeper waters, calling for "genuine" offshore turbines with an output of 5 MW,
- further from shore in ultra-deep waters, for which only floating structures are possible at present.

Giese also reported on logistic demands in the installation of the Beatrice (in the North Sea off the east coast of Scotland), Thornton Bank (in the North Sea off Belgium) and alpha ventus (in the North Sea near the German island of Borkum) wind farms.

The conference's final speaker was Stefan Kansy, head of Offshore Engineering at EnBW Erneuerbare Energien ("Renewable Energies") in Hamburg. In a richly illustrated presentation titled "Experiences, demands and requirements for the installation of large offshore wind farms – The development of Baltic 1 and 2", Kansy reported on the construction and start-up of the two Baltic Sea wind farms. Along with shifting weather conditions and deviations from schedule, Kansy pointed to the "pioneer" existence of the offshore wind industry and potential supply bottlenecks as the farms' biggest logistic and operational hurdles. In addition, he said, the entire approval process is extremely complicated and time-consuming.

Challenges to be met in the future have to do principally with the external grid link, the necessary standardisation of design and certification processes, the acceleration of permit processes, and noise reduction during construction and operation of the facilities.

Summary

At the end of the conference, the three chairmen – Dr Walter Kuehnlein, Michael Jarowinsky and Andreas Wagner – summarised the presentations and the insights gained from them. Although the three major offshore segments oil and gas, ocean mining and renewables place different demands on operators, manufacturers and suppliers, cooperation among them and the transfer of some technologies and know-how are clearly quite useful, the three concluded.

Oil and gas continue to constitute the largest offshore segment and are therefore the offshore industry's financially strongest growth driver. But rapid technological and economic progress can be expected in both the (deep sea) marine mining and offshore wind segments.


Dr Andrew Garrad


Dr Cornelius Pieper


Norbert Giese


Stefan Kansy

Offshore renewables were the focus of section three, held on the second day of the conference. The subsequent panel discussion was chaired by Andreas Wagner (photo at lower right, second from left)

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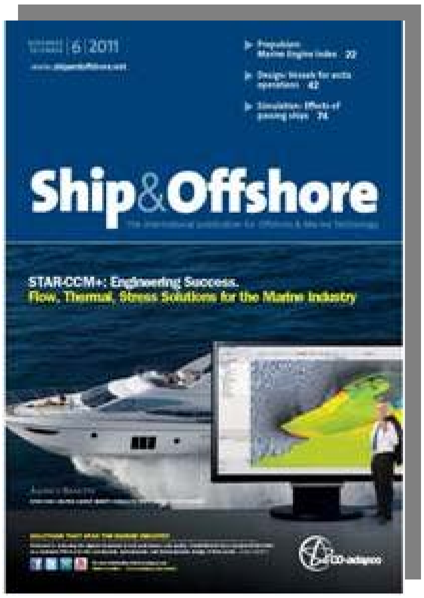

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