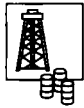
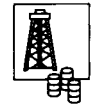


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OIL & GAS TECHNOLOGY



THERMIE PROGRAMME: promotion of energy technology in Europe

Offshore Technologies - Europe rules the waves

SINCE THE MID 1970S when the first installations in the North Sea went into production, the technology associated with the offshore industry has continued to evolve. This has resulted from a number of factors including the need to operate in deeper water and increasingly hostile environments, enhanced safety features in all operations, and greater efficiency through improved maintenance and fault detection. In addition, as installations near the end of their economic life the question of decommissioning becomes increasingly important.

Today the Community's service and equipment sectors in the oil industry have acquired unique experience of offshore operations. However, if they are to remain an international force in offshore activities



EDITORIAL

it is important that Europe's technological know-how continues to compete with the best in the world.

This issue of Oil & Gas Technology describes a range of emerging offshore technologies from France, Germany and The Netherlands which have received

support from the THERMIE programme and are now available for commercial use. The projects described show the diversity of offshore technologies which the EC supports, including cutting techniques for decommissioning, blast walls for increased safety, methane sniffing to assist in pipeline maintenance and new current meters to improve oceanographic research.

A wide range of offshore technologies will be on display at the MOEX exhibition being held in Malta on 25-27 January 1994. The European Commission's stand at this event will promote technologies which have been developed by small and medium sized companies within the Community, including non-EC funded projects, which are now ready for commercial use.

MEDUSA - measuring methane dissolved in sea water

SMALL LEAKAGES in offshore gas and oil producing facilities and underwater pipelines have until now been hard to detect, particularly if the leak was inaccessible. A new device named MEDUSA (MEthane Detection for Undersea Applications) resolves this problem. The device was designed and built in Germany by GKSS Forschungszentrum Geesthacht at a cost of 2.5 MECU, of which the EC contributed 35% under its hydrocarbons programme.

MEDUSA extracts dissolved gases from the water in a flow-through regime and the methane level is determined by laser absorptiometry. This innovatory technique allows the measurement of concentrations between 15 pg of methane per gram of water (15 ppt) and 50 ppm. The large dynamic range corresponds to between one-third the natural methane background level and near saturation at 300m, the maximum operational water depth of the present system. Response time is 1.5 minutes.

MEDUSA can be connected to a ROV for applications where precise navigation is required. Direct operation from shipboard via an umbilical is also possible.

Although primarily developed for applications in the offshore petroleum industry, the system can be used for biological, geological, climatological and



Commission of the European Communities - Directorate-General for Energy

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Decommissioning - French technology at the cutting edge

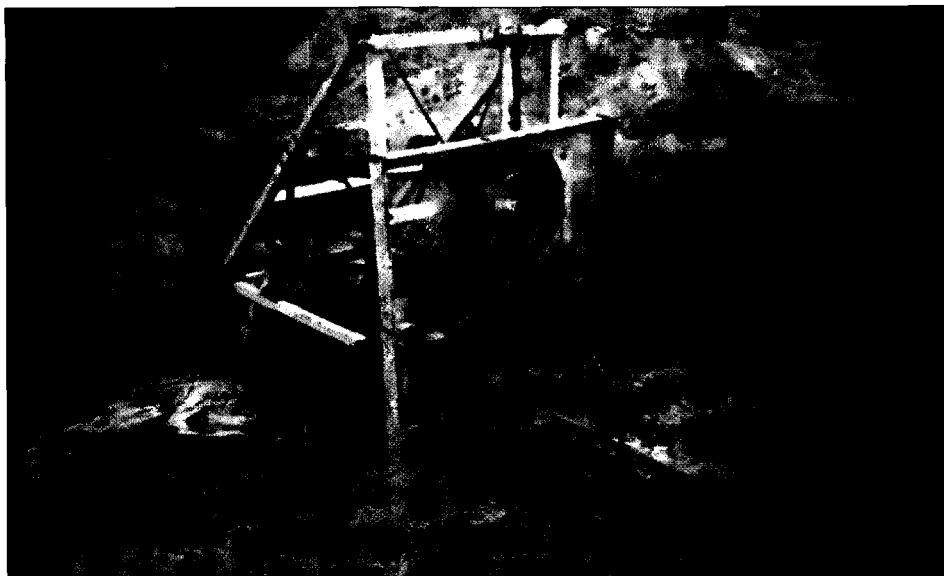
IN SEPARATE projects supported by the EC's THERMIE programme, Stolt Comex Seaway has developed two cutting systems which are now available for offshore decommissioning work.

The cable sawing cutting system, designed in association with Diamant Boart, is able to perform the major cutting tasks required in platform/subsea structure decommissioning such as cutting very large wall thicknesses (sandwich material or reinforced concrete) from the outside.

The system gives clean, neat and accurate cuts with minimal impact on the environment as very little debris is created. It is also highly versatile, capable of being adapted for use in virtually any situation. Additional benefits include full surface control which ensures total safety and minimum vibration which helps to maintain the structural integrity of surrounding structures.

The system consists of:

- a 20ft surface control/storage container;
- a diesel powered hydraulic pack;



Cable Sawing Cutting System

- an hydraulic/electrical umbilical;
- a subsea module which can be deployed by either ROV or diver.

Additional features include a frame with facilities for clamping on to the structure and a cutting module composed of diamond beaded wire and driving wheels.

Doppler Sonar - advances in oceanographic measurement

THE FRENCH COMPANY Remtech has developed an effective sonar for oceanographic research which can be used to determine currents around platforms, an important consideration for offshore drilling operations.

The Doppler current meter, which in its present form is a vessel mounted system, was designed for applications in which:

- a considerable range is required (greater

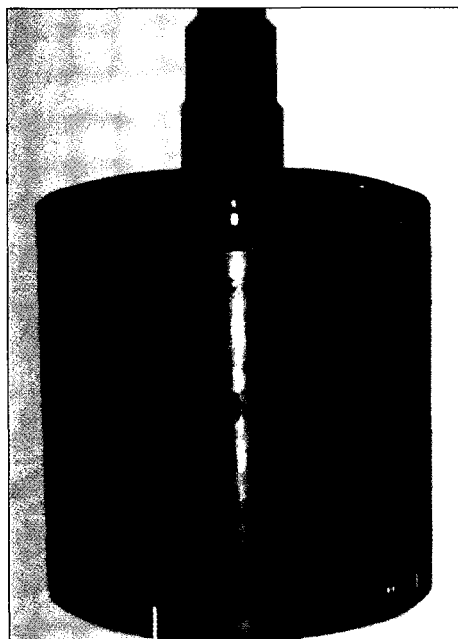
than 1,000 metres);

- the ambient acoustic noise is significant;
- spurious back-scattered echoes could superimpose themselves on the signal (for example the proximity of a pier, bottom reflections, etc.).

A large range means functioning at a relatively low frequency (40 kHz), taking into consideration the reduction in sound absorption. Despite the low frequency requirement, Remtech has designed a transducer which is sufficiently small to be mounted on the hull of a boat and is less susceptible to hydrodynamic noise when the boat is moving.

The other original feature of the equipment lies in the signal processing. The received signal is initially pre-processed using a Fast Fourier Transform (FFT), which allows an extremely accurate frequency analysis compared to the usual method. In addition, the emitted pulse is frequency coded which allows the instrument to work with signal-to-noise ratios which are much weaker than with standard sonars.

The project, supported by THERMIE, has resulted in a product which offers a very deep range capability and consists of one small transducer and minimum off-the-shelf hardware.



Doppler current meter

The abrasive jet cutting system, based on high pressure water mixed with copper slag or sand, has been specifically developed for underwater applications from existing technology for platform or pipeline decommissioning.

After an extensive evaluation of the available technologies, the DIAJET abrasive metering device was selected. A 350 bar unit was rapidly followed by a unique 700 bar prototype machine. Both units have been extensively tested at the company's Marseilles facilities; trials carried out in 1992 involved more than 100 tests over a 5 month period. These developments have resulted in diverless pipeline or pile subsea cutting systems including:

- a 20 foot surface container including a DIAJET unit (350 or 700 bar), a hydraulic power pack for subsea tool motion, a HP pump and a control panel;
- an integrated umbilical which consists of hydraulic and slurry lines;
- a choice of two types of subsea module for various cutting configurations:
 - the E-JAC (External Abrasive Jetting Clamp) for pipeline cuts,
 - the I-JAC (Internal Abrasive Jet Cutter) with a full range of tools allowing piles or conductor pipes internal cuts.

All these tools are remotely operated units, ensuring safe operation.

MEDUSA *continued from p1.*

environmental applications in which real-time in-situ data and horizontal and vertical profiles of dissolved methane are required.

MEDUSA has already proved itself in a number of field campaigns in the Baltic and North Sea.

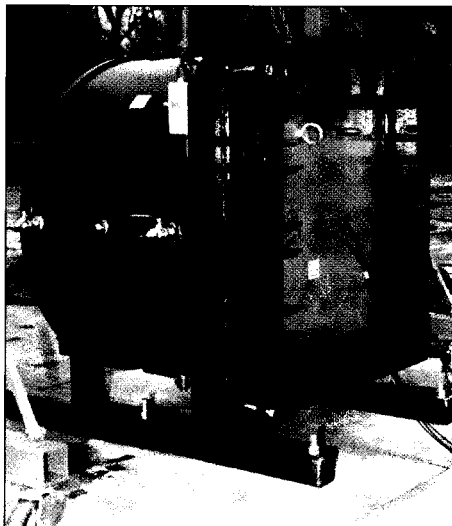
Light-weight walling to protect against blast and fire

FIRE WALLS on many existing off-shore platforms, for instance those which separate production module and personnel compartments, are designed to withstand a fire load only. If damaged by a blast, from say a vapour cloud explosion, they would lose their protective capability against a subsequent fire.

Upgrading existing fire protective structures to include blast resistance requires the addition of considerable weight when traditional materials and design methods are being applied. In many cases this may be unacceptable.

A light-weight wall system that protects against both fire and blast is being developed by TNO in The Netherlands in close co-operation with SLP Engineering in the UK.

Of the materials which were studied,



Gas explosion vessel for small panel tests

glass fibre-reinforced plastic sandwich panels with laminated skins were selected as being most appropriate. The support conditions are such that membrane stresses will develop to fully exploit the structural strength potential.

Small-scale blast tests are currently being carried out in a gas explosion vessel to assess variations in:

- gas type and concentration;
- ignition location and area;
- independent combinations of overpressures;
- duration of the explosion;
- rise time to maximum overpressure.

Full scale panels will be tested next Spring to demonstrate the capabilities of this new design concept for both blast and fire resistance.

CONFERENCE, EXHIBITION and WORKSHOP REPORTS

Promoting European Technologies in the World Market

AUTUMN was a busy season in the THERMIE hydrocarbons calendar with the EC participating in events in Kazakstan, Greece, Belgium, Japan and The Netherlands.

The 1st Kazakstan International Oil & Gas Exhibition, held on 5-8 October, provided an opportunity for companies wishing to expand their business in the Central Asian Regions to explore the new and developing markets of the oil and gas industry.

The EC stand, which featured hydrocarbon technologies developed under the THERMIE programme and the EC Centre in Tyumen, attracted over 1,000 visitors including government officials from Kazakstan, Azerbaijan, Tajikistan, Uzbekistan, Turkey and Iran.

The 5th THERMIE Exhibition, held in Brussels on the 11-16 October, emphasised

THERMIE's key role in providing assistance to SMEs as they are the key to technological developments in the hydrocarbons sector. This includes companies which have received no prior funding from the EC for their projects as well as those that have. In respect to this, greater effort will be made in making SMEs aware of the assistance available to them for promoting their innovative technologies.

The International Conference and Exhibition of the AAPG was held on 17-20 October in The Hague. Over 1,500 delegates attended the event to see the latest developments and advanced technologies in exploration and reservoir management from a record number of 96 exhibitors.

Over 200 delegates from a wide range of countries including Brazil, Australia, Russia, Tunisia and China, visited the EC stand which featured technologies on

water sampling, seismic analysis and hydraulic fractures.

The International Energy Agency's Natural Gas Technologies Conference held in Kyoto from 31 October to 3 November addressed security of supply, protecting the environment and economic development. The EC sponsored the event and participated with a stand. The keynote speech was given by Mr Maniatopoulos, the Director-General of DGXVII.

Mr Maniatopoulos was also on hand to inaugurate the AERION '93 exhibition held in Athens on 4 to 6 November. Over 1,500 people attended the exhibition with 120 participating in the parallel workshop "Industrial Natural Gas Equipment". The event was a great success and plans are already underway for AERION '95.

Assistance for Small and Medium Sized Companies

ONE OF THE MAIN AIMS of the THERMIE programme is to provide assistance to European small and medium sized enterprises (SMEs) to promote the innovative technologies that they have developed and which are now ready for commercialisation. THERMIE makes no distinction between those projects which have received EC funding and those which haven't - all are eligible for assistance.

This assistance is primarily through the provision of exhibition space on the EC's stand at international exhibitions such as Offshore Europe, OTC, AAPG etc. In this way SMEs are given the opportunity to promote their technologies at exhibitions which otherwise may have been too costly

for the company to attend. The EC pays for the stand, stand services, freighting and insurance. The company is not reimbursed for man-hours, travel and accommodation.

Any SME wishing to investigate the possibility of participating on an EC stand should contact an OPET for the EC's Exhibition programme for 1994.

New Publications

The *European Oil and Gas Demonstration Project Inventory* of non-EC supported projects is now available and can be obtained on request from PSTI.

Two new flag brochures on THERMIE-funded hydrocarbons projects will be available in the near future. A remote offshore multiphase pumping station for hydrocarbon recovery, developed by

Havron Energy Systems in the UK, is described in brochure No.172. The technology will be of interest to most offshore oil and gas companies but is particularly relevant for marginal fields where production facilities exist but the original reserves have been severely depleted.

Brochure No.175 describes a system for downtime analysis of marginal field production developed by EOLAS in Ireland. The package has been well received by a number of operators who have used it to determine both exploration and production efficiency. The system is of use primarily to offshore operators and design consultants.

A maxibrochure entitled "Oil and Gas Technology: Investing in a major European industry for future security and prosperity" will be published in January 1994.

Mediterranean Oil & Gas Exhibition, Malta, 25-27 January 1994

The EC stand at MOEX will feature a number of technologies developed by European small and medium sized enterprises (SMEs). These technologies will include both non-EC funded projects as well as those which have received support from THERMIE. A parallel conference on "Commercial Opportunities in the Mediterranean" will be held during this year's exhibition. For further details contact Rosaria Gandolfi of the Italian OPET FAST.

Non-Destructive Testing for Offshore Applications, London, February 1994

Workshop co-sponsored by the British Institute of NDT and the European Council of NDT. Details from Jane Kennedy at PSTI.

Slimhole Drilling - Business Workshop, Paris, March 1994

Workshop featuring the Euroslim system developed by DB Stratabit, Forasol as

described in O>N No.10. Details from Jane Kennedy at PSTI.

Pipeline Integrity - East European Workshop, Kiev, 20-21 April 1994

Workshop featuring technologies from across Europe. Details from Mr Drenkard at GOPA.

Moscow International Oil & Gas Exhibition, Moscow, 18-22 April 1994

MIOGE '94 will be attended by key people from the oil and gas industry of Russia and

the independent states. The EC stand will host four European projects as well as the EC Energy Centres of Moscow and Tyumen. The main topics will be onshore drilling, production and transportation. A one-day workshop of technical projects carried out by SMEs in the Community will also be held during the show. Further details from Michel Ningler of the French OPET GEP.

Offshore Technology Conference, Houston, 2-5 May 1994

Once again the European Commission will be participating at OTC, one of the main events in the offshore calendar. The EC will have a large stand promoting both the THERMIE programme and specific near-market technologies developed within the Community. Twelve European SMEs will be invited to exhibit their technologies on the EC stand, giving them the opportunity to promote their products at this prestigious event. The technologies featured will include both THERMIE and non-EC funded projects. For further details contact Jane Kennedy at PSTI.

Reader Reply Card Reminder

We received an excellent response from the Reader Reply Card issued with the September 1993 edition of O>N - it is encouraging to know that the newsletter is read in 150 different countries.

We would be grateful if any readers who have not yet returned the reply card do so in the near future or send a fax to the Editor stating that you wish to continue receiving the newsletter.

Entries for which we receive no reply will be removed from our list.

OPET - Organisations for the Promotion of Energy Technology

THE ROLE of the EC's OPET Network is to encourage the development of an energy strategy and the implementation of innovative technology within Europe. The Network also fosters the growth of smaller enterprises and cross-border collaboration within the Community.

The benefits for Europe which follow from these actions include securing the energy supply, building an industrial base and improving the potential for exports, whilst at the same time protecting the environment.

To achieve these objectives, the OPETs are involved in a range

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of activities including market studies, workshops, conferences, trade exhibitions and publications.

The activities of the OPET Network promote improved efficiency and competitiveness, and contribute to European technology transfer not only within the Single Market but also outside the European Community.

OPETs are there to help and advise. For further information on the technologies described in this newsletter please contact the appropriate office.

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