

Upstream in Italy, focus on safety and the environment

The workshop of Assomineraria at OMC: experts, industries and institutions exchange views on regulations, technological developments and markets

“Italy is a country with great potential of resources, technology, capacity and competences. We wish that, in line with the National Energy Strategy, hydro-carbon production could double”. This was stated by president of Assomineraria and Eni executive vice president Europe Region, Giuseppe Tannoia, at the workshop which Assomineraria organized at OMC 2015.

A time for an in-depth analysis of regulatory, technical and market aspects, chaired by the director general of the association, Andrea Ketoff, which focused on developments in Italy.

From the point of view of the regulations, for instance, director general of Mining and Energy Resources of the Ministry of Economic Development, Franco Terlizzese, discussed the recent updates of the managerial decree of 2015, the implementation of the standard specification (that minister Federica Guidi signed on Wednesday), which establishes the operational methods for the performance of E&P activities (granting of permits, concessions, etc.).

“Such a new instrument derives from the “Sblocca Italia” decree and it should take account of development of the European and national regulatory framework, which were translated into tougher guarantee and safety measures”, explained Terlizzese. “More stringent regulations are to be implemented in terms of the guarantees, particularly



sureties. As for safety, in turn, the rules set forth in the guidelines on seismic activity and subsidence monitoring are to be put in place”.

Finally, when it comes to the timing, Terlizzese reminded that the ministerial decree was already operational, whereas the managerial decree implementing the regulations “will enter into force in a few weeks, upon consultation with the parties in order to verify their comments”. And this exchange of expertise began “precisely here, at the OMC”.

The workshop was an occasion to anticipate some aspects of the 2015 Environmental Report of oil&gas activities, elaborated for Assomineraria by company Avanzi. “We are collecting the environmental data and the best practices of the companies from the E&P sector in order to provide coherence and the possibility to compare data in time, especially for the period of 2012, 2013 and 2014”, said Marco De Simone from Avanzi. It is planned that the second re-

continued on page 3 →

Focus

The offshore industry 5 years after Macondo

Page 5

Talent scouting at OMC 2015

Page 6

Edison: the trilemma of the energy sector

Page 7

Enel targets Italy, Spain and Algeria

Page 8

logp: upstream needs political support

Page 11



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■ *continued from page 1*

port edition will focus, for instance, on the social impacts and on the contribution of the segment to the country's competitiveness. To be more precise, there were anticipated data which indicate a reduction in the CO2 emissions into the atmosphere per product unit, zero offshore spills and a considerable reduction to zero of onshore spills which, according to De Simone, is "one of the best results in the world". These first results will be followed by a detailed data analysis contained in the report.

The issue of safety was discussed in-depth by Pietro Cavanna, president of the Hydrocarbon sector of Assomineraria. For instance, in the case of the Macondo incident "a myriad of errors was made". Cavanna would like that this episode could be reflected in the provision of the European directive on the offshore activity. There are positive aspects such as "the check and the certainty that the operators have the necessary competences and funds". However, on the other hand, "there is no talk about huge mistakes made in Macondo". Therefore, "we must en-

sure that safety should be an aspect of proper engineering, especially of the well engineering", concluded Cavanna, reminding that "prevention is the best cure". Yet, numerous possible developments of the sector depend precisely on the EU guidelines, stated Bernard Vanheule, EU Affairs manager of Iogp, who underlined that the drivers which will direct the energy segment include the climate policies and some important projects such as the Energy Union.

In turn, Sergio Polito, president of the sector Goods and Services of Assomineraria, accounted for the issues of the service sector market. "The companies offering services to the oil enterprises are going through a difficult time". These companies "provide their services abroad, but they are still based in Italy", hoping for "reassurances over the future", concluded Polito.

One of the topical issues, that is that of the airgun, was discussed by professor Carlo Doglioni from La Sapienza University of Rome: "Declaring the airgun an eco-crime is out of place" and "its prohibition is an attack on a certain industrial world". Doglioni considers it

necessary that in future "the scientific community will have to be heard before any laws are passed" because "certain choices should be based more on data and knowledge of facts".

This was also echoed in the words of Gianni Bessi, regional counselor from Emilia-Romania, who defined the issue of airgun as "an own goal," which also introduced the problem of scarce scientific and technological culture outside the sector: "The language of knowledge has to be brought to all the levels, not only at the technical conferences", he explained.

Elisabetta Erba, president of the Geological Society of Italy, put forward one of the possible solutions, namely the extension of knowledge to civil society: "Teaching of geology should be provided at all levels of education." The main objectives of the Geological Society encompass: the exchange of know-how between the fields of geology and industry, correct dissemination for civil society and the world of politics, implementation of teaching.

ANTONIO JR RUGGIERO

Italian upstream, unexpressed potential

Interview with Giuseppe Tannoia, president of Assomineraria and Eni executive vice president Europe Region

Assomineraria workshop underlined the service sector's difficulties. What is the scale of the problem?

Concern was revealed over a 15/20% cut in investment announced by all the companies. This means that one out of five projects will be canceled. Such an element may potentially entail problems in the global market. We will see the ability of Italy and its cluster (one of the most technologically important in the world, with a turnover of €65 billion a year and 40,000 workplaces) to absorb such a possible cut in investment.

The discussion shed a light on the fact that Italy has great potential for development, which is yet not exploited appropriately. We have competences and technological clusters, but is missing a system of stakeholders that would perceive the fossil sources not as a problem but as a solution. We must keep in mind that the access to energy means prosperity.

A widely debated issue at this OMC is how safety and reflections on "after Macondo" are part of these considerations. Where do we stand?

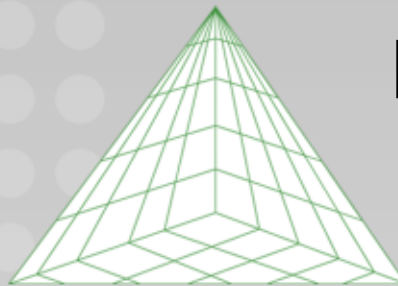
In the Macondo incident, the human factor was determining. Basically a lot of effort was put into the development of technologies and the message conveyed by the conference is precisely the capability of technology which has allowed overcoming a great deal of problems. A similar incident, characterized by those developments, would not be possible today.

Let's go back to Italy. The National Energy Strategy has established a target of doubling the national hydrocarbon production, but so far, no rapid measures have been taken. What are the problems?

The Strategy sets forth that production should be doubled, a target that refers to the already discovered resources. It is not about a chimera, but



about the reality that has to embrace the entire potential of Italy. The Italian bureaucratic and permit granting system actually impedes the performance of activities. A representative of a foreign company told me a meaningful thing: "In the world an activity is undertaken when someone allows and authorizes it, whereas in Italy an activity is undertaken when no one says that it must not be undertaken".



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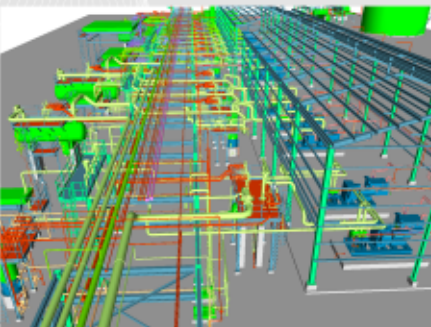
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Offshore Regulations and Technologies: 5 years after Macondo

During his hearing at the European Parliament in October 2014, Commissioner Miguel Arias Cañete said: “We will have to foster the development of indigenous energy sources...”. Offshore oil and gas resources are currently the main European indigenous source of hydrocarbons, contributing significantly to our needs – covering 9% and 13.6% of EU-28 energy needs in oil and gas, respectively (2012) – and creating wealth, jobs and growth in Europe¹. Increased energy production in the European Union is also recognised as one of the pillars of the European Energy Security Strategy.

The exploitation of these resources is not, however, without risks, as it was dramatically demonstrated at the Macondo accident in the Gulf of Mexico in April 2010. Following the shock from the disaster, the world realised that the exploitation of offshore hydrocarbon resources, in deep and ultra-deep waters and under technologically challenging conditions, cannot be done without a robust safety regulatory framework and without the appropriate technological solutions capable to prevent and mitigate accidents.

In the last 5 years significant developments have happened worldwide, both regulatory and technological. In the regulatory arena one saw significant developments in the United States, Canada, Australia and Europe, while, through the International Regulatory Forum, the regulators are aligning their policies to high safety principles. These include the need to use safety and environmental management systems, to measure and monitor safety performance, to learn from past accidents and incidents, and to collaborate for exchange of best safety practices. Industry on the other hand has responded through the Global Industry Response Group (GIRG) and a series of developments covering the complete risk management chain, from prevention, to mitigation, response and recovery. Focus was given to well integrity, design of blow-out preventers (BOP), new capping devices and oil spill response, revision of technical standards and improvement of training for rig personnel.

The European Union has adopted a new Directive on offshore safety² (30/2013/EU), which will be transposed

into national law by 19th July 2015. The Directive is goal-oriented legislation, aiming at high safety standards and at the implementation of best safety practices. Among its main requirements are:

- before exploration or production begins, companies must prepare a Major Hazard Report for their offshore installation, containing a risk assessment and an emergency response plan. Technical solutions which are critical for the safety of installations must be independently verified;
- when granting licenses, EU countries must ensure that companies are well financed and have the necessary technical expertise. Moreover, national authorities must verify safety provisions, environmental protection measures, and the emergency preparedness of rigs and platforms;
- companies will be fully liable for major environmental damages caused.

But, which are the implications for operators and authorities? In fact, the Directive ensures an EU-wide high level of safety. For the regulators, especially in countries with less or no experience in offshore installations, it is necessary to ensure the right level of expertise and access to specialised knowledge. Capacity building is a big challenge for the successful implementation of the new Directive. To facilitate collaboration and sharing of best practices among the inspectors of EU countries, the Commission has established the European Union Offshore Oil and Gas Authorities Group (EUOAG)³. Moreover, the Commission, both the Directorate General for Energy and the Joint Research Centre, in collaboration with the national authorities, is organising specialised workshops (e.g. Stresa 2013, Siracusa 2014) for the authorities and promotes the development of common tools and procedures⁴. Collaboration amongst the authorities of neighbouring countries, even outside the Union, is also promoted in the Directive, since the consequences of potential accidents do not recognise borders. Collaboration on common safety goals, mainly in areas such as the Mediterranean with great potential for development, is absolutely necessary.

Summarizing, the exploitation of offshore hydrocarbons can contribute to the common regional and EU objectives of energy security and the Energy Union. The regulatory framework has matured with many new initiatives undertaken worldwide and in the EU in particular. Applying the appropriate technology and safety management systems, and building capacity within the authorities, are still among the challenges for safe offshore hydrocarbons exploitation.

GIOVANNI DE SANTI,
DIRECTOR, INSTITUTE FOR ENERGY AND TRANSPORT,
JOINT RESEARCH CENTRE, EUROPEAN COMMISSION

1. €430 billions in revenues for EU28+Norway in 2011 (source: NERA report on Energy Taxation and Subsidies)

2. <http://ec.europa.eu/energy/en/topics/oil-gas-and-coal/offshore-oil-and-gas-safety>

3. <http://euoag.jrc.ec.europa.eu>

4. For example, the Common Reporting Format, EU Regulation 1112/2014

Talent scouting at the Offshore Mediterranean Conference

The Youth Programme: 500 university students from 30 Italian and foreign universities. The three winners of the Energy Contest



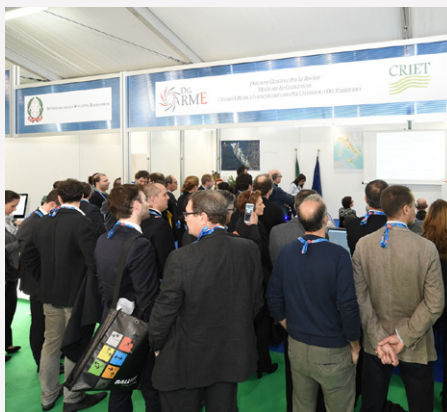
Offshore safety in Italy, the role of the Ministry of Economic Development

The General Directorate for Mining and Energy Resources (DGRME) of the Ministry of Economic Development is implementing numerous activities to increase the safety of offshore plants. In order to report on this work and exchange expertise with the operators, DGRME has arranged for a series of in-depth discussions in the course of the 2015 OMC.

According to director general Franco Terlizese, “we must be able to convey to the citizens the feeling of the operations’ safety shared by everyone who works in this sector”.

In this respect, there is a regulation (Legislative Decree no. 152/2006) “which entrusts the Ministry of Economic Development with a task of incident prevention”, adds Terlizese.

Precisely for this purpose, among a great deal of measures put in place, there is the readiness to elaborate an indicator to assess the safety level change of the plants with



respect to current state, in order to identify possible critical elements. Furthermore, is foreseen the elaboration of feasibility studies for seismic activity and soil deformation monitoring, as well as the promotion of activities for energy optimization of offshore plants, also by means of renewable resources.

In the course of Thursday’s workshop, Liliana Panei, chief officer of DGRME, pointed out the “added value” which these activities gained following the agreements signed between the Ministry of Economic Development and INGV, Marina Militare, RSE, OGS, Politecnico di Torino, CRIET, AMRA, University of Bologna and Harbor Master’s Office.

Gianluca Longoni from the University of Milano-Bicocca, Claudia Zoccarato from the University of Padua and Paolo Zanini from the Politecnico di Milano are the winners of the “5 Minute Speech Contest,” a contest on energy dedicated to the university and post-graduate research students organized within the 12th edition of the Offshore Mediterranean Conference & Exhibition.

“OMC has always promoted young people because we believe that precisely they and their effort may relaunch the oil&gas sector”, declared president of the OMC 2015, Innocenzo Titone.

The jury of experts examined twenty one speeches on the subject of “Technologies to Meet the Future Energy Demand,” selecting the best three ones.

The Energy Contest is part of the Youth Programme of the OMC 2015, which was participated by 500 students from 30 Italian and foreign universities.

On the day of March 26 the students’ presentations alternated with the presentations of Total, Halliburton, Rosetti Marino, Edison and Schlumberger on the employment opportunities in the oil&gas sector.

The trilemma of the energy sector

Combining security of supply, affordability and environmental sustainability. The solution? Exploitation of domestic resources. Interview with Edison Ceo Bruno Lescoeur



What challenges is the energy sector facing?

We are facing a trilemma trying to combine the security of supply with the competitiveness of prices and the environmental sustainability. Seen from the point of view of importing countries such as Italy and Europe in general, the exploitation of domestic resources would lower our dependence by producing countries enhancing the security of energy supply and triggering a virtuous circle between investments, economic growth and job creation at the same time. Just think at the estimates in the National Energy Strategy: it is expected that the sustainable development of certain reserves will generate investments worth €17 billion and employment providing around 25,000 workplaces. It is an opportunity that Italy must not miss.

Is the “Sblocca Italia” decree a move in the right direction?

Yes, it certainly does: it is a step towards exploitation of the country’s resources and reduction in oil and gas importation which currently represents more than 90% of the energy demand. The “Sblocca Italia” decree recognizes oil and gas activities and natural gas storage as urgent with the status of public interest and strategic nature, simplifies the authorization process through a unique license for E&P and transfers the regions’ competences to the central Government even for the onshore projects. It is a crucial step to

encourage Italian and foreign investors to operate in Italy. The current oil price of \$50 per barrel actually encourages companies to direct investments to countries which have clear regulations and offer incentives to the hydrocarbon-related activities. In turn, for a long time, Italy discouraged undertaking the E&P activities with extra tax - such as the “Robin Tax” - and too many uncertainties and obstacles. The result is evident: not a single offshore exploration well has been drilled in 7 years. In order to bring a decisive change to the sector and create new perspectives it is thus important that the “Sblocca Italia” decree is implemented completely.

Does this mean that Edison will continue to invest in Italy?

Yes, definitely. We have just gone through, along with Eni, the authorization process of an offshore gas project in the Sicily channel and we are about to complete a similar procedure which will allow us to extend the life of the Vega field offshore Sicily. It is a significant investment plan that will bring royalties and employment to a regions such as Sicily which direly needs it. Our industry can’t operate without public acceptance: it’s essential to establish an effective dialogue with local communities based on transparency and trust in order to reach the acceptance of our activities as a resource and development opportunities for the territory that hosts us.

And abroad? What are the Edison’s plans of international development for the next 3-5 years?

Edison intends above all to reinforce its presence in the Mediterranean. During 2013-2014 we were awarded new exploration licenses in Egypt and Greece and we started to produce gas in Croatia. We are continuing our geological analyses in Israel, we envisage opportunities for development in Algeria and we are trying to transform Italy into a European and Mediterranean gas hub. Despite the fall in oil price, we keep operating with a long-term perspective and we are partner of the countries where we are active. Our strategy is to combine organic growth with targeted opportunities in order to optimize our production portfolio and to consolidate our positioning. In Egypt, for instance, we have recently signed two memorandums of understanding for the building of a 180 MW gas-fired combined-cycle power plant, which will produce efficient and sustainable energy for the local market contributing to the modernization of the country’s generation fleet. Finally yet importantly, we remain present in the upstream of the North Sea, looking to middle- and long-term opportunities for development.

LUCA TABASSO



Gas security? We only need to look at the Mediterranean

Marco Arcelli, Upstream director at Enel: we focus on Italy, Spain and Algeria. Our country has “a treasure under its feet” which is worth about “15% of the public debt”

“2014 was a year of transformation in the sector. I refer to the cases of Libya and Ukraine which brought the issue of security to the fore again. Moreover, considering the fall in oil prices and the relevant cancellation of the projects, besides little success in exploration in the last two years, the questions of where gas will come from in the future are raised again”.

The matter is explained by Marco Arcelli, head of Upstream Gas at Enel, who describes an energy scenario in the framework of which the upstream investment plan of the Italian company is being defined.

How is the plan structured and which geographical areas does it cover?

The paradigm of security is the most important element considered in the strategy that we are developing. The second aspect is the price and therefore the competitiveness. There is a lot of talk about restarting the economies of Greece, Italy and France, taking account also of the public debt they have accumulated. In such a case competitive energy

sources may be helpful. The sources which can have a positive effect on taxation and their trade balance, which is strictly related with the rating and the cost of debt. These are the starting points which have brought us to focus on the Mediterranean basin. Specifically, we have begun from Italy, Algeria and Spain.

At present, everybody points to the United States when it comes to unconventional hydrocarbon resources. It is worth saying that we also have our “killer application” in the Mediterranean: our onshore and offshore oil and gas resources, which are conventional and thus contrary to shale gas, the debate on environmental sustainability does not apply to them.

However Europe appears to have an intention to evaluate all possible routes in order to ensure energy security.

Diversification of sources is a widely debated issue, if one thinks for instance, of the Caspian region or Iran. Before we search for new ways, we have to see what is available in our



country and benefit from what we have, including also the importation from North Africa. The recent events have made Egypt too an importer, whereas the difficulties of Libya are already known. That is why we need to increasingly focus on Algeria ensuring that this country maintains the exported volumes and capacity that it has achieved in the recent years.

One has to consider that the potential of exportation from Algeria and the Italian domestic resources of hydrocarbons combined constitute half of the entire exportation from Russia to Europe. Thinking in terms of figures, for instance, Moscow exports to Europe 130/160 billion cubic meters of gas every year. On the other hand, Algeria may reach 60 bcm and Italy 15 bcm. We are very much concerned about what will happen in the east of the EU in the future, but we do not think of the Mediterranean, and precisely for this reason we have focused on this subject.

What is the potential of hydrocarbons in Italy?

The data released by Assomineraria contains extraordinary figures. It is a treasure under our feet which, if valued at current prices, is worth about 15% of Italy’s public debt. Our reserves could cover the demand for about twenty years. They would diminish the expenditure by 20/30%



with respect to the present importation costs, reducing the trade balance by about €5 billion a year. Moreover, this would bring in one or two billion euros of new revenue each year. Finally, 100,000 workplaces could be created.

What are the main projects in the areas of interest that you have indicated?

In Italy we have a project called Longanesi. It is the largest onshore gas field under development in Italy, in the area of Ravenna. Not far away from there, we have other licenses in which we have identified three exploration prospects we want to drill once we have the permissions granted. We are also intending to reach deeper areas in the western Po Valley, offshore Adriatic Sea and the Gulf of Taranto. These are longer-term projects and geological analyses and seismic inquiries will show if further drilling may be undertaken.

At the same time, we have submitted applications regarding the offshore Mediterranean of Spain, which is similar to the eastern basin of this sea, where in the recent years, between Cyprus and Israel, more than 1,000 billion cubic meters of gas reserves have been discovered. Also in these countries we are vigilant but careful as they require expensive wells, as they are very deep. Therefore I do not expect anything new in the short term. We were also in Egypt where we drilled an exploration well which, however, did not bring any discoveries.

In Algeria we have created a remarkable portfolio, including a project under development (out of four in the country) and three exploration licenses (out of eight). In fact, our activity there covers about one third of the new Algerian resources. There is potential to start the production from a new field in one or two years, as of 2018.

Recently, you did not participate in the final phase of the last upstream tender launched by Greece. What happened in that case?

We were greatly interested in Greece. In the first days of February, the fall in oil prices was followed by the wish of the Greek government to propose new forms of license management which were different from the royalty system in force. Considering that the situation had changed, we thus decided to allow the procedure to lapse and perhaps to meet each other at a later time with the aim to develop a mechanism which will satisfy everybody in the future.

How do the regulatory and administrative procedures that you encounter in all these countries differ compared to Italy?

Whereas every country is distinct, in Italy every region has its peculiarities. Local communities in Emilia-Romagna offer a great support, due to the presence of a strong and well-known industry. After the earthquake a few years ago and establishing the research commission, the ICHESE Commission (International Commission on Hydrocarbon Exploration and Seismicity in the Emilia Region), the approach revealed was very careful. Now the results have not shown any demonstrable correlation between hydrocarbon industry and seismic activity, and we are ready to restart. Bureaucracy in Italy moves twice as slow than in other countries: this affects the interest in investing.

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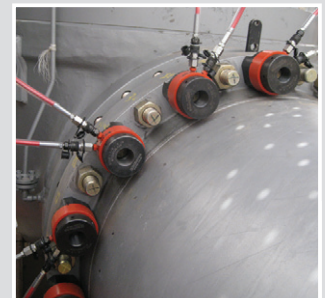
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The Internet of Things in the oil&gas sector

*The advent of “electronic brains” to optimize the processes and maximize the savings.
Interview with Diego Pareschi, advanced control engineer - R&D specialist ABB*

Reduction on the plant's operating costs, above all at the very time of reduced margins, has become crucial for the companies in the hydrocarbons upstream sector. A solution arises from a technological innovation in the field of IoT. We talk about this with Diego Pareschi, advanced control engineer – R&D specialist, local business unit oil, gas and chemicals ABB, who attends the OMC in Ravenna, to analyze in detail the solutions that maximize the availability, the reliability and the efficiency of critical rotating machines.

Did you undertake this technology analysis long ago?

ABB, already in the early 2000s, began to talk about a new paradigm of automation called “Industrial IT.” It was an attempt to introduce IT technologies into all fields of industry, from the machines and highly advanced devices to the plant management software.

At that time, this was considered something new, but distant, whereas now it is a standard. Although the market was not ready, ABB moved forward and tried to focus on some sectors. Now everybody is talking about the “Internet of Things”, but in the end, there are very powerful and underutilized platforms, because the applications are not commonly taken into account.

Therefore, we sought to have a powerful platform the

real advantage of which would consist in making good use of it. We focused on the oil&gas aspect, particularly on the most critical element of the plants that is rotating machines. They include pumps, compressors, turbines, fans, and all assemblies that are basically intended for oil and gas handling.

Then we went on to examine the existing electrical and automation technologies and we attempted to evolve them. This resulted in the technologies that are currently being introduced into the oil segment.

Which ones, specifically?

The main elements are the costs of energy and maintenance as well as the emissions (which are an indirect expenditure in terms of taxation). Thus, we focused on the IT and the rotating machines with the ultimate goal of reducing the operating costs and the emissions.

The outcome of this research was the development of technologies such as “smart machine”, a kind of artificial intelligence that we insert into the machines' control systems. This solution encompasses the measurements of the field sensors and through the algorithms, it learns how the machine operates and it develops a mathematical model that allows tracing the system's performance, providing useful information.

That is not all. This technology opens new perspectives. For example, when we have more sections operating together, such as a compressor group running in parallel, these brains are able to cooperate exchanging data in order to determine the best operating conditions making the plant use less energy.

It is small chips that are inserted into the machine and connected to the existing mechanisms, which provide additional functionalities which are not available in the market.

Are there any cases of its application?

Yes, for instance, we have two electronic brains at two compression stations of the TransMed between Italy and Algeria, which generate estimated savings of one and a half million cubic meters of gas a year and reduce the CO2 emissions from the compressor by 7,000 tons.

Are there any market areas that are more receptive to the sector's technology innovation than others?

In December, I was in the Emirates where I could exchange expertise with the heads of the main local companies. I must admit that the enterprises from that region are more open to similar solutions. Apart from wide margins that can still have, they are always very attentive to innovation, which is already in place.

They are attentive also in the U.S., but the extraction process is not particularly green, especially if we think of shale gas or bituminous sands. Russia shows an interest. Nevertheless, the countries of the Persian Gulf are the most advanced of all.

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Mediterranean upstream “needs a clear political support”

“A functioning market for natural gas can be fostered by more domestic production”.
Interview with Alessandro Torello, Communications manager of logp

In its last “Energy Union Package” the European Commission recognize the importance of the upstream sector in contributing to Europe’s security of supply. That being so, what can be the role of the Mediterranean E&P?

One of the top priorities of the Energy Union is to improve Europe’s security of supply. Developing domestic EU oil and gas resources – as well as making the most of those surrounding the EU – is vital to reach that goal, and we are glad that the European Commission itself recognizes it in its communication.

In this context, the Mediterranean – the Adriatic for example, as well as the East Mediterranean and potentially other areas – is one of the key regions on which we should focus, because of its significant oil and gas potential. Some companies, including members of logp, are already active in the area.

To make sure that we make the most of the Med’s potential, we need clear political support – by the EU and at national level – for exploration, and for the role that oil and gas will have to play in the future energy mix

of the EU. Such recognition would encourage investment and contribute to the success of the Energy Union.

Recently logp underlined the role of the European domestic oil&gas production for the development of a competitive and active wholesale gas market. How could it happen in detail?

Another central priority of the Energy Union is the development of a fully-functioning EU energy market. We welcome such an initiative, and we believe that a robust market will be instrumental to improving security of supply. Robust wholesale energy markets will help deliver a secure supply and trigger the necessary investment in infrastructure and innovation.

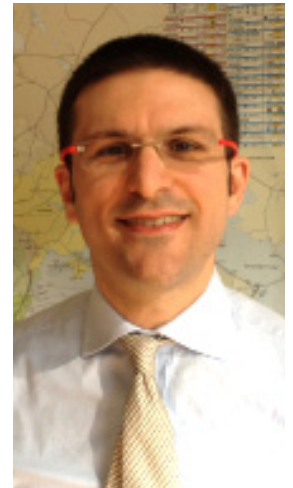
The development of a functioning market for natural gas can actually be fostered by more domestic production.

The experience of the United Kingdom – which, because of the activity in the North Sea, has decades of experience in oil and gas production – shows that this is the case. Production in the North Sea has supported the development of liquid hubs for the exchange of gas, promoting the market. This could happen in other European regions, and we hope the EU will encourage such developments.

Will the improvement of European domestic production have other positive effects?

In general, the more an industry develops, the more the costs for the industry tend to go down, because of the effect of economies of scale. Shale gas in the United States is a good example of those dynamics: the more the drilling, the lower the costs – and CO2 emissions have also fallen, as gas has replaced coal in electricity production.

We have some data on the potential impact of the development of shale gas in Europe. According to a study that we commissioned to independent consultants – Poyry Management Consulting and Cambridge Econometrics – indigenous gas production could reduce energy prices compared with a no-shale gas scenario. Relatively lower prices would increase the income available to households and reduce costs for industry, making Europe’s industry more competitive internationally.



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Certification, a solution-based approach

*Reliable and transparent evaluations are required to ensure maximum predictability.
Interview with Ettore Favia, chief executive officer TÜV Italia*

TÜV Italia is active in all major industrial sectors. What is your offer for the oil&gas business?

Even for oil&gas companies, the proposition of TÜV Italia is represented by the synergy of the services it offers. We are, in fact, able to meet the requirements of companies within the whole supply chain. We offer tests on materials, components and equipment according to the main widely recognized standards, personnel certification related to material and welding processes, and analysis and certification of pressure related equipment. We can combine the activities mentioned above with management systems' certifications according to ISO 9001, OHSAS 18001 and ISO 14001 standards as well as with risk management activities - the latter being of strategic importance within the complex chain of the oil&gas. Let's think, for example, about the ISO 31000 assessment activities, which we carry out as a basic tool to improve internal processes required by the big EPC Contractors within their supply chain.

Following our recent acquisitions of the Bytests' laboratories we have also enlarged our portfolio with non-destructive testing on materials used in components, equipments and installations. To complete our offering to the O&G industry, through the acquisition of the pH laboratories, we are now able to provide environmental and hygiene verifications and tests. As you can see, we satisfy the most important needs within the O&G industry, concerning testing, monitoring, inspecting, training and certifying: in a word, "total and reliable control".

What is the advantage for clients to have their products and services audited and certificated by an independent body?

During its 150 years of history TÜV SÜD, the group we belong to, has become a solid player in the industrial sector and a partner for its customers by supporting them in the management of their supply chain complexity and related risk management. Long-lasting technical know-how and worldwide operational capabilities, together with a solution-based approach (instead of a mere inspecting



one), are the basis for our support to the customer. This attitude is widely appreciated by our customers. The reliability and the awareness of our brand within international markets also represent a mutual guarantee for providers, buyers and users involved in the oil&gas sector.

How do you see the development of the certification in the oil&gas industry in the next future?

Given the recent market trend, TÜV Italia has established sound partnerships with companies within the oil&gas players and, in particular, with its supply chain. Thanks to the ability to decode and understand the customers' needs, TÜV Italia is today an ideal partner for maximizing efficiency and minimizing risks through the delivery of oil&gas tailored services.

One of the needs for the oil&gas sector stakeholders' is to maximize operational efficiency and safety while reducing risk. For the oil&gas investors, reliable and transparent evaluations are required to ensure maximum predictability; while operators and owners have now more pressure when trying to satisfy international regulations and standards.

TÜV SÜD provides end-to-end solutions for every step of a product's lifecycle, including planning, procurement, assembly, operation, modification and decommissioning.



Best Papers Award Luncheon

The event will acknowledge the best technical reports produced by universities and companies and the best exhibition

Recognizing excellence. This is the goal of the Best Paper Award Luncheon, the event that will acknowledge the best technical reports produced by universities and companies and the best exhibition stands of the 12th edition of the Offshore Mediterranean Conference. The prize-giving ceremony, main event of OMC 2015 closing day, is scheduled for today at 1 pm in the Arena of Pala De André.

This year too, Adriatic LNG, the company that built and operates the offshore regasification terminal located 15 kilometers off the Veneto coastline, is sponsoring the lunch. This long-standing partnership with Adriatic LNG is based on the common desire to promote innovation as well as sharing technical and scientific development and best industrial practices.

There will be two winners for technical reports: 'Best paper for outstanding Technical Content' and 'Best paper presented by a young talent'. The best papers will be selected among the reports that have been presented during the conference's sessions and that have investigated several topics concerning the offshore field: from seismic events to safety and environmental protection in offshore operations, from energy efficiency to regulations.



Three different awards will be bestowed to exhibitors following criteria of quality, technological content and design of the stands (Best Stand for Outstanding overall quality, Best Stand for Outstanding technical content and the Best Stand for Outstanding design).

Adriatic LNG, together with Innocenzo Titone, chairman OMC 2015, will award the winners selected by a technical judging panel. The jury for papers is composed by the chairmen of the different technical sessions and Mario Augusto Chiamonte, Programme Committee chairman. The jury that is called to choose the best stands is composed by OMC and IES, the exhibition organizer.



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Cryogenic techniques for gas purification in Lng production

Low-temperature processes competitive for exploitation of sub-quality gas reserves

Projections on LNG trades show a continuous growth worldwide: a sign of the growing importance of LNG in the global energy market can be highlighted considering the increase in liquefaction train sizes from 1960 to 2011, from less than 1 MT/y (Algeria) up to 8 MT/y (Quatargas and RasGas).

Cryogenic operations during liquefaction require the deep removal of carbon dioxide down to levels of ppms, to avoid freezing. Several techniques are available for the sweetening of natural gas streams. Amine scrubbing, in particular, has been largely used; however, this technology is energy intensive when the CO₂ content in the feed gas is high with a consequent increase of the operating costs and low profitability in the recovery of such a kind of reserves. In this scenario, natural gas producers need new process solutions to allow the profitable exploitation of low-quality hydrocarbon gas reserves that were not considered suitable for commercialization until some years ago. Low-temperature

Purification process scheme	Equivalent net CH ₄ input [kg/s]	Potential CO ₂ emissions [kg/s]
Ryan-Holmes	1.3862	3.8121
Dual-pressure	1.1179	3.0742
MDEA	3.0528	8.3952

purification processes have started to gain attention for their applications in the CCS routes for natural gas purification, power plants CO₂ capture and synthesis gas purification. Typically, from these processes carbon dioxide is recovered in liquid phase under pressure, which makes it suitable for the direct pumping and transportation for EOR (Enhanced Oil Recovery) or storage.

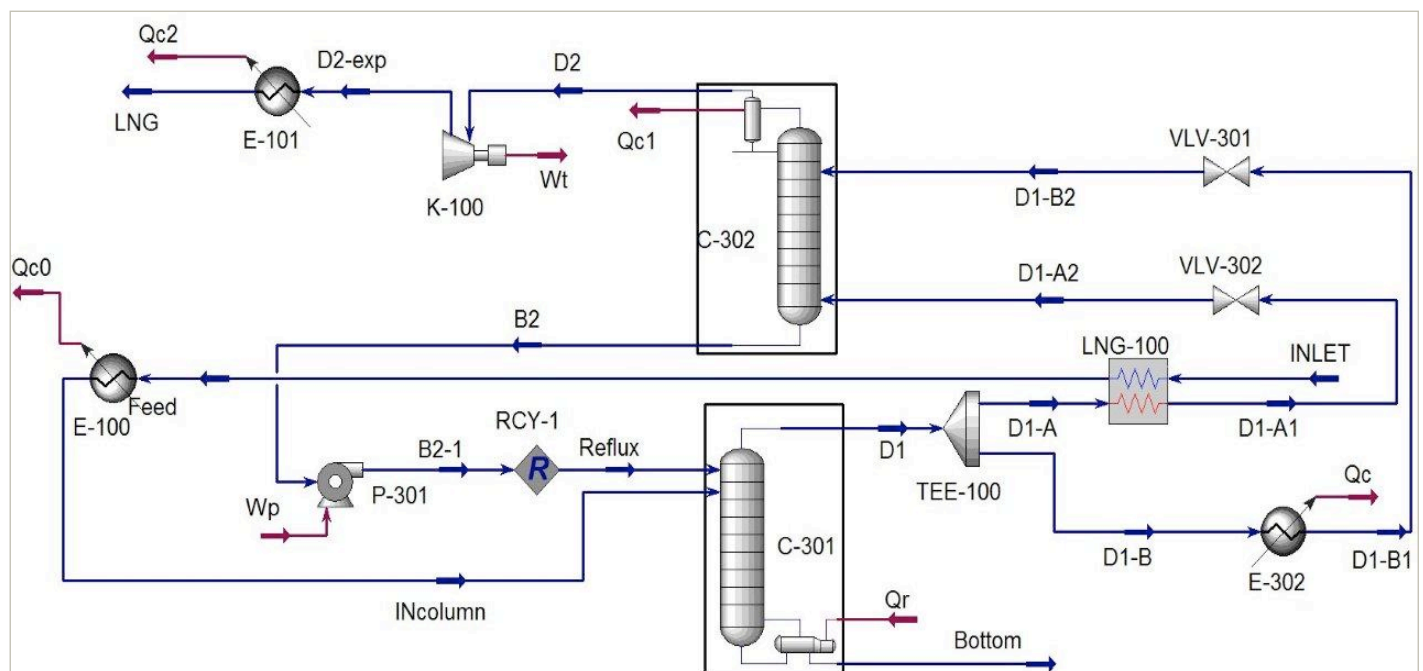
Three process solutions for the purification of natural gas streams with high CO₂ contents and LNG production have been compared (Pellegrini, L. A., Langè, S., Baccanelli, M., De Guido, G. Techno-economic Analysis of LNG Production Using Cryogenic vs Conventional Techniques for Natural Gas Purification. OMC 2015 Conference, 25-27 March 2015, Ravenna). The first and the second processes are distillation schemes operated at low and cryogenic temperatures. The first flowsheet examined is the well-known Ryan-Holmes extractive distillation process. The second LNG production scheme is a new low-temperature purification process (Pellegrini, L. A. Process for

the Removal of CO₂ from Acid Gas. Patent WO2014/054945A2, 2014), where the natural gas is treated in a dual pressure distillation unit without dry ice formation. The third one employs MDEA to remove CO₂ at temperatures close to the ambient one. Energy consumptions for each type of process have been considered and the profitability has been determined in terms of the equivalent amount of CH₄ needed to produce the required duties. The low-temperature purification processes, in particular the dual-pressure one, seem to be competitive for the profitable exploitation of sub-quality gas reserves as shown in the table where the results for a natural gas feed of 5000 kmol/h with 40 mol% of carbon dioxide are reported.

The low-temperature processes perform better than traditional amine scrubbing units also in terms of environmental impact evaluated as potential CO₂ emissions.

L. A. PELLEGRINI,
DIPARTIMENTO DI CHIMICA,
MATERIALI E INGEGNERIA CHIMICA
"G. NATTA", POLITECNICO DI MILANO

Process scheme for LNG production, using the dual pressure low-temperature process for natural gas purification



Micro-seismic monitoring of underground gas storages

The Collalto Seismic Network

Underground gas storage is playing an increasing role in European gas markets in order to match supply/demand of gas and guarantee the gas supply security. Despite the persisting economic crisis and consequent reduction of gas demand during the last years, storage operators are requested to offer a wide range of services to optimize and improve the reliability of the delivery system. This trend is even more marked in Italy considering the strong dependence on this energy source.

Nevertheless, in this country, storages, and more in general E&P business, are “under popular investigation” after the Emilia earthquake of May 2012 because of the suspicion that the tremors may have been triggered by storage/production activities in that area. So, following the raising demand of safety and knowledge by the population living around storages, and in full compliance with a ministerial prescription, Edison Stocaggio (ES) entrusted OGS (the National Institute of Oceanography and Experimental Geophysics), an Italian public research institute, with the task to develop the Collalto Seismic Network (Rete Sismica di Collalto - RSC) in order to perform a high-quality microseismic monitoring service in the gas storage area, as well as to provide transparent information and public data.

The RSC has been operating since December 1, 2011. Based on the first three-years of collected data, the RSC detects

all earthquakes down to about a local magnitude of 0.0 in the volume surrounding the reservoir for about 10 km; thus it fully meets the prescribed design specifications. To obtain these excellent results, new tools have been developed concerning the automatic detection of micro-seismic events and the improvement of the signal/noise ratio. Moreover ES has signed an agreement about “who does what” with the competent authorities, anticipating and being an example for the preparation of the guidelines for seismic monitoring coordinated by the Directorate-general for Mineral and Energy Resources (UNMIG) of the Italian Ministry of the Economic Development, which were published on November 2014.

The RSC represents an effective example regarding the best way to approach a sensitive and tricky subject like the potential correlation between storage and seismic activity, since RSC provides a high quality micro-seismic detection capability and a full transparency of data information with no restriction. In addition, as first case in Italy, the agreement signed by ES, OGS and “Regione Veneto” defines clearly and openly the criteria adopted for data analysis, the procedure to be activated, the attention/action thresholds and the responsibilities of each actor involved into the seismic monitoring. The RSC and the adopted data management policy prove to be very powerful tools for ensuring and objectively demonstrating safe operations in the storage activities.

G. ANNUNZIATA, FORMERLY OPERATIONS MANAGER
AT EDISON STOCAGGIO S.P.A.

E. PRIOLO, SENIOR RESEARCHER AT NATIONAL INSTITUTE
OF OCEANOGRAPHY AND EXPERIMENTAL GEOPHYSICS

Daily Short Sessions at the Total Stand - Hall 6 - L10

OMC
2015

Friday 27th March

10:00 am

Total E&P Italy
Corporate Social
Responsibility

Valentina ROTICIANI

10:30 am

Seismic baseline
monitoring on Tempa
Rossa area

Sara CIVELLO

11:00 am

Environmental base
line and monitoring on
Tempa Rossa

Roberto PASOLINI

11:30 am

Tempa Rossa
project update

Massimo DAPOTO

1:30 pm

Unconventional
revolution

Philippe CHARLEZ

Just drop by the Total stand



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Friday 27 March

9.00 - 10.40 Digital poster presentations (HALL 3)

- Reservoir and EOR Technologies

09.00 - 10.40 Technical Sessions

Unconventional Resources (ROOM B)

- How to export the unconventional revolution out of North America?
- Application of hydraulic pulsed jet generator for rop enhancement in shale gas well
- Optimized shale resource development: transforming unconventional to conventional technologies
- Hydrocarbon retention: a new way to evaluate source rock and unconventional resource potential with petroleum system modelling applications
- Ordovician undiscovered resources in South Hassi Messaoud. Ordovician Hamra Quartzite, an example of tight oil – Hassi Messaoud Basin

Production Optimisation 2 (ROOM C)

- Innovation instruments and techniques for measurement system operation management
- Subsea gas compression technology for maximized hydrocarbon recovery
- A real case application of integrated production optimization modelling: wellhead compressor performances
- Chemical strategy “globalization” where water means oil

09.25 - 10.40 Geohazards (ROOM D)

- Do the new broadband acquisition techniques allow us to improve sub-surface geohazard detection?
- Geohazard: innovative geophysical methodology to reduce the uncertainties in pore pressure prediction
- Geohazard: lowering the project risk profile



09.00 - 13.00 Special Session

Offshore regulations and technologies: 5 years after Macondo (ROOM A)

11.00 - 12.40 Technical Sessions

Facilities and Their Life Cycle Assessment (ROOM B)

- A system approach for evaluating residual life of existing fixed offshore platforms
- The acid gas removal unit at Gasco's Habshan 5: simulation and comparison with field data
- Structural integrity management: an updated assessment of structural performance at the base of service life extension evaluation
- Offshore facilities integrity monitoring and management

Production Optimisation 3 (ROOM C)

- Dual boosting ESPS: a solution to deliver high required flow in limited casing size
- First off shore installation wellhead compressor dewatering system
- Production optimization and emissions reduction by adaptive load sharing of turbocompressors
- A new downhole oil-water separation system

Gas to Market (ROOM D)

- Project options to monetize stranded gas
- FLNG production optimisation through reliability, availability & maintainability predictions and modeling
- LNG storage distribution and regasification in a single plant an innovative challenge for the Italian market
- Deka project from evaluation to start-up

13.00 Best Papers Award Lunch Sponsored by Proger - Adriatic LNG

