



OLT Offshore LNG Toscana Press Kit 2018



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1. OLT Offshore LNG Toscana S.p.A.

OLT Offshore LNG Toscana S.p.A. (OLT) is the company that developed and now owns and manages the floating regasification Terminal “FSRU Toscana”. The OLT Terminal represents one of the main infrastructures of national interest for gas supply in Italy. At full capacity, the plant has a regasification capacity of 3.75 billion cubic metres per year, which corresponds approximately to 4% of the annual national gas requirement.

OLT Offshore LNG Toscana was set up by some of the major industrial companies in the domestic and international energy sector, that hold the shares of the company:

IREN Group, holding the 49.07%, is a multiutility listed on the Italian Stock Market and operates in the sectors of electricity (production, distribution and sale), heat energy (production and sale), gas (supply, distribution and sale), management and delivery of integrated water services, environmental services (waste collection and disposal) and services for Public Administrations. Within IREN Group it is also included the share of 2.28% of ASA-Company Environmental Services of the Municipality of Livorno, which is another shareholder of the company.

Uniper Global Commodities, holding the 48.24%, is the commodity trading business of Uniper, a global energy company active in more than 40 countries and about 12,000 employees. Uniper generates, trades, and markets energy on a large scale. They also procure, store, transport, and supply commodities such as natural gas, LNG, and coal as well as energy-related products. The company is headquartered in Düsseldorf.

Golar LNG, holding the 2.69%, is an LNG shipping company specialized in the acquisition, ownership, operation and chartering of LNG carriers and FSRUs.

Overall IREN Group, also through the subsidiary company ASA, and Uniper hold about 97.31% of the shares. The governance remains equal between the two main shareholders.



2. OLT History

The regasification terminal "FSRU Toscana" is one of the main infrastructures of national interest for the import of LNG (liquefied natural gas), in the service of the development and independence of the Italian energy system.

The OLT project consisted in the conversion of an existing LNG carrier - the "Golar Frost" - into a floating regasification terminal, which transforms the LNG back to its normal gaseous state.

The project started in 2002 and it underwent a long and complex permitting process, which implied a significant extension of the project's realization timeframe, due to the modifications requested by the competent national institutions.

The Terminal was realized by Saipem S.p.A. The works, started in Dubai in June 2009 at the shipyard Drydocks World Dubai, ended in June 2013, when the Terminal sailed away to reach the Italian coasts. "FSRU Toscana" arrived in Livorno on July 30th, 2013.

Meanwhile, the mooring system which anchors the Terminal to the seabed (120 meters depth) was completed - through 6 anchors installed in situ - and the connection to the undersea pipeline for the onshore transport of regasified gas was concluded. The connection pipeline was constructed and is currently managed by Snam Rete Gas (works from December 2009 till August 2012).

At the beginning of September 2013, the commissioning period started with LNG on board the Terminal. The certification authority RINA validated the correct conclusion of these operations. The commissioning phase of the plant was successfully finalized on December 19th, 2013. As a result, on December 20th, 2013, OLT Offshore LNG Toscana started its commercial activities. Following the positive results of the commissioning by the Interministerial Committee as per art. 48 of RCN (Rule of the Code of Navigation), the Ministry of Infrastructures and Transports issued the final Commissioning Authorization for the operations of the Terminal on March 17th, 2015. On 25th July 2016 the Ministry of Economic Development issued the final Commissioning Authorization for the operations of the Terminal and of the related connection pipeline.

From an engineering point of view, FSRU Toscana represents a case of excellence in the LNG field, for its structure, its design and the long and



complex authorization process, as well as for the certifications obtained in terms of safety and environment.

With the aim of improving the flexibility of the Terminal, OLT began and concluded the authorization process necessary to receive LNG ships belonging to the “New Panamax” class, which have a cargo capacity between 65,000 and 180,000 m³. Following the authorization obtained by the Ministry for the Environment and Protection of the Territory and the Sea (MATTEM), by CTR for what concerns safety and by the Harbour Master of Livorno, at present the Terminal is authorized to receive all the carriers belonging to the ‘New Panamax’ class, keeping unchanged the maximum authorized annual regasification capacity of 3.75 billion m³ of natural gas.

The ‘New Panamax’ class vessels represent the new construction standard and allow the Terminal to maximize its receiving flexibility with a substantial increase in the number of LNG carriers approved up to around the 90% of the worldwide LNGc fleet. Moreover, this would allow to receive in the coming years the LNG carriers from the new liquefaction terminals currently under construction / project in the United States. In addition, the expansion project of the Panama Canal, concluded in June 2016, allows the transit of LNG carriers with this size and the creation of a new route between the Atlantic and the Pacific, making possible to create connections which were not economically feasible so far.

3. Plant

The Terminal, permanently moored about 22 km off the Italian coast between Livorno and Pisa, in the Region of Tuscany, transforms the liquefied natural gas, received by LNG carriers, back to its normal gaseous state.

“FSRU Toscana” is permanently anchored to the seabed through an advanced mooring system, with a single point of rotation at the bow in order to allow the ship to move around the mooring turret, therefore being able to adapt to different sea weather conditions.

The Terminal is connected to the mainland through a pipeline of 36.5 km: 29.5 km at the sea, 5 km in the floodway, the remaining 2 km on dry land, completely buried and directly connected to the Italian National Grid.



The Terminal (out of water) has the following features: length 306.49 meters, width 48 meters, height 26.5 meters.

At full capacity, the plant has a regasification capacity of 3.75 billion m³ per year (covering roughly 4% of the national requirement), a maximum regasification capacity of 15 million Sm³ per day and a storage capacity of about 137,100 m³ of LNG.

The Terminal is equipped with a Wobbe Index correction system installed onboard, that enables to receive almost all the LNG produced in the world and to correct the LNG characteristics to meet the limits required by the Italian gas grid operator.

The plant can receive LNG from carriers with a cargo capacity between 65,000 m³ and 180,000 m³ (New Panamax class, around the 90% of the current worldwide LNGc fleet) at a maximum flow rate of 12,000 m³/hr.

3.1. The steps of the regasification cycle

The regasification Terminal “FSRU Toscana” was realized using safe and well-proven technologies. All the subsystems and components are largely used in various sectors of the oil and gas industry.

The steps of the regasification cycle are:

1. Unloading and storage of LNG in the regasification Terminal’s tanks

During operation, the LNG is unloaded by direct transfer, through four loading arms, from LNG carriers moored to the Terminal (“side-by-side configuration”).



2. Regasification - LNG is reconverted into natural gas

The LNG stored in the tanks is then sent to the regasification module, where it undergoes an increase in temperature and it is brought back to the gaseous state.

3. Gas sendout in the national grid

Gas is sent to a depth of 120 meters, through two risers, and it is then injected into an undersea pipeline which is part of the national grid.

4. The LNG

The LNG (Liquified Natural Gas) is a natural gas (mixture of hydrocarbons mainly made up of methane - 80-90% - and of lower percentage of ethane, propane and heavier hydrocarbons) that has been converted to liquid form in order to be transported by LNG carrier in an easier and safer way. Once liquified, the LNG takes up about 1/600th of the volume of its gaseous state (at standard conditions for temperature and pressure). It is odourless, colourless, non-toxic and non-corrosive.

LNG properties and reliability:

✚ IF LNG SPILLS INTO THE WATER

LNG does not dissolve in water, it is a substance that evaporates on contact with water without mixing and without leaving any residual.

✚ LNG IS NOT TOXIC

If LNG is poured into a glass of water, once the gas has evaporated the water can be drunk. It does not cause pollution on sea nor on the seabed.

✚ IN CASE OF AN LNG SPILL?

LNG is stored in the plant at atmospheric pressure and low temperatures (cryogenic); in the unlikely case of a spill, it would disperse in the air evapo-



rating without leaving any residual. If LNG spills on the ground, it evaporates and leaves no residual to clean up.

🚧 CAN LNG BURN?

LNG is not inflammable except in very particular conditions which cannot occur inside the regasification terminal or the LNG carrier (it must be in a closed saturated environment, mixed with a percentage of oxygen between 10% and 15% being simultaneously in contact with an ignition source).

🚧 CAN LNG EXPLODE?

LNG even in contact with fire does not explode or create flames, it originates a lazy flame which evaporates without causing any shock wave. In confirmation of this, it is well known that during the Iran-Iraq war a ship carrying gas at low temperature, the Gaz Fountain, was hit by 3 missiles and started to burn. The crew was able to put the fire out and subsequently get the 93% of the cargo back without any further incident.

5. Safety aspects

The **CTR - Regional Technical Tuscany Committee** - concluded the authorization process related to safety aspects of the Terminal with the approval of the Final Safety Report, on December 2012, and with the positive verification of prescription's compliance, obtained by the CTR on 02/04/14.

Moreover, OLT sent to CTR, as per regulations (D. lgs. 105/15), the update of the Safety Report, which represents the accord of all the information and evaluations to the configuration "as built" of the project and includes the evidence of acknowledgement of all the prescriptions issued by the Competent Authority during the former authorization process.

Prevention and safety measures adopted by the regasification Terminal "FSRU Toscana" and highlighted in the Safety Report are divided into measures related to the plant and operational measures.

The design and construction criteria of the equipment and the plants were essentially aimed at eliminating the possibility of off-site releases.



As a result, tanks, piping, pumps, valves and the operating systems in general have been constructed in accordance to specific standards, considering the materials to be used and the resistance in the hardest operational conditions with particular reference to the coupling and connection systems between pipes and equipment. These systems were realized considering all the preventive measures aimed at mitigating the evolution of major accidents and the limitation of their consequences.

The prevention of major accidents on board the Terminal is mainly based on a Safety and Management System. This system has been developed by integrating marine aspects (ISM Code: International Safety and Security Management) and the process ones (the management system is in accordance with the requirements of the law related to the highrisk plants and it is certified ISO 9001 and ISO 14001).

Particular attention (through the application of the abovementioned system) is dedicated to the monitoring of process systems, to the control of the navigation in the area surrounding the Terminal, to the realization of correct inspection procedures and scheduled maintenance (considering also the "risk assessment" of the different equipment), to the behaviours to be followed in case of emergency, in compliance with the internal emergency plan and the relative procedures, in order to mitigate the evolution of any incident both in environmental and safety terms.

The incidental analysis and the relative impact both on population and vulnerable sites, which has been elaborated by the Safety Report and updated at any potential modification, considers the following aspects:

- The Terminal is located offshore approximately 22 km off the Tuscan coast between Livorno and Pisa, in an area characterized, within a range of about 12 nautical miles, by a population density equal to zero and with no vulnerable territorial elements;
- The Terminal is constantly monitored by a guardian vessel (LNG Guardian), a well-advanced naval vehicle planned and realized as a support unit in case of emergency with specific equipment against fire and pollution and for the monitoring of the area forbidden to navigation;
- In order to guarantee an adequate control and monitoring of the area around the Terminal, 3 different areas have been defined, in



compliance with the Ordinance no. 137/2013 of the Harbour Master of Livorno:

- *Area 1* denominated “area of complete interdiction” to navigation, of circular conformation, with an indicative radius equal to 2 nautical miles (3.7 km): in this area, the navigation, the stop, the anchoring and the fishing are forbidden, as well as any superficial or underwater activity.
- *Area 2* denominated “limited traffic area” contiguous to the previous one and included between 2 and 4 nautical miles, in which any activity is forbidden, except for the transit at a speed lower than 10 knots;
- *Area 3* denominated “area of notification”, contiguous to the previous one and included between 4 and 8 nautical miles, in which the stop is allowed only for necessity/emergency reasons, and only after having communicated the motivations to the Harbour Master of Livorno. The routes are also monitored and plotted by the Terminal.

Moreover, in the Safety Report it was highlighted that the effects of possible major accidents do not affect the population or any vulnerable site. This result ensures a considerably higher level of safety than the one of onshore terminals. As a further guarantee in terms of security, there were no significant accidents in over 90,000 trips of LNG carriers in the least 50 years (Source: SIGTTO, 2017).

6. Environmental Sustainability

The company obtained all the necessary authorizations in terms of environmental sustainability, in particular:

- **EIA** - Environmental Impact Assessment
- **SEA** - Strategic Environmental Assessment
- **IEA** - Integrated Environmental Authorization

The results of EIA and IEA highlighted the possibility of a real coexistence of the floating unit with the assets present on the territory.



In particular, the EIA allowed OLT to start the operation phase of the Terminal, considering different environmental aspects related to the regasification activities (such as garbage, noise, etc.), with particular reference to the emissions into water and air.

During the authorization process, to protect the territory and the environment, ISPRA and the Ministry of the Environment prescribed a series of monitoring activities for the whole life of the plant, with specific regard to the emissions into water and air. There is a continuous monitoring system of the emissions into the air (CEMS), that implied the installation of a specific instrumentation in order to measure the multiple emissive parameters, including NO_x (nitrous oxide), on each emissive duct of the two boilers on board the Terminal.

The monitoring of the main drains of the Terminal, specifically of the water's drain necessary for the regasification activity, was prescribed. This kind of monitoring required the installation on board of a series of particular instruments that allow to verify continuously the content of free active chlorine, of the flow of water to the drainage and of the difference between the temperature of the water at the inlet of the Terminal and at the outlet of vaporizers.

Furthermore, the Ministry of the Environment, within the EIA procedure, requested, for the whole operative life of the Terminal (20 years) – including the year previous to the installation of the plant and the year after its disposal – a well-structured **"Monitoring Plan of the Marine Environment"** around the Terminal, in order to keep under control the potential environmental effects of the plant. This plan requires the realization of 4 physical-chemical, biological and eco-toxicological monitoring campaigns per year focused on: the water column, the sediments, the biological environment, the measurement of undersea noise, the morphology of the seabed. The Interuniversity Centre of Marine Biology and Applied Ecology "G. Bacci" of Livorno won the realization of this monitoring.

The results of this analysis demonstrated that, during the first four years, there were no situations of potential risk for marine flora and fauna.

Some more environmental details:

- Liquefied Natural Gas

There is no risk of pollution of sea water related to an eventual spill of LNG. The LNG, in fact, once in contact with the air, would pass immediately to the gaseous state dispersing into the atmosphere.



- Chlorine

Chlorination is the chemical antifouling method more used worldwide for its effectiveness at all levels, both civil (drinking water) and industrial (cooling circuits with sea/water, fresh water or sewage). Within the sea/water circuits, chlorination is carried out by dosing of sodium hypochlorite (NaClO) produced on board by electrolysis of sea water itself. Therefore, this process does not require the external addition of chlorine into the sea water, but it transforms the chlorine, already contained in it, in a form useful to perform the antifouling function.

The quantities of free active chlorine released into the sea are, in any way, significantly lower than those prescribed by national regulations on discharges to water (Environmental Unique Text). Moreover, levels of discharge of this parameter were carefully valued by the competent authorities, which proceeded to issue the necessary authorizations. Finally, the concentration of free active chlorine into drainage is subject to a constant control and monitoring during the activity by OLT and by the Authorities. In particular, a continuous monitoring of the main drainage is provided.

- Water temperature

The temperature variations of the sea water were analysed by the competent Authorities and they are continuously monitored and controlled by OLT and by the Authorities (in particular, a continuous monitoring of the temperature difference between the inlet and the drainage system of vaporization is prescribed).

- Undersea noise

Particular attention was dedicated to sound emissions that are generated by the activity on the regasification plant. In this sense, the noise produced on board the Terminal was verified to be lower than the one produced by similar ships moving through the area, considering that "FSRU Toscana" has no engine, hence there is no propulsion noise released into the water. During the authorization procedures it has been clarified that, given the location of the Terminal, there is no impact on the population or on sensitive targets located in proximity of the plant. Anyway, OLT will carry out a specific monitoring of undersea noise, as agreed with competent Authorities. The monitoring shows that the levels of noise produced by the Terminal in operation, measured experimentally, are significantly lower than the hypothesis



made during the analysis of the project and lower than the quantity authorized with the relative measures.

7. Certifications and Registrations

OLT has been deliberately engaged in an accountability and certification path related to its business.

All the commitments outlined in the HSEQ Policy (Health, Safety, Environmental and Quality) are defined in the Integrated Management System set up by OLT according to standards UNI EN ISO 9001 (Quality), UNI EN ISO 14001 (Environment), BS OHSAS 18001 (Health and Safety) and SA 8000 (Social Accountability) and according to European Commission Regulations n 1505/2017 and n.1221/2009 (EMAS: Eco Management Audit Scheme).

Indeed, since 2011 OLT has obtained 4 important Certifications (ISO 9001, ISO 14001, OHSAS 18001 and SA8000) with the independent certification body Bureau Veritas. Moreover, in 2018, OLT obtained the EMAS Registration (registration n° IT-001882).

Moreover, ECOS – joint venture between the Consortium Exmar Ship Management (international group operating in the LNG transport) and the company F.lli Cosulich (Italian company operating over the last 50 years in the shipping field) responsible of the operative management and of the crewing on board the Terminal – obtained the certifications: ISO 9001:2008, ISO 14001:2004 and OSHAS 18001:2007.

8. The socio-economic benefits for the territory

In line with the policy of its shareholders, OLT manages its business in a responsible way. This means maximum standards on safety and the environment as well as a particular sensitivity for the socio-economic needs of the territory that hosts the infrastructure.



1. OCCUPATION

The plant provides a significant contribution to the employment in the territory. Overall, 122 persons are permanently employed. In particular, 20 people are employed in the OLT's office in Livorno.

ECOS – joint venture between the Consortium Exmar Shipmanagement (international group operating in the transportation of LNG) and the company F.lli Cosulich (Italian company operating for more than 150 years in the shipping business) responsible for the crewing and technical management of the Terminal – employs 63 people and F.lli Neri, a company of Livorno leader in the management of naval vehicles at the service of the Terminal, employs 39 people.

2. SOCIO-ECONOMIC OPPORTUNITIES

From an economic point of view, the OLT industrial initiative guarantees important opportunities first of all to the territory of Livorno, in which the main investments are concentrated, but also on the other municipalities that are involved. In particular, the economic impact at a local level is estimated at around 400 million euro in 20 years starting from 2013, which is the Terminal's expected life term. This amount includes a series of specific activities: from the management and the maintenance of the Terminal to the surveillance system, from the use of direct workforce to all the other services related to the environment protection.

In particular:

- OLT collaborates with many local companies, specialized in the fields of repair, maintenance, purchasing, warehousing and transportation, for the organization and the execution of activities related to the ordinary and extraordinary maintenance of the plant. This activity generates an economic spin-off equal to about 10 million euro a year.

Overall benefits for 20 years: 200 million euro.



- OLT signed 3 contracts for the activities of naval support (overall value: 8 million euro a year), related to the tug boats service for the mooring of the LNG carriers to the Terminal (4.5 million euro a year for 2 tug boats), to the transport of personnel on board the Terminal (0.6 million euro a year), and to the surveillance service of the Terminal by the Guardian Vessel "LNG Guardian" (2.6 million euro a year in operation) and for the Marine Base (about 0.3 million euro a year).

Overall benefits for 20 years: 160 million euro.

- The collaboration with the Consortium of Marine Biology and Applied Ecology (CIBM) of Livorno generates an economic benefit of 0.95 million euro per year, due to the provision of a twenty-year program of monitoring for marine, physical, biological, chemical-physical, bathymetric and ecotoxicological surveys which will be carried out.

Overall benefits for 20 years: 19 million euro.

- The fee for the occupation of state property amounts to approximately 0.5 million euro a year.

Overall benefits for 20 years: 10 million euro.

3. ENVIRONMENTAL COMPENSATIONS

Many other economic benefits on the territory will be possible thanks to OLT financial commitment on projects that involve the area in the form of environmental compensation.

1. With reference to the **environmental compensations related to the EIA Decree, for a total amount of 1 million euro**, OLT signed with the Municipality of Livorno, the Municipality of Collesalveti and the Municipality of Pisa 3 specific agreements, aimed at defining the procedures related to the supply of the contribution.

In particular:



- The **Municipality of Livorno and the Province of Livorno** proposed two projects:
 - a contribution for the realization of the Visitors Centre of the Marine Protected Area “Secche della Meloria”, amounting to 400 thousand euro.
 - a contribution of 80 thousand euro for the realization of an environmental characterization of the sites along the coast of Livorno, aimed at the revision of the Structural Plan and of the Urban Regulations of the Municipality of Livorno.

 - The **Municipality of Collesalveti and the Province of Livorno** requested the financing of a project of environmental requalification of the urban centre of Stagno with a total contribution of 420.000 euro.

 - The **Municipality of Pisa and the Province of Pisa** requested the financing for the realization of an equipped park in the public area "La Camilla" at Marina of Pisa for an amount of 100.000 euro. The agreement was signed on 21st March 2016, in order to proceed with the supply of this contribution. The park was inaugurated on April 2017.
2. For the **Municipality and the Province of Pisa**, public tender worth about 4,8 million euro for the **Opening of the Incile Canal**, the link between Arno and Navicelli Canal, in order to make the navigation possible again from the centre of Pisa to the port of Livorno. The works, started in 2014, mainly concerned the removal of the waters and the sludge of a section of the canal and the works of civil and hydraulic engineering to complete the ship canal Pisa-Livorno, currently being finalized. Among the most important works, we found the realization of the principal hydraulic gate on Arno river bank and the two shipping basins inside the canal. To complete the project, other important infrastructures have been realized, which are linked to Pisa urban viability. The project is almost concluded.



3. **Compensations in accordance to the Unilateral Act of Submission signed by OLT on 26th July 2005.** The Tuscany Region, with the Deliberation n. 151 of 3rd March 2014 of the Regional Committee, assigned this contribution to the **Municipality of Livorno**: 500.000 euro per year for 5 years for the realization of the service of door-to-door waste collection for a total amount of **2.5 million euro**. The agreement between OLT and the Municipality of Livorno was finalized on 15th April 2014.
3. **Compensation in accordance to the Agreement signed with the Municipality of Collesalvetti on July 12, 2005:** a co-financing of the project for the realization of a Centre for separate waste collection in Stagno for an amount of **100.000 euro**.

4. SUSTAINABILITY

OLT's mission is based on two principles: responsible management of its activities and full disclosure in reporting them.

The only way of doing business on the territory is the one based on Sustainability, that means realizing and maintaining a plant with the best available technologies on the market, ensuring the highest standards in terms of safety and environment management and a socio-economic contribution to the territory.

For this reason, OLT decided to report its activity through "Rapporto Sicurezza, Ambiente e Territorio" and "Dichiarazione Ambientale - EMAS". These two documents represent OLT's way of doing business, but they are also a means for dialogue and confrontation with the company's stakeholders in order to get inputs for improvement.

5. LOCAL INITIATIVES

OLT supports a series of initiatives to increase the value of local community. Company's intent is to integrate itself with the territory and the community that host the infrastructure.

OLT cooperates with organizations in favor of childhood by supporting them economically. From 2009, for example, the company gives every year a



contribution to the Pediatric Ward of Livorno Hospital. OLT also supports the association “Il Porto dei Piccoli”, an ONLUS association, which through its activities it approaches the hospitalized children and their families to sea culture.

OLT, always sensitive to the sea as a resource and what goes around it, has made donations over the years in favor of Assonautica Livorno, with the aim to support the Sailing School for young disabled people.

Other initiatives sponsored by OLT are: Livorno Marathon, Palio Marinaro, Open Opera and Effetto Venezia.



9. The authorization process

The main steps of the authorization process are:

- **5th November 2003 – Preliminary Safety Report**, pursuant to law no. 334/99 of 05/11/2003 (at present D.Lgs. 105/2015), authorization for the construction of the plant for the safety aspects under the responsibility of the CTR, Regional Technical Committee;
- **20th July 2004 – Strategic Environmental Assessment (SEA)** by the Tuscany Region with Regional Council decision no. 28;
- **15th December 2004 – Environmental Impact Assessment Decree (EIA)** of Ministry of the Environment no. 1256 for the whole project, with the favourable opinion of the Tuscany Region and the agreement of the Ministry of Cultural Heritage;
- **23rd February 2006 – Ministerial Decree by Ministry of Economic Development** for the authorization to construct and operate the regasification Terminal and the subsea gas pipeline;
- **20th November 2006 – Authorization Decree by the Ministry of Economic Development** for the authorization to construct and operate the onshore gas pipeline;
- **2nd July 2008 – Purchase of LNG carrier ‘Golar Frost’** by OLT;
- **10th December 2008 – Offshore land concession** no. 469, issued by the Ministry of Infrastructure and Transport and signed on 10/12/2008 with the Harbour Master of Livorno, for the occupation of the offshore area where the unit is located and the area occupied by the subsea pipeline connecting the unit to its arrival point onshore;
- **11th May 2009 – Permit for the movement of the seabed** no. 19/2003 pursuant to Regional Law for the laying of the pipeline in the floodway and of the anchors by the Province of Pisa and following update (2012);



- **21st June 2009 – The ship Golar Frost entered the shipyard Dubai Drydocks World (DDWD) to start the unit's conversion works;**
- **20th October 2010 - Exclusion of the application for the procedure of Environmental Impact Assessment** for the changes improved on the Terminal during the phase of Executive Engineering (2010) with the measure of 20/10/2010, prot. no. DVA-2010-0025280;
- **14th June 2012 – Request of Offshore land concession variations:** the request for the modification of the Land Concession was demanded because of the change of the route of the pipeline into the sea, consistent with the compliance to the environmental prescription. On 28/05/2010 the Land Concession Variations Act no. 469, pursuant to art. 24 of Navigation Laws (Supplementary act) was signed by OLT and Livorno Harbour Master, then registered by the Ministry of Infrastructures and later approved by the Court of Auditors. Moreover, on 14/06/2012, OLT and Snam Rete Gas (SRG) signed the Supplementary Act no. 472 through which SRG took over from OLT to the Land Concession related to the pipeline. This Supplementary Act has been duly approved by Decree of the Ministry of Infrastructure and Transport and registered by the Court of Auditors.
- **1st October 2012 - Exclusion of the application for the procedure of Environmental Impact Assessment** for the design's update related to the typology of LNG carrier compatible with the Terminal and the related number of ships approaching the Terminal with measure of the Ministry of Environment prot. no. 23515;
- **2nd October 2012 - Exclusion of the application for the procedure of Environmental Impact Assessment** for the changes improved on the mooring system with measure prot. no. 23531;
- **12th December 2012 - Approval of the Final Safety Report pursuant to Legislative Decree 334/99 (at present D.Lgs. 105/2015) for the emission of "Conclusive Technical Opinion".** The Definitive Safety Report was approved with note no. 21396 on 12/12/12 by CTR Tuscany with the emission of Conclusive Technical Opinion.
- **15th March 2013 - Integrated Environmental Authorization.** The IEA Decree was issued by the Ministry of Environment with prot. 0000093;



- **19th July 2013** - **Ordinance for the safety of the navigation** no. 137/2013 issued by the Harbour Master of Livorno in order to define the areas where navigation is forbidden;
- **20th December 2013** - the Ministry of Infrastructure and Transports, on the basis of the Memorandum of the Local Commission, issued the **Authorization for the Provisional Exercise** of the plant;
- **29th January 2014** - Ordinance no. 06/2014 issued by the Harbour Master of Livorno that approved and made operative the **Regulation of the Terminal's activities**;
- **29th January 2014** - OLT obtained by CTR the **declaration of no increase of risk** in order to allow also the use of LNG carriers with capacity of 155,000 cm;
- **2nd April 2014** - CTR acknowledged complied the prescriptions concerning the Final Safety Report;
- **17th March 2015** - Following the positive results of the commissioning by the Interministerial Committee as per art. 48, **the Ministry of Infrastructures and Transports issued the final Commissioning Authorization for the operations of the Terminal**;
- **23rd June 2015** - OLT obtained by CTR **the authorization to receive LNG carriers with a capacity up to 200.000 m³**;
- **9th November 2015** - the Ministry of Environment, Land and Sea issued the **Decree of exclusion from the EIA procedure** with which the increase in the limit of capacity of carriers that can approach the terminal up to 180,000 m³ was authorized as well as the increase of the thermal gradient related to the seawater necessary for the regasification up to a hourly average value equal to -6.0 ° C, while maintaining a same quantity of annual frigories;
- **14th April 2016** - Authorization of the Maritime Authority of Livorno for the mooring to the Terminal of **"New Panamax"** vessels, with capacity limits authorized by the Ministry of Environment with provision prot. 0398 of 9/11/2015;
- **25th July 2016** - The Ministry of Economic Development issued the **final Commissioning Authorization for the operations of the Terminal**.



10. Regulatory aspects

The OLT Terminal has been defined as an essential infrastructure for the National Gas System with Decree of the Ministry of Economic Development. As a consequence, the plant is at the disposal of the Country to guarantee the supply security and the diversification of gas supply. The rules to access the regasification services of the Terminal are defined by the Regasification Code published on the OLT website.

The Italian Regulatory Authority for Energy, Networks and Environment (ARERA) regulates the tariff criteria for the regasification service for each regulatory period. In particular, the Resolution ARG/gas438/13 defines the tariff criteria for the regulatory period which goes from 1st January 2014 to 30th December 2017.

With Resolution 653/2017/R/gas, the Authority decided to postpone the beginning of the new regulatory period to 2020, and to extend the current regulatory criteria to the transitional period 2018-2019.

The tariff system is studied to promote the efficiency, to guarantee transparency and to support the development of investments in a logic of regulatory long-term stability.

OLT also responds to the functional and accounting separation regime defined by the Unbundling normative and it is subject to the REMIT regulation (Regulation on the Integrity and Transparency of the Energetic Market). This regulation entered into force in 2011 and it is valid for all the EU Member States. In particular, it aims to establish shared rules at the European level for the integrity and the transparency of the energy market, to prevent illegal practices.



11. Commercial aspects

11.1. Preliminary remarks

The floating regasification terminal "FSRU Toscana" started its commercial activities on 20th December 2013, by offering the first Delivery Slot. Starting from this date, on equal and not discriminatory terms of access in accordance with the regulation, OLT made the regasification capacity of the terminal available to all the players of the market.

"FSRU Toscana" contributes to improve the Italian energetic security, since it allows to diversify the source of gas supply. Such contribution is relevant especially in the light of what defined by the SEN (National Energy Strategy), which consider as essential the diversification of gas sources, through the optimization of the use of existing infrastructures, such as the regasification terminals. To reach this aim, the SEN underlines the role of the new mechanisms for the allocation of the regasification capacity through auctions, which should increase the regasification terminal's utilization (see paragraph 11.3 for more details).

11.2. The market scenario and the supply contracts

The LNG market has dramatically changed in recent years. Following the economic crisis of 2009, there has been a substantial lowering of gas demand in Italy and in Europe, with a consequent surplus of regasification capacity that has not been allocated to European Terminals.

Moreover, the long-term regasification contracts started to be progressively replaced by "spot" and "short term" contracts, in the direction of a flexible and dynamic market.

In the last few years, there has been a significant increase in the number of LNG importing countries, and the advent of new importing ones such as China, Poland, Lithuania, Malta, Latin America and Middle East. At the same time, there has been an increase in liquefaction capacity, which is expected to increase further between now and 2020. Indeed, 16 projects



currently under construction are expected to become operative by 2020. The 80% of the abovementioned projects are placed in the USA and in Australia. If the rise in the LNG supply will not be followed by an increase in the demand, there may be a lowering of LNG prices, in the short and medium term, with the possible increase of LNG imports in Europe.

With the goal of making the Terminal as much available as possible to national and international operators and to adapt it to new market scenarios, OLT has required and obtained an increase of the maximum regasification capacity of LNG carriers that can discharge on the Terminal. Currently, the Terminal is authorised to receive around the 90% of LNG carriers, with a maximum capacity between 65,000 and 180,000 cubic meters (New Panamax class), keeping unchanged the maximum authorized regasification capacity of 3.75 billion cubic meters. This flexibility allows the user of the Terminal to profit from the opportunities that, in the next years, will involve the Mediterranean area. Thanks to this increased flexibility, OLT is able to take the opportunities offered by the LNG changing market, in view of the entrance in the market of new operators that currently cannot be connected to Italy by pipeline. This opportunity also represents a guarantee in order to reduce the risks that may occur on imports (from Africa due to political events and Russia due to the known issues related to transits in Ukraine). Starting from the beginning of commercial operations, OLT Terminal has received LNG from the major LNG exporting countries: Algeria, Nigeria, Norway, Peru, Qatar, Trinidad e Tobago, USA, as well as from other European terminals (Spain and the Netherlands).

11.3. Firm regasification services

Starting from the beginning of commercial activities, in the “Business Area” of the website, OLT makes available all the documents useful to request a Delivery Slot.

In line with the deadline provided for by law and with the allocation procedures of the other Italian terminals, OLT starts the allocation processes of regasification capacity on multi-year / annual and monthly terms, according to the timing provided for by the Regasification Code.

With resolution 660/2017/R/gas, the Authority has introduced market mechanisms for the allocation of regasification capacity (through auctions)



with the aim of making the use of the regasification terminals more attractive.

This new modality will allow to allocate capacities in the following way:

- 1) Ascending clock logic auction for pluri-annual and annual capacity
- 2) Pay as bid for infra-annual, monthly and spot capacity.

The new allocation mechanisms should be implemented within 2018.

The resolution 660 also provides the possibility for regasification companies to use the services of the GME (Gestore Mercati Energetici) for the implementation of a platform to perform the auctions (Platform for the Allocation of Regasification Capacity – PAR).

Following these regulatory developments, OLT has modified its Regasification Code, in order to be able to allocate capacity through auctions. The new Code, that after a phase of public consultation has been approved by the ARERA with resolution 110/2018/R/gas, provides the following allocation procedures:

- 1) Allocation of annual and pluri-annual capacity:
 - a. For the capacity from the 6° to the 15° year following the year of the allocation, the User can send an expression of interest by the 1st of April of each year;
 - b. The capacity from the 1° to the 5° year is offered through auction on annual basis.
- 2) Infra-annual capacity: one monthly auction (which offers the regasification capacity from the month which follows the auction till the end of the gas year); two spot auctions (which offers the capacity remained available after the monthly auction) and two allocations on a First Come First Served basis (FCFS) to allocate the capacity remained available after the spot auctions.

The resolution 110/2018/R7gas also provides that the auction mechanisms should be in place from March 31st, 2018 onwards. For this reason, OLT has performed the first auction on April 10th, 2018.



11.4. The Peak Shaving Service

In 2017, OLT offered the Peak Shaving service for the fifth consecutive year. This service is one of the emergency measures established by the Decree of the Ministry of the Economic Development within the "Emergency Plan" to face unfavourable events for the national gas system, which may happen during the winter period and to guarantee the security of the Italian Gas System. In case of emergency this service would allow to insert gas in the network - previously unloaded and stocked into the tanks of the Terminal - at short notice, with the aim to face peak requests of the gas system for a limited period of time.

In five years, OLT Offshore LNG Toscana provided to the system a quantitative of LNG in the amount of 460,000 mc through this service. At the same time, OLT is still offering regasification capacity on pluriannual, annual and infra-annual base, according to applicable law.

During the Peak Shaving service for the gas year 2016-2017, the Terminal received the first cargo from the United States. For further information and more details on the service please visit the dedicated area on the website:

<http://www.oltoffshore.it/en/terminal/services/peak-shaving-service/>

10.5. The Regasification and Storage Bundled Service

Since 2013, the Terminal has contributed to the security and the diversification of energy supply of the Italian Gas system, by providing its storage and its flexibility in case of emergency.

The Regasification and Storage Bundled Service has been introduced by the Ministry of the Economic Development and by the Regulatory Authority for Energy Grids and Environment (ARERA) as a further measure to guarantee the energetic supply security in Italy, through the diversification of the source of gas supply.

The service entails the offer, by the regasification companies and the major storage company STOGIT, of LNG regasification and storage, giving priority in the assignment of the service to the gas coming from states from which importations of equal or superior duration to one year are not ongoing.



ing.

In 2017, this service has been offered by OLT for the second consecutive year, and OLT was able to allocate 10 slots between April and September, for a total quantity of 836,5 standard cubic meters of LNG, coming from 5 different countries: USA, Trinidad & Tobago, Qatar, Algeria and Norway.

These results represent a good signal for the LNG Market recovery and for the “FSRU Toscana” Terminal as well. Indeed, the OLT Terminal demonstrate to be an important infrastructure, endowed with high flexibility, which is able to intercept the needs of the intentional LNG market.

For further information and more details on the service please visit the dedicated area on the website:

<http://www.oltoffshore.it/en/terminal/services/the-regasification-and-storage-bundled-service/>

11.6. Future Perspectives

The LNG is more and more at the core of the EU debate on green fuels, since it is considered the fossil fuel with the lowest environmental impact, which may at the same time assure high-level performances in terms of energetic efficiency.

The objectives defined by the EU for the next years in this field are particularly demanding. The Directive 2014/94/EU on the deployment of alternative fuels infrastructures stated that all the EU Member States should provide, by 2016, plans for the development of different fuels for the transportations' sector, among which LNG. The Directive 2014/94/EU (DAFI) has been adopted with the Legislative Decree n. 257, approved on 16th December 2016. This latter includes the National Plan for the use of LNG in Italy, providing the guidelines for the development of sector regulations.

By 2020, all Member States will have to rely on more sustainable fuels, with the aim of drastically reducing the particulate emissions, NOx and Sox. More precisely, for what regards the maritime transportation, there are two long-term deadlines: 31st of December 2025, by which date there should be in the seaports an adequate number of LNG supply points, belonging to the European networks along the main Nord-South and East-West corridors,



which are nominated “Blue Corridors”, and 31st of December 2030, deadline for implementation of LNG refueling stations in the main inland ports.

The SEN, approved in Parliament in October 2017, has confirmed what already defined in the DAFI, by introducing a proposal to realize a SECA (Sulphur Emission Control Area) pilot area for the Mediterranean in Sardinia.

In this scenario, the regasification Terminal “FSRU Toscana” can assume an important role in the “**Small Scale LNG**” initiative - the new frontier for LNG supply- thanks to its versatility and thanks to the strategic location of the plant. More precisely, the “Small Scale LNG” service regards the possibility for carriers of small dimensions to receive the LNG directly from a regasification and storage plant, and then to discharge it to gas stations onshore, within the Mediterranean seaports. Within port areas there may be “service stations” at which it will be possible to add fuels both for ship and for vehicles using LNG in transport.

With a view to the future development of a Small Scale LNG logistics (SSLNG), through the Ministry of Infrastructure and Transport (MIT) and with the coordination of the Port Authority of Livorno (AP), OLT performed a feasibility study, co-financed by funds provided by the European Commission under the “Sea Terminals” project. The study provided positive results, and it confirmed the possibility for the Terminal to discharge on small LNG carriers, with a cargo capacity between 1.000 and 7.500 cubic meters, a length between 60 and 110 meters, and a cargo capacity between 250 cm/h and 900 cm/h.

For what concerns safety standards, the study has taken in consideration the international standards for big LNG carriers. As a consequence, the so-called “LNG bunkering vessels” must comply with OCIMF (Oil Companies International Marine Forum) standards, such as the ones concerning the hooking “manifold” systems. In addition, they must have electronic safety systems (ESD) in compliance with SIGTTO’s standards, in order to guarantee the maximum level of safety during the discharge on every type of terminal.

The study also showed that the changes required to provide this new service are marginal, and they could be performed in a short time (1 or 2 years). These changes cover the left side of the system, where elements for the mooring and for the discharge are already in place. The Terminal “FSRU Toscana” has shown, therefore, to have all the credentials to be able to operate as LNG bunkering station in Livorno, functioning as a centre



for LNG sorting in the North Tyrrhenian, providing the necessary quantities of LNG to supply the major ports in the area.

Following the results of the feasibility study, OLT started the realization of a detailed study. In addition, OLT participates to the tender "Connecting Europe Facilities - CEF" of the European Commission, in order to receive funds for the permitting analysis.

"FSRU Toscana" would therefore represent a key element in the chain for the supply and distribution of LNG, which also involves other partners at local level.

12. Numbers and timing

- "FSRU Toscana" main features: length overall 306.49 meters, width 48 meters, height 26.5 meters
- 12 nautical miles (about 22 km): Terminal's distance from the coast
- 3.75 bcm: maximum authorized capacity per year
- 4%: the national gas requirement that the plant could satisfy
- 36.5 km: total pipeline length (29.5 km at the sea, 5 km in the floodway, the remaining 2 km on dry land, completely buried and directly connected to the Italian National Grid)
- 6 meters: onshore pipeline depth
- 4 billion of LNG cubic meters: annual gas consumption of Tuscany Region
- over 90,000: trips of LNG carriers in the least 50 years without relevant accidents.
- Origin of the LNG received by the Terminal: 9 different countries (Algeria, Nigeria, Norway, Netherland, Perù, Qatar, Spain, Trinidad e Tobago, Usa)
- About 850 million euro: project's total investment
- 400 million euro: economic benefits in 20 years
- 05/02/13: launch of the Terminal "FSRU Toscana" in Dubai



- 02/06/13: sail away of the Terminal "FSRU Toscana" from Dubai
- 30/07/13: arrival of the plant at the installation site off the coast between Livorno and Pisa, after an activity of towing of about 40 days
- 19/12/13: conclusion of the commissioning phase of the plant
- 20/12/13: starting of commercial activities
- 17/03/15: the Ministry of Infrastructures and Transports issued the final Commissioning Authorization for the operations of the Terminal
- 25/07/16 - The Ministry of Economic Development issued the final Commissioning Authorization for the operations of the Terminal.

For further information: www.oltoffshore.it

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