

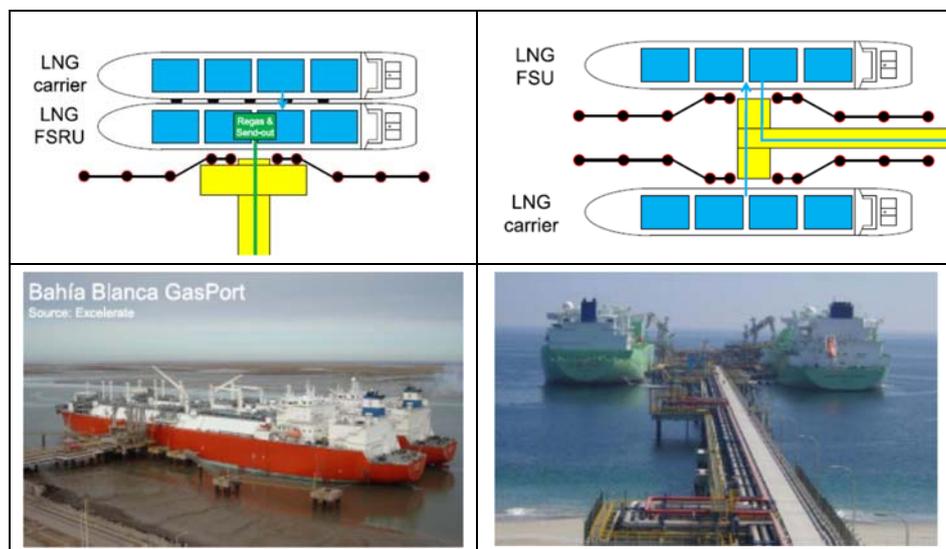
Ph.D. POSITION AT CERTEC-UPC-BarcelonaTech

New challenges in risk analysis of LNG port infrastructures

Research project objectives

LNG is already recognized to be an attractive fuel alternative for transportation, particularly maritime, to meet current requirements for **decreasing green house emissions**. A core network of refuelling points of LNG at maritime ports are nowadays being built up to promote the use of this fuel. Illustrative examples can be already found in numerous European countries motivated by the **2014/94/EU Directive** (Spain, Portugal, Malta, etc.), but also some other ports worldwide are developing this new logistic framework. Brasil (Gunabara), Argentina (Baia Blanca, Escobar), Chile (Antofagasta), Dubai (Jebel Ali) are also interesting examples in this sense.

New infrastructure LNG networks will surely involve **new operating modes** that will imply **new challenges in risk analysis** and safety management (Figure 1). While the logistic chain for the supply of LNG is being already developed, technological risk assessment of these new fuel supply scenarios has been so far disregarded.



*Figure 1: Different mooring arrangements imply different risks, so far unexplored
 (Source, Harsema-Mensonides, 2013)*

Risk analysis assessment of new LNG port infrastructures is characterized by the presence of complex geometries, with semi-confined spaces and barriers. Traditional dispersion models cannot take into account this complexity, hence **new modelling techniques based on CFD** (Computational Fluid Dynamics) need to be used for this purpose.

In this PhD project, overall technological risks analysis by means of cutting-edge CFD tools will be performed to compare new operational forms within the LNG logistics framework. The expected goal is to come up with scenarios design recommendations based on minimising risk of accidental events, to prevent harmful effects to workers, population and ultimately marine pollution.



Requisites

The candidate has to have chemical or mechanical (industrial) engineering background and be enrolled in a Master's degree with a good student record. The candidate has also to master English and Spanish language, both written and spoken.

Salary and start date

The candidate is offered a 4 years full-time position. The salary will be linked to Spanish official grant for PhD students (*FPU Ministerio de Economía y Competitividad, FPI-UPC*) **that is now opened (deadline February 3^d)**. The start will be on September 2017.

Host research Centre: CERTEC at UPC-BarcelonaTech

The Universitat Politècnica de Catalunya· BarcelonaTech (UPC) www.upc.edu is a public institution dedicated to higher education and research, specialised in the fields of engineering, architecture and science. The activity that goes on at UPC campuses and schools has made the University a benchmark institution. The University harnesses the potential of basic and applied research, and transfers technology and knowledge to society. These actions make the UPC—in partnership with industry—an agent and driver of economic and social change. The UPC puts its scientific and technological infrastructure at the service of research groups and centres, researchers and students, professionals, companies and institutions.

The successful candidate will work at CERTEC (Center for Technological Risk Studies, www.certec.upc.es) located at the brand-new Diagonal Besòs Campus at Barcelona. The group exists of an enthusiastic, diverse and creative team, including scientific tenured staff members (full and associate professors), PhD and MSc candidates and undergraduate students.

Moreover, this PhD project will offer the possibility of doing research stays in **different research centres** (University of Sao Paulo, Brazil; University Bahía Blanca, Argentina) as well as in port related **enterprises** and **engineering consultancy companies**

Contact

Those interested please, send a letter of application and a CV to:

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