



**TRUSS**  
**www.trussitn.eu**

TRUSS (Training in Reducing Uncertainty in Structural Safety) is a Marie Skłodowska-Curie Innovative Training Network funded by the European Union under the Horizon 2020 Programme. TRUSS is structured into taught modules combined with original and impactful research supported by secondments that will give the successful candidates significant insights and exposure to research and innovation in both academia and industry.

**EARLY STAGE RESEARCHER VACANCY:**  
**ESR 5**



Project Title:  
**INTEGRITY MANAGEMENT OF SHIP STRUCTURES**

**Host**

Lloyd's Register EMEA

**Address**

Technical Investigation Department; Lloyd's Register Global Technology Centre;  
Southampton Boldrewood Innovation Campus; Burgess Road, Southampton SO16 7QF

**Country**

United Kingdom

**Main Supervisor**

Dr. Kian Banisoleiman

**Background**

*Passenger ships* can operate in extreme and harsh conditions and are designed for a certain life span. *Lloyd's Register* is currently investing in monitoring technology and methods that will lower the costs of Integrity management of ageing ship structures. There are differing requirements from a statutory and operator point of view. This is a complex and difficult arena with potentially significant benefits where *TRUSS* will invest further research. *Lloyd's Register* has operated a long term acoustic emission and strain based monitoring system on a semi-submersible offshore asset in the North sea to identify and quantify any fatigue related cracking in nodal joints. It has also operated long term vibration and strain based monitoring system on a class of cruise ships to assess the loading and monitor the effects of structural changes which has been used to support the recommendations for the structural integrity management of these vessels. Both sets of data are also correlated environmental date sets including wave height, wind speed and direction. The long term data sets already gathered are unique and valuable and representative selected sets will be made available to the ESR. Furthermore global FEA models of vessel, fatigue test characteristics of materials with a range of instrumentation for crack detection and monitoring will be available to the



ESR on a similar selective representative data set basis. The monitoring and test programmes undertaken can be viewed as specific examples of integrity monitoring and assessment. The methodology will be extended to improve the prediction and identification of structural issues which threaten the integrity of the vessel from both the statutory and operator points of view.

### Objectives

The proposed project will focus on the requirements for integrity assessment both from a statutory view point and from an operational/reliability viewpoint with the aim of forming a united picture. Existing data sets will be investigated, for example improved sizing of fatigue cracks and estimates of growth rates from predictions, acoustic emission data and operational profile. The candidate will finally propose a system of combined monitoring technology, analysis and reporting which will address the statutory and operator's needs. The limits of such a system will be explicitly investigated and approaches to integrating this within framework to achieve as low as reasonably practicable risk will be formed.

### Expected Results

Survey and reconciliation of statutory and operational requirements for shipboard integrity management; Identification of technology for monitoring to enhance the current integrity management paradigm; recommendations on integrity management methods for modern day large passenger vessels.

### Secondment

This position involves a secondment of some months to University College Dublin (*UCD*). Simulations global ship FE models, fatigue calculations (combined with corrosion levels) and crack monitoring will be used to propose a monitoring strategy.

### Specific Requirements

- At the date of closure of appointments, candidates must have obtained, or finalize within 3 months, a 4-yr Bachelor or a Masters degree in Engineering, with a strong background in Structures.
- Prior knowledge and skills in programming are desirable but not mandatory.
- We are looking for candidates with a strong motivation to pursue a career in engineering and an open mind for new approaches and a lot of team spirit. Creativity and level of independence will be considered.
- Solid written and oral communication skills in English are prerequisites of any successful application.

### Eligibility Criteria

- Researchers can be of any nationality and age.
- All recruited researchers **must be Early-Stage Researchers (ESRs)**. A ESR shall, at the time of recruitment by the host organisation, **be in the first four years of their research careers** and not yet have been awarded a doctoral degree. The four years start to count **from the date when a researcher obtained the degree which would formally entitle**

#### him/her to embark on a doctorate.

- Researchers are required to undertake transnational **mobility** (i.e. move from one country to another) when taking up their appointment. One general rule applies to the appointment of researchers: **At the time of recruitment by the host beneficiary, researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their host beneficiary for more than 12 months in the 3 years immediately prior to the reference date. Note that the *mobility* rule applies to the beneficiary where the researcher is recruited, and not to beneficiaries to which the researcher is sent or seconded.**
- For all recruitments, the eligibility and mobility of the researcher will be determined at the time of their (first) recruitment in the project. The status of the researcher will not evolve over the life-time of a contract.

#### Salary and Working Conditions

- Each position is for a period of 36 months. These positions will be available from August/September, 2015. The Marie Skłodowska-Curie programme offers highly competitive and attractive salary and working conditions. Exact salary will be confirmed upon appointment. It consists of a living allowance (= 37320 euro/year [the Marie Skłodowska-Curie rules apply a correction factor to this amount to allow for the cost of living in different countries]) + a monthly mobility allowance (= 600 to 1100 euro/month depending on the family situation).
- Furthermore, PhD tuition fees for the ESR are covered and the research project is aimed at defending a thesis and obtaining a PhD degree. In addition to their individual scientific projects, all positions will benefit from further continuing training, which includes internships and secondments (All ESRs will be seconded at least once during this period at another partner site), a variety of training modules as well as transferable skills courses, active participation in workshops and conferences, and exposure to large enterprises, SMEs and Universities from different European countries involved in TRUSS.

#### Application Procedure

- (1) Check you meet **Eligibility criteria** and **Specific requirements for the ESR position** project/s you are applying for.
- (2) Prepare the following **application documents** (in English):
  - a. **A curriculum vitae**, including contact details, education (at University level and other), work experience, prizes/awards, language skills, etc... (max. 2 pages). The CV should reflect a representative array of achievements and qualifications appropriate to the post for which application is being made.
  - b. **Official academic record** of undertaken courses & grades for Bachelor (and Master if required in specific criteria) degree.
  - c. **A motivational letter** in which the applicant describes his or her motivation to pursue postgraduate studies and to conduct the research project/s applied for. Mention the ESR project number or numbers (in the latter indicate order of preference if any) on your motivational letter and the subject of the email.



d. **A reference letter.**

- (3) Email your application documents as attached files to: [trussitn@ucd.ie](mailto:trussitn@ucd.ie) **before the 1<sup>st</sup> May 2015 deadline** and mention the ESR project number/s you are applying for in the subject line.
- (4) The documents provided will be used to select the best candidates. Successful candidates will be informed **before 29<sup>th</sup> May 2015**.

**For more information on a position with TRUSS, please check [www.trussitn.eu/vacancies](http://www.trussitn.eu/vacancies) or email [trussitn@ucd.ie](mailto:trussitn@ucd.ie)**