Development Paper

Introduction

October development paper presents an interview with Prof. Dr. Reza Ziarati, Surpass Project Coordinator, and Principal of TUDEV – Institute of Maritime Studies.

Biography – Prof. Dr. Reza Ziarati

Professor Dr Reza Ziarati

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Principal at TUDEV – Institute of Maritime Studies

Professor Reza Ziarati commenced his degree studies in the Department of Mechanical Engineering, University of Bath and graduated in 1976. In 1977, he concluded his MPhil studies and transferred to PhD. He was then awarded a PhD in 1979. In 2003, he was invited to support the establishment of a new institute for the maritime industry in Turkey with a view to help establishing the first maritime university in Turkey. As a catalyst he initiated a series of major and prestigious EU funded projects and several higher degree research programmes with a number of universities in the UK.

Professor Ziarati, while supporting the establishment the maritime institute and the university in Turkey, also remained as the Chairman of CFF (Centre for Factories of the Future), based in Coventry in the UK. In 2005, he was awarded one of the first five EU funded Leonardo projects by the Deputy Prime Minister of Turkey. Several other projects have since been initiated. This interview concerns one of these projects called SURPASS. The SURPASS Project was prepared after concerns about the increasing number of accidents and engine stops due to automation system failures on board vessels.

SURPASS PROJECT

SURPASS (**S**hort C**our**se **P**rogrammes for **A**utomated **S**ystems in **S**hipping) is a European Union (EU) funded Leonardo Project and is of a particular interest to the shipping industry. It has been initiated by TUDEV (Turkish Maritime Education Foundation) Institute of Maritime

Studies with support from Centre for Factories of the Future in the UK. There are 7 partners from 5 different countries in the consortium.

The project is based upon the development of a short course programme design, delivery and assessment on automation to fill the gap created as the result of emergence and application of the automated systems. The intention of the project is to reduce accidents and incidents due to automation failures at sea.

A paper prepared by Professor Ziarati (2006) and a report to IMO (International Maritime Organization) Maritime Safety Committee (MSC) clearly identified a major source of accidents particularly in the future to be the problems with the application of automated systems and failures in any aspect of automation. STCW training standards for Engineers have not been updated to account for working with automated engines. Instrumentation and control systems including hydraulics and pneumatics need to be included in the syllabuses of the programmes for the Engineer and Deck officers. Under STCW, when the project commenced, there was no specific training requirement for electrical engineering officers on board vessels, and therefore no internationally or European agreed standard by which shipping companies can effectively assess their knowledge.

The SURPASS project's main aim is to fill this gap created as the result of emergence and application of the automated systems in the education and training of seafarers by provision of a training course enabling them to have a full understanding of automated systems, and these systems' weaknesses and limitations.

Although this project focuses on the maritime industry, it may support other business areas which have been severely suffered from the automation related accidents.

The following interview is made to provide enhanced information on this important project.

INTERVIEW

Question: *Sir, how did the idea of project SURPASS come from?*

Answer: Having attended the Maritime Safety Committee (MSC) representing the Institute of Marine Engineering, Science and Technology (IMarEST) and as member of the delegation of the Turkish Government, some concerns were expressed on the increasing number of accidents due to automation failures at sea. My report was submitted to IMarEST and a summary to the Turkish Chamber of Shipping. The Chamber decided to support TUDEV in drafting a proposal (SURPASS) to the Turkish National Agency. The idea of SURPASS came about in 2006 after a discussion with the representatives of the shipping

community in Turkey led by Mrs Sadan Kaptanoglu, from Kaptanoglu Shipping who is also a member of the Executive Committee of the Turkish Chamber of Shipping in 2006. The idea was transformed into a project and eventually approved. The project was carried out under the auspices of Mrs Sadan Kaptanoglu.

Let me stress that; automation has brought two problems with it. One is concerning the inadequacy of existing seafarers' education and training in many aspects of automation hence inability of the crew to respond to the failure effectively. The second problem basically is that the human operators rarely understand all the characteristics of automated systems and weakness, limitation of those systems which have now been found to be the main causes of many of the accidents at sea.

Q. *Sir, Would you please clarify the scope of the project SURPASS?*

A.   As you may well know, there are international standards for the education in merchant navy. There has also been a rapid revolution in design of ships and equipment used on board ships. This links to the automation problems. With this particular link, the inadequacy of existing seafarers' education and training in any aspects of automation is of paramount importance. Therefore the **SURPASS** projects is in fact a short course for the seafarers clearly to understand the main principles of automation on board the ships.

Q.   *What is the aim of the project SURPASS?*

A.   The main aim is to transfer innovation already developed in design, delivery and assessment of short courses, in all possible educational environments i.e. in class-rooms; in simulators, laboratories and ultimately in e-learning platform, in order to fill the gap created as the result of emergence and application of the automated systems on board vessels. Ultimately, the outcome is a short online course on automation used on board modern ships.

In summary, the education and training of seafarers, by provision of a training course enabling them to have a full understanding of the concepts of automated systems is the main aim. The intention is to make this course available to the industry for the maritime companies, helping their crew to become familiar with various aspects of automation used on board their vessels.

The adaptation of the SURPASS course as an e-learning and e-assessment platform means that the course is available to all companies worldwide at any time on demand.

Q. *Sir, what would be are the main components of the SURPASS course?*

A. Well, to get a clear picture of the stated content of the course, this is presented in Table 1 which outlines the main headings of the course. The project website: www.surpass.pro gives details of the SURPASS and the course in full.

Q.   *Who are the partners in the project consortium?*

A.   There are 7 international partners appointed for the development of the project. By the way, TUDEV – Institute of Maritime Studies in Turkey is the leading partner, and the project manager.

Q.   *How would you define the proposed contents of the SURPASS training course?*

A.   The content is organised under the following sections:

-       Investigation of the fundamentals of instrumentation and Automatic Control – Fundamental knowledge

-       Study of the information and Energy Control Systems - – Automation Systems

-       Operation of the Instruments and Automated Systems – Automation Operations

-       Management of the Unmanned and Fully Automated Commercial Ships – Automation Management

Each section has basically, all the course content presented as text, slides, animations, videos and a set of scenarios supported by several self-assessment exercises. References are also provided to other research and learning material when needed.

An example of the course content is presented in the Table 2. Table 2, represents the headings for fundamental knowledge only; for full content see project website or the project DVD.

Q. *What about the recognition and dissemination of the project at this stage?*

A. The proposed project is supported by maritime industry, professional and awarding bodies as well as well known nautical centres in several countries. They have agreed to support the valorisation activities. The SURPASS short course is of interest to a wide global audience as many fleets are increasingly opting for vessels with automated and integrated navigation and propulsion systems.

In order to disseminate the SURPASS project course CD/DVDs will be distributed to target groups free of charge. SURPASS course content will be available on the project website. The results may be translated into other languages if needed.

Q.   *Do you think that the over-reliance and over-confidence will be remedied as a result of this project?*

A.   Automated systems can be difficult to understand even for a well-educated seafarer or lecturer and it is important that all merchant navy officers understand them, but it is also important that they are also able to understand them using a suitable learning platform. There is sometimes an over-reliance on automation by crews, leading to a false sense of security that the automation will always handle the situation safely. Ships' crews are often overconfident in the data presented to them by automated control systems and this leads to a lack of cross-checking of data.

Q. *Finally, Sir, what would be the benefits and deliverables of SURPASS?*

A. Basically, they can be categorised as short to long term specific outcomes. Some of them are as follows:

1)   Improved quality of VET systems and practices for seafarers

2)   Skills, knowledge and competency in automated system for the target groups

3)   Safer working environment

4)   Training on team work on board vessels

5)   Improved transparency and recognition of qualifications

6)   Innovative ICT-based tools and services as well as techniques for lifelong learning

7)   Improved European and international standards for training of ratings, cadet officers and senior ranks in automation

8)   Reduction in loss of life and injury due to reduced number for accidents due to automation failure and less frequent engine stops.

9)   Reduction in cost of accidents and opportunity to be more competitive

10) Safer working environment for the target groups

11) Increased the volume of cooperation between the institutions involved with delivery and accreditation of the SURPASS training course

Final: *Sir, thank you for the information on this project which will be a very good example for encouraging cooperation between education institutions and industry.*

For tables 1 and 2 see attached.

Table 1: Project Scope and Details

Project Name: SURPASS

Project Title: Short Course Programmes for Automated Systems in Shipping

Acronym: SURPASS

Number of Partners: 7 (Seven)

Number of the participating countries: 5 (Five)

Total Project Cost: 367.270,00 €

Total Community Grant Requested: 275.449,50 €

Project Participants:

Turkish Maritime Education Foundation Institute of Maritime Studies**,** Turkey

(Project Owner Institute, Applicant Coordinator)

Core Partners:

C4FF (**Centre for Factories of the Future**), United Kingdom

Spinaker, Slovenia

Satakunta University of Applied Sciences, Finland

Maritime University of Szczecin, Poland

University of Plymouth – **Faculty of Science**, United Kingdom

Edexcel/BTEC: Associated Partner:

Table 2: Course content sample – Fundamental knowledge only for full content see website

Classroom and/or online learning
Power Point slides, Sound recorded
1. MAIN MENU
1.0 Investigate the Fundamentals of Instrumentation and Automatic control

	1.1.0 Need for process control
1	1.1.1 Quality
1	1.1.2 Safety
1	1.1.3 Consistency of product
1	1.1.4 Optimum plant performance
1	1.1.5 Human limitations
1	1.1.6 Efficiency
1	1.1.7 Cost
1	1.1.8 Environmental protection
	1.2.0 System terminology
1	1.2.1 Accuracy
1	1.2.2 Error
1	1.2.3 Repeatability
1	1.2.4 Precision
1	1.2.5 Linearity
1	1.2.6 Reliability
1	1.2.7 Reproducibility
1	1.2.8 Sensitivity
1	1.2.9 Resolution
1	1.2.10 Range