### PhD in Management, Production and Design
**OS&H criteria special for Research Universities**

#### Research Title: Definition and Validation of approaches special for OS&H in Research Universities, from Risk Assessment to Quality Management in the frame of PoliTo-UniTo Guideline

**Funded by**

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**Supervisor**

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<th>Supervisor</th>
<th>Mario Patrucco, DIATI, PoliTo - <a href="mailto:mario.patrucco@polito.it">mario.patrucco@polito.it</a></th>
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<td></td>
<td>Enrico Pira, DSSPP, UniTo – <a href="mailto:enrico.pira@unito.it">enrico.pira@unito.it</a></td>
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**Context of the research activity**

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<th>The development of a specific design and management culture (implying full synergy of management and employees as actors with different tasks and skills) is a basic requirement for system sustainability. OS&amp;H is particularly complex in the case of Research Universities, due to a number of typical characteristics, such as:</th>
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<td>• the often very large number of employees and students of various nationalities, degrees, age, study &amp; research activities;</td>
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<td>• the frequent presence of visiting professors and experts, both as individuals and in groups, and student relatives, for example in the occasion of the degrees;</td>
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<td>• the age and historical/artistic value of many Italian settlements, which entails the need for careful preservation, and makes it difficult the implementation of safety systems;</td>
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<td>• the possible presence of both products containing critical or innovative materials and substances, and special devices of original or somehow modified design in the laboratories;</td>
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The approaches to OH&S in industries or secondary educational institutions can prove inadequate, and the task of Occupational Risk Assessment and Management analysts more demanding.

In this regard, J.T. Reason [see 1] points out that effective OS&H conditions require a System Approach based on a thorough Risk Assessment and Management special for the analyzed situation.
In accordance with the EC Directives [see 2,3] laying at the very base of the OS&H National law [see 4,5], both Prevention through Design [see 6] and System Quality approaches [e.g. according to 7] in the Residual Risk Assessment and Management are an essential obligation for the Rector [see 8].

Such a target can be reached only based on rigorous and special approaches, derived from an in depth study and research work to identify the most suitable Risk Analysis techniques, and the Risk Management solutions for the various, and complex, Hazard Factors. Obviously, each step resulting from the theoretical research work should be field tested, and the result used for an effective Information, Formation and Training - IFT action.

References (main)
4. Italian Regulation, 2008, Decreto Legislativo 81;
5. Italian Regulation, 2010, Decreto Legislativo 17;
8. Italian law 1998, Decreto Ministeriale 363;

As above discussed, the effective quality and sustainability of a system requires the fulfillment of the OS&H principles, which in turn requires a correct Risk Assessment and Management, a statement all the more important for Research Universities. It is therefore necessary to establish:

- a rigorous definition of the operative scenarios, and a coherent selection of techniques and technologies suitable to face possible incidental chains;
- the inclusion in such scenarios, and at the different levels, of operators aware of their responsibilities vs safety, and able to distinguish whether the situation conforms with the design, or presents deviations (faults, disconformities, etc.).

A very important result, achieved thanks to the multidisciplinary cooperation of PoliTo and UniTo experts, and the patient and
precise work developed as part of a doctoral thesis on the topic [see 9], made possible the issuing of a Guideline for the Occupational Risk Assessment and Management of employees and students and people occasionally involved in the Research University activities [see 10]. The Guideline was specially conceived to substantially improve the continuous effort towards the OS&H management in a quality approach, and provide for each person the actual residual exposure to Hazard Factors. The Guideline stresses the paramount importance of a detailed and unambiguous definition, since the very first step of the study, of the Line and Staff Organization in a context of general delicacy in establishing a clear governance.

The objective of the present PhD project is to provide developments –based on a rigorous study and research approach- in the Sub-Phases of the Guideline. Increasingly detailed and thoroughly tested results will become available, in particular in terms of Hazard Identification and Management through the identification of effective, up to date and workable solutions in each specific context. Consequently, useful tools will be available also for the promotion of the Culture of Safety.

The PhD research work contemplates the fulfillment of the following phases:

1st year:

- analysis of literature on the possible improvements of Hazard Identification approaches. Some positive results are expected e.g. from the introduction of some Forensic Investigation techniques [see e.g. 11] in the already available criteria for the evaluation of workplace condition in terms of structure, materials, plants, energy qualification, performance limits, necessary to verify the absence of critical components (e.g. asbestos or radioactive materials), and the actual consistency with the intended use.

- with special reference to the possible presence of artifacts containing critical substances, definition -in a Quality approach- of decision making criteria suitable for planning effective and correctly scheduled response actions where necessary, and for systematically checking the state of conservation of artifacts not needing immediate action. Contribution to the improvement of a computerized
procedure, and to the IFT programs on the discussed Risk Assessment and Management approach and on the deriving procedures.

- analysis of the evolution of techniques / technologies [see e.g. 12] and epidemiological knowledge [see e.g. 13, 14, 15], to grant the real time availability of up to date references for the analysis and management of the identified Hazards. This phase in particular calls for close cooperation with the experts of Occupational Medicine of UniTo, as officially agreed in accordo quadro tra il Politecnico di Torino e l’Università degli Studi di Torino inerente la collaborazione sul tema della tutela della sicurezza e salute dei lavoratori nei luoghi di lavoro (approvato da CdA del 17/12/2014)

2nd year:

- continuation of the study on the topics approached in the 1st year work, and critical discussion of the in field tests results;
- investigation on the possibility of identifying patterns of cause - consequence correlation for accident scenarios. The study will be based on accident data bases, and on expert systems for the analysis of work related accidents [see 16];
- discussion in a Metrological approach of the various phases leading to both the exposure models and the concentration values, taken into due account the representativeness criteria;
- data collection – also through on site direct information collection- on the formalized Quality systems already adopted by some European Research Universities, and discussion on the possibility of introducing such approaches to Italian Research Universities.

3rd year:

- conclusion of the research work of the 2nd year, and discussion on the best prevention measures and techniques suitable for different situations;
- field tests of introduction of formalized Quality systems to Italian Research Universities, and discussion on problems and results:
- dissemination of the final results;
- preparation of the final PhD report.

References (main)

9. Luisa Maria Teresa Maida: PhD thesis: Strategic choices in
For an effective development of the activity, the following skills and competences are recommended:

- in deep knowledge from University courses and direct experience of the Risk Assessment and Management principia for OS&H applications:
- proved knowledge of the criteria upon which the PoliTo – UniTo Guideline is based, and some basic expertise in the Guideline application in real Research Universities scenarios, in particular with regards to the Hazard Identification and Risk Assessment and Management phases;
- basics in advanced training sciences, specifically for the Research Universities contexts under exam.