

## **Report of STSM (COST TU0904)**

Applicant name: Jan Hricák, Czech Technical University in Prague, Czech Republic

Host name: Fernando Morente Belmez, Tecnalía Corporation, Spain

Period of visit: 5.4.2013 to 27.4.2013

### **Purpose of the visit Tecnalía Corporation**

Tecnalía Corporation is a research institute with the aim of contributing to the scientific and technical development of our society.

The research is focused on getting the knowledge of behaving of steel beams with welded Class 4 cross-sections exposed to high temperatures. The aim was to verification of the numerical model using a data obtained from the experiment and the subsequent a benchmark study with numerical model developed in Tecnalía Institute.

### **Activities during the work placement**

- Tour of the area Tecnalía Corporation including laboratories, acquaintance with projects and activity of the institute.
- Verification of the numerical simulation of the experiment (ABAQUS), benchmark study.
- Preparation of parametric study for analytical model.

For verification of the numerical model, material tests were performed at normal temperature and at high temperature (450°C and 650°C). For benchmark study, two models were created. The first numerical model was modified according to the actual material properties and according to the actual temperature. Material properties at high temperatures were obtained by the reducing coefficients from EN 1993-1-2. The second numerical model was modified according to the material properties from the material tests at high temperatures. These numerical models were compared.

After verification of the numerical simulation, work was started for the parametric study. Individual cross-sections for parametric study were designed and next work was the creation of Input File (\*.inp) for ABAQUS.

### **Contribution of work placement:**

Verification of the numerical model was completed. Benchmark study highlighted the different behavior of numerical models due to reduction coefficients of steel at high temperatures.

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Jan Hricák



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Host:

Fernando Morente Belmez



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