

**Working Group 2 (WG 2) Meeting**  
**COST Action TU0601**  
**Robustness of Structures**  
**COWI, Lyngby, Copenhagen, Denmark, 4<sup>th</sup> and 5<sup>th</sup> of October 2010**

Attending:

T. Badea (RO)  
R. Bancila(RO) (Attending the meeting on 4<sup>th</sup> October)  
C. Bucur (RO)  
G. Decan (BE)  
K. Gramatikov (MK) – Action Rapporteur (Attending the meeting on 5<sup>th</sup> October)  
B. Izzuddin (UK)  
M. Pereira (UK)  
L. Kwasniewski (PL)  
Z. Drabowicz (PL)  
B.J. Leira (NO)  
J. Markova (CZ)  
L. Costa Neves (PT)  
Gerasimidis (GR)  
M. Gundel (Ger)  
L. Rolle (Ger)

## **1. Opening**

The meeting was chaired by B.J. Leira since the Workgroup Leader T. Vrouwenvelder was not able to attend the meeting.

## **2. General**

### **3. Adoption of the agenda**

The agenda proposed by Ton Vrouwenvelder was adopted.

### **4. Minutes of the Brussels meeting June 2010.**

The minutes are considered to be fine; Some of the actions listed in the minutes still remain.

## **5. Factsheets**

### **5.1 Activity 4**

#### **(4.1) Exposure conditions**

This document is ready. Comments of an editorial nature can still be implemented.

#### **(4.2) Human error**

This document needs some further elaboration. See list of action items below.

#### **(4.3) Explosion**

Comments by a Norwegian expert have been received and need to be implemented. An additional section based on the work by Leslaw Kwasniewski on external explosion should also be included.

## 5.2 Activity 5

### (5.1) Models and Analysis

This document is basically completed. Comments of an editorial nature can still be implemented.

### (5.2) Steel

An additional contribution to this document was offered by Gerasimidis from the University of Athens. This contribution can be completed by early December, see list of action items below.

### (5.3) Concrete

Some examples of application together with guidelines on how to increase the robustness will be provided by Costa Neves/Decan, see list of action items below.

### (5.4) Timber

The document is to be reviewed and possibly updated, see list of action items.

### (5.5) Composite structures

A first draft has been completed and the content was presented by L. Rolle. The written document will be distributed to the other Workgroup members. Comments to the document should be received by Nov./Dec., see list of action items below.

### (5.6) Existing structures

The document should be somewhat updated by focusing on robustness topics, see list of action items.

### (5.7) Example of strengthening of an existing bridge

An additional fact sheet with an example of strengthening an existing bridge in Romania was offered by R. Bancila, see list of action items.

## 6.Future work

### 6.1 Completion of work

The Action Rapporteur K. Gramatikov was present during part of the meeting on 5<sup>th</sup> October. He stated that the work in the project should be completed by March. Furthermore, the work will be evaluated by comparing the deliverables with the description given in the Memorandum of Understanding.

Hence, it is important to identify the remaining work and to identify responsible persons and associated dates for completion. A list of action items which was presented at the meeting is summarized in the table below

Item	Status	Responsible	Date
4.1	Completed		
4.2	To be updated	Sykora/Markova	December
4.3	To be updated/supplemented	Leira/Kwasniewski/Vrouwenvelder	November
5.1	Completed		
5.2	To be supplemented	Gerasimidis	December
5.3	To be extended	Costa Neves/Decan	January
5.4	To be reviewed/revised	Thelandersson/Vrouwenvelder	November
5.5	Updated based on WG comments	Rolle	January
5.6	Update	Sykora/Markova	December
5.7	Complete for review by WG	Bancila	December

## 6. 2 The Example structure

The example structure was discussed. It was agreed to apply the building which were analysed previously by Leslaw Krasniewski as an example. He has investigated three different column collapse scenarios for the ground floor. Parametric studies will be performed for the same structure based on simplified models which are calibrated to the previous and more elaborate numerical simulations.

A tentative list of action items associated with the example structure is given in the table below.

Item	Action to be performed	Responsible	Date
1	Summary of column capacity for given explosion/impact loads to be distributed to WG members	M. Gundel	As soon as possible
2	Test data related to ductility of connection joints to be distributed to WG member	L. Rolle	As soon as possible
3	Matrix of input parameter variations and description of output parameters to be established	B.J. Leira/T. Vrouwenvelder	November
4	Parametric studies corresponding to specified matrix performed by means of simplified models. Ductility parameters for joints are to be varied within relevant range	B. Izzuddin	January
5	Partial building collapse in focus, with possibility of total building collapse to be assessed in a simplified way.	B. Izzuddin	January
6	Consequence modeling for partial and total building collapse	WG2/WG3	January
7	Establish probabilistic models for input parameters	B.J. Leira/T. Vrouwenvelder	December
8	Robustness to be estimated	WG2	February
9	Example calculation distributed for review	WG2/WG1/WG3	February
10	Updated calculations	WG2	March

## 7 Summer Course

In the plenary meeting it was decided to prepare teaching material for the summer school, but not to organize the course itself as part of the project since the associated costs are not covered. A list of five main topics which are to be developed by WG2 was presented by the summer school coordinator N. P. Høj. Much of the course material can be based on Power-Point presentations which have been given at meetings and Workshops during the present project. Responsible persons for the different topics need to be identified within WG2.

## 8. Closure