

	
<p>NATO North Atlantic Treaty Organization SCIENCE FOR PEACE AND SECURITY PROGRAMME Public Diplomacy Division</p>	<p>Earthquake Engineering Research Center Department of Civil Engineering MIDDLE EAST TECHNICAL UNIVERSITY</p>
<p>WORKSHOP OF NATO SfP983054 Project "Harmonization of Seismic Hazard Maps for the Western Balkan Countries" ANKARA, TURKEY October 24, 2011</p>	

MINUTES OF THE CLOSING WORKSHOP

NATO SCIENCE FOR PEACE PROJECT NO. 983054

“Harmonization of Seismic Hazard Maps for the Western Balkan Countries”

The Closing Workshop took place in Ankara, Turkey and has been prepared and organized, on behalf of Earthquake Engineering Research Center Department of Civil Engineering, MIDDLE EAST TECHNICAL UNIVERSITY, by NATO Project Director, Prof Sinan Akkar.

The representatives of participating institutions gathered to present and discuss the final results of the four-year Project achievements. The invited guests were Dr Chris de Wispelaere, Director of the NATO SfP Programme, and Prof F. Mulargia from University of Bologna, as well as Dr. L. Luzi and R. Puglia from INGV-Milano.

Meeting commemorated tragic victims of recent Van earthquake that struck eastern Turkey on October 23, 2011.

NATO Project Director, Prof Akkar greeted the guests and participants emphasizing the BSHAP Project relevance. He reminded guests on principal objectives and major accomplishments of this project.

Dr Chris de Wispelaere, Director of the NATO SfP Programme, emphasized BSHAP Project relevance to SfP Programme. Dr Wispelaere presented the new structure of SfP Programme.

On behalf of project participants, the major Project findings as well as other results were presented by chosen speakers:

- Prof. LLambro Duni presented the *Final BSHAP Regional Earthquake Catalogue*,
- Ms. Jadranka Mihaljevic presented the improved *Seismotectonic Model of the BSHAP Region*.
- Prof. Neki Kuka made overall insight into *Final PSHA Results for the BSHAP Region*.

In continuation,

- Mr. K. Kuk presented the recent upgrade and state of *Seismic Networks in the Western Balkans after The BSHAP Project*.

Having in mind future cooperation and connections with current European projects Ms. L. Luzi, PhD, presented the recent results and initiatives related to *Integration of Strong Motion Data in Europe*.

Prof. Mulargia made insight into some particular - still wide open questions related to seismic hazard assessment. His presentation was entitled: *Beyond seismic codes: the lessons learnt from the Abruzzo, April 2009, earthquake*.

During the afternoon session the non-formal discussion on PSHA results followed. Most of discussions were related to possible improvements of methodology in respect to proposed future collaboration:

-F. Mulargia: the participants have reached the current standards in PSHA and fulfilled the main project objectives. Created GIS may serve as valuable starting point for further investigations – proposing to use INSAT images for the better identification and characterization of active faults.

-K.Kuk: information on contact with USGS. All relevant participants' addresses forwarded.

-S. Radovanovic: The final BSHAP catalogue provides variety of information. In this way, the Ms and Mb conversion to Mw was enabled. Moreover, a better regional Scordilis interpretation of macroseismic magnitude conversion into Mw may be developed (during the follow-up project). The fulfillments of all missing data categories of BSHAP earthquake catalogue may be another important task for the new project.

Comment for Catalogue – instead of ML of EMSC (up to 1979) in ME catalogue to be corrected as ML of BCIS.

-N.Kuka: The final catalogue is more realistic. A significant number of extremely high magnitudes which were present in the first Catalogue version were reevaluated. Possible improvements into PSHA are involvement of fault influence – in particular for some zones as well as more realistic modeling of seismotectonic input file.

-Z. Milutinovic: the outcome is confident regional seismic hazard estimate at the level of smoothed seismic hazard assessment that provides good insight in background seismicity, at least for Macedonia. However, there are shallow sources, and other characteristic zones, that shall be specifically assessed in order to produce EC8 National documents; and shall be a subject of the planned NEW NATO project.

-L. Duni: from the seismological point of view the results are satisfactory – on the contrary some engineering needs may be involved when seismic zoning is elaborated.

-S. Radovanovic: Very deep earthquakes (apart of study region) such are Vrancea earthquake and very rare earthquakes in northern Hungary may alter the national (Serbia) seismic hazard maps.

-Z. Milutinovic: suggestion to ask for the results of SfP Project “Harmonization of seismic hazard maps for the Vrancea region” - to study it and incorporate recommendations into follow up project.

-V. Kuk: a sensitivity study on influence of different inputs (variants of earthquake catalogues, data completeness, seismotectonic models etc.) that has been used might be useful.

-N. Kuka: **Task** to check out the final declustering of important events. This was an automatic procedure and some important events might be removed. In particular this refers to Banja Luka surrounding - to check out the earthquake depths and declustering procedure.

-Z. Milutinovic: implementation of INSAT images in follow up project to be involved as separate WP.

-B. Glavatovic: the Draft Final report is uploaded to server. **Task:** The final annexes from partners as well as comments are needed.

The results were accepted by all speakers. The numerous valuable efforts have provided reliable seismic hazard maps for the BSHAP region. Harmonized PSHA results are well reflecting general expectance of chosen ground motion parameters.

The common agreement is that some specific features and more detailed seismotectonic models should be used to produce seismic hazard for the national territories and included into national documents that should serve as the Eurocode's National annexes for the purpose of safe building design.

The countries participating the NATO SfP 983054 Project reaffirmed their willingness to take active part in the project related to organizing and integration of information related to regional strong motion data. The project will be proposed by Dr. L. Luzi to South East Europe programme (SEE).

The last session was devoted to closer elaboration of follow up project proposal. With a view and the aim of developing regional managerial capability and leadership in the field, the workshop reaffirmed Zagreb's workshop position that new NATO Project PPD position shall consistently be delegated to junior generation, assuming extensive assistance and support of senior colleagues.