

32nd International Geological Congress

Florence, 22 August 2004

INQUA Subcommittee on Paleoseismicity

MINUTES OF THE MEETING

Agenda:

- 1) INQUA TERPRO STRUCTURE AND SUBCOMMISSION STRUCTURE
- 2) INQUA SCALE PROJECT: STRUCTURE, MAIN OBJECTIVES
- 3) STATE OF THE ART AND EXPERIENCES IN DIFFERENT COUNTRIES
- 4) THE INQUA SCALE FORM
- 5) FUTURE STEPS

List of Participants:

A.M. Michetti (Chairman), V. Comerci, L. Guerrieri, E. Esposito, S. Porfido, E. Vittori, J. Clague, M. Abdeen, S. Marco, R. Amit, E. Rogozhin, R. Tatevossian, Y. Ota, Y. Kinugasa, B. Slemmons, A. Chatzipetros, P. Suhadolc, S. Shanov, Y. Awata, F. Dramis, F. Audemard, C. Beck, K. Chunga, A.M. Blumetti, F. Giardina, J. Zamudio, P.G. Silva, H. Kondo, M.J. Guccione, A. Radulov, B.S. Sukhija, M.A. Aurelio, B. Mohammadioun, A. Gürpınar, A.D. Ahluwalia, C. Zazo, L. Serva, L. Piccardi, D. Kroeling, N. Mörner.

MORNING SESSION (9.00-13:00)

1. INQUA TERPRO STRUCTURE AND SUBCOMMISSION STRUCTURE

Michetti & Clague illustrate briefly the structure of INQUA, and the history of the Subcommittee on Paleoseismicity included in the Commission on Terrestrial Processes (TERPRO) after 2003 Reno INQUA Congress.

The structure of the Subcommittee is made by A.M. Michetti, President; Koji Okumura and Pablo Silva, Vice – Presidents; Luca Guerrieri & Valerio Comerci, Scientific Secretary; the Secretary is based in Rome at APAT. The list of Subcommittee Members is open.

The INQUA TERPRO web page is at the address <http://terpro.dri.edu>. A suitable website for the Subcommittee on Paleoseismicity will be activated in November in the APAT website (now active at http://www.apat.gov.it/site/en-GB/Projects/INQUA_Scale/default.html)

2. INQUA SCALE PROJECT: STRUCTURE AND MAIN OBJECTIVES

Michetti illustrates the scientific framework of the INQUA Scale Project, one of the main projects carried on by the Subcommittee. The project aims at joining different earthquake scientists (geologists, seismologists, engineers) in order to test the INQUA Scale for assessing earthquake intensities based on seismically-induced ground effects in natural environment.

The project is supported by INQUA in 2004 and 2005, including the meetings in Florence 2004 and in Hokudan (Japan) 2005, but the budget is limited to cover the travel expenses of young researchers who wish to join the scheduled meetings.

It is very important to emphasize that INQUA funding is to be considered “seed money”, in order to use the INQUA umbrella for applying for funding from other sources.

Scientists interested in working in this project are always welcome. They are expected to test the INQUA Scale to historical and recent well-known strong earthquakes.

The SubCommission website (hosted in the APAT site at www.apat.gov) will include all documents and news concerning the project.

3) STATE OF THE ART AND EXPERIENCES IN DIFFERENT COUNTRIES

Italy

Porfido illustrates the state of the research on seismically-induced ground effects on natural environment in Italy. Then, a detailed explanation of the methodological approach used to define the present version of the INQUA Scale follows. The discussion includes comments from Tatevossian and Audemard.

Colombia

Michetti introduces the results of the application of the INQUA Scale to important Colombian earthquakes conducted by the Working Group coordinated by C. P. Lalinde Pulido.

A discussion follows with comments from Audemard and Clague.

The report will be sent to all the meeting participants for further discussion.

Slovenia

Suhadolc describes a research aimed at correlating intensity and ground effects after a strong earthquake occurred in Slovenia in 1998. Then describes seismic parameters and ground effects related to a recent seismic event occurred in the same area.

4) THE INQUA SCALE FORM

The INQUA Scale Form is in progress. In order to improve it, several comments have been made:

Marco suggests including in the Form 2 fields containing information on the thickness of soft sediments and groundwater depth.

Kinugasa suggests to change the title “Intensity” with “Epicentral intensity” in the Earthquake fields and to add information about hypocentral depth and PG velocity.

Ota asks for clarification about the tables correlating surface faulting parameters (SRL and MAXD) and Intensity that depends also on local effects.

Michetti emphasizes that epicentral Intensity has a physical meaning because it is a measure of the earthquake strength. It is very important anyway to understand the local geomorphic and stratigraphic setting of each site, which must be always interpreted using an expert judgment.

Vittori explains the procedure used to construct the cited tables from the Wells & Coppersmith (1994) worldwide database. The focus was to relate ground effects to the local geological environment more than the presence/absence of buildings.

Tatevossian does not agree with the field Intensity in the first part of the Form. In fact, this it is the final result of the analysis. Michetti replies that it was an artifice to make one form suitable for historical and recent earthquakes.

Tatevossian remarks a size problem: for example in case of complex landslides different ground effects could suggest different intensities in close areas.

Rivka Amit suggests to report in the Form only field observations but not interpretations.

Shanov ask to add a double field for localities whose “ancient” name (at the time when the earthquake occurred) is different from the present one.

Guccione suggests to establish velocity classes for slope movements. An area of the Form should be dedicated to draw a sketch of peculiar ground effects (surface faulting, ground effects) and to map their geometry.

Dramis proposes to i) distinguish new gravitational movements from reactivation of old landslides, and bedrock lithology from soft sediments lithology; ii) to add the debris-flow category; iii) to include sackungen in rock creep category; iv) to change “rotational slide” in “rock slide”.

Suhadolc proposes i) to not include PGA data in the Form (it is not a field description); ii) to standardize the datum (if possible); iii) to specify the Agency providing seismological data.

Clague suggests to send the present version of the Form via email to each project participant, and get comments back through the Project Secretary.

Piccardi would like to insert more landslide categories.

Michetti underlines that there must be a balance between completeness of the Form and the quick procedure of the field analysis; also, the Form must be user-friendly, if its use is intended to be widespread in geological and seismological surveys worldwide.

COFFE BREAK

5) FUTURE STEPS

Regional Working Groups (RWG)

Michetti recommends the creation of Regional Working Groups. It is important the standardization of data in order to arrange a geodatabase allowing the comparison of data produced by different RWGs.

Thematic Working Groups (TWG)

A specific Thematic Working Group on Seismology will be led by Bagher Mohammadioun.

Future meetings

- [January 2005, Hokudan \(Japan\)](#)
- September 2005, Como (Italy): more info will be ready soon at http://www.apat.gov.it/site/en-GB/Projects/INQUA_Scale/default.html

A new application for INQUA support for the 2005-2007 period will include the meeting at Como, and two meetings in 2006 in Wien (IAEA) and in South America.

Abdeen propose to dedicate to the INQUA Scale project a session of the Geological Society of Africa (December 2005, Egypt).

Publications

Michetti illustrates potential editorial issues collecting scientific papers regarding the themes of the INQUA Scale project:

- a Special Issue of “Geomorphology” (coordinator: P. Silva);
- a Special Volume of “Memorie Descrittive della Carta Geologica d’Italia” (APAT)

Clague recommends the need to end the project with a Special Volume collecting scientific papers.

LUNCH

AFTERNOON SESSION (14:30-16:00)

ROUND TABLE

Michetti suggests to include a chapter describing the physical meaning of Intensity in the next version of the Special Paper describing the INQUA Scale.

Mohammadioun remarks the importance of dynamic properties of the seismic source.

Tatevossian outlines the need to accurately define the area where the intensity assessment is valid.

Serva remarks that INQUA Scale work very well especially in the epicentral area.

Gurpinar outlines the importance to define the “fragility” of territory. Acceleration parameters should not be confused with intensity. To get acceleration you should use instruments. And in fact soil failure is more important than the elastic response of the soil; in other words, before having intensity on a building, you have intensity on a soil, if the soil fails (liquefaction, cracks, compaction, etc.), damage to the overlying building is much worst. Most of the economic loss during an earthquake is due to soil failure.

Serva remarks the importance of professional judgment. After surface faulting, the fragility of territory is the most important one for secondary effects. Thus it is necessary to define the main characteristics of soil.

Rogozhin announces his intention to create a Russian Working Group which will apply the INQUA Scale to 5-6 russian earthquakes.