



**APPENDIX 3**

**MINUTES OF JTC3 MEETINGS.**

**(2006 - 2009)**



## **1<sup>ST</sup> JTC3 MEETING. NOTTINGHAM, 8<sup>TH</sup> SEPTEMBER 2006**

1<sup>st</sup> Meeting of the JTC3 was held on 8<sup>th</sup> September 2006 during the 10<sup>th</sup> Int. Conference of the IAEG.

The President and Secretary –General of IAEG and ISSMGE were present. Five Core Members and eleven invited members attended the meeting.

The two above mentioned Presidents introduced JTC3 to participants. Chair of JTC3 and members discussed during 3 hrs the main points included in Agenda.

Basic ideas, procedures and tentative a working programme were proposed, as well as future meetings.

A list of Participants is included in attached file.

### **Agenda:**

TOR and objectives

Membership Composition

Proposed activities

Sub-Committees

Future Meetings

Romania 2008 Int. Conf. on Education and Training in Geo-engineering

Working procedures and assignment of tasks

JTC3 Secretariat

### **Summary of agreements and proposals:**

TOR has been accepted by Core Members (CM) as approved by FIGS.

Guidelines for Suggestion / Recommendations on Education and Training on engineering geology (EG), geotechnical engineering and soil mechanics (SM) and engineering rock mechanics (RM) have been considered as a fundamental task of this committee. CM and invited members suggestions have been heard .List of Competences should be a priority to set up and guidelines educational programmes, as well as key skills and requirements. Bock's Report will be used as a core –reference document.

Education and training Guidelines on GeoHazards have been proposed to be included in JTC3 objectives.

Questionnaires on educational programmes, drivers for education, data base on universities, research centres, and related training sites has been also proposed to be carried out.

Sub-Committees (SC) have been proposed attending to the following aspects:

To be geographically worldwide distributed and representative of the EG, SM and RM as stated by FIGS.

SC will be under the leadership of the 9 CM proposed by FIGS and accordingly with the technical competence of each CM and his/her geographic region where they come from.

ASC on Education and Training on GeoHazards will be proposed. Co-opt Members should be appointed for this SC as soon as possible.



It has been proposed to set up a web site for internal communication among JTC3, as well as a website for public use.

JTC3 CM agreed to meet once a year accordingly with the following events:

- 2007 Lisbon Int. Conf. ISRM
- 2008 Romania Int. Conf .on Education and training in Geo-engineering
- 2009 Alexandria, ISSMGE

Besides, it is encouraged JTC3 members to meet whenever they have opportunity, e. g. international symposiums, conferences, etc.

Prof. Manoliu presented the 2<sup>nd</sup> Int. Conf. on Education and Training on Geotechnical Engineering to be held on 2008, June, in Romania. Full support from JTC3 has been agreed .CM will cooperate providing conference topics .1<sup>st</sup> Bulletin will be planned for 2007, March. It was agreed to substitute Geotechnical Engineering by Geo-Engineering in the title of the conference and to include EG, RM and SM in the conference topics.

Prof. Luis Gonzalez de Vallejo proposed CM to set up a Secretariat for JTC3. Dra. Aurea Perucho, Senior Researcher of CEDEX (Spain), Dr. Civil Eng. Associate Professor of Rock Mechanics and Member of the Board of the Spanish National Group of Rock Mechanics, has been accepted as Secretariat. CEDEX will be also host the Secretariat.

President ISRM has to appoint a 3<sup>rd</sup> CM, and if it is possible from USA due to the lack of representation of this region and Canada in RM Sub Committee.

## **2<sup>nd</sup> JTC3 MEETING. SINGAPORE, 9<sup>th</sup> NOVEMBER 2006**

Attendants:

- **Marek Kwasniewski** (The Silesian University of Technology, Gliwice, Poland). Past president of ISRM Commission on Education, 1993-2001.
- **Sergio Fontoura** (Departamento de Engenharia Civil PUC-Rio de Janeiro, Brazil). Member of ISRM Commission on Education.
- **Giovanni Grasselli** (University of Toronto, Ontario, Canada). Member of ISRM Commission on Education.
- **Jin-an Wang** (University of Science and Technology, Beijing, China). Secretary of ISRM Commission on Education.
- **Frederic Pellet** (University Joseph Fourier, Grenoble, France). Member of ISRM Commission on Education.
- **José Estaire** (Geotechnical Laboratory, CEDEX, Madrid, Spain). Member of JTC3.
- **Áurea Perucho** (Geotechnical Laboratory, CEDEX, Madrid, Spain). Secretary of JTC3.

-----

The meeting started with Aurea Perucho informing about the following points:

**1<sup>ST</sup> MEETING JTC3 – NOTTINGHAM. 2006  
LIST OF PARTICIPANTS**

<b>NAME</b>	<b>JTC3</b>	<b>COUNTRY</b>	<b>E-MAIL</b>
Niek Rengers	President IAEG		rengers@itc.nl
Pedro Seco Pinto	President ISSMGE		pspinto@lnec.pt
Neil Taylor	Secretary General ISSMGE		secretary.general@issmge.org
Michel Deveughele	Secretary General IAEG		michel.deveughele@cgi.ensmp.fr
Luis Gonzalez de Vallejo	Chair JTC3		vallejo@geo.ucm.es
A. K. Turner	CM IAEG	U.S.A	kturner@mines.edu
Warwick Prebble	Co-opt. M. IAEG	New Zealand	w.prebble@auckland.ac.nz
Hyeong-Dong Park	CM. IAEG	Korea	hpark@snu.ac.kr
R. Azzam represented by Tomás Fernandez-Steeger	CM. IAEG	Germany	<a href="mailto:azzam@lih.rwth-aachen.de">azzam@lih.rwth-aachen.de</a> fernandez-steeger@lih.rwth-aachen.de
Iacint Manoliu	CM. ISSMGE	Romania	manoliu@utcb.ro
Michael de Freitas		U.K.	m.defreitas@imperial.ac.uk
Ricardo Oliveira		Portugal	ricardo.oliveira@coba.pt
Paul Marinos		Greece	marinos@central.ntua.gr
Helmut Bock		Germany	QS-Consult@t-online.de
J. A. Rodrigues Carvalho		Portugal	rc@fct.unl.pt
Pieter Michiel Maurenbrecher		Netherlands	p.m.maurenbrecher@tudelft.nl
Simon Loew		Switzerland	loew@erdw.ethz.ch
Louis Van Rooy		South Africa	louis.vanrooy@up.uz.za
Dwikorita Karnawati		Indonesia	dwiko@indosat.net.id
Dominique Ngan-Tillard		Netherlands	d.j.m.ngan-tillard@tudelft.nl
José Chacón		Spain	jchacon@ugr.es

Core Members not present at Nottingham but sent suggestions and apologised:

CM – ISRM: - Prof. Kwasniewski – Poland (marek.kwasniewski@polsl.pl)  
- Prof. Cai - China (caimeifeng@ustb.edu.cn)

CM – ISSMEG: - Prof. Hachich - Brasil (whachich@usp.br)  
- Prof. Jaksa - Australia (mjaksa@civeng.adelaide.edu.au)



- Prof. Gonzalez Vallejo, chairman of the JTC3, has not been able to attend this meeting and has asked her to represent him
- The secretariat of this Committee has already been established in Madrid, in the Geotechnical Laboratory of CEDEX (Spanish institution for research in civil engineering). The secretariat of this Committee is Dr. Aurea Perucho, from CEDEX, and also the secretary of the Spanish group of ISRM.
- An e-mail address has been already opened, which is:
  - [secretariat-jtc3@cedex.es](mailto:secretariat-jtc3@cedex.es)
- The JTC3 is starting to move now, after the first meeting held in Nottingham in last September. It has been created a "task force" to coordinate all the works. This "task force" is formed by 4 members: the chairman, prof. Gonzalez Vallejo, the secretariat, Dr. Aurea Perucho, Dr. Jose Estaire and Dr. Fernando Puell, all of them from Spain.
- Each Core Member (CM) has been asked to provide us before February 2007 with the following information:
  - a) A short list on the main aspects that should be considered in guidelines on their respective discipline (EG, SM, RM). The idea is to provide what it can be constitute the list/index of contents of the guidelines. Obviously, this will be a first approach. Based on CM proposals we will produce an integrated and agreed list of contents for guidelines.
  - b) To provide a list of competences on what CM consider should be the skills to be achieved by each discipline (EG, SM, RM) and for the 2 considered levels (graduated and post-graduated). Although this is a major question we encourage CM to try to present a working proposal on this question. Obviously, such list of competences should be tentative, but will be very useful as a starting point.
  - c) It is intended to send a questionnaire to universities, national groups, etc, to provide a database on Education and Training in different regions, therefore CM are asked to send us a list of questions to be included in the questionnaire.
- Almost all the core members (CM) have been already appointed, and there have been set up 4 Sub-Committees (SC) for Rock Mechanics, Soil Mechanics and Geological Engineering. The core members (CM) have been distributed according with regional distribution and FIGS affiliations, in the following way:
  - SC 1-EG: Engineering Geology:
    - Europe: Prof. Azzam (Germany)
    - America: Prof. Turner (USA)



- Asia: Prof. Park (Korea)

#### SC 2-SM: Soil Mechanics and Geotechnical Engineering

- Europe: Prof. Manoliu (Romania)
- America: Prof. Hachich (Brasil)
- Australasia: Prof. Jaksa (Australia)

#### SC 3-RM: Rock Mechanics

- Europe: Prof. Kwasniewski (Poland)
- Asia: Prof. Cai (China)
- America: pendent ISRM nomination

#### SC 4.GH: Geohazards

Members to be appointed by CM and FIGS. Some have been already proposed: Prof. Jim Griffiths, Dr. Sergio Mora, Prof. Jose Chacon, and Dra Karnawati. More are needed.

- For the CM pendent of ISRM nomination, the representative of USA National Group in the Council meeting, Peter Smeallie, has suggested to ask Prof. Herbert Einstein. Prof. Giovanni Grasselli has also suggested that a Canadian representative should be chosen, as there is already a CM from USA (Prof. Turner) and none from Canada.

Prof. Marek Kwasniewski indicated that he had read the Guidelines set up for this JTC3 and that he didn't agree with them, as those topics had been already studied during several years in the Committee on Education of ISRM, not having reached to any point. He pointed out that it is very difficult to achieve the points established in the Guidelines, and he suggested that one of the main goals of JTC3 should be to find financial support for the educational project established under the 3 societies. All the rest of the members of the Commission on Education of ISRM agreed with this point. Prof. Marek Kwasniewski agreed in sending the report of the activities of the ISRM Commission on Education to the secretary of JTC3.

He also indicated that the Commission on Education of ISRM had started organizing some "Lectures tours" of the ISRM, with the idea of attracting to the Rock Mechanics and the ISRM the new engineers.

The Commission on Education of ISRM is working on a recopilation of PhD thesis related with Rock Mechanics.

Also this Commission is planning to organize an International Symposium on Education of Rock Mechanics.

The "task force" of JTC3 will start with evaluating all the works done in the respective Commissions on Education of the 3 Societies.



### 3<sup>TH</sup> JTC3 MEETING. LISBON, 10<sup>TH</sup> JULY 2007. ISRM INT.CONFERENCE

Attendants:

- **Iacint Manoliu** (Romania).
- **Heinz Konietzky**, (Germany)
- **Marek Kwasniewski** (Poland).
- **Ricardo Oliveira** (Portugal).
- **Giovanni Barla** (Italy).
- **Paul Marinos** (Greece).
- **Robert Zimmerman** (Sweden).
- **Jin-an Wang** (China).
- **Pieter Michiel Maurenbrecher** (The Netherlands).
- **Giovanni Grasselli** (Canada).
- **Meifeng Cai** (China).
- **Luis Gonzalez de Vallejo** (Spain)
- **José Estaire** (Spain).
- **Áurea Perucho** (Spain).

-----

#### **AGENDA, 10<sup>th</sup> July 2007, Lisbon.**

1. Summary of previous activities
2. Membership
3. Organisation
4. Guidelines for University Education on Geo-engineering. TOR.
5. Reference documents
6. Training Activities
7. Website
8. Collaboration with the Organising Committee 1st Int. Conference on Education and Training. Romania 2008.
9. Proposed Plan of Action and Assignment of Tasks
10. Future Meetings

-----

#### **SUMMARY**

- The meeting started with a presentation by Prof. Vallejo and Dr. Perucho, following the main points contained in the Agenda. Membership, organization, guidelines established by TOR and main reference documents, all of them previously sent to JTC3 members were presented.

This presentation is attached at the end of this letter as Annexe 1.

- Prof. Manoliu gave details on the Inter. Conference on Education and Training to be held in Romania, in June 2008. He informed about the invited lectures. It is proposed 6 Keynote lectures, 4 of them still to be decided.



- There was a discussion about the topic that students will not work in the academic world but in industries, so someone's opinion was that this point, not taken into account in the Bologna declaration, should not be forgotten.
- Other collected opinions were that industry would need professionals trained in geo-sciences, not distinguishing between the 3 disciplines, being this one reason why we should focus in geo-engineering education in the 3 disciplines. This reached to the question: are we doing right in separating the 3 programmes?
- Other opinions were that the programmes about what it must be taught in Soil Mechanics, in Rock Mechanics and in Engineering Geology should be defined in the 3 Societies, respectively; So, the main task of the JTC3 should be the integration or relation between them.
- Another topic was the possibility to make questionnaires to be filled by the members of JTC3, about the culture of Education in every country, the CV's, etc.
- It was discussed that the basis of these geo-engineering disciplines were very different for the different areas, such as civil engineering, petroleum, mining, etc.
- Four different areas were proposed by a member, pointing out that a first goal could be to define what should be taught in them:
  - Civil engineering
  - Environmental engineering
  - Mining engineering
  - Geological engineering
- It was also pointed out that it was very important to ask the 3 Presidents for financial support for Education and Training.
- It was pointed out, as well, that we should not loose this opportunity to include Rock Mechanics not only in Geo-Engineering but also in Geo-Sciences.

#### **4<sup>TH</sup> JTC3 MEETING. MADRID, 26<sup>TH</sup> SEPTEMBER 2007** **ISSMFG EUROPEAN CONFERENCE**

Attendants:

- **Iacint Manoliu** (Romania).
- **Arsenio Negro** (Brasil).
- **Luis Gonzalez de Vallejo** (Spain).
- **Áurea Perucho** (Spain).

This meeting was organised just to give the opportunity to those JTC3 members present at SM and GE European Conference in Madrid to meet and discuss the agenda presented at Lisbon meeting. The same aspects and conclusions of Lisbon were achieved in Madrid.





**5th. JTC3 MEETING. CONSTANTZA (ROMANIA), 1<sup>st</sup> JUNE 2008**  
**1<sup>st</sup> INTER. CONF. ON EDUCATION AND TRAINING IN GEO – ENGINEERING SCIENCES.**

**SUMMARY AND MAIN CONCLUSIONS**

1. Nineteen participants from 15 countries attended at the 5<sup>th</sup> Meeting of JTC3 in Constantza, Romania, on 1<sup>st</sup> of June 2008, during the 1<sup>st</sup> Int. Conference on Education and Training in Geo-Engineering Sciences. Three past Presidents of IAEG, 4 JTC3 Core Members (CM) and its Chair were present. An Attendance List is attached.

2. All points listed in the Agenda were discussed during the Meeting.

3. All CM present in the Meeting agreed NOT TO PROPOSE a new university first degree (BSc.) on Geo-Engineering.

4. All CM present in the Meeting agreed to propose ONE unified, coordinated and integrated report on the “Guidelines for Education and Training in Geo-Engineering Disciplines: Engineering Geology(EG), Rock Mechanics(RM) and Soil Mechanics and Geotechnical Engineering (SM)”(GET). Therefore 3 independent reports on each discipline will be not presented.

5. In order to prepare this unified report on GET the following CM were proposed to be in charge of the preparation of GET report:

- Prof. Turner, EG
- Prof. Azzam, EG
- Prof. Kwasniewski, RM
- Prof. Jaksa, SM
- Prof. Hachich, SM
- Dr. Niek Rengers has accepted to co-operate on GET Report, particularly on the integration aspects and reviewing.

6. The following tentative deadlines were proposed:

- 2009, January 15<sup>th</sup>: GET Draft Report sent to JTC3 Secretariat by CM in charge
- 2009, April, 15<sup>th</sup>: GET Draft Report revised by all Members and sent to JTC3 Secretariat.
- 2009, June, 30<sup>th</sup>: GET Report Draft finished, pending on final revisions.
- 2010: GET Report sent to FIGS

7. Prof.Azzam has accepted to develop a web site for JTC3.

8. Next Meetings:

- 2008, September 16<sup>th</sup> Madrid, during the IAEG EnGeo Conference.
- 2009, October, Alexandria, during the ISSMGE Inter. Conf.

9. JTC3 is very much in debt to Prof. Manoliu, Chair and Organiser of the 1<sup>st</sup> Int. Conf. held in Constantza who set up a benchmark on the field of Education and Training in Geo-Engineering, and hosted this 5<sup>th</sup> JTC3 Meeting.



**Attendance List**  
**JTC3-5<sup>th</sup> Meeting**  
 Constantza, 1<sup>st</sup> June 2008

Nº	Surname and Name	Association			Country	e-mail
		ISSMGE	IAEG	ISRM		
1	OLIVEIRA, RICARDO		X		PORTUGAL	ricardo.oliveira@coba.pt
2	AZZAM, R.		X		GERMANY	azzam@lih.rwth-aachen.de
3	TURNER, ALAN KEITH		X		USA	<a href="mailto:kturner@mines.edu">kturner@mines.edu</a>
4	RENGERS, NIEK		X		NETHERLANDS	<a href="mailto:rengers@itc.nl">rengers@itc.nl</a>
5	JAKSA, MARK	X			AUSTRALIA	mark.jaksa@adelaide.edu.au
6	JOSSEF, MECSEI	X			HUNGARY	mecsei@pmmh.pte.hu
7	VINCENTAS, STRAGYS	X			LITHUANIA	vincentas.stragys@st.vgtu.lt
8	BARLA, GIOVANNI			X	ITALY	giovanni.barla@polito.it
9	LO PRESTI, DIEGO	X			ITALY	d.lopresti@ing.unipi.it
10	MARINOS, PAUL		X		GREECE	marinos@central.ntua.gr
11	FRANK, ROGER	X			FRANCE	<a href="mailto:frank@enpc.fr">frank@enpc.fr</a>
12	ORR, TREVOR	X			IRELAND	<a href="mailto:torr@tcd.ie">torr@tcd.ie</a>
13	PANTAZIDOU, MARINA	X			GREECE	mpanta@central.ntua.gr
14	KASTWER, RICHARD	X			FRANCE	richard.kastwerw@insa-lyon.fr
15	EMERIAULT, FABRICE	X			FRANCE	fabrice.emeriault@insa-lyon.fr
16	CINICIOGLU, FEYZA	X			TURKEY	feyzac@istanbul.edu.tr
17	M <sup>C</sup> CABE, BRYAN	X			IRELAND	bryan.mccabe@nuigalway.ie
18	MANOLIU, JACINT	X			ROMANIA	manoliu@utcb.ro
19	GONZÁLEZ DE VALLEJO, LUIS		X		SPAIN	vallejo@geo.ucm.es



**6<sup>th</sup> JTC3 MEETING. MADRID, 16<sup>th</sup> SEPTEMBER 2008.**  
**EUROENGEIO / AEG CONFERENCE**

**Participants:**

- Prof. A. Keith Turner, IAEG, CM
- Prof. Paul Marinos, IAEG, M
- Dr. Nick Rengers, IAEG, M
- Dr. Fred Baynes, IAEG President
- Dr. Dominique Ngan-Tillare, IAEG, M
- Dr. Aurea Perucho, ISRM, JTC3 Secretariat, M.
- Prof. Luis Gonzalez de Vallejo, Chair JTC3

**SUMMARY:**

The listed participants held the 6<sup>th</sup> JTC3 Meeting in Madrid on September the 16<sup>th</sup> 2008 during EUROENGEIO IAEG Conference.

The Meeting was focused on the Contents of the Guidelines on Education and Training Report (GET Report).

There were agreed the following points:

1. To nominate the following Committee (GET Committee) in charge of leading the GET Report :
  - Prof. Keith Turner (EG)
  - Prof. M. Jaksa (SMGE)
  - Prof. M. Kwasniewski (RM)
2. GET Report will include two main points:
  - Definition of Competences
  - Curricula
3. GET Report will consider the Reports submitted at Constantza Int. Conference on E & T on Geo-Engineering, last June, as well as other relevant papers.
4. GET Report will be presented in accordance with the proposed dates agreed in Constantza:
  - 2009, January 15<sup>th</sup> : First Draft will be presented by GET Committee and delivered to JTC3 Members for revision.
  - 2009, April 15: First Draft will be revised and sent back to GET Committee
  - 2009, June 30<sup>th</sup> : Second Draft will be send to JTC Secretariat
  - 2009, October, GET Report will be presented at JTC3 7<sup>th</sup> Meeting to be held at Alexandria, during ISSMGE Int. Conference.



**7<sup>th</sup> JTC3 MEETING. ALEXANDRIA, 7<sup>th</sup> OCTOBER 2009. XVII ICSMGE CONFERENCE**

**Present:**

S. Feyza Cinicioglu, ISSMGE  
A/Prof. Mark Jaksa, ISSMGE (Chair and Minute Taker)  
Prof. Iacint Manoliu, ISSMGE  
Prof. Marina Pantazidou, ISSMGE  
Prof. Stephan Semprich, ISSMGE/ISRM  
Prof. William Van Impe, FedIGS, ISSMGE (present for part of meeting)  
Dr. Leon van Paassen, ISSMGE/IAEG

**Apologies:**

Prof. Rafiq Azzam, IAEG  
Prof. Giovanni Barla, ISSMGE  
Prof. Michael de Freitas, ISSMGE  
Prof. Luis I. Gonzalez de Vallejo, IAEG  
Prof. Waldemar Hachich, ISSMGE  
Prof. Heinz Komietzky, ISRM  
Prof. Paul Marinos, IAEG  
Prof. Dominique Ngan-Tillare, IAEG  
Prof. Niek Rengers, IAEG  
Prof. A. Keith Turner, IAEG

Meeting commenced at 5:30 pm

**1. Discussion of Turner & Rengers report and the ASCE Body of Knowledge Approach Contained Therein**

The document prepared by Drs. A. Keith Turner and Niek Rengers entitled “*Report Proposing the Adaptation of the ASCE Body of Knowledge Competency-based Approach to the Assessment of Education and Training Needs in Geo-engineering*” had been circulated previously by the Chair of JTC3, Prof. Luis I. Gonzalez de Vallejo. The report was briefly summarised by the meeting Chair. Comments provided by Prof. Michael de Freitas, which were recently emailed to the Committee, were presented.

The Committee noted the extensive amount of work carried out by Drs. Turner and Rengers and thanked them for their excellent report. The Committee noted Prof. de Freitas’s comments and was in agreement with them.

Discussion followed regarding the Turner & Rengers report and the de Freitas comments.

**The Committee agreed to:**

1. Accept the recommendation that the ASCE Body of Knowledge be adopted for geo-engineering, and
2. Work to the timeline proposed by Turner & Rengers, and in particular, Step 3, as outlined on pages 21 and 22.



**The Committee noted the following:**

- The competency-based assessment needs to account for variations relevant to a particular country or region, e.g. the two-cycle Bologna Model, with exit points at Bachelors and Masters levels. The JTC3 competencies need to clearly identify the competencies achieved at the end of each cycle.

(**Chair's note:** Committee member's attention is drawn to Figure 1 on page 8, where the distinction between Bachelor's and Master's level competencies is specified.)

- The outcomes and rubric are not specific, in that they only provide a title. For example, what does 'Design' mean with respect to geotechnical engineers, engineering geologists and rock engineers? The Committee needs to decide whether further detail is needed.

## **2. Specialisations Within Geo-engineering**

This item was discussed as part of the previous agenda item.

## **3. Issues Related to FedIGS**

Prof. Van Impe thanked the members of JTC3 for their efforts. He then outlined the 1st FedIGS International Conference to be held in Hong Kong in 2012. He requested JTC3, as an important initiative, to organise a session at the conference, perhaps lasting half of a day, devoted to engineering and training in geo-engineering. Prof. Jaksa suggested that might involve JTC3 arranging a keynote lecturer, inviting papers and presentations on the topic, and arranging chair(s) for the session. Prof Van Impe agreed. A workshop format would also be suitable. Prof. Van Impe noted that some financial support can be provided, if needed.

Prof. Van Impe expressed a strong desire to circulate deliverables, in the form of a report and/or other documents, via the JTC3 website.

Finally, Prof. Van Impe mentioned that a longer term objective of FedIGS is to engage other geo-related societies such as ICOLD, Tunnelling, Mining, Hydraulics and Geophysics.

(Prof. Van Impe was present for only this item, as he was, at the time, attending two other concurrent meetings.)

## **4. Proposed Next Steps and Tasks for JTC3**

**The Committee agreed with the following next tasks and timelines:**

- To proceed with Step 3, as proposed by Turner & Rengers, and to complete this task by December, 2009. This step will be progressed by email circulation.
- To begin the task of organising a *Geo-engineering Education and Training* session at the forthcoming 1st FedIGS International Conference to be held in Hong Kong in 2012.

Meeting closed at 6:50 pm