

## International Society for Soil Mechanics and Geotechnical Engineering Technical Committee No. 33: Geotechnics of Soil Erosion

### Minutes of the Meeting held on 14 November 2004 at Meritus-Mandarin Hotel, Singapore at the occasion of the Second International Conference on Scour and Erosion

#### Present:

Jean-Louis Briaud (Chair) (USA), George Annandale (USA), Brian Barkdoll (USA), Erik Bollaert (Switzerland), Yee Meng Chiew (Singapore), Anand Govindasamy (Malaysia), Michael Heibaum (Germany), Gijs Hoffmans (Netherlands), Beatrice Hunt (USA), Christine Lauchlan (UK), Siow-Yong Lim (Singapore), Bruce Melville (New Zealand), Olivier Semar (Germany), Max Sheppard (USA), Soon Keat Tan (Singapore), Richard Whitehouse (UK), Karl Witt (Germany).

#### Chairman's Report:

- z TC33-Scour of Foundations was instigated in 1997 under President Ishihara. In 2001, under President van Impe, the name of the committee was changed to TC33-Geotechnics of Soil Erosion. The new committee was given a broader scope, and including subjects such as surface erosion, internal erosion in dams, etc.
- z The following events have been organised: the Melbourne Symposium at the ISSMGE Conference in 2000; a session at the Istanbul Conference in 2001; ICSE-1 at Texas A&M; ICSE-2 at Singapore.
- z Members of TC-33 need to be recommended by their respective (national) ISSMGE committees and to be members of such committees.
- z Discussion: ISSMGE and IAHR be encouraged to cooperate with respect to TC-33 objectives.
- z **ACTION: Every one is encouraged to become members of TC-33**

#### Membership:

Because TC33 is a committee of ISSMGE, members of TC33 are expected to belong to the parent organisation. Given that some potential members of TC33 are not members ISSMGE, but are members of similar organisations to ISSMGE (e.g. IAHR, IECA, ICOLD), it was suggested that it would be advantageous for ISSMGE to allow members of any of the other societies to become members of TC33. A benefit of such an arrangement would be a broadening of the expertise of the committee to include other disciplines, especially hydraulic engineering. It was agreed that IAHR would be approached:

- ... **ACTION: Briaud to facilitate discussions between ISSMGE (Neil Taylor, General Secretary) and IAHR (Chris George, Executive Director), to foster cooperation and to determine if IAHR membership can be used in lieu of ISSMGE membership for TC-33 eligibility**

#### Report on ICSE-2 (Chiew):

Chiew reported that a total of about 100 papers are to be presented by about 72 delegates from many different countries. More hydraulics papers are included than geotechnical papers. Break-downs of the countries and regions represented at the conference are attached as pie charts.

Briaud suggested that future ICSE conferences should have co-chairs, one each for hydraulics and geotechnics.

#### ICSE-3 Proposals:

Two proposals were received from:

- ... Netherlands (presentation by Hoffmans)
- ... Germany (presentation by Witt)

After discussion by the Committee, it was decided that the 2006 conference would be hosted by the Netherlands CUR (Centre for Civil Engineering Research and Codes) and held in the Netherlands. CUR is an independent, non-profit organisation, representative of civil engineering companies, contractors, construction materials suppliers and research institutes. Gijs Hoffmans was invited to chair the organising committee and to investigate (with Karl Witt of Bauhaus-Universität, Weimar) the possibility that Bauhaus also be involved in organising the conference.

#### **Dam Erosion Task Force (Annandale):**

Annandale's report is attached. It addresses Terms of Reference, scope of activities and potential membership of the Task Force.

#### **Surface Erosion Task Force (Briaud):**

Briaud reported that this Task Force had made minimal progress, principally because the chair-person had resigned. Although the scope of activities of this Task Force are important, it was decided that the other two Task Forces were responsible for higher-priority activities at this stage. Accordingly, it was decided that the activity of the Surface Erosion Task Force would be postponed until more progress has been achieved by the other two Task Forces.

#### **Scour of Foundations Task Force (Chiew):**

Chiew's report is attached. It addresses Terms of Reference, scope of activities and potential membership of the Task Force.

#### **Future Projects:**

Several potential TC-33 activities were discussed. These are listed below in priority order.

- ... Email list: establishment of an internet-based correspondence group, with the following possible name: "**Scour-Erosion**". Richard Whitehouse offered to investigate the feasibility of establishing the Scour-Erosion email group and to be its moderator.

Following the discussion at the Singapore meeting, a moderated email list with the address [scour-erosion@hrwallingford.co.uk](mailto:scour-erosion@hrwallingford.co.uk) was suggested as being a possible starting point; Dr. Richard Whitehouse will investigate. **ACTION: Whitehouse**

- ... Compendia of published papers: The proposal is to produce compendia of existing published papers in two fields, Dam Erosion and Scour at Foundations. **ACTION: Annandale and Chiew**
- ... List of references: To be compiled by each Task Force. **ACTION: Annandale and Chiew**
- ... Short courses: These are important and are best organised by individual members.
- ... State-of-the-art reports: These are the end objectives for each Task Force.

A number of suggestions were made for future research needs, as follows:

- ... Annandale: determination of the best parameter(s) to characterise erosive capacity of water.
- ... Lauchlan: general scour in rivers, specifically the link between bed erosion (an hydraulic engineering problem) and bank erosion (a geotechnical engineering problem).
- ... Briaud: "unknown" foundations, an important bridge foundation problem in US.
- ... Bollaert: data collection for model calibration, e.g. for dam erosion. It was noted that data collection should be added to the Terms of Reference of the Task Forces. **ACTION: Annandale and Chiew**
- ... Sheppard: wave-induced scour, including storm surge effects.

#### **Next Meetings:**

The next meeting of ISSMGE-TC33 is planned for the 2005 International Conference on Soil Mechanics and Geotechnical Engineering, which will take place in Osaka, Japan on September 12-

16, 2005 (<http://www.icsmge2005.org/>)

*Minutes prepared by Melville, 18 November, 2004*

## **Dam Erosion Task Force Terms of Reference**

The Task Force on *Dam Erosion* was set up during the meeting held at the occasion of the First International Conference on Scour of Foundations in College Station, Texas, USA. The purpose of the Task Force, which focuses on Dam Erosion, is to support tasks undertaken by Technical Committee No 33: Geotechnics of Soil Erosion. The terms of reference of the Task Force are as follows:

### 1. Topics of Interest

The Task Force will focus on the following aspects of dam erosion:

- **Dam foundation erosion**  
Dam foundation erosion includes erosion of foundations that may occur due to overtopping of concrete gravity and arch dams, as well as erosion of foundations that might occur due to the presence of earth fissures
- **Plunge pool scour**  
Plunge pool scour includes scour of rock and other earth materials due to impingement of free-falling jets.
- **Erosion of Auxiliary Spillways**  
Scour of auxiliary spillways include scour in earth, vegetated earth materials and rock.
- **Dam breach**  
Dam breaching include breaching of dams due to overtopping, and internal erosion (flow through cracks in embankments and flow leading to piping failure).
- **Infrastructure scour**  
Scour at infrastructure downstream of dams. This includes general and local scour at infrastructure resulting from the presence of dams.
- **Scour currently unidentified**  
Scour at facilities and the environment that has not been identified in the list above, but is related to or caused by dam erosion.

Facets of dam erosion include temporal and spatial features.

### 2. Identification of the extent of dam erosion.

- Collect case studies of dam erosion illustrating the topics of interest indicated above. Focus on images of dam erosion; and geotechnical, rate of scour / erosion, hydrologic, hydraulic and geometrical data. Prepare a compendium of major dam erosion incidences.

### 3. International practices to manage dam erosion.

Identify and collate methods and procedures adopted internationally to manage dam erosion. This includes scour analysis, modelling, testing, monitoring, interpretation of monitoring data, and approaches to manage and prevent dam erosion incidences. A memorandum summarizing state-of-the-art knowledge will be prepared, for inclusion in the final committee report.

### 4. List of important references on dam erosion

Prepare a list of references on dam erosion technology for inclusion in the final report.

5. Prepare a Report on the State-of-the-Art of Dam Erosion

Prepare a report on the findings of the Task Force, summarizing the state-of-the-art on dam erosion.

6. Technology Transfer

Facilitate technology transfer by publishing the state-of-the-art report and distributing it, and by organizing workshops, seminars and conferences.

*Terms of Reference prepared by George Annandale*

**Dam Erosion Task Force****Membership**

November 14, 2004

**Chairperson:**

Dr. George W. Annandale, Engineering and Hydrosystems Inc., Denver, Colorado, USA

**Members:**

Prof. Anton Schleiss, EPFL, Lausanne, Switzerland

Prof. Robin Fell, University of New South Wales, Sydney, Australia

Dr. Erik Bollaert, EPFL and Aquavision, Lausanne, Switzerland

**Proposed New Members (to be contacted):**

Dr. Jose de Melo, Portugal

Mr. Kerrin Spurr, Independent Consultant, Canada

Mr. Jeff Farrar, Bureau of Reclamation, Denver, Colorado, USA.

Dr. Greg Hanson, ARS, Stillwater, OK, USA

Dr. Kaare Hoeg, Norway – (obtain address from Jean-Louis Briaud)

Prof Karl Witt, Weimar, Germany: [kj.witt@uni-weimar.de](mailto:kj.witt@uni-weimar.de)*Prepared by George Annandale*

## **Scour Of Foundations Task Force Terms Of Reference**

The Task Force on *Scour of Foundation* was set up during the meeting held at the occasion of the First International Conference on Scour of Foundations in College Station, Texas, USA. The purpose of the Task Force, which focuses on area relating to foundation scour, is to support tasks undertaken by Technical Committee No 33: Geotechnics of Soil Erosion. It aims to promote better design and management of foundations against scour. The Task Force concentrates in scour around the following foundation types: bridges, outlet structures, embankments and submarine pipelines. To this end, a more defined set of terms of reference has been identified, with the intention that tangible deliverables can be obtained within a shorter time frame. The followings are the terms of reference of the Task Force:

1. Identification of global and local (regional needs) problems relating to scour of foundation

This includes identification of research needs that may be global or localized. An example of global research needs may be related to scour of foundation of very old bridges in which data of the structure are not available. A local problem may not relate to shortcomings of the state-of-the-art; but on information dissemination. Here, sharing of information and how this can be achieved through activities such as short courses organized in conjunction with Federal agencies of a particular country through international bodies such as the World Bank may be pursued.

2. International practices to mitigate foundation scour

Identify and collate methods and procedures adopted in different parts of the world to counteract scour of foundation. This not only includes design methods and procedures, but also matters relating to maintenance of hydraulic structures against scour. To this end, documents outlining such methods and procedures are compiled in the short term; and published in the long term.

3. List of important documents on scour by category

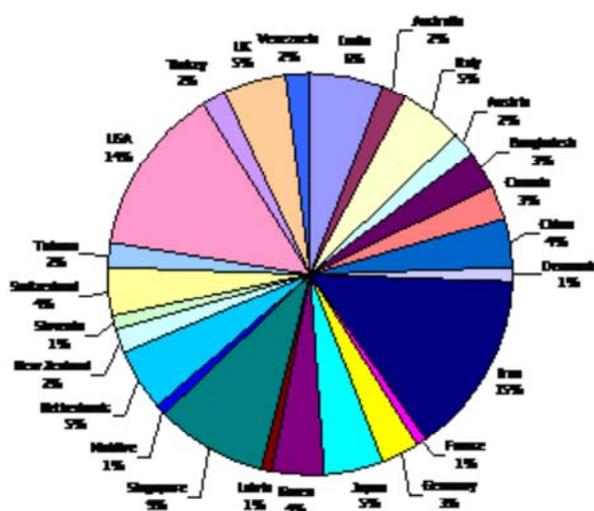
Relevant and pertinent scour manuals and documents on scour by category such as prediction, monitoring, countermeasure, maintenance, etc. could be identified and collated. The reference citation may be published in the TC-33 web-site.

4. List of country representatives

A list of relevant personnel from around the world could be identified and published. Such country representatives may be identified from recommendations of participants attending relevant international conferences such as ICSE-2.

*Terms of Reference prepared by Meng Chiew*

**ICSE-2**  
**Country Representation of Presenters**



**ICSE-2**  
**Region Representation of Presenters**

