# Minutes for 21st ISSMGE TC304 Meeting
# 22-26 February 2016 (email meeting)

**Date: 22-26 February 2016**
**Time:** Meeting closes as of 5:00 pm (Singapore, UTC/GMT +8 hours), 26 Feb 2016

1. **Approval of the 20th TC304 minutes (15 ARC meeting, 10 Nov 2015)**

   The minutes are approved.

2. **Updates and matters arising from the previous meeting**

- ASCE GSP in honour of Professor Wilson Tang (ASCE GI-RAM; Eds.: Hsein Juang, Bob Gilbert, Limin Zhang, Jie Zhang, and Lulu Zhang) – Tang GSP has received 22 contributions and will be published this year.
- Georisk Special Issue on "Distinctive and Critical Elements in Geotechnical Risk and Reliability" (Yu Wang) – 1 paper accepted, 8 papers under review, 1 paper to be submitted
  - Christian, JT and Baecher GB, Sources of uncertainty in liquefaction triggering (accepted paper)
- Georisk Special Issue on "10th Anniversary Issue for Georisk" (KK)
  - 5 papers are currently under review and 5 papers are being drafted (see list below).
    1. Richard J. Bathurst & Sina Javankhoshdel, Influence of model accuracy, input parameter variability, bias variability and bias dependencies on reliability analysis for simple limit states in soil-structure interaction problems
    2. Jinbo Chen and Robert B. Gilbert, Updated Model Biases for Offshore Pile Systems based on Hurricane Performance
    3. J. Michael Duncan & Matthew D. Sleep, The Need for Judgement in Geotechnical Reliability Studies
    4. Herbert Einstein, Rita Sousa, Karim Karam & Ana Costa, Reliability and Exploration in Geotechnical Engineering - A Case Study
    5. Ahmad Kahiel, Shadi Najjar, and Salah Sadek, Reliability-Based Design of Spread Footings on Clays Reinforced with Aggregate Piers
    6. Sara Khoshnevisan, Lei Wang & C. Hsein Juang, Practical Robust Geotechnical Design of Supported Excavation Using Response Surface
    7. Dian-Qing Li, Te Xiao & Zi-Jun Cao, A Simplified Reliability Method for Full Probabilistic Design of Soil Slopes Considering Spatial Variability
    8. Trevor Orr, Defining and selecting characteristic values for geotechnical parameters
    9. Iason Papaioannou & Daniel Straub, Assessing the Reliability of Shallow Foundations with Spatially Variable Measurements
    10. Yu Wang & Adeyemi Emman Aladejare, Evaluation of rock property variability
- Monograph for "Reliability of Geotechnical Structures in ISO2394", CRC Press/Balkema (KK)
  - The purpose of this monograph is to compile published results that are relevant to Annex D. This monograph consists of 7 chapters with headings:
    1. Introduction – Reliability as basis for geotechnical design (KK)
    2. General principles on reliability according to ISO2394 (JV Retief)
    3. Uncertainty representation of geotechnical design parameters (KK, WA Prakoso, Yu Wang, Jianye)
    4. Statistical characterization of multivariate geotechnical data (Jianye, Dianqing, KK)

5. Statistical characterization of model uncertainty (M Dithinde, JV Retief, KK, Jianye, Limin)
6. Semi-probabilistic reliability-based design (KK, Jianye)
7. Direct probability-based design method (Yu, Timo, Wenping Gong, Tengyuan Zhao, KK)

- Future collaboration with TC205 (KK)
  - There was a good discussion in 5ISGSR last year. A summary of the meeting notes is enclosed (Annex A). It has been submitted for publication in ISSMGE Bulletin (April 2016 issue). As an outcome of this discussion, Brian (Chair of TC205) and KK discussed the formation of a Joint TC205/TC304 Working Group on "Discussion of statistical/reliability methods for Eurocodes". Some terms of reference have been suggested in the agenda. The steps and deadlines for carrying out activities in this joint working group are:
    - Request people who are interested to lead a discussion topic to submit a 1-page brief containing: (a) title of topic, (b) name of lead and other contributors, and (c) an abstract describing what the group hopes to achieve say within a time frame of 3 months. Jianye has prepared a sample of a 1-page brief for a discussion topic on "Updating design soil parameters from multiple data sources in site investigation". (Annex B)
    - The lead discusser can invite members personally and/or publicise these briefs on our websites to invite participation (by end of March 2016).
    - The concrete deliverable for lead discusser is to work with their team to prepare a 10-page report as a first draft by say August 2016.
    - Comments on these 10-page reports will be invited in August to fill in gaps in the coverage, to reduce overlap in the coverage of the topics between groups, and other concerns, over say a 2-month period.
    - Target to finalize these reports by say Mar 2017.
    - Compile these reports into a single SOA report as a deliverable of TC304. Results from these reports could be presented in Georisk, ICOSSAR if there is interest, but they should certainly be presented in 19ICSMGE.
      Timelines:
      March 11 2016: submission of 1-page brief
      March 31 2016: lead discusser invites participants
      August 31 2016: draft for the 10-page report
      March 31 2017: final report
  - The following discussion groups have been proposed by members during the email meeting
    - Jianye Ching (jyching@gmail.com) – transformation uncertainties & multivariate soil data (Marco, KK, Dianqing, Celeste Jorge)
    - Gordon Fenton (Gordon.Fenton@dal.ca) –Benefits and limitations of code calibration using reliability analyses (Timo, Wim Kanning, Zhongqiang, Laura, Axel Moellmann)
    - Hsein Juang (hsein@clemson.edu) – implementation of robust design concept in RBD and LRFD (Hongwei)
    - Kerstin Lesny (kerstin.lesny@hcu-hamburg.de) – model uncertainties
    - Dianqing Li (dianqing@whu.edu.cn) – incorporating spatial variability into geotechnical reliability based design (Zijun, Jinsong, Mark Jaksa, Giovanna, Armin)
    - BK Low (CBKLOW@ntu.edu.sg) – EXCEL-based direct reliability analysis and its potential role to complement Eurocodes

        - Yu Wang (yuwang@cityu.edu.hk) – selection of characteristic values for rock and soil properties using Bayesian statistics and prior knowledge (Zijun, Jianye, Trevor)
        - Jie Zhang (cezhangjie@gmail.com) – application of Bayesian methods in geotechnical analysis (Adrian, Shadi, Michele Calvello, Malcolm Eddleston)
    - The following topics were mentioned in TC205 meeting (25th Feb 2016):
        - Transformation uncertainties and model uncertainties
        - Application of direct reliability analysis to rock engineering
        - Distinctions between ULS and SLS, especially in cases where this distinction is less clear
        - Robustness, and the problem of extrapolating from "probable" data to the improbable extremes relevant to design, especially for ULS
        - Could there be a critical reliability study of the values of partial factors currently recommended in Eurocode 7?
    - Suggestions from Brian
        - The discussion groups provide the reliability community, particularly TC304, to present their ideas to a wider community, TC205 and beyond. So it would be wise to ensure that each discussion group includes at least one person who is not a member of the reliability community. They may need to be educated and they may ask challenging questions. TC205 could be a good source of people willing to be involved in this way.
        - In relation to geotechnical data, it would be good to involve engineering geologists as well as engineers.
    - Suggestions from KK to lead discussers
        - There is no need to limit members to TC205 or TC304. They should reach out to anyone who could help. It is good to point out possible engagement with our colleagues in rock engineering and engineering geology.
        - There is no need to restrict to reliability issues. Topics that would clarify the role of reliability or tools that complement RBD (such as robustness) to handle conditions not amendable to statistical treatment are welcomed.

**3. Future activities in 2016/2017+**

- 6th Asian-Pacific Symposium on Structural Reliability and its Applications (APSSRA 2016), May 28-30 2016, Shanghai, China, http://www.apssra2016.org/ (Hongwei)
    - 110 papers are tentatively accepted. Final papers are due by the end of Feb.
    - 8 keynote lectures, including the 1st Suzzane Lacasse Lecture to be delivered by Vaughan, were arranged. Four of the keynote lectures are related to geotechnical engineering.
    - Wilson H. Tang Best Paper Award
    - Online registration is open. Deadline for early registration is April 5 2016
    - Software demonstration session (KK, Jianye, Gordon)
        - The purpose of this session is to promote awareness on the availability of user-friendly probabilistic softwares that engineers can use and to hasten the development of these softwares for practice. Participants were encouraged to showcase the capabilities of their softwares using existing TC304 benchmark examples and to contribute more benchmark examples (http://140.112.12.21/issmge/edu_2010.htm).
        - Contributors
            1. VO Akeju & Yu Wang, Probabilistic Characterization of Geotechnical Properties from Limited Project-Specific Data using Excel VBA Add-in

2. PC Chi, CW Shen, YD Lyu, YG Hu & Jianye Ching, A Demonstration of GeoRASS
3. Dianqing Li, T Xiao, Zijun Cao & X Liu, Non-intrusive Geotechnical Probabilistic Analysis Using NIGPA
4. R Pukl, Tools and methods for nonlinear reliability analysis of concrete structures
5. BK Low, Practical FORM routines for geotechnical reliability-based design
6. J Nuttall, Timo Schweckendiek, W Kanning & A Teixeira, Software demonstration: Reliability and inverse analysis for geotechnical design with FEM
7. R Chobi & Bruno Sudret, Use of the UQLab uncertainty quantification platform in geotechnical engineering

- 1st International Symposium on Reducing Risks in Site Investigation, Modeling and Construction for Rock Engineering (GeoSafe 2016), May 25-27 2016, Xi'an, China, http://www.geosafe2016.org/dct/page/1 (Hongwei)
  - Sponsored by ISRM.
  - Hongwei will deliver a keynote lecture.
- 4th China National symposium on Engineering Risk and Insurance, Aug 26-28 2016, Wuhan University, Hubei, China (Hongwei, KK & Dianqing)
  - TC304 session (Jie Zhang, LuLu Zhang and Zijun Cao)

There are three major events in 2017:

1. Georisk 2017, Denver, 4-6 June, 2017
2. ICOSSAR, Vienna, 6-10 August, 2017
3. 19ICSMGE, Seoul, 17-22 September, 2017

- Georisk 2017/ISGSR 2017, June 4-6 2017, Denver, Colorado (Vaughan)
  - The main Geo-Risk 2017 web site will go live in the first week of March at http://www.georiskconference.org/
  - Preliminary publicity materials can be found at http://www.geoinstitute.org/event/2017-06-04geo-risk/
  - Deadline for general abstract submission will be May 11th 2016
  - 5th Wilson Tang Lecture & 2nd Suzanne Lacasse Lecture (Greg Baecher)
  - Call for proposals in the following areas
    - Session Proposals on more focused topics (proposers in this category are encouraged to include the names of up to 6 speakers who are willing to participate)
    - Short courses
    - Software demos

    Proposals should be sent to the Technical Program Committee by March 31 2016 consisting of Jinsong Huang (Chair), Limin Zhang, Vaughan Griffiths and Gordon Fenton: jinsong.huang@newcastle.edu.au; cezhangl@ust.hk; d.v.griffiths@mines.edu; Gordon.fenton@dal.ca. Decisions on these proposals will be made early in April.
- 12th International Conference on Structural Safety and Reliability (ICOSSAR2017), Vienna, Austria, 6-10 August, 2017 (http://www.icossar2017.org/)
  - Possible TC304/TC205/GI-RAM/GEOSNet mini-symposium (KK): KK suggests that we coordinate our session submissions within a mini-symposium umbrella, possibly based on the following ideas discussed in our 15ARC meeting (refer to minutes):
    - Developing distinctive identity for the georisk community

        - Engaging the broader community to discuss how reliability can be applied to practice
        - Data and user-friendly software
    - No session proposals were received at the end of this meeting. Due to deadline of 29 Feb 2016, KK will move ahead to submit mini-symposium with Jianye and Gordon as organisers.
- 19th ICSMGE, Sep 17-22 2017, Seoul, Korea, http://www.icsmge2017.org/.
    - 3rd Suzanne Lacasse Lecture (Farrokh Nadim)
    - Possible TC304/TC205/GI-RAM/GEOSNet event with the following themes (Hyunki Kim)
        - Risk, safety and reliability in geotechnical practices & Reducing uncertainties and enhancing safety in geotechnical design
            - Risk assessment and management in geo-hazards: Landslide, debris flow, earthquake, etc.
            - Reliability based design in offshore structures
            - Numerical modeling methods and computer software for reliability based geotechnical design
            - Forensic engineering for geotechnical designs and analyses
            - Harmonization of various reliability based geotechnical design codes