Panel discussion: Liability and litigation in the practice of geotechnical engineering

Débat de spécialistes: Responsabilité et litiges dans la pratique de la géotechnique

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ABSTRACT: The terms of reference given to the third international committee on Professional Practice (TC20) include the objective of encouraging co-operation and communication between practicing engineers. Professional Liability is defined in terms of responsibility which has to be managed with skill. Reference is made to reviews of international practice carried out by two previous international committees. The responses to a questionnaire on the subject of Liability and Litigation sent to ISSMFE member countries are analysed and discussed. The issues of inadequate investigation, training and experience, communication and uncertainty, emerge as matters of particular interest from the discussion, and are examined in further detail. Suggestions are made for further involvement of the TC20 Committee in the preparation of guideline documents and position papers in order to address areas of common concern.

RESUME: Les termes de référence donnés au troisième comité international sur la Pratique Professionnelle (TC20) comprend l'objectif d'encouragement à la coopération et la communication entre les ingénieurs pratiquants. La Responsabilité Professionelle a été definie selon les termes de responsabilité qui ont été établies adroitement. Une référence est donnée aux revues de pratique internationale exécutées par les deux comités internationaux précédents. Les résponse au questionnaire au subjet des obligations et de litigation envoyées aux pays, membres de l'ISSMFE, sont analysées et discutées. Le problèmes d'investigation inadéquate, de formation et d'expérience, la communication et l'incertitude apparaissent comme les questions d'intérêts particuliers de la discussion et ont été examinés pour plus de details. Les suggestions sont proposées pour plus de participation du comité TC20 pour la préparation des documents d'instructions générals et les papiers de prise de position pour adresser les secteurs d'intérêts commun.

1 INTRODUCTION

The terms of reference given to the Third International Committee on Professional Practice (TC20) by ISSMFE President Professor Jamiolkowski include the following aim:

To promote cooperation and exchange of information among those concerned with the conduct of professional practice in geotechnical engineering.

Five specific objectives were adopted when the Third Committee met for the first time at the XIth ECSMFE in Copenhagen, of which the following reflects the original terms of reference:

"To encourage communication between Professional Practitioners on an international basis, leading to a proper understanding and recognition of sound practice within member countries."

This paper on the subject of liability and litigation seeks to encourage communication between engineers with widely differing experiences of professional practice.

2 PROFESSIONAL LIABILITY

The Oxford dictionary definition of liability encompasses "... a thing that is troublesome as an unwelcome responsibility", "exposed to something undesirable", "answerable for something". The word is derived from the Latin ligare (to bind).

Engineers may perceive professional liability as an unwelcome responsibility, but such responsibility is a part of professional life, and has to be managed with the same degree of skill applied to technical engineering work.

Professional liability has been recognised as an important aspect of professional practice in all fields of engineering, and the topic has previously been considered in the reviews of international practice undertaken by the first two international committees between 1985 and 1993 (ISSMFE 1989 and 1993).

There is a strong link between mitigation of liability and risk management. The survey of risk management practices carried out as part of the report of the second committee on Professional Practice of Geotechnical Engineering (ISSMFE 1993), concluded that the TC20 Committee should take a lead in providing guidance on risk management, and in developing a Code of Practice.

The third international committee have based their general objectives on reviews conducted by the two previous committees, and decided on six topics for discussion at the XIVth ICSMFE at Hamburg in 1997. The topic of Liability and Litigation is one of those selected, and is a subject highlighted in the presidential address by Bengt B Broms to the XIIth ICSMFE in Rio de Janiero (1989):-

"A dark cloud on the horizon is the rapidly rising number of lawsuits and the high costs for insurance which can amount to 3% to 6% of the Consulting Engineer's fee".

3 QUESTIONNAIRE ON LIABILITY AND LITIGATION

In the spirit of promoting cooperation and exchange of information, the Australian members of TC20 responsible for preparing a discussion paper on the topic of Liability and Litigation, sent a questionnaire to ISSMFE representatives in 67 countries. At the time of preparing this paper, 37 responses had been received, representing 16 countries.

The responses to the questionnaire are analysed and common trends are identified upon comparison with surveys carried out by previous international committees. Particular aspects are discussed in more detail.

3.1 *Response to Questionnaire*

Responses to the questionnaire have been received from the following countries:

Argentina
Australia
Canada
Denmark
Germany
Ireland
Israel
Japan
Korea
New Zealand
South Africa
Spain
Sweden
Syria
Turkey
United Kingdom

In addition to the responses from ISSMFE representatives in each country, 12 replies to the questionnaire were received from Australia, and 7 from New Zealand.

3.2 *Perception of the Issue*

Respondents were asked whether professional liability is considered to be a major issue in the practice of geotechnical engineering in their country.

Over half the countries responding indicated that professional liability is considered to be a major issue.

The issue is considered to be of "some concern" by three respondents' countries (Denmark, Ireland and Turkey) and is not a major issue in three other countries (Argentina, Japan and Korea).

3.3 *Use of Disclaimers*

Respondents were asked if it was common practice to use disclaimers in technical reports in order to limit liability, and whether such disclaimers appeared within the body of the text of a report.

About half of the countries responding indicated that some form of disclaimer was commonly utilised in technical reports.

Frequently used forms of disclaimer seek to restrict reliance on the contents of technical reports to the party directly involved in commissioning the work.

Attention may be drawn to limitations imposed by the amount of exploratory work carried out, or the possible extent of variations within a site.

It was noted by a respondent from the United Kingdom that courts tend to disregard such disclaimers if not worded carefully.

3.4 *Scope of Geotechnical Reports*

Respondents were asked to indicate what is commonly included in geotechnical reports. The following list emerged:

[a] results of investigations (eg borings and laboratory tests);
[b] interpretation of ground conditions;
[c] assessment of (design) parameters;
[d] geotechnical design recommendations;
[e] engineering advice on construction methods

The responses indicated that except for a relatively few cases where only a factual report is commissioned, the current expectation is for technical reports to contain an interpretation of ground conditions, together with an assessment of design parameters and provision of geotechnical design recommendations. About half the countries responding indicated that it was usual to provide engineering advice on construction methods.

3.5 *Extent of Information included in Contract Documents*

Respondents were asked if it is usual for a complete report to be supplied to parties (other than the client/owner) for construction purposes, for example, in contract documents calling for tenders.

Of the 16 countries responding, only 9 indicated that interpretations and design advice would usually be presented in construction contract documents. One of the respondents from the United Kingdom indicated that in some cases, tender documents would state that complete reports were available for inspection.

3.6 *Origin of Disputes*

Respondents were asked what (in their experience) are the common causes for the origin of disputes concerning geotechnical reports.

This question encouraged a wide variety of replies, and answers received have been classified under a number of headings, as summarised in Table 1.

Table 1 Common Causes for Disputes

COMMON CAUSES FOR DISPUTES	RESPONDENT
(a) unexpected excavation conditions,including tunnelling	Argentina, Australia, Korea, New Zealand and Sweden, Canada
(b) Lack of understanding of Engineering Geology	Denmark, Australia
(c) Inadequate investigation due to budget constraints, poor quality data, poor quality (technical) reports	Australia, Germany, Ireland, South Africa, United Kingdom
(d) Poor communications and lack of involvement of geotechnical specialists in design, construction and monitoring phases	Australia, Germany, Ireland, New Zealand
(e) Settlement and poor performance of structures, piling difficulties	Australia, Israel, Spain, Syria
(f) Lack of appropriate experience by geotechnical engineers and designers, and engineers working outside their area of competence, failure to recognise problems	Australia, Japan, New Zealand, South Africa
(g) Inexact nature of the art	Australia, Japan, New Zealand
(h) Earthworks and compaction difficulties	Australia, New Zealand, United Kingdom
(i) Reports not directed to construction issues	Australia, New Zealand, United Kingdom
(j) Groundwater problems	Australia, Sweden, United Kingdom

3.7 *Insurance Cover*

Respondents were asked if it was usual for geotechnical consultants to have Professional Indemnity Insurance Cover, and whether such insurance was available from professional organisations and/or private insurance companies.

The answers received to this question suggest that professional indemnity insurance is not available in some regions of the world.

It appears that insurance is not widely held or is difficult (or impossible) to obtain in some Near East and Middle Eastern countries (eg. Turkey, Syria) and in parts of South America (eg. Argentina). Insurance is not widely held in some Asian countries (eg. Japan, Korea).

Professional Indemnity insurance is held by most geotechnical consultants in North West Europe (represented by responses from Denmark, Germany, Ireland, Spain, Sweden and the United Kingdom) and in Australia, New Zealand, South Africa, and Canada.

In countries where professional indemnity insurance is widely held, such cover is available from private insurance companies. In some countries, insurance cover is available through professional organisations (eg. Australia, Ireland, Israel, New Zealand, Sweden, South Africa, Spain, and the United Kingdom).

Some countries reported a trend towards increasing insurance premiums. In New Zealand, Engineers have been advised that due to an increase in claims, premiums for professional indemnity insurance for civil and structural firms will increase by 15%, with an additional 10% loading for geotechnical specialists.

3.8 *Involvement in Litigation*

Respondents were asked whether geotechnical engineers in their country become involved in litigation cases as expert witnesses.

The response to this question may be summarised as follows:

Frequently:	Country
	Australia, Canada, Denmark, Ireland, Israel, South Africa, Sweden, United Kingdom (often by specialists in this area)
Occasionally:	**Country**
	Argentina, Germany, Israel, Japan, New Zealand, Spain, Syria
Very Rarely:	**Country**
	Korea, Turkey

3.9 *Guidelines on Behaviour*

Respondents were asked if the geotechnical engineering profession in their country had guidelines on the behaviour of engineers involved in litigation cases.

A few respondents indicated the existence of such guidelines:

Australia:	Australian Geomechanics Society
Canada:	ASFE (USA)
Denmark:	Voldgifte
New Zealand:	Association of Consulting Engineers
South Africa:	Society of Arbitrators
United Kingdom:	Institution of Civil Engineers/Law Society

4 DISCUSSION

The subject of professional liability has been considered in previous reports of the technical committee on professional practice (ISSMFE 1989 and 1993). The present review is based on a limited number of responses, but nevertheless, has in some areas confirmed trends which emerged from previous studies.

In particular, the following issues are common to the previous surveys and the present review.

- Liability arising from inadequate investigation work due to pressures of fee competition.
- Failure to recognise potential problems as a result of inadequate training or experience.
- Increasing incidence of litigation in some countries.
- Increasing cost of professional indemnity insurance cover in some countries.

In addition to the issues identified above, two further aspects emerge from the present review. These appear to be closely linked to the matter of professional liability, namely:

- Poor communications and the lack of involvement in geotechnical specialists in the design, construction and monitoring phases.
- Uncertainties inherent in the art/science of geotechnical engineering.

Having identified issues for further consideration, the question arises of the future role of TC20 in attempting to mitigate liability arising from such causes.

4.1 *Inadequate Investigation*

Many factors effect the success of geotechnical investigations, but it is evident that the pressures of time and money form a common link in the experiences of ISSMFE member countries.

Many authoritative papers have been written of this subject, and publications such as "Inadequate Site Investigation" (Institution of Civil Engineers, 1991) seek to inform clients and engineers about the delays and additional construction costs arising from inadequate ground investigation.

The key to mitigating the problem appears to be educating owners, clients and engineers about the consequences of inadequate investigation.

It is suggested that TC20 could play a continuing role in this education process, possibly by synthesising existing literature and producing a position paper.

4.2 *Inadequate Training and Experience*

One of the aims of the third international committee on professional practice is to support the continuing education and training of geotechnical engineers. The subject of undergraduate education is now the responsibility of a separate ISSMFE Technical Committee (TC31).

It is important to appreciate the different levels of understanding required by the main participants in engineering projects. In this respect, the concepts developed by Muir Wood (1994) are worthy of consideration, which are expressed in the form of three levels of understanding defined as:

Level 1 - Awareness: a basic level of understanding of contribution by others

Level 2 - Competence: an ability to assess expectations, limitations and conclusions

Level 3 - Expertise: full ability to perform this function in respect of the particular project

All the main participants in a project should develop awareness (Level 1) in aspects of the project which affect their area of expertise. The project manager and others involved directly in the design discussions should satisfy Level 2 (competence) in relation to each others area of activity. Each member of the design team should satisfy Level 3 (expertise) in relation to the skills they require personally for the specific project. For proper interaction to occur, overlap at Level 2 is required between different disciplines.

This is considered to be an area where TC20 could promote a proper understanding of such concepts. Ideas could be promoted

which improve knowledge about the degree of skill required to properly fulfil a particular role.

4.3 *Communication and Uncertainty*

The origins of uncertainty in geotechnical engineering arise from such factors as:

- Unexpected ground conditions, due to complexity of geology or insufficient investigation.
- Features in the ground which cannot be modelled in quantitative terms.
- Lack of communication between the parties involved.

It is important to recognise that the results of geotechical investigations are often expressed as opinions without qualification, and that such results may be utilised as factual input to the next stage of design (see Muir Wood 1994). Many problems arise from the failure to recognise the limitations of opinions based on interpretation. If the limitations of interpretations are recognised, the right questions can be asked, and appropriate precautions taken in the design and construction monitoring stages.

Further education of engineers and owners is required to promote the importance of monitoring during construction.

If the consequences of uncertainty lie outside previously accepted guidelines, the monitoring process (by personnel with appropriate experience and skill) facilitates corrective action. It is suggested that TC20 examine ways in which the consequences of uncertainty can be mitigated by proper communication and construction monitoring.

5 CONCLUSIONS AND RECOMMENDATIONS

One of the main terms of reference of the third international committee on professional practice (TC20) is to promote co-operation and exchange of information among those concerned with professional practice in geotechnical engineering.

Reviews of international practice have been undertaken by the first two international committees. A survey of risk management practices concluded that the TC20 Committee should take a lead in providing guidance and in developing a Code of Practice.

A questionnaire on liability and litigation distributed by the present author has prompted responses from sixteen countries. The present review has in some areas confirmed trends which emerged from the previous studies.

Particular issues linked to professional liability, and selected for further discussion include:

- inadequate investigation
- inadequate training and experience
- communications and uncertainty

It is suggested that the TC20 Committee examine ways in which such issues can be addressed by preparation of guideline documents and position papers. Three international committees have identified areas of common concern, and it would now seem appropriate to find ways of addressing these concerns.

It is recommended that consideration be given to improving direct communication by utilising the facilities available from the internet and electronic mail.

Professional liability may be an unwelcome responsibility, but it is a responsibility which merits proper management using all available resources.

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REFERENCES

ISSMFE 1989.*Professional Practice of Geotechnical Engineering* Report of the Technical Committee on Professional Practice (TC20). Twelfth International Conference. Rio de Janiero

ISSMFE 1993. *Professional Practice of Geotechnical Engineering* Report of the Technical Committee on Professional Practice (TC20). Thirteenth International Conference. New Delhi.

Muir Wood, A.M. 1994. Chapter 6 of *Geotechnical Engineering, Emerging Trends in Design and Practice.* K.R.Saxena, Editor. Oxford and IBH Publishing Co.

The Institution of Civil Engineers, UK,1991. *Inadequate Site Investigation* Thomas Telford, London,1991