

Measurement and Monitoring: What do “They” expect from?

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“*They*” -The Users - have to take decisions

Geotechnical Instrumentation is a support in decision-making.

“*They*” expect to obtain information and to have a partner in the decision process.

Is the Geotechnical instrumentation Community able to answer them?



Manufacturers

Service providers



The Italian view

- ✓ Measuring instrumentation has reached a good and satisfactory level;
- ✓ System components are quite satisfactory: few remarks;
- ✓ New promising technologies are emerging (fiber optic, SMART sensors, MEMS sensors, GSM, GPRS, Internet).

✓ Quality of services is not, generally speaking, satisfactory.

Users expectations are not met;

✓ There are no measurement

Why ?

✓ There are no state who is allowed to perform measurement and monitoring activities.

✓ It is difficult to find “Instrumentation Experts” who are able to understand the real expectations.

The History

**1990-2005:
The era of PCs and Communication**



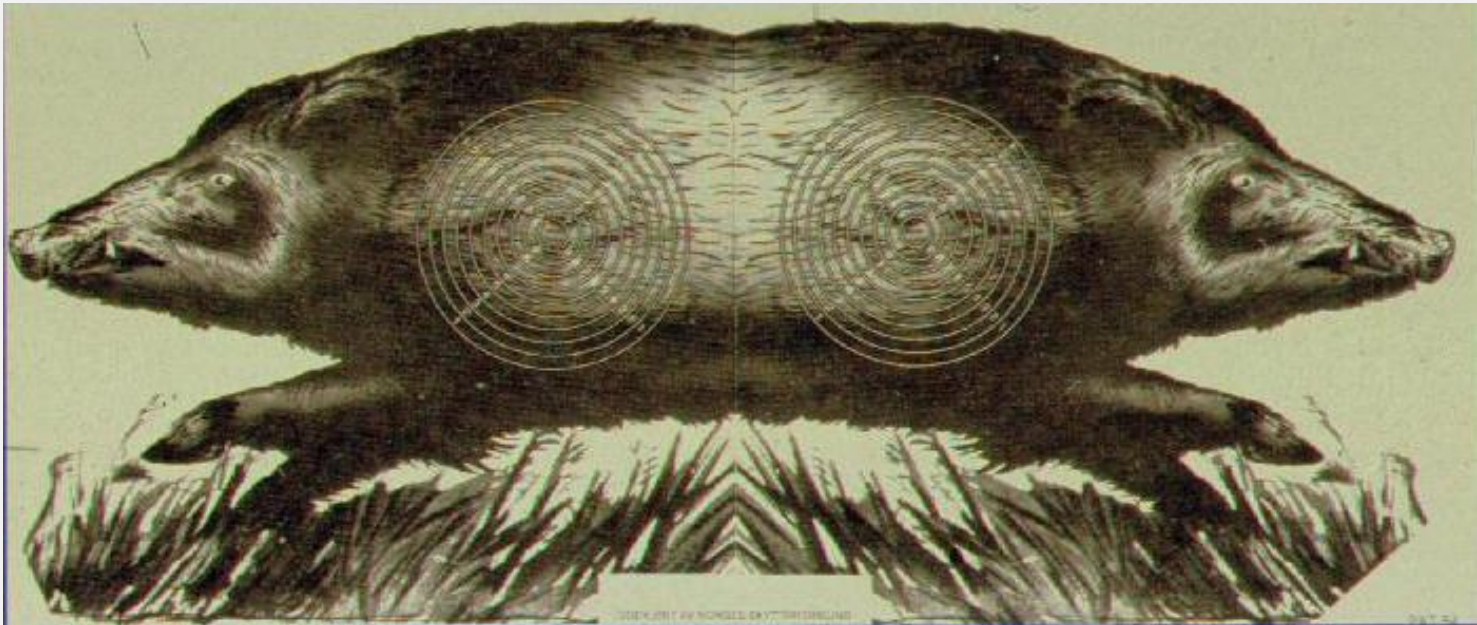
Nowadays: Back to???



< 1970: The era of Engineers

1970-1990: The era of Instruments

It's a Moving Target !



(ref: J. Løvholt, 2003)

Users Perception



Reasons

Manufacturers

Connection with Industrial world which continuously changes.

Introduction of new technologies.

Requests from the market.



Compulsory

Service Providers

No rules.

Increase of labor cost.

Supremacy of economical aspects.



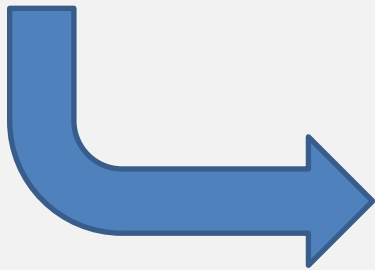
Not Mandatory

No rules means

No interests (technical and legal)

No responsibilities

Bad contracts



No improvement

No suitable answers

Conflicts

Consequence

Manufacturers, who are mainly commercial organizations, cover also the service activity. They are the leaders of the “geotechnical instrumentation activity”.

They are considered to be “*the Measurement Community*”.

Service Providers have lost their leading role.

They are considered as a *complement to the Manufactures*.

“Norme Tecniche sulle Costruzioni” - Chapter 6 “*Geotechnical Design*”, point 6.2
“*Contents of the design*”, paragraph 6.2.5. “*Monitoring of the Soil-Structure complex*”.

“The monitoring of the Soil-Structure Complex and of the interventions consist of the installation of a suitable instrumentation and of the measurement of significant physical parameters – such as displacements, stresses, forces and pore pressures – before, during and/or after the structure construction.

Scope of the monitoring is to verify the correspondence between design hypothesis and observed behavior and to check the structures functionality during time. When the Observational Method is used, the scope of monitoring is to validate the adopted design solutions or, in case of discrepancies, to evaluate the most appropriate solutions among the ones included into the design. If foreseen, the monitoring plan must be described in the geotechnical report”.

Suitable instrumentation and measurement: What is suitable?
Who decide?
Which references?

Observational Method: Adopt design solutions: not allowed or very difficult

If foreseen, the monitoring...: Who decide? Which related responsibilities

Proposal to start

Suitable instrumentation and measurement:

What is suitable?

Eliminate.

Who decide?

The Engineers/Designers who must take the responsibility to state why.

Which references?

General guidelines such as “Geotechnical investigation and testing – Geotechnical Monitoring by field Instrumentation – General rules” by CEN/TC 341-WG1. Others . . .

Observational Method:

Allow for new solutions under Engineer/Designer responsibility

If foreseen, monitoring...:

Who decide?

The Engineers/Designers who have to state when and why, taking the responsibility for NON using measurement.
(EUROCODE Categories?)

Which responsibilities:

The Engineers/Designers will be responsible for the general specifications. Service Providers will be responsible for detailed design, installation, measurements.

moreover . . .

Contract award criteria:

- NO LOW bids. (Mikkelsen 1991!!!)
- Curricula (technical capabilities, experiences, financial capacity) must be considered.
- No contracts to Contractors.
- Measurement and Monitoring have to be directly under Owner or Designer contractual responsibility.

Qualification:

Service Providers must be qualified for different level of activities.

The Construction Code must define terms for qualification and the Ministry has to issue the relevant documents.

Methodological Code:

The Geotechnical Association has to prepare a “Methodological Code” to use as reference together with international guidelines (CEN/TC 341-WG1)

The solution:

Codes: state when and why Measurement / Monitoring has to be used / Responsibilities.

Codes: how to award a contract: technical and economical aspects to be considered.

Qualification: who can be awarded by contracts.
No Contractors. Third Party?

Responsibilities: who is responsible? one single responsible.

Methodological code: to support the activities enhancing the quality.

.... and last but not least . .

Manufacturers and Service Providers:

They must work together joining their capabilities, skills, abilities, competences, experiences, knowledges to reach the goal:

“Provide for appropriate information to meet Users expectations”



*“There is little chance that our theories
or design procedures and construction practice
will ever become so reliable and foolproof
that field instrumentation will no longer be needed.
Instrumentation has been, is, and always will be
one of the most important implements in our
geotechnical tool box”.*

Elmo DiBiagio

GRAZIE E ARRIVEDERCI.