CNISF
CONSEIL NATIONAL DES INGENIEURS ET DES SCIENTIFIQUES DE FRANCE

European Council of Civil Engineers (ECCE)

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Climate change and civil engineering

Climate change is largely taken into account in France through a big political debate in progress at national level and through researches also in progress.

1. National debate "Grenelle de l'environnement".

This debate is organised under the auspices of the Ministry « Ecology, sustainable development and equipment".
Conclusions and decisions should be announced end of October 2007.

It is based on specific Working Groups in charge of discussions and propositions on following topics:

1. To fight against climatic changes and to control energy
2. To protect biodiversity and natural resources
3. To develop an environment health-friendly
4. To adopt sustainable modes for production and consumption
5. To built an ecological democracy
6. To promote ecological development modes prone to competitiveness and employment.

Conclusions involving civil engineering should be found in several Working Groups, more especially in WG 1 for which CNISF wrote 2 reports , one on energy in buildings, by Jean-François Coste, Chairman of the Civil engineering Committee, one on transport, by Georges Dobias, Chairman of the Transport Committee.

2. Researches are in progress under authority of the Ministry.

It is generally recognized that at least 3 changes will affect the French territory: increase in temperature, intensification of weather season factors (Highest temperature in summer, drought in the South, intense rains, strong, storms,…), severe natural disasters (Floods, landslides, strong wind,, wild fires, etc..)

Then various research programmes are in progress, in many Universities and research institutes. Dealing with effects in the civil engineering fields, the Ministry launched calls for research projects.

- "**Management and impact of climatic change**"

Research deals with environment topics.

- "**Vulnerability of infrastructures towards climatic change**", managed by DRAST (Directorate for Research and Scientific and Technological Action), of particular interest for ECCE.
The aims are: direct consequences of climatic change, indirect consequences of climatic change, understanding and prediction (based on models), regulations and socio-economic aspects of climatic change.

At this time, 4 research projects are in progress:

- **Swelling-shrinkage of clays**.
It deals with knowledge and long term prediction of relations between weather factors and soils behaviour. This research could be applied on foundation behaviour of buildings and other structures, on long term stability of slopes, etc..

- "**Hydrodetect**".
Systems based on sensors equipped geotextiles systems in order to detect possible hydraulic problems in banks and dams (protection against floods and storms). It deals with development of sophisticated equipments and their experimentation in laboratory and in situ.

-" **Stability of rock slopes**".
Study of the impact of climatic change on thermic and hydric factors on stability of rock layers. It deals with development of measurement systems of hydric and mechanical efforts, in situ experiments and practical integration.

- "**GeRiCi**" (Management of risks induced by climatic change on infrastructures).
It aims at reducing vulnerability of roads, highways and networks. The basic consideration is that infrastructures are designed for long term use (50-100 years) and that, in this range of time, climatic change could affect their operation. Risk factors will be analysed : Climate factors (rain, wind, drought…), Infrastructure intrinsic factors, Site factors, taking into account pavements, structures, geotechnical works, hydraulic works, environment, etc… .
Results should deal with: easy updating of meteorological knowledge of climatic change, simulations at network level and at section level, risk maps for alert and prevention plans, easy long term capitalisation of local experience.

G.Pilot