BUSINESS PLAN

CEN/TC 318
HYDROMETRY

EXECUTIVE SUMMARY

Scope

The standardization of methods, procedures, instruments and equipment related to techniques for hydrometric determinations of the water cycle including for example:

a) velocity, stream flow, water level, load transport, erosion, sedimentation and ice phenomena in rivers, reservoirs, open channels, lakes and seas;
b) precipitation, snow water equivalent and snow cover;
c) infiltration, evapotranspiration, soil moisture and soil frost;
d) groundwater level, groundwater movement and groundwater temperature;
e) description and use of instruments, structures and equipment used for measurement, and the evaluation of associated uncertainties;
f) standards for data collection, data processing, evaluation and analysis, data exchange and presentation.

Business environment

Many European countries suffer, to varying degrees, from water resource pressures, e.g. droughts and flooding. The distribution of water supply and abstraction throughout Europe is not uniform for reasons including climatic conditions and human intervention. There is a risk that these pressures will increase with time because of issues such as overexploitation and climate change. Also, Europe has quite rightly long recognized the need to protect the often fragile water environment. This results in additional pressures and management issues. The provision of good quality hydrometric data is essential for the optimum management and protection of the water environment.

As a significant part of renewable energy resources hydropower plays a very important role in energy production. In aspects of economy and risks for society connected to water power production the demand of data covering the whole water cycle in river catchments is of crucial importance.

Rivers and other water bodies do not respect national boundaries. Consequently, the management of river basins and groundwater resources cannot be achieved at either the catchment or national level. Co-operation between organizations at both the sub- and supra- national level is imperative. These bodies need standards to ensure that they are all producing hydrometric data which are based upon agreed procedures and of the required quality.

The measurement and comparison of measurements of precipitation and river/stream flows will be even more important in the future for predictions of changes in weather patterns, affecting the entire world.

Accurate measurements across the whole of the hydrological cycle are of great importance in order to facilitate the efficient management of water resources, as required

by the European Union Water Framework Directive. Human intervention in the water cycle is possible only when precipitation has fallen and the water is available as run-off or groundwater.

Benefits

Since the committee's first meeting in 1994, eighteen standards (including revisions) have been published, the majority of which were European adoptions of international (ISO) standards.

The development and use of standards in the area of hydrometry will facilitate accurate measurement of all the key parameters in the hydrological cycle.

The priority of the committee is to develop standards for making hydrometric measurements throughout the water cycle. This will become increasingly important as Governments and water resource management authorities develop and maintain the river basin management plans required by the Water Framework Directive.

1 BUSINESS ENVIRONMENT OF THE CEN/TC

1.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal, societal and/or international dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this CEN/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

The scope of CEN/TC 318 applies to the measurement of original water resources and measurement of the amounts of transfer of these resources. There are responsible organizations in every member of the EC. These include all the organizations that are responsible for the abstraction of water supplies (either from surface or sub-surface sources) for domestic, agricultural or industrial use, the disposal of all wastewaters, and for the storage and/or transfer of waters by means of natural rivers and streams or man-made channels. Several large European rivers have catchment areas shared between many countries. The majority of European countries receive a proportion of their water from transboundary rivers, and several countries are heavily dependent on external sources.

European Water Policy has undergone a thorough restructuring process in the recent years and in 2000 the EU Water Framework Directive was installed as the operational tool for setting the objectives for water protection for the future. This directive requires management plans to be derived for all river basins within the EU. Since it is becoming necessary to manage the resources on an international basis, it is essential that measurements of the water cycle are comparable. To a large extent, this implies the use of the same measurement techniques and similar equipment, good data can only be achieved with good quality, hydrometric records and the standards produced by CEN/TC 318 will assist in this.

Another aspect is the treatment and disposal of wastewater. The need to monitor both the quantity and quality of treated effluent discharged into Europe's watercourses has become a high priority since the introduction of the EU Urban and Wastewater Treatment Directive in 1991. Monitoring of the performance of treatment plants and receiving waters; controls of sewage sludge disposal and re-use as well as treated waste water re-use whenever it is appropriate, need accurate flow measurement as an essential tool in maintaining public health. Pollutants, pathogens and other materials that increase the biochemical oxygen demand of water courses require a quantitative measurement to be performed, as well as one that identifies the concentration. Therefore, discharges from wastewater treatment plants and industrial sources, run-off from agricultural land, etc. must all be accurately established and once again, the standards produced by CEN/TC 318 will assist in this.

The EU directive on the assessment and management of flood risks, which was established in 2007, now requires Member States to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. Floods are natural phenomena but through the right measures their likelihood and their impacts can be reduced. An important key factor for these measures are good water cycle data based on hydrometric records and the standards produced by CEN/TC 318 will assist in this.

CEN/TC 318 is also addressing, or has addressed, technological developments in the field such as the application of time of flight methods and Doppler flow measurement techniques, rainfall intensity and snow water equivalent measurement and the uncertainties in hydrometric data.

Once measurement of relevant quantities has taken place, it is important that the data can be easily and accurately exchanged between organizations and compared. CEN TC318 has therefore recently been developing a Technical Specification on the *Management of Observed Hydrometric Data – Recommendations*.

1.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the CEN /TC:

The total turnover of the water industry in Europe [EU-25] is approximately estimated to be 80 000 million euros of which the hydrometric element is estimated to be 250 million euros.

In the last 50 years, the demand for European water has steadily increased from 100 km^3 /year to over 650 km^3/year. Because of this increase in demand, parts of the region have become increasingly vulnerable to droughts. It was estimated that by 2007, at least 11 % of Europe's population and 17 % of its territory had been affected by water scarcity, putting the cost of droughts in Europe over the past thirty years at EUR 100 billion. The European Commission expects further deterioration of the water situation in Europe if temperatures keep rising as a result of climate change. Water is no longer the problem of a few regions, but now concerns all 500 million Europeans.

Flooding is the most common natural disaster in Europe and can have very large economic consequences. A report published in 2010 indicates losses of €50 billion during the last decade. These include the central Europe floods in 2002 (greater than €20 billion), France and the Swiss Alps in 2000 (about €12 billion) and in the UK in 2007 (greater than €4 billion). Recent research has shown that over the 35-year period from 1970 to 2005, the average annual estimated cost of flood losses in Europe in 2006 prices was in excess of €3 billion. In 2015 the estimated cost of natural disasters in Europe, the majority of which were attributable to high precipitation was about €11 billion. In December 2015 in the UK alone the effects of flooding resulted in costs of about €2 billion. It is estimated that about 16000 homes were inundated as a result of these floods. Assuming a climate change medium-high emission guideline it is estimated that the average annual damage costs of flooding by the 2050s could be of the order of €45 billion with nearly 300000 people affected annually. In order to maintain current protection levels would require an estimated investment of €3 billion per annum. Good quality hydrometric data is of prime importance in flood analysis and warning, design of protection works and the minimization of costs through over or under design.

Precipitation is the source of all freshwater resources. However, it is unevenly distributed across Europe being higher in the west and in the more mountainous areas. The annual average run-off from rain varies from around 25 mm in southern and central Spain to over 3000 mm in western Norway. Therefore, in some regions of Europe there is a mismatch between demand and rainfall and sustainable water resources utilization.

Water power is the second most important contributor to the renewable energy in

Europe with about 15 % of the total. For economic and dam safety reasons, the water power industry is highly dependent on accurate measurements and predictions of water inflow to the water reservoirs.

In absolute terms, the total renewable freshwater resource for Europe is around 3500 km^3/year and the total annual abstraction is around 10 % of this figure. To reach the goal of sustainable water management, a balance has to be achieved between abstractive uses, e.g. irrigation, industrial use and public water supply, in-stream uses, recreation and ecosystem maintenance, the discharge of effluents and the impact of diffuse sources. Achievement of this goal requires that both quantity and quality are taken into account, while at the same time protecting the water environment.

2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC

Standards developed by CEN/TC 318 are primarily methods of measurement and specifications which provide the means for obtaining these measurements, e.g. for water level measurement devices, use of current meters and rainfall measurement techniques.

These measurements are essential for the effective management, protection and utilization water resources and eco-systems. Also, they are a great aid in the protection of human life and property both in particularly in flood forecasting and pollution control.

Recent developments in the industry have seen an increasing use of innovative techniques such as the use of ultrasonic meters and Doppler flow measurement methods. CEN/TC 318 has been quick to keep abreast of these innovations by considering standardization in these areas.

The standards produced by CEN/TC 318 will assist stakeholders implementing EU Directives in the field of water resource planning, such as the Water Framework Directive, the Urban Wastewater Directive and the Directive on the Assessment and Management of Flood Risks.

3 PARTICIPATION IN THE CEN/TC

All the CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. To participate in the activities of this CEN/TC, please contact the national standards organization in your country.

4 OBJECTIVES OF THE CEN/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

4.1 Defined objectives of the CEN/TC

1) To develop and maintain a set of standards and other deliverables for methods, procedures, instruments and equipment for measurement techniques related to the water cycle.

2) To have a flexible work programme in order to be responsive to the changing needs of the industry.

3) To make the standards more relevant to industry by ensuring timely delivery.

4) To co-ordinate the work programme in close liaison with ISO/TC 113 and its SCs and liaison members to avoid duplication of effort and possible conflict.

4.2 Identified strategies to achieve the CEN/TCs defined objectives

CEN/TC 318 has adopted the following strategies to achieve the preceding objectives.

1) To ensure that there is no duplication of effort, CEN/TC 318 reviews appropriate standards published by its international counterpart ISO/TC 113 "Hydrometry" and adopts them, where appropriate.

2) TC 318 will also collaborate in the drafting of standards using the Vienna Agreement.

3) To continue to use a single language for meetings in order to avoid the expense of providing translators/interpreters.

4) To re-establish liaison with the World Meteorological Organization.

5) To encourage the use of electronic distribution of documents to accelerate the production process and reduce the carbon footprint.

4.3 Environmental aspects

The CEN TC318 Committee on Hydrometry is committed to the protection of the environment

1) Many of the hydrometric standards that are developed by CEN/TC 318, or with which they are involved, concern hydrometric monitoring where the data is used for water environment protection purposes, such as the control of over abstraction and pollution.
2) Whenever, possible new standards are developed that have the potential to minimize the environmental cost of hydrometric data collection. For example CEN/TC 318 has been involved with the development on new standards on fish passage at flow measurement structures and the use of acoustic and other more recent developments in flow measurement which can minimize the environmental impacts of construction and installations.
3) Whenever, possible the use of products and techniques that are potentially harmful to the environment are avoided. For example, CEN/TC 318 recently requested that the ISO standard on dilution gauging using radioactive isotopes was withdrawn.

5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC WORK PROGRAMME

The major factors affecting the completion of the work programme are as follows.

1) *Suitable expertise*: The difficulty in finding suitably qualified personnel, with employer approval, to act as project leaders to drive the work forward and also finding

enough WG experts to participate in appropriate projects.

2) *Loss of existing experts*: The loss of existing expertise over the next few years because of retirement, changes in circumstances, etc. The TC needs to be more proactive in ensuring that the necessary level of expertise is maintained whenever there is a change of personnel.

3) *Delays*: Where standards are developed under the Vienna Agreement, delays in ISO/TC 113 affect corresponding project targets in CEN.

4) *Cost:* The costs of producing standards, including the attendance at meetings, will increase due to inflation. This will continue to be a challenge. Nevertheless, it is believed that attendance at periodic, well-focussed meetings can result in greater efficiency, improved exchanges of technical expertise, more proactiveness (see paragraph 2) and thus a superior final product. Also, the costs of development and application of hydrometric standards, resulting in good quality hydrometric data are totally insignificant in terms of the costs resulting from the use of inadequate or no hydrometric data.