

## Report on international standards for hydrological observation and processing in RA-VI region based on a questionnaire

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In year 2000 came into force the Directive 2000/60 of the European Parliament and of the Council establishing a framework for Community action in the field of water policy – the well-known **Water Framework Directive** (WFD). It is obligatory to implement for the 27 EU Member States (MS) and as it has to be applied for river basins entering the sea. Many non-EU neighbouring countries joined the implementation process. The Article 8 of WFD states “Member States shall ensure the establishment of programmes for monitoring of water status in order to establish a coherent and comprehensive overview of water status within each river basin district.” These programmes had to be operational by end of 2006. This Directive is to contribute to the implementation of the UNECE Convention on the protection and use of transboundary water courses and international lakes as well. It means that the EU MSs implement the WFD on national – Transboundary – river basin – EU levels.

**In the Action Plan 2008-2011 of RA-VI Working Group on Hydrology** there is a task “*to initiate joint effort with the International Organization for Standardization (ISO) and European Committee for Standardization (CEN) on international standards for hydrological observation and processing*” under my responsibility. The aim is the improvement of the comparable monitoring results. To survey the situation we need an overview of the European practice related to the standardization. For this reason a survey was made in the first quarter of 2008 based on a questionnaire sent (Annex 1.A) in December 2007. The questions were related to the surface – and groundwater quantity parameters both for measurement - observation and data processing. The following parameters figured for surface water: water level, water temperature, discharge, suspended and bottom sediment; for groundwater: water level, water temperature. It was requested to indicate which type of regulation-guidance was used by the National Hydrological Services (NHS) for field measurement and data processing: hydrological guidelines (these are technical guidance published internally by the NHS and have no binding value) – national standards – ISO standards – CEN standard. The following 14 countries’ NHS sent back the filled in questionnaire: Croatia – Czech Republic – England – Estonia – Finland – Germany – Hungary – Iceland – Latvia – Macedonia – Poland – Slovakia – Spain – Sweden (**Annex 2.**)

Based on the result of this questionnaire (**Annex 3.**) it can be concluded that most of these countries use basically hydrological and national standards both for field measurement and data processing. The use of the international standards is the highest for measuring discharge (10 countries indicated) and for surface water level (6 countries). But even for these parameters at the data processing columns only 5 countries indicated use ISO for discharge and 3 countries for water level. For surface water temperature only one country, in case of groundwater level and temperature also only one country indicated ISO for measurement and any countries indicated ISO for data processing. The suspended sediment is measured only by 8 countries and the bottom sediment only by 4 countries. At the suspended sediment column one country indicated use of ISO for field measurement and any for data processing. No country used them for bottom sediment. For information it is attached the list of the ISO standards reported by these 14 countries.

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The WMO hydrological technical regulations, guides and manuals' declared the aim "to ensure adequate uniformity and standardization in practices and procedures". But beside the general rules and procedures these documents also refer to ISO standards.

The ISO hydrological frame is the Hydrometry TC 113 that has the following areas and items:

Velocity area methods	23 items
Flow measurement structures	17 items
Terminology and symbols	3 items
Instruments, equipment and data management	13 items
Sediment transport	10 items
Groundwater	5 items

In **Annex 4**, are listed the ISO standards used by RA-VI countries.

There was a question in the RA-VI questionnaire related the participation either in ISO or CEN activities. Only one country answered yes.

There is an ongoing process for the future cooperation of ISO and WMO. It can be underline the importance of the common efforts of these two international organisations if we would like to have comparable hydrological data produced by the NHSs for international data exchange on bilateral – catchment – European - international level.

Circular letter to Network Partners of the RA VI WG on Hydrology

Dear Colleague,

In the Action Plan 2008-2011 of RA VI Working Group on Hydrology there is a task “to initiate joint effort with the International Organization for Standardization (ISO) and European Committee for Standardization (CEN) on international standards for hydrological observation and processing” under my responsibility. The aim is the improvement of the comparable monitoring results. To survey the situation we need an overview of the European practice related to the standardization.

The survey is based on the attached questionnaire as first step related for the surface – and groundwater quantity parameters both for measurement/observation and data processing. You are kindly requested to fill the questionnaire and send it to the following address preferably via e-mail

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**before 25<sup>th</sup> January 2008** to enable me to summarize the report before end of January. I would appreciate your opinion about the further steps, the proposed order of parameters for standardization related both observation and processing. Please inform me also if your hydrological/hydrometeorological service participates either in ISO or CEN activities and if yes in which process is your expert involved. If you have any questions or need for further clarification, please, do not hesitate to contact me.

For information I attach the list of related CEN standards including their current work program.

I express sincere thanks for your collaboration. Simultaneously I wish you a Prosperous Happy New Year!

Budapest, 20 December 2007.

Buzás Zsuzsa

**CEN/TC 318 Hydrometry – published standards**

EN 13798:2002	Hydrometry - Specification for a reference rain gauge pit
EN ISO 748:2000	Measurement of liquid flow in open channels - Velocity-area methods (ISO 748:1997)
EN ISO 772:2000	Hydrometric determinations - Vocabulary and symbols (ISO 772:1996)
EN ISO 6416:2005	Hydrometry - Measurement of discharge by the ultrasonic (acoustic) method (ISO 6416:2004)
EN ISO 4375:2004	Hydrometric determinations - Cableway systems for stream gauging (ISO 4375:2000)
EN 14968:2006	Semantics for groundwater data interchange

**Current work programme**

prEN ISO 4373	Hydrometry - Water level measuring devices (ISO/DIS 4373:2006)
prEN ISO 748	Measurement of liquid flow in open channels - Velocity-area methods (ISO/DIS 748:2005)
prCEN ISO/TS 25377	Hydrometric uncertainty guidance (HUG) (ISO/TS 25377:2007)
prEN ISO 772 rev	Hydrometric determinations - Vocabulary and symbols
prEN ISO 24578	Hydrometry - Acoustic Doppler profiler - Method and application for measurement of flow in open channels
prXXXX	Methods for determining the water equivalent of snow

**List of ISO standards**  
**Result of inventory from 14 WMO RAVI countries**  
**April 2008**

**ISO 748:2000**

**ISO 748**

**EN ISO 748**

**EN ISO 748:2000**

*EN ISO 748:2001*

*Measurement of liquid flow in open channels. Velocity-area methods*

Spain, Finland, Sweden, Estonia, Germany, England, Hungary

**ISO 772:2000**

**EN ISO 772:2000**

**EN ISO 772/A1**

**EN ISO 772:2001**

**772/A2:2006**

*Hydrometric terminology. Terms, definitions and symbols (ISO 772:1996)*

Latvia, Spain, Hungary

**ISO 1100**

**ISO 1100-1**

*ISO 1100-1:2000*

*Measurement of liquid flow in open channels. Part 1: Establishment and operation of a gauging station*

Finland, Latvia, England

**ISO 1438/1:1980**

*Hydrometry -- Open channel flow measurement using thin-plate weirs*

England

**ISO 2537**

*ISO 2537:1995, 1994*

*Liquid flow measurement in open channels. Rotating element current- meters*

Finland, England, Hungary

**ISO 3455**

*ISO 3455:1995*

*Liquid flow measurement in open channels. Calibration of rotating- element current-meters in straight open tanks*

Finland, England

**ISO 3454:2001**

*Liquid flow measurement in open channels. Direct depth sounding and suspension equipment*

England

**ISO 3846:1989**

*Hydrometry -- Open channel flow measurement using rectangular broad-crested weirs*

England

**ISO 4359:1983**

*Liquid flow measurement in open channels -- Rectangular, trapezoidal and U-shaped flumes*

England

**ISO 4360:1984**

*Liquid flow measurement in open channels by weirs and flumes -- Triangular profile weirs*

England

**ISO 4369 : 1979**

*Measurement of liquid flow in open channels -- Moving-boat method*

Latvia

**ISO 4373**

*ISO 4373:2000*

*Measurement of liquid flow in open channels. Water-level measuring devices*

Finland, Latvia, England

**ISO 4374:1989**

*Liquid flow measurement in open channels -- Round-nose horizontal broad-crested weirs*

England

**ISO 4377:2002**

*Hydrometric determinations -- Flow measurement in open channels using structures -- Flat-V weirs*

England

**ISO 4375:2004**

*Hydrometric determinations. Cableway systems for stream gauging*

Estonia, England, Hungary

**ISO 5667-12**

*Water quality -- Sampling -- Part 12: Guidance on sampling of bottom sediments*

Czech Republic

**ISO 5667-17**

*Water quality -- Sampling -- Part 17: Guidance on sampling of bulk suspended solids*

Czech Republic

**ISO 6416:2005, 2006, 1992**

*EN ISO 6416:2006*

*Hydrometry. Measurement of discharge by the ultrasonic (acoustic) method*

Estonia, Germany, England, Hungary

**ISO 6420:1994**

*Liquid flow measurement in open channels -- Position fixing equipment for hydrometric boats*

Hungary

**ISO 8601:2004**

*Data elements and interchange formats -- Information interchange -- Representation of dates and times*

Germany

**ISO 8363:1993**

*Liquid flow measurement in open channels. General guidelines for the selection of methods*

Slovakia

**ISO 8368:1999**

*Hydrometric determinations -- Flow measurements in open channels using structures -- Guidelines for selection of structure*

England

**ISO 9123**

*ISO 9123:2004*

*Measurement of liquid flow in open channels. Stage-fall-discharge relationships*

Latvia

**ISO 9195:2001**

*Liquid flow measurement in open channels -- Sampling and analysis of gravel-bed material*

Hungary

**ISO 9196**

*Liquid flow measurement in open channels -- Flow measurements under ice conditions*

Latvia

**ISO 9213:2004**

*Measurement of total discharge in open channels -- Electromagnetic method using a full-channel-width coil*

England

**ISO 9555/1:1994**

**ISO 9555/3:1992**

*Measurement of liquid flow in open channels -- Tracer dilution methods for the measurement of steady flow -- Part 1: General*

England

**ISO 10240:1999**

*Small craft -- Owner's manual*

Hungary

**ISO 14139:2000**

*Hydrometric determinations -- Flow measurements in open channels using structures -- Compound gauging structures*

England

**ISO/TR 11627: 1998**

*Measurement of liquid flow in open channels -- Computing stream flow using an unsteady flow model*

Latvia

**ISO 15769:2000**

*Hydrometric determinations -- Liquid flow in open channels and partly filled pipes -- Guidelines for the application of Doppler-based flow measurements*

England