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Hydrometric determinations — Vocabulary and symbols

AMENDMENT 1: Additional terms and definitions

Déterminations hydrométriques — Vocabulaire et symboles

AMENDEMENT 1: Termes et définitions supplémentaires

Reference number
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Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this Amendment may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

Amendment 1 to ISO 772:1996 was prepared by Technical Committee ISO/TC 113, *Hydrometric determinations*, Subcommittee SC 3, *Terminology and symbols*.

Amendment 1 to ISO 772:1996 gives additional English terms and definitions, used in the field of hydrometric determinations, to the terms and definitions included in ISO 772:1996.

Hydrometric determinations — Vocabulary and symbols

AMENDMENT 1: Additional terms and definitions

1 General terms

Page 22, clause 1

At the end of clause 1, General terms, add the following terms and definitions.

1.146
hydrometry
science of the measurement of water including the methods, techniques and instrumentation used

NOTE The adjective is "hydrometric".

1.147
hydrological cycle
constant movement of water above, on and below the earth's surface

1.148
hydrogeology
study of subsurface water in its geological context

1.149
hydraulic gradient
change in static head per unit distance in a given direction

1.150
static head
height, relative to an arbitrary reference level, of a column of water that can be supported by the static pressure at a given point

1.151
creek
⟨river⟩ small river, often a tributary to a larger river

1.152
creek
⟨sea coast⟩ recessed inlet on a sea coast or estuary

1.153
hydrograph
relation in graphical, equational or tabular form between time and flow variables such as depth, discharge, stage and velocity

NOTE Typically, stage and discharge hydrographs are used for open channel flows.

1.154
gradually-varied unsteady flow
generally nonuniform flow in which there are no abrupt changes in depth along the longitudinal axis of a channel and in which depth, together with discharge and velocity, changes with time

1.155
live storage
reservoir storage which can be drawn off for users downstream

1.156
total storage
reservoir storage between the lowest bed level and the top water level

1.157
flood storage
volume of water temporarily held above the top water level of a reservoir during a flood event

NOTE Flood storage is not retained in the reservoir but is discharged through an overflow until the normal top water level is reached.

1.158
boundary condition
condition to be satisfied by a dependent variable of a differential equation along the boundary of a model domain

NOTE Boundary conditions for the dependent variables are specified at the physical extremities of the modelled region for the duration of the model application.

1.159
Courant condition
condition for the numerical stability of the explicit formulation of a numerical scheme which requires that the ratio (C_r) of the propagation speed of a physical disturbance to that of a numerical signal should not exceed unity, i.e. $C_r \leqslant 1$

NOTE The condition is a requirement for an explicit-finite difference formulation applied to a hyperbolic partial differential equation.

1.160
explicit finite-difference numerical scheme
scheme which converts either the characteristic equation or the governing equation into an equation from which any unknown may be evaluated directly (explicitly) without an iterative computation

NOTE 1 Dependent variables on the advanced time level are determined one point at a time from known values and conditions at the present or previous time levels.

NOTE 2 The stability of an explicit scheme is conditional upon an error being a function of the time and distance finite-difference step sizes which may result in an error growing as the solution progresses.

NOTE 3 When the Courant condition is met, resulting in limitations in the maximum time and distance steps which can be used, generally an explicit scheme is stable, but there can be instances of instability.

NOTE 4 If the converted equation is linear and algebraic, an iterative computation is not needed.

1.161
implicit finite-difference numerical scheme
scheme which converts either the characteristic equation or the governing equation into a nonlinear algebraic equation from which an unknown may be evaluated iteratively

NOTE 1 All of the unknowns within the model domain are determined simultaneously.

NOTE 2 Generally an implicit scheme is stable.

NOTE 3 Although complex algorithms are required, generally an implicit scheme is computationally sufficient.

1.162
initial condition
description of the discharge, depth of flow or other dynamic condition at the beginning of a simulation period for unsteady flow models

NOTE For subsequent times, the state of the system is described by the governing equations and the boundary conditions.

1.163
method of characteristics
mathematical approach for solving boundary values by transforming the original partial differential equations representing the physical system into corresponding characteristic equations

NOTE Characteristic equations are ordinary differential equations and, generally, are more amenable to numerical solution than are the partial differential equations.

1.164
momentum coefficient
Boussinesq coefficient
quantification of the deviation of the velocity at any point in a cross-section from a uniform velocity distribution in the same cross-section

NOTE Values of the coefficient:

a) unity indicates that a uniform velocity distribution is present in the cross-section;

b) 1,01 to 1,12 indicates a fairly straight prismatic channel;

c) $< 1,0$ indicates a large or deep channel.

1.165
standing wave
stationary wave
curved symmetrically-shaped wave on the water surface, and on the channel bed, that is virtually stationary

NOTE When standing waves form, the water surface and the bed surfaces are roughly parallel and in phase.

1.166
isotropic
having the same properties in all directions

1.167
photomultiplier
electronic device for amplifying and converting light pulses into measurable electrical signals

2 Velocity-area methods

Page 32, clause 2

At the end of clause 2, Velocity-area methods, add the following terms and definitions.

2.57
large river
river in which measurements are difficult because of its large discharge or its large physical parameters

2.58
flood flow
flow corresponding to or exceeding natural bankfull stage

NOTE It may or may not be confined within banks.

2.59
bankfull stage
stage at which an open watercourse just overflows its natural banks

2.60
rating curve
graphical representation of a stage-discharge relation or rating

2.61
divergence of tidal conditions
angular deviation in degrees between the flow axis of the ebb current and of the flood current, at a point where the axes cross

NOTE In a straight ideal reach, there will be no deviation. In most cases, when conditions are not ideal, the ebb and the flood directions are not on the same axis and there will be an angular deviation.

2.62
mixed tides
tides which have at least two markedly unequal successive high waters, or at least two markedly unequal successive low waters, or both

2.63
ebb predominance
situation where the ebb flow exceeds the flood flow, over a tidal cycle, at a point or on a vertical

NOTE Usually the extent of the predominance is assessed using integrations of velocity-time graphs.

2.64
flood predominance
situation where the flood flow exceeds the ebb flow, over a tidal cycle, at a point or on the vertical

NOTE 1 Usually the extent of the predominance is assessed using integrations of velocity-time graphs.

NOTE 2 When an integration value is a net zero, there is no predominance.

2.65
sand point
pipe with a well screen, underlying or adjacent to a stream, in which a gas-purge orifice could be installed

3 Notches, weirs and flumes

Page 43, clause 3

At the end of clause 3, Notches, weirs and flumes, add the following term and definition.

3.47
vertical underflow gate
vertical gate situated in a channel of rectangular cross-section with a flat bed for regulating the water level upstream of the gate or the discharge through the gate opening

NOTE 1 The gate is movable in vertical slots and it can be raised or lowered by hand or mechanically.

NOTE 2 The underflow is two-dimensional except at vertically narrow gate openings.

4 Dilution methods

Page 46, clause 4

Replace the term and definition entry 4.19 with the following:

4.19
becquerel
Bq
curie ⟨superseded⟩
$1\ \mathrm{Bq} = 1\ \mathrm{s}^{-1}$

NOTE 1 The becquerel is the special name for second to the power minus one, used as the SI unit of volumetric radioactivity; it has replaced the curie (Ci), where $1\ \mathrm{Ci} = 3{,}7 \times 10^{10}\ \mathrm{Bq}$ (exactly).

NOTE 2 The following multiples are used: $1\ \mathrm{kBq} = 10^3\ \mathrm{Bq}$; $1\ \mathrm{MBq} = 10^6\ \mathrm{Bq}$; $1\ \mathrm{GBq} = 10^9\ \mathrm{Bq}$.

Page 50, clause 4

At the end of clause 4, Dilution methods, add the following terms and definitions.

4.43
radioactive tracer
emitter of gamma rays or beta particles which has properties that mimic the properties of the fluid being traced

cf. **radioactive isotope** (4.28)

4.44
radiation detector
part of the detection apparatus sensitive to gamma radiation that permits the measurement of activity or of count rate

NOTE The detector is comprised of a solid scintillation detector which uses the excitation of atoms or molecules by gamma radiation, and a photomultiplier tube and preamplifier.

4.45
lead castle
lead shield comprising a layer or mass of intervening material designed to attenuate or reduce the strength of radiation from a radioactive source during transport, or when not in use, and to protect analytical instruments from background radiation

4.46
radiation detector count rate
N_m
rate of production of electrical pulses in the radiation detector (i.e. the count rate measured by the detector), which is equal to the sum of the count rate due to the activity of the radioactive tracer together with the background count rate with no radioactive tracer present, and is given by the expression

$$N_m = N + N_\mathrm{b}$$

where

N is the radioactive count rate;

N_b is the background count rate

NOTE This definition applies only to detectors where a pulse signal is the result of an individual directly or indirectly ionizing particle passing through the sensitive volume of the detector.

4.47
radioactive decay
A
decrease in activity of a radioelement with time and described by the following expression:

$$A = A_0 \exp(-\lambda t)$$

where

A is the activity at time t;

A_0 is the activity at time t_0 (t = 0);

λ is the radioactive decay constant, expressed in reciprocal seconds, specific for each radioelement;

t is the time, expressed in seconds

NOTE 1 In terms of the **radiation detector count rate (4.46)**, this expression is given as

$$N = N_0 \exp(-\lambda t)$$

where N and N_0 are the relevant radioactive count rates determined under identical counting conditions.

NOTE 2 The radioactive decay constant is given by the following expression:

$$\lambda = 0{,}693 / T_{1/2}$$

where $T_{1/2}$ is the half-life of the radioelement.

4.48
dead time of the counting apparatus
τ
one of the following whichever is greater:

a) pulse resolving time of the associated electronics; or

b) minimum time from the initial production of a pulse due to radiation and that time the detector is next able to detect ionizing radiation

NOTE 1 It is related to the radiation detector count rate by the expression

$$N_{\tau 0} = \frac{N_\mathrm{m}}{1 - N_\mathrm{m}\tau}$$

where

N_m is the radiation detector count rate;

τ is the dead time of the system;

$N_{\tau 0}$ would be the count rate if the dead time were zero.

This expression is only true where the total time the system is dead does not approach the real time limit.

NOTE 2 The dead time is not necessarily a constant for a detector, it can vary with the count rate and the type of radiation being detected.

4.49
radionuclide generator
system, often automatic, which utilizes the property of certain water insoluble radionuclides, in producing a soluble radionuclide by radioactive decay

NOTE After a certain regeneration time, a dose of usable daughter nuclide is obtained by elution of the mother nuclide.

4.50
conservative tracer concentration
tracer concentration that would occur at a downstream cross-section if the mass of tracer passing the cross-section were the same as the injected mass

4.51
dispersion of a tracer
process by which differential velocities, turbulent motions and the rate of diffusion of a liquid causes the spreading of a cloud of dissolved or suspended substances throughout the liquid

NOTE In a stream, generally dispersion takes place vertically in the water columns, transversely across the stream and longitudinally in the direction of flow.

4.52
dispersion coefficient of a tracer
coefficient used to describe the capacity of a moving liquid to dissipate an initially localized substance or property throughout the liquid

NOTE In open channel flow, dispersion takes place vertically, transversely and longitudinally. Each component of the dispersion has its own dispersion coefficient.

4.53
time of trace of a tracer
time for the movement of liquid, or of dissolved materials, between cross-sections in an open channel

NOTE 1 Time of travel may refer to the leading edge, the peak concentration, the mass centroid or the trailing edge of a dissolved material in a stream.

NOTE 2 When the term is used for the time of travel for any part of the tracer other than the centroid, it should be qualified.

4.54
tracer recovery ratio
ratio of the tracer mass recovered in a stream to the tracer mass injected, as determined by sampling

4.55
unit tracer concentration
concentration of a tracer in a stream for one unit of injected conservative tracer in one unit of discharge

5 Instruments and equipment

Page 63, clause 5

At the end of clause 5, Instruments and equipment, add the following terms and definitions.

5.66
permanent flowmeter
flowmeter installed for a long period of time (in excess of about 12 months) and used to determine flow continuously or at discrete time intervals

NOTE 1 Any high costs incurred in the installation of these flowmeters may be tolerated as they are spread over a period of time.

NOTE 2 The measurements provided may be used as the basis for an archive system to examine present trends, to forecast future trends and to determine daily operational requirements.

5.67
temporary flowmeter
flowmeter installed for a specific period of time (no more than about 12 months) and used to determine flow continuously or at discrete time intervals

NOTE The installation of the flowmeter needs to be simple with minimal or no associated civil engineering costs.

5.68
portable flowmeter
flowmeter, not used as part of a fixed installation, used to obtain instantaneous measurements of flow or the velocity and depth components thereof

5.69
hydrometric equipment
equipment used for the hydrometric monitoring of hydrological parameters

5.70
recording device
device that records automatically, either continuously or at regular time intervals, the parameters sensed by any associated sensors

5.71
recording equipment
equipment comprising one or more sensors and a recording device

NOTE 1 The equipment producing a record demonstrating changes of value of a hydrological parameter with time may require the incorporation of a timing device.

NOTE 2 If the record comprises observations of the changes of the value of a sensed hydrological variable linked to changes in one or more other physical parameters, the recording equipment should monitor adequately such linkages.

5.72
non-recording equipment
equipment comprising one or more sensors but no recording device