

4th meeting of WMO RAVI- Europe Hydrological Forum
2nd – 4th April 2019

Proposed CEN TR on Hydrometric Network Design and Optimization

Stewart Child, CEN/TC 318 Hydrometry, Chairman
and Rod Wilkinson, UK

Presented by: Ing. Lotta Blaškovičová, PhD., *Expert for hydrology*
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CEN TC318

CEN - The European Committee for Standardization/
(isation)



CEN TC 318 Hydrometry



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Network Design

2012 – CENTC318 discussed and recognised need for consideration of networks following a proposal from Netherlands delegate

2014 – adopted as preliminary new work item, WG14 formed

2016 – first informal draft - delays due to change in personnel



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2018 – first draft close to finalisation but still await inputs from some contributors

2019 – final contributions for consideration at next CENTC318 meeting in Salzburg for agreement as form NWIP

2021? – Final publication

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Working group currently consists of representatives from:

Austria, the Netherlands, Slovakia, Sweden, Switzerland and the UK

Convenor: Mr Rod Wilkinson (UK)

CEN TC318 would welcome representation from other countries



CEN TC318 - Network Design



South Korea has proposed and is leading new ISOTC113 Hydrometry Committee project on Precipitation networks

In order not to be over-ambitious - Focus will be on stream flow networks



Network Design – Considerations driving need for standard

- a) **Water resources supply** – assessment of present and future water availability, planning, design and operation of water supply schemes
- b) **Flood management** – design and operation of flood relief schemes, flood forecasting and warning
- c) **Effluent discharge and pollution control** – dilution of effluents
- d) **Monitoring of abstraction and discharge of effluents**



Network Design – Considerations driving need for standard

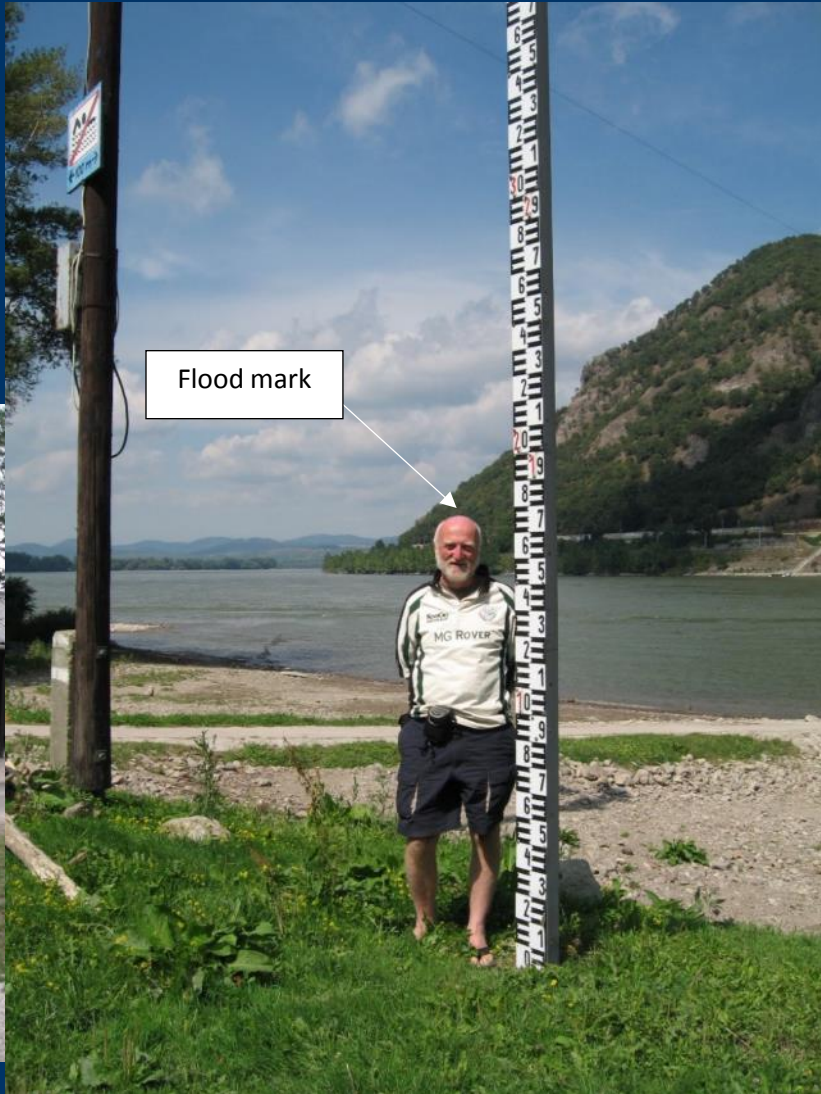
- e) **Conservation** – environmental protection, fisheries management, maintenance of compensation flows, environmental impacts of major water related developments.
- f) **Hydro-electric power** – assessment of hydro-electric power (HEP) potential, design and management of schemes
- g) **Agriculture**



Network Design – Considerations driving need for standard

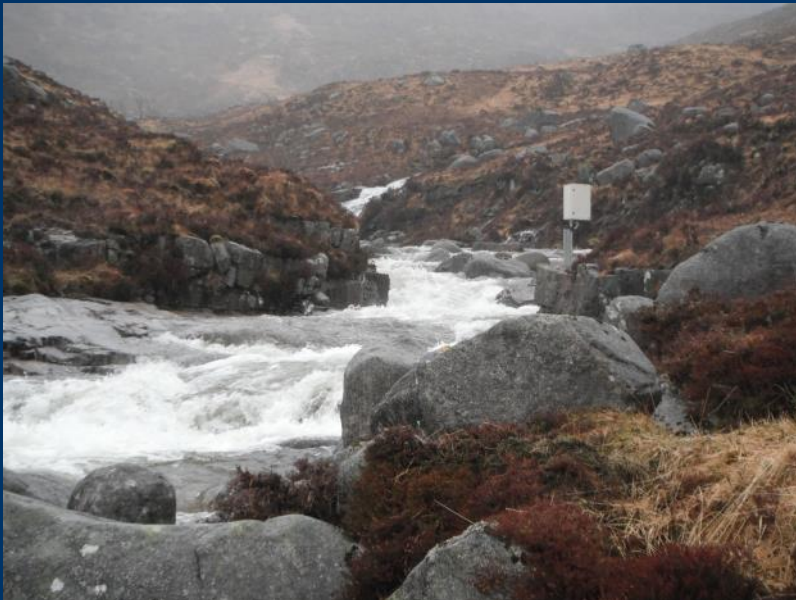
e)

f)



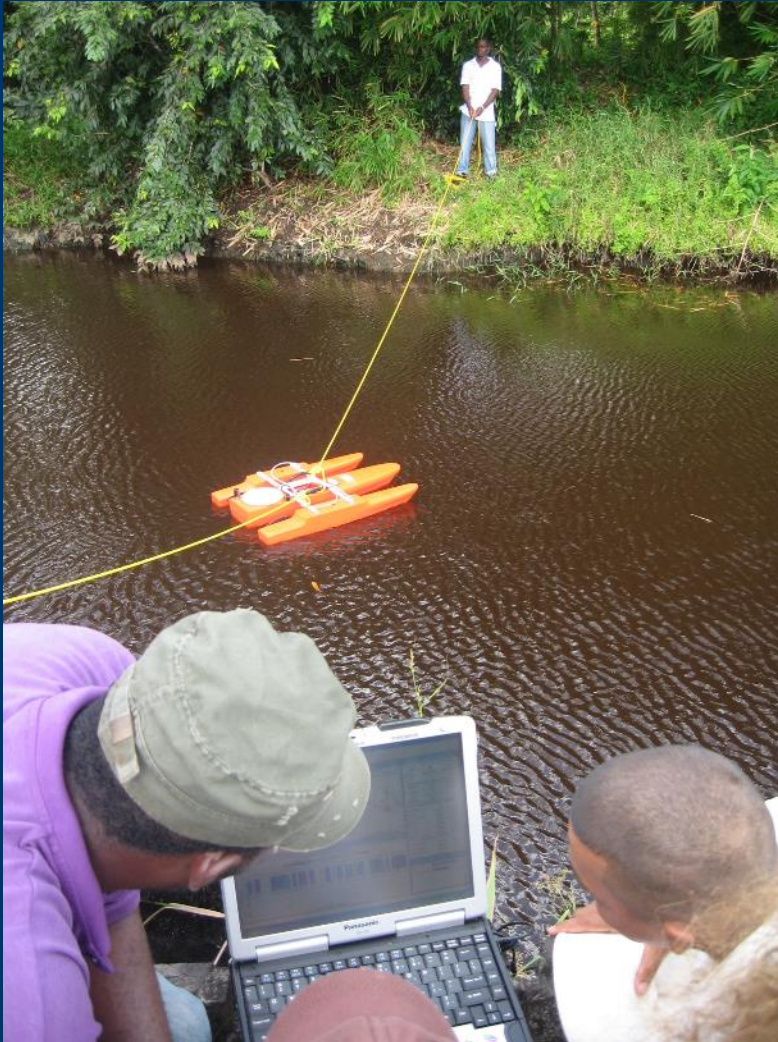
The TR is intended for use when:-

1. a new network is being planned and designed;
2. the nature, value and extent of an existing network is being assessed;



3. a redundant network is being decommissioned or modified.

The likely audience could include:



- Government and NGO Institutions and agencies responsible for hydrometric monitoring and the water environment
- Water supply and treatment undertakings
- Power and navigation authorities
- Research and academic institutions
- Developers of the built environment

The Contents of the new TR to include but not be limited to the following:

Factors affecting network design

- Factors affecting network design – precipitation, snow, ice, losses, evapotranspiration, catchment morphology
- Use of surrogate catchments and ungauged catchments
- Existing and potential catchment uses
- Available water resources and demands



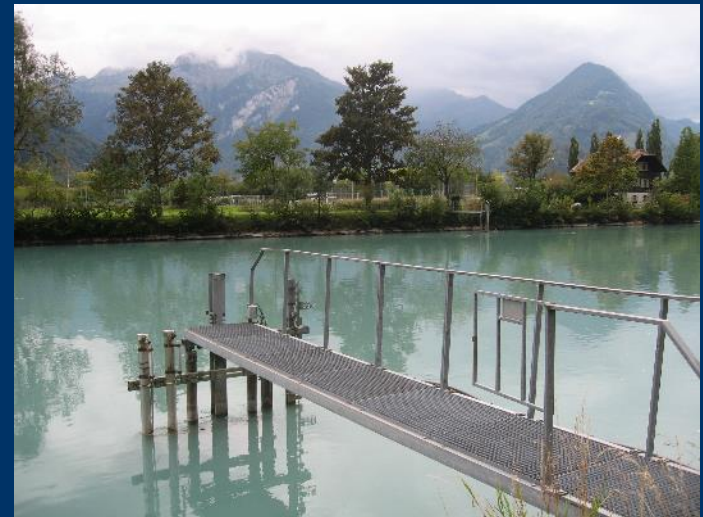
The Contents of the new TR to include but not be limited to the following (contd.):



- Data management constraints
- Environmental constraints
- Legislative issues
- Possible flow measurement techniques

Technical and economic considerations

- Primary, secondary and short term networks
- Whole life cost of network
- Optimisation of existing networks



The Contents of the new TR to include but not be limited to the following (contd.):

Methods of network design

- User surveys
- Prioritisation, ranking, scoring
- Physiographic components
- Catchment hydrology
- Statistical
- Sampling strategies

Uncertainty – reduction in uncertainty

Socio economics – cost benefit analysis
Strategic value of network



ACCESSIBILITY

The Contents of the new TR to include but not be limited to the following (contd.):

Optimisation of existing networks – including consideration of decommissioning

SUSTAINABILITY has two very important meanings:

1. Carbon footprint
- 2. Maintaining network over time to high standard**



Network Design Philosophy of one of TC 318 Hydrometry committee = PAULS

- **P**ragmatic
- **A**chievable
- **U**nderstandable
- **L**ow cost - affordable
- **S**ustainable

A also stands for accuracy i.e. low uncertainty



Network Design Philosophy - Several other key issues to consider when drafting TR

Cost of ownership – often better to spend more on capital costs rather than running costs

Quality vs quantity – fewer high quality gaugings stations may be better than too many

Good hydrometry - begins in the field – despite advances in technology



CEN TC 318 would welcome more of our European hydrometric friends & colleagues to join us

