



**The European Commission's
science and knowledge service**

Joint Research Centre

Water Safety and Security
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European Reference Network for
Critical Infrastructure Protection
Thematic Group on Chemical and Biological
Risks to Drinking Water

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erncip



Work programme 2016 Activity 2, task 2

Requirements for real-time monitoring systems
related to chemical & biological threats to drinking
water



**Global
sensor
manufacturers**

**European
water
utilities**



Questionnaire

- The first question was: If your company uses/produces online sensors or monitoring equipment(s) as part of an early warning system, please tick the boxes of the parameters involved as an indicator of either a microbial or chemical contamination (49 parameters and possibility to add other)
- The second set of questions investigated maintenance features of the early warning system
- The third set of questions investigated which products or services a sensor manufacturer delivers or supports according to the Water Utilities and the Sensor Manufacturers themselves. (23 products and services in total)

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Distribution

- Sensor manufacturers
 - Over 260 international sensor manufacturers;
- Water Utilities
 - EIP-Water- and the "Real Time Water Quality Monitoring" Action Group (RTWQM-AG) website;
 - Members of the RTWQM-AG distributed the invitation to their personal contacts
 - FP7 and H2020 projects;
 - Members of the TG-Water of ERNCIP distributed the invitation to their personal contacts;
 - The invitation was sent to DG-Environment and DG-Home for distribution
 - SWIG in the UK distributed the invitation to their members;
 - The Austrian Association for Gas and Water distributed the invitation to their members;
 - The invitation was sent to the EUREAU-network
 - German Technical and Scientific Association for Gas and Water (DVGW);
 - The WIPAC LinkedIn page (Water Industry Process Automation & Control).

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Observations (1)

- The response rate to both surveys was very low, 14 water utilities and 9 sensor manufacturers
- Majority of sensor manufacturers reacted fulfil a niche market
 - They fill gaps in terms of parameters
- Generally, operational expenses seem to be higher than presented by manufacturers
- Those that responded tend to be active to use online sensors and monitors for both operational- and event monitoring, (55% of the responding water utilities)

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Observations (2)

- Water utilities and sensor manufacturers agreed on the most important user-related issue(s) with instrument operation and maintenance. These issues are:
 - Lack of available personnel;
 - Lack of skilled personnel;
 - Lack of IT (Information technology) expertise or resources to develop or support information systems for collecting and acting on monitoring data;
 - Lack of integration options into plant / network operations (software, data processing, communications protocols);
- Benefit of the use of sensors and monitors is not always clear to operators

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RTWQM
REAL TIME WATER
QUALITY MONITORING

EIP Water Action Group
Pooling resources – Innovating water

Objective: **to foster solutions to water challenges based on online water quality monitoring technologies and affordable monitoring strategies**

- Water sectors: water bodies, drinking water and waste water, including water reclamation and reuse
- Applications:
 - **Resource efficiency**, in terms of chemical dosing and energy, in water treatment processes for both water supply and waste water;
 - **Early warning** systems to detect pollution of surface water, ground water catchments and drinking water resources;
 - **Control networks** to monitor industrial and urban waste water discharges and water reuse schemes.

<http://www.eip-water.eu/RTWQM>



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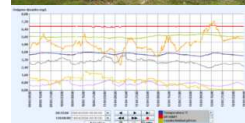
The RTWQM concept



Sampling +
lab analysis



Online
Monitoring
= **RTWQM**



* Static and exhaustive vision.

* "Posteriori" measurement.

* High number of parameters but discrete

* Accuracy

* Specific lab methods

* Captures the dynamic of the process.

* Real time measurement

* Few parameters but continuous

* Not so accurate

* Alternative measuring methods

**Concentration
management**



**Deviation
management**



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Drinking Water Directive consultation

How can European water legislation be formulated in such a way that it does not hamper or block the use of innovative (online) monitoring technologies which can contribute significantly to achieving the directives' goals?

Water Safety Plans as proposed by WHO

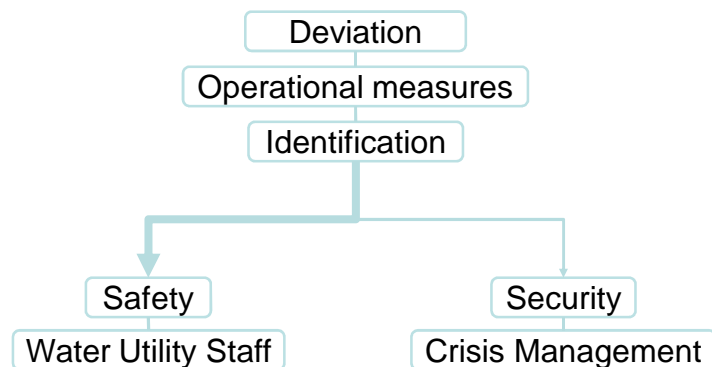
Location	Purpose	Examples of parameters/technologies
Catchment	WSP monitoring	Risk assessment on the basis of upstream industrial/agricultural activities or intentional contamination
	Early warning	Online biomonitoring for the detection of pesticides; online alpha or beta radiation detection
Treatment	WSP monitoring	Risk assessment of treatment process
	Process optimisation	Colour, DOC
Distribution	WSP monitoring	Microbiological aftergrowth in network; risk assessment of intentional contamination
	Early warning	Refractive index, conductivity, pH; online alpha or beta radiation detection
Tap	Compliance monitoring	<i>E. coli</i> , pesticides, nitrate

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Water Safety/Security Plan

Location	Purpose	Examples of parameters/technologies
Distribution	WSP monitoring	Microbiological aftergrowth in network; risk assessment of intentional contamination
	Early warning	Refractive index, conductivity, pH; online alpha or beta radiation detection etc.

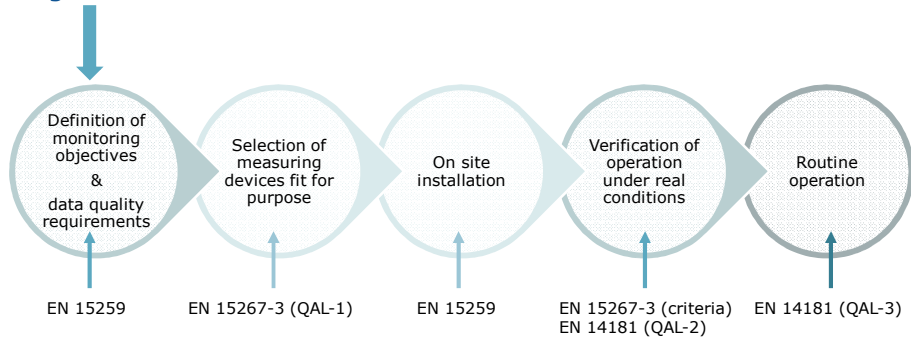


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CEN/SABE ENV: Standardisation continuous air quality monitoring

Regulations

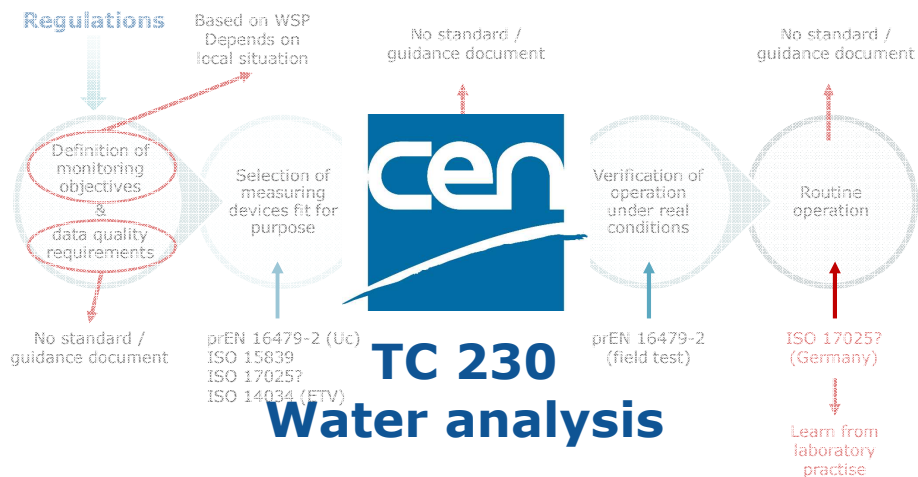


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CEN/SABE ENV: Standardisation continuous water quality monitoring

Regulations



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THANK YOU FOR YOUR ATTENTION

Any questions or remarks?

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Stay in touch



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