Platform for monitoring, district distribution and loss reduction

Pietro Fiorentini

AQUAWORKS

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AQUAWORKS an advanced software platform designed for **monitoring**, **district distribution** and **water loss detection.**

Thanks to **real-time monitoring of flow rates and pressures** AQUAWORKS shows the **detailed status of the water network and districts**, enabling more flexible network management and planning of **targeted interventions**.The platform constantly monitors the network and **actively detects losses**, adopting a district-based approach.

AQUAWORKS is supported by the **Pietro Fiorentini Integrated Support Service** and is designed to guarantee **high performance, safety and scalability**.

Technical operational staff/ leakage search teams

Control Room and Operation Manager

Automation /SCADA / ICT managers

Functions	Description
Organisation of districts by level	Multi-level hierarchical representation (Authority, Aqueduct, District) with **geolocalisation** on satellite maps.
Creating and configuring districts	**Guided interface** with four levels to quickly define district parameters, involved peripherals and associated variables.
Advanced dashboards and performance indices	Automatic calculation of **IWA ILI**, **UARL**, **NRW** indicators, including ARERA macro-indicators **M1a** and **M1b**, with dashboards for **comparison between districts.**
Night minimum analysis	IWA 'bottom-up' method to estimate actual losses with **breakdown of AUL, UBL, actual loss components.**
Water balance calculation	IWA 'top-down' method for calculating **injected volumes, NRW and billed water** with graphical and tabular views.
District leakage monitoring chart	Real-time monitoring of flow and pressure, with targeted analysis of **night behaviour** and calculation of **economic convenience threshold for repair**.
Alarm and tracking system	Anomaly **detection** and **intervention priorities**. Identification of districts in alarm, quantifying **volume lost and economic impact**.
Intervention monitoring and cost-benefit analysis	**Reporting** to track **activities** and compare them with alert situations, with dedicated dashboards for **the economic evaluation of interventions**.
HyperAlarm and derived variables	**Customised dynamic alarms** and calculation of **derived variables** for advanced analysis.

Table 1 Functions

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Architecture and distribution

AQUAWORKS is available both as a cloud service (**SaaS**) and as software installed at the customer's site (**On Premise**). In both cases, it is accessible via a normal web browser, without the need to install applications on the devices.

The platform is designed to offer high **scalability**, guarantee service continuity and ensure **maximum operational reliability**, thanks to its containerised microservices architecture.

Software updates are released in a controlled manner, **with no impact on operations**. Scheduled maintenance is also provided, aimed at maintaining consistently high performance and ensuring the full safety of the installed environment.

Aquaworks: optional modules

- Diana module for advanced pressure monitoring (pressure transients)
- RTCP ML module for pressure regulation via machine learning algorithm

Aquaworks: competitive advantages

- **Native** integration with **SCADA, GIS, WFM, SAC** via RESTful and MQTT API
- Compliance with **IWA** methodologies with automatic calculation of **ILI, UARL, NRW** and other indicators
- Compliance with **ARERA** regulation, with calculation of **M1a** and **M1Bb macro-indicators**
- Maximum **safety** and **service continuity**
- **Interoperability** with **field devices** via standard protocols and open APIs
- **Intelligent alarms** and economic evaluation of interventions
- **Collaborative interface** and multi-user access
- Dedicated **technical support** and **continuous training**

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