

# **Predstavitev izvedbe CNS za projekt »Oskrba s pitno vodo v porečju Drave – 3. sklop«**

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## ***Presentation of the project "Drinking water supply in the Drava basin - 3rd part"***

In recent years, quite a few major projects have been implemented in Slovenia in the field of ensuring a more reliable supply of quality drinking water. This paper will present the central control system implemented as part of the project "Drinking water supply in the Drava basin - 3rd section". As part of this project, 110 km of pipelines were built, a new control center was erected, and 69 new and 16 existing facilities were equipped with new electrical installations, automation and telemetry.

The facilities built as part of the project are water measuring shafts, pumping stations, reservoirs and a control center. The equipment used in the field of automation and telemetry includes, among other things, loggers, programmable controllers, mobile routers and frequency converters. A rather wide range of technologies is also used, from Modbus RTU, protocol converters, sending measurements with a time stamp via UDP, to web servers, virtual private networks and Radius servers.

In the control center, the manager of the water supply network can manage the system via web SCADA, which can also be accessed via tablets or mobile phones. The reporting system and alarm system (to send certain alarms via SMS) are based on web technology as well.

Finally, the technical security system with video surveillance and access control, the role of automation and telemetry in achieving the project's goals, and some interesting examples from the period of testing and troubleshooting will be presented.

## ***Kratek pregled prispevka***

V zadnjih letih je bilo Sloveniji izvedeno kar nekaj večjih projektov na področju zagotavljanja zanesljivejše oskrbe s kvalitetno pitno vodo. V tem prispevku bo predstavljen centralni nadzorni sistem, izveden v okviru projekta »Oskrba s pitno vodo v porečju Drave – 3. sklop«. V sklopu tega projekta je bilo zgrajenih 110 km cevovodov, postavljen nov nadzorni center, z novimi električnimi inštalacijami, avtomatiko in telemetrijo pa opremljenih 69 novih in 16 obstoječih objektov.

V sklopu projekta izvedeni objekti so vodomerni jaški, črpališča, prečrpališča, naprave za dvig tlaka, vodohrani ter nadzorni center. Uporabljena oprema s področja avtomatike in telemetrije med drugim obsega regulatorje, programabilne krmilnike, mobilne usmerjevalnike ter frekvenčne pretvornike. Uporabljen je tudi precej širok nabor tehnologij, od Modbus-a RTU, pretvornikov protokolov, pošiljanje meritev s časovno značko preko UDP, pa do spletnih strežnikov, navideznih privatnih omrežij ter Radius strežnikov.

Upravljalca vodovodnega omrežja ima tako v nadzornem centru možnost upravljati sistem preko SCADA, dostop do katere pa je tudi preko tablic ali mobilnih telefonov. Pri tem je uporabljena spletna tehnologija, ki omogoča polno funkcionalnost na vseh brskalnikih, seveda le preko varnih povezav

ali omrežij. Na spletni tehnologiji temeljita tudi poročilni in alarmi sistem, ki dežurnemu posreduje določene alarme preko sporočil SMS.

Za konec bo predstavljen še sistem tehničnega varovanja z videonadzorom in kontrolo dostopa, vloga avtomatike in telemetrije pri doseganju ciljev projekta ter nekaj zanimivih primerov iz obdobja testiranja in odprave napak.