EMLURB SAVES OVER US$ 5 THOUSAND PER MONTH WITH ELIPSE SOLUTIONS THAT CONTROL ITS TUNNEL DRAINAGE SYSTEM

Elipse E3 and Elipse Mobile platforms monitor and control pumps and water levels in the water drainage system of Josué de Castro, Augusto Lucena, and Chico Science tunnels in Recife

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Needs

Recife's EMLURB (Maintenance and Urban Cleaning Company) is tied to the Public Services Secretariat of municipality Recife, in the Northeast of Brazil. Its main goal is to maintain and repair the road system and the green areas in the capital city of Pernambuco (PE). It's also responsible for implementing and maintaining the city's drainage network, paving, public lighting, necropolis, and urban cleaning.

EMLURB's building façade

Due to the heavy rains in Recife, drainage of Josué de Castro (Pina), Augusto Lucena (Boa Viagem), and Chico Science (Ilha do Retiro) tunnels required undergoing a modernization process. Robust and easy to operate, Elipse Software's Elipse E3 and Elipse Mobile platforms were chosen by EMLURB to automate these tunnels' drainage automation system. IHM Engenharia, the system's integrator, was the company responsible for implementing the Elipse solutions in this application.

*Augusto Lucena tunnel, in Boa Viagem/Recife*

Solution

With Elipse E3, the company's operators are able to control the rainwater drainage system in the tunnels, in order avoid any traffic disturbances. To do so, the software allows monitoring the level of the reservoirs, where water flows through manholes located on the edges of the tunnels. In addition, it controls the tunnels' relief pumps, which pump water from the reservoirs into the river network.

To implement this system, the company acquired drainage pumps panels activated by soft-starter (Josué de Castro tunnel) and inverters (Augusto Lucena and Chico Science tunnels). In order to control the pumps' startup, ultrasound level transmitters were installed.

Automatic control of pumps' startup at the reservoirs level is performed via a Wago PLC, model PFC200, with a built-in GSM modem. Thus, data from the

pumps and reservoir levels are transmitted via MQTT (Message Queuing Telemetry Transport) protocol to a MQTT Mosquitto server in the client's server (laptop with Windows operating system).

Information from the tunnels is passed from the MQTT Mosquitto server to the MQTT Elipse driver installed in the same server. With that, data arrives at the server's Elipse E3, where it is possible to monitor pumps statuses, reservoirs levels, alarms history, and trends via screen charts.
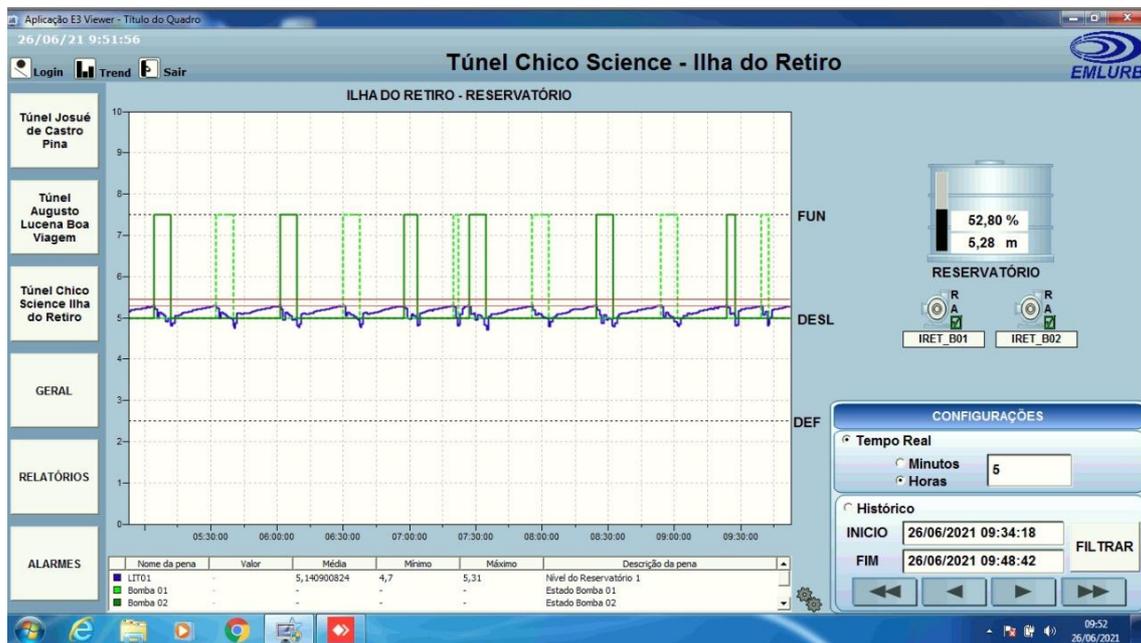
*Screen charts depicting pumps and water level at reservoirs from Chico Science tunnel's drainage system*

In these charts, the operator starts by selecting which period they want to follow on the screen, and whether they will follow it in real time or history. Once they do so, lines in different colors are displayed: green lines refer to the pumps, and blue lines refer to water level at the reservoir.

Red lines refer the water level setpoint that activates one of the pumps. If the blue one and the red one touch, one of the pumps is automatically activated to pump water from the reservoir into the river network before it overflows.
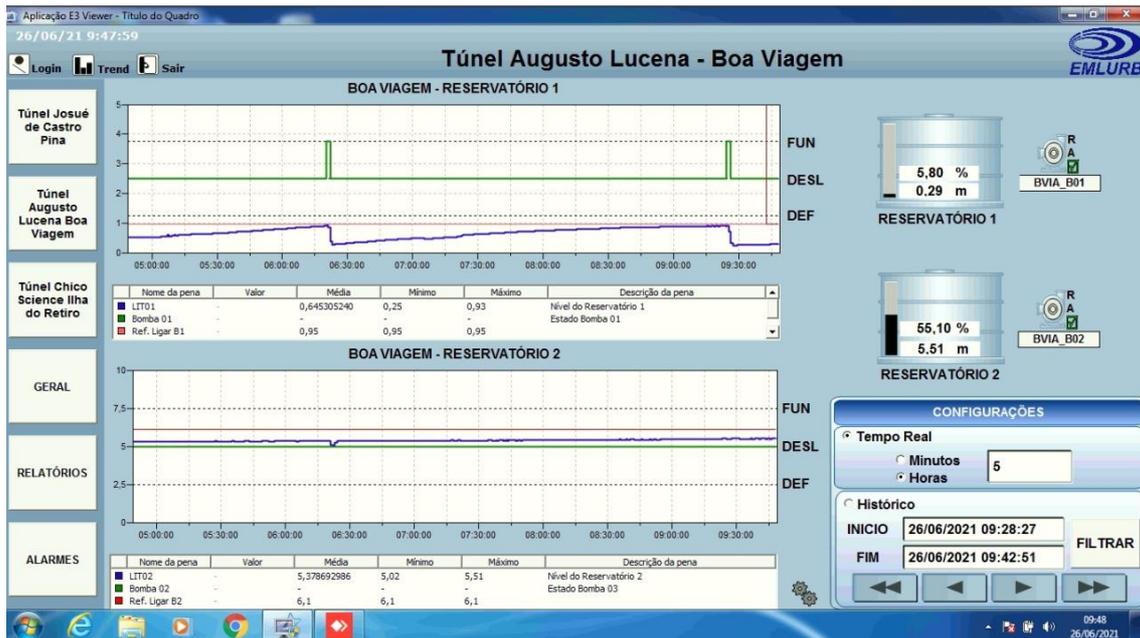
Screen charts depicting pumps and water level at reservoirs from Augusto Lucena tunnel

Water level from each reservoir can also be monitored individually on another screen in the software. Finally, Elipse E3 allows visualizing all alarms that are activated in case of failure, or when high levels of water are found in the reservoirs.
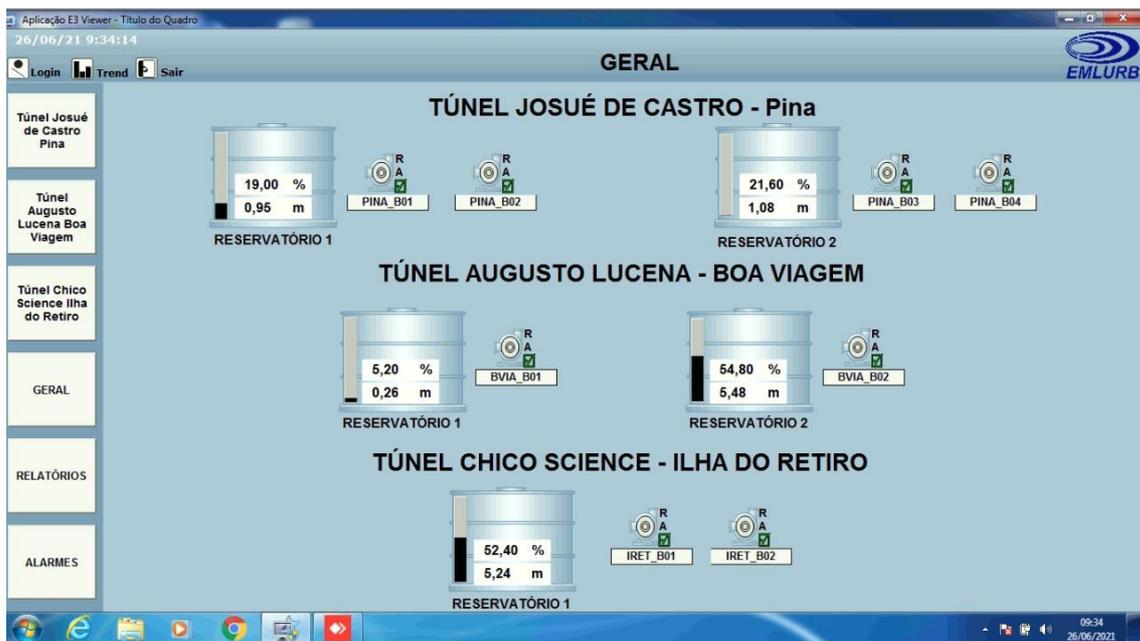
Water levels control at tunnels' reservoirs

Elipse Mobile Server also was installed in this application. The software allows accessing E3's screens and commands, via smartphone, to up to five users. If high levels in the tunnels' reservoirs are detected, or if there is any failure in a drainage pump, Elipse Mobile will text (SMS) eight people from the maintenance staff at EMLURB.
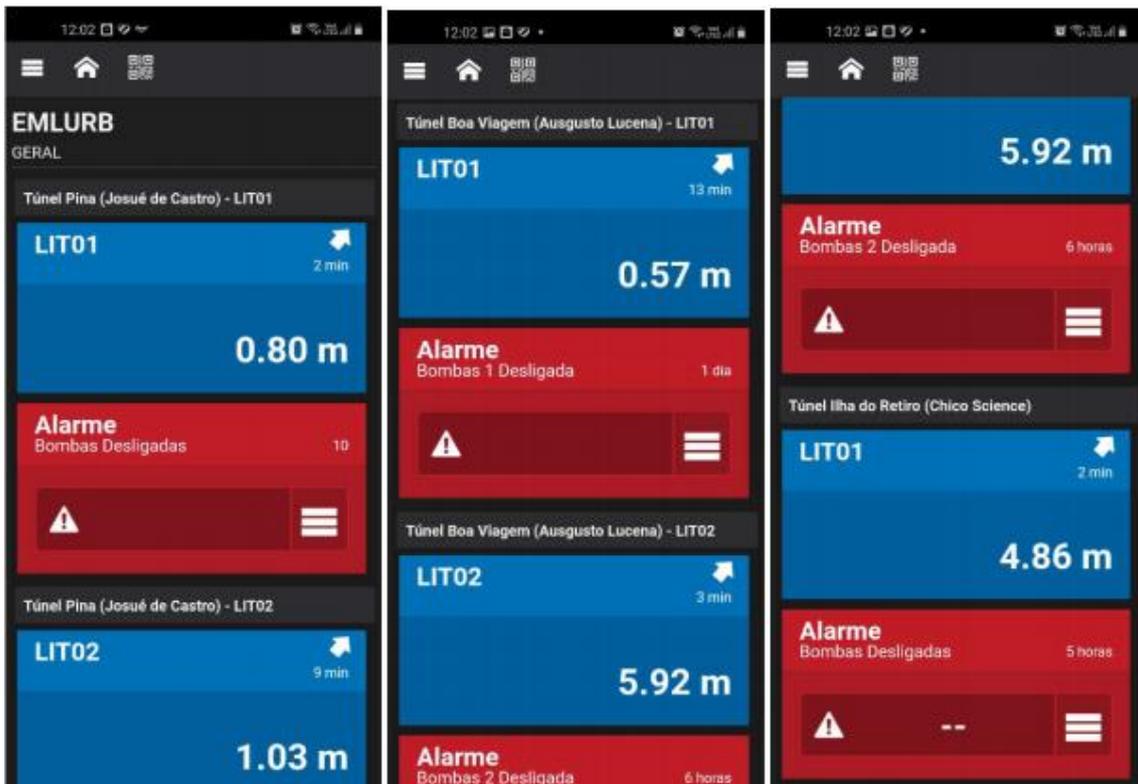
Elipse Mobile screens monitor the level at reservoirs and turned off pumps

Benefits

According to Lúcio Luiz Fidelis de Freitas Júnior, EMLURB's Public Lighting Executive Director, the Elipse platforms helped keeping track of the tunnels' drainage system operation. Presently, the company no longer needs to send a team to monitor pumps in site, and instead relies on corrective measures based on the charts and alarms sent by the software. The system also provided EMLURB with financial benefits, says its Executive Director.

"We are currently saving R$ 30 thousand per month (roughly U$ 5,200) in operational costs, since, in order to manage these assets, we need fewer

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human resources integrated to the supervision and control processes now performed by Elipse products," he said.

Check out the list below for other important benefits obtained by EMLURB with Elipse solutions (Elipse E3 and Elipse Mobile) to control the drainage system of Josué de Castro, Augusto Lucena, and Chico Science tunnels:

- Remote, optimized management of tunnels' drainage system supervision.

- Monitoring pumps and water levels operation in the tunnels' reservoirs via graphic analysis provided by the platforms.

- Monitoring the system via smartphone with Elipse Mobile.

- Warning system for failures that can compromise pumps operation: Alerts are fired via SMS to the maintenance staff's smartphones via Elipse Mobile.

- Smart, remote system that modulates how water pumps are activated and operated according to water level in the reservoirs.

Datasheet

Client: EMLURB – Recife's Maintenance and Urban Cleaning Company
Systems integrator: IHM Engenharia
Elipse products used: Elipse E3 and Elipse Mobile
Platform: Windows 7 Professional
Number of copies: 1 Elipse E3 and 1 Elipse Mobile
Number of I/O points: 250
I/O driver: MQTT