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Editorial

With the start of 2020, **CAE Magazine is renewed**: in addition to the Italian and English versions, those in French and Spanish language are born.

CAE Magazine is CAE's information tool to address **major issues related to the effects of climate change on the territory and on the safety of people living in areas at risk, and to propose the most technologically advanced solutions to increase the safety of the population and territories**. The effects of climate change are plain to see, sudden and increasingly frequent extreme weather events are putting a strain on people's safety in many Countries. There is an increasing number of floods, inundations and flooding, landslides and environmental disasters that are not always predictable. Consequences are dramatic for territories, for personal property and for productive fabric. Institutions are working to tackle and solve problems of the risk areas with works often very important. In the meantime, **CAE's mission focuses on monitoring and alerting to risk's situations such as: floods, inundations, flooding, underpasses' flooding, landslides and even fires. We work with concrete and technologically advanced solutions to increase the degree of people's safety**. Today, CAE is the leading company in the sector and not only in Italy. It was founded in 1977 with a very specific purpose: to provide public and private entities with advanced technologies for monitoring environmental risk due to natural phenomena.

Today, the company is responsible for the design, implementation and maintenance of systems and technologies for multi-risk monitoring and warning. To date, we have implemented more than 5000 installations in Italy and worldwide. We constantly invest in the development of reliable, innovative and interoperable technologies useful for the protection of the territory and population's protection. In particular, we produce dataloggers, measuring sensors, communication systems, and software, both web-based and desktop. In the hope that you will find this Magazine useful and interesting, we wish you a pleasant reading. ■

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Georgia: tested the early warning system of Jinvali's Dam

CAE magazine had already reported on Jinvali's dam project in Georgia and the monitoring and early warning system test followed, during the second week of October (for further information [click here](#)).

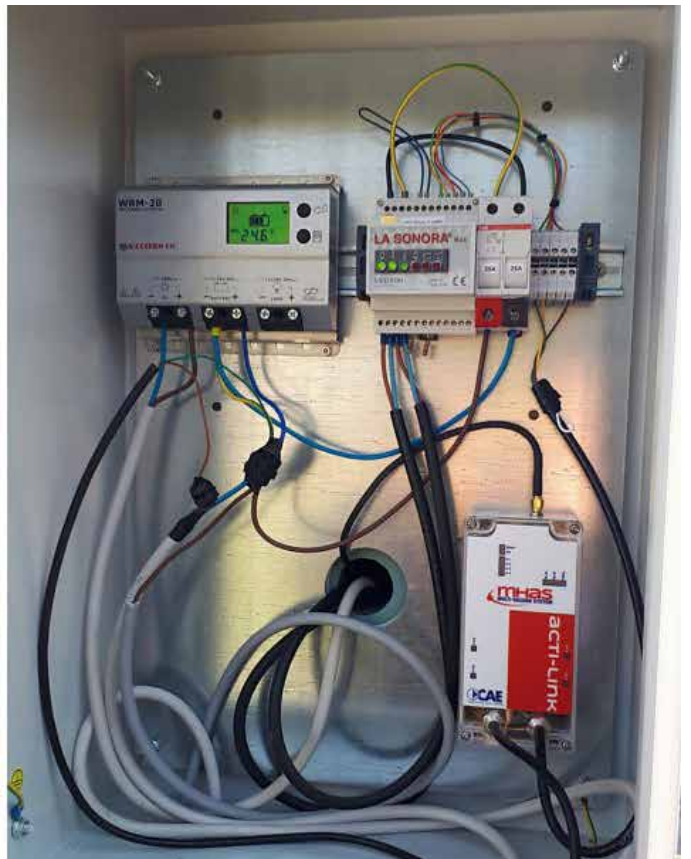
The operations concerned the control room, where a workstation and radio switchboard were installed, configured and connected. The workstation features Patrol, an automatic control and alarm system which manages all information necessary to evaluate and activate a quick response to eventual alerts.

All sirens are activated in case of alert by **ACTI-Link** and were also connected and checked, site by site. ACTI-Link is a **CAEtech** device designed for remote activation of instruments to trigger acoustic and visual alarms, or to block vehicular





traffic. A check of workstation radio margins was carried out, along with a sirens check without sound, followed by two activation tests, with -ten continuous minutes of ringing sirens, the first triggered using Patrol software and simulating a problem in the dam, the second using the emer-





gency button.

These simulations did not produce false alarms among the local population, thanks to information meetings organised to inform them of these tests by Georgian Water and Power (GWP), which manages the dam.

GWP expressed its satisfaction with the test results, also reported by Georgian TV. In the TV report, engineer Alessio De Faveri, CAE's project manager, speaking both for CAE and Field, said he was honoured and proud to have been part of such an important project, the objective of which was to protect people who live underneath the Jinali dam. De Faveri also thanked the partners of HD ([Hydrodiagnostics](#)), with whom it was possible to complete the job, for their demonstration of professionalism and competence.

[Click here](#) for full video report, for the moment only available in Georgian. ■



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CAE and its partners bring the river Piave under control



CAE leads the group which won the tender for the project of “Environmental Regeneration of the terminal section of Piave river” managed by the Basin Authority of the Eastern Alps District. The project scope is to determine the real discharge capacity of the river and obtain the necessary information to develop a work plan. To this end, hydrometric level and discharge measuring stations will be installed and their working will be supplemented by manual measuring campaigns.

Environmental regeneration of the end part of the river Piave – between Piave bridge and the river mouth – by means of monitoring of the flow rate. This is the call for tenders opened by the District Authority of the Eastern Alps in synergy with the Veneto region, and won by CAE, which leads

a temporary business group, in Joint Venture with Survey Pilot and MMI. The contract will last 48 months.

A team of sector leaders with decades of experience come together here to form a unit able to bring to this essential mitigation project competence and quality for the safety of local population and the protection of the eco-system.

During the Vaia storm last year the Piave barely managed to sustain a flood of 2,500 cubic metres per second.

It was necessary to adopt a **complete hydrogeological system plan**, able first of all to measure **river discharge**, with the aim of widening them, and then to build a rolling basin to be activated before the watercourse reaches the plain. Climate chan-



ge poses challenges which can be overcome as long as **adequate prevention, maintenance and regeneration plans** are in place, helped by the use of **state of the art technological systems**.

The **hydrogeological monitoring** activities, object of the public tender in this first phase, include supply and installation of a network consisting of one control centre and four monitoring stations equipped with **Mhaster** datalogger:

- 2 hydrometric stations with radar level sensor, which will be located near the hydraulic tollgate at Cortellazzo (Jesolo, VE) and at the Granatieri di Sardegna's bridge, in the district of San Donà di Piave (VE);
- station for water surface speed measurement with fixed horizontal ADCP and hydrometric pressure level sensor, for discharge rate estimation, placed at the bridge which connects Eraclea (VE) and Jesolo (VE);
- discharge monitoring station with two radar level sensors, one to measure surface speed and one hydrometric levels. The station will be placed near the bridge which connects the di-



stricts of Ponte di Piave (TV) and San Biagio di Callalta (TV).

Moreover, maintenance and training will be provided to the contracting entity through specialized courses on hydrometric and hydrogeological measurement techniques.

Services planned include:

- 20 measurement campaigns for rating curve calibration scale and for river discharge calculation model in the existing four stations;
- 36 programmed river discharge measurement campaigns with ADCP sensor;

- 10 on-call river discharge measurement campaigns with ADCP sensor.

Planned among the other tasks is the verification of river bed's floor morphology and rating curve at the four fixed stations. Moreover, at stations located near the sea, as well as **speed of the current**, its **direction** will also be measured where deviations occur due to **salt-water intrusion effect**. ■



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Avellino's Province is increasingly attentive to surface water pollution



The area around the river Sabato is characterised by high industrial density operating in a regime of intense interchange with the fluvial basin. In recent years, continual spills led to **increased pollution levels in the fluvial waters**. Consequently, concern has grown with regard to the quality of the water, both from regional and provincial authorities and from the local community. For this reason the **Province of Avellino**, in charge of safeguarding and enhancing local environment, has launched a public tender to **complete and strengthen the existing monitoring and control system of surface water bodies** to evaluate the quality index of the water of the river Sabato.

CAE won the tender which envisages the setup of a local warning system linked to an automatic water quality monitoring network, on the river, in the tract between Pianodardine and Altavilla Irpina. This system will allow an H24 water monitoring, with

data acquired and transmitted to the control panel every ten minutes using a UMTS/GPRS cellular communications system. Monitoring and control stations for surface water bodies will allow to set alarm thresholds for different parameters measured and, on this basis, to **automatically send alarm notifications** to responsible personnel.

Measurement points will be installed upstream and downstream of the industrial units along the section of interest, enabling the collection of specific data which will help to exactly locate anomalies with regard to chemical parameters of the water, identify the single industrial zone waste from where they emerge and activate targeted monitoring on it. The aim is twofold: monitoring of water resources and protection and enhancement of local environment.

The monitoring stations are autonomous from an energetic point of view, powered by solar panels



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ELEMENTI

- Conducibilita'	510 uS/cm	
- pH	8.050 pH	▲
- Redox	197.0 mV	
- Ossigeno Disciolto	8.125 mg/l	
- Torbidita'	11.20 mg/l	
Op Temperatura Ambiente		▼
- Temperatura Ambiente	9.89 °C	
Op Temperatura Acqua		
- Temperatura Acqua	9.7 °C	
Op Umidita' Relativa		

tutti off

continuo

singola

Navigation icons: back, home, lock, power.

and lithium batteries, which provide a month's autonomy in the event of a total absence of electrical power or exposure to sunshine.

This project will maximize integration of both the new and already existing monitoring equipment, ensuring the reuse of existing hardware and software components in use.

The supply, installation and activation of 6 automatic water quality control units is planned, each equipped with **Mhaster**, cellular communications system UMTS/GPRS, webcam and multi-parameter and spectrophotometric probe. These probes will enable the monitoring of the following water parameters:

- Hydrometric level
- Temperature
- Electrical conductivity
- pH
- Dissolved Oxygen
- TSS Total Suspended Solid
- Turbidity
- Nitrogen Nitrate (NO₃)
- COD Chemical Oxygen Demand

- BOD Biochemical Oxygen Demand
- TOC Total Organic Carbon
- Aromatic Hydrocarbons BTX

The **Mhaster** datalogger, with state of the art Linux operative system, is **interoperable, open and programmable** and can execute any customised external command. The maximum programmability and expandability of the Mhaster datalogger will allow if required future interfacing with additional sensors.

Moreover, some of the stations will be equipped with a **THS thermo-hygrometer** and a **PG2 rain gauge**, to measure, respectively, temperature, and relative humidity of ambient air and rainfall accumulation and intensity. ■

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The Autonomous Region of Sardinia (Italy) invests on an ever faster and multi-risk infrastructure network



The Autonomous Region of Sardinia continues to invest in mitigating environmental risks. Three orders will be completed by 2019.

Since Sardinia is one of the Italian regions most affected by fires, back in 2018 **ARPAS** (the Sardinian Regional Agency for the Environment) launched an open tender for the **supply and installation of new sensors for real-time monitoring of the weather variables used by Forest Fire-Fighting (AIB) models**. This project exploits part of the funds of **P.O.R. FESR (Regional Operational Programme) Sardinia 2014-2020 – Axis V – Environmental protection and risk prevention**

– Action 5.3.1, and follows the resolution of the Sardinia Regional Council to strengthen the measurement instrumentation of the Civil Protection remote infrastructure network, an integration and further development of multi-risk prevention systems for fire risk reduction.

CAE was awarded the tender for this project; this allowed the integration of **58 THS thermo-hygrometers and 10 pyranometers** – useful for measuring irradiation on a flat surface, which is the sum of the direct irradiance produced by the Sun and of the diffused irradiation - **in the meteorological and hydro-pluviometric monitoring infra-**



structure network.

ARPAS pays attention not only to the **fire risk**, but also to **hydraulic and hydrogeological risk**: thus the launching of an open tender for the **supply and installation of hydrometric sensors and related equipment in existing meteorological monitoring stations, in the main artificial basins of Sardinia.**

Also in this case, CAE was awarded the contract and is responsible for the supply and installation of 16 hydrometric sensors, divided between radar and immersion hydrometers. These data are transmitted in real time through the **infrastructure network**, at the service of the **regional alert system for hydraulic and hydrogeological risk for civil protection purposes.** Considering the critical purpose for which these sensors are used, the tender required **certified instrumentation with high operating standards**, to ensure **continuous**



and uninterrupted operativity even in complex conditions.

Finally, still with the aim of monitoring with more effectiveness and timeliness the intense and extreme hydrometeorological events which are increasingly affecting the Sardinian territories, the works for the **project that halved the polling time**



of UHF radio network linked to real-time meteorological and hydro-pluviometric monitoring network for civil protection purposes were completed. The network is currently under monitoring, awaiting the final declaration of compliance. It was necessary to technologically adapt the repeaters and the radio panels of the primary and secondary stations of the aforementioned network by updating radios **from 2400 to 9600 baud**. The works on radio equipment, as well as those related to the software update of the control units and the reconfiguration of the network, have



been carried out **without interrupting the functioning of the network**, with minimum disruption in data acquisition and transmission. Furthermore, among the results achieved by this project, there is a reduction in the number of radio frequencies currently in use: now there are **only 2 frequency pairs**, a condition which entails a reduction in radio license costs for the administration. Three diverse interventions aimed at further increasing the quantity and quality of data relating to the Sardinian infrastructure network and the safety of all citizens. ■

CAE MAGAZINE

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