



## INDEX

G7 environment in Bologna: a half success? p. 3

A monitoring and alert system for the  
Landslide in Civitacampomarano (Campobasso) p.4

Earthquake and hydrodynamic balance. The  
River Torbidone has resurfaced (Norcia) p.7

Safety for citizens first: a new alert system  
For the underpass in Via Contea, in Rubiera  
(Reggio Emilia) p.8

## Editorial: CAE CELEBRATES 40 YEARS!



*The 9th of June the Company opened its doors to employees and suppliers to celebrate altogether with their families and friends its 40 years of successful operations. Apart from sharing a good dinner together, the Open Day was the chance for everybody to show their own workplaces and let each other's families meet.*

*CAE was founded in 1977 by four electronic engineers and researchers of the Marconi Foundation, specialized in telecommunications, with a well-defined purpose: to offer public and private bodies evolved technologies to monitor the environmental risk due to natural events. Paolo Bernardi, Giancarlo Maria Pedrini, Franco Bertolani and Luigi Lo Vecchio worked hard and first-hand to identify those three unique elements which boosted the company growth: readiness to deliver during emergencies, constant attention to satisfy clients and develop break-through technologies to change the market.*



*“These distinctive ele-*

*ments transformed a small start-up into the Italian market leader already during the 80ies and they identify our Company until now. We are convinced that this unique positioning has been achieved thanks to the example given by the founders and thanks to all those people who followed, and still follow, their guidelines and dedication.” declares Giorgio Bernardi, member of the Board of Directors. When questioned on the special birthday of*



*CAE, he also adds: “This year is a special occasion for us, that’s why we decided to create a museum dedicated to CAE’s historic technologies and entitle it to Franco Bertolani, one of our founders who passed away in August 2016. We also renewed some of the common spaces within our premises, with a special care about the room dedicated to the spare time of our employees ... because we strongly believe that good interpersonal relationships and exchange of ideas can be very important for CAE, and we also believe that these attitudes can be encouraged by a comfortable sofa or a table football, something more than a traditional coffee machine.”*

*Today we are the Italian company leader in designing, creating and servicing multiple risk alerting and monitoring systems and technologies. We continuously invest in developing reliable, innovative and interoperable technologies useful to preserve the territory and to safeguard the population: we can proudly declare to be a company which “Innovates for a safer world”.*

## Photogallery



## G7 environment in Bologna: a half success?

Edited by Patrizia Calzolari

[BACK TO THE INDEX](#)

The G7 Environment chaired by the Italian Minister of the Environment, Gian Luca Galletti, in Bologna ended on June, 12th. The authorities that took part in the meeting included: Germany (represented by Barbara Hendricks), Japan (represented by Koichi Yamamoto), France (represented by Nicolas Hulot), the USA (represented by Scott Pruitt), Canada (re-

presented by Catherine McKenna), the UK (represented by the Secretary of State, Therese Coffey) and two European Commissioners (Karmenu Vella, responsible for Environment, Maritime Affairs and Fisheries, and Miguel Arias Cañete, responsible for Energy and Climate Action). Moreover, the Ministers of the Environment of four extra G7 countries had been

invited to the meeting: Chile, Rwanda, Maldives and Ethiopia. Finally, the meeting included three companies and two Universities for each country, that discussed circular economy and innovation respectively.

Several subjects have been discussed and analysed by the board during the two-day meeting: environment, climate, su-

tainable growth, green finance and sea pollution. The works ended with a unanimous purpose as far as: sustainable development, removal of fossil fuel subsidies, use of sustainable resources, circular economy, promotion of clean technology, marine litter, environmental fiscal reform, dialogue with the most vulnerable countries and with Africa in order to fight climate

change.

On the contrary, no agreement was reached about climate (maybe the most relevant subject of the meeting) and multilateral development banks (MDBs): as a matter of fact, even if the United States of America signed the final communiqué issued by the board, they added a note, stating that the USA will continue to demonstrate through action their engagement to reduce CO2 footprint, in a manner that is consistent with their dome-

stic priorities, preserving both a strong economy and a healthy environment. As a consequence, the footnote states: "We the United States do not join those sections of the communiqué on climate and MDBs, reflecting our recent announcement to withdraw and immediately cease implementation of the Paris Agreement and associated financial commitment".

Certainly it was no surprise, as US President Donald Trump's statements has never left any inter-

pretative doubts about this subject. Anyway, this USA step backwards about the Paris Climate Agreement did not discourage the other six G7 countries and the European Union, that confirmed their intention to implement the environmental condition promoted by the Sustainable Development Goals (Agenda 2030), as well as achieve the energy transition towards a zero-carbon economy by 2050.

"We worked to build bridges not walls - said Mi-

nister Galletti - Italy, Canada, France, Germany, Japan, the United Kingdom and the European Union confirmed clearly that the Paris climate agreement is irreversible, non-negotiable and the only possible instrument to fight climate change. We hope to be able to continue to engage in a constructive dialogue with the USA in the future, but only on the basis of these premises. There is no alternative position for us". ■



## A monitoring and alert system for the landslide in Civitacampomariano (Campobasso)

[BACK TO THE INDEX](#)

After the huge landslide occurred in the Municipality of Civitacampomariano, an automatic monitoring and alert system in real time has been implemented and tested, aiming at guaranteeing public safety and managing the emergency situation of this Municipality.

The system allows to

automatically and uninterruptedly monitor the area, in order to create a large database that, after an appropriate data processing and correlation, will allow the municipal technicians and the regional staff to:

- evaluate the behaviour of the monitored area during and after

significant meteorological events;

- obtain the necessary knowledge in order to manage any future emergency;

- plan and examine any possible strengthening interventions that might become necessary, and test their effectiveness.

The multi-risk station (Mhaster), that depends on the system, is installed in the imposing Angionino Castle that overlooks the town threatened by the landslide. This station is equipped with an air thermometer and a hydrometer that allow us to associate the evolution of the instability to the rainfalls



on the spot, which are the main priming phenomenon of the instability itself. Moreover, the station collects the data registered by all the geotechnical equipment, which consists of crack width gauges, surface clinometers, piezometric devices and manual inclinometers.

The sensors installed near the red zone, which has been evacuated, communicate with the station through a Self-Reconfigurable Wireless Mesh Network, that makes the system highly adaptable and allows us to easily and quickly modify the position of the sensors in order to adapt it to the changes occurring on the landslide.

The data are transmitted through a duplex communication system consisting of a GPRS/UMTS module and an UHF band radio device; this way, the



station is connected to the remote measuring radio network of the Civil Protection System. Apart from being sent to the Functional Centre of the Civil Protection System and to the Municipal Operative Centre (C.O.C. - Centro Operativo Comunale), where the headquarters for the data acquisition and visualisation has been installed permanently, the data will also be available on a WEB platform accessible through an internet browser.

Apart from the monitoring data collection, the system also performs many alert functions, that are essential when a landslide occurs in inhabited areas like

this. Particularly, 3 automatic scenarios can be defined: normality, pre-alarm and alarm. The activation of these scenarios is functional to the rainfalls level and the landslide movements, measured by the movement of the sensors, whose alert threshold can be set on a different level for each network sensor. When an intense rainfall phenomenon occurs, the pre-alarm scenario is activated and the number of measurements for the data acquisition automatically increases. Moreover, when at least 1 sensor indicates some sort of stress (inclination/opening) that exceeds the alert threshold, the alarm setting is activated and

notifications are sent via SMS/vocal message/Fax/Mail to the staff. The client is free to set the system so that these notifications are sent even when a pre-alarm scenario is activated.

Finally, as any other CAE device installed for the Civil Protection System, the above-described system works H24 in any sort of environmental operating conditions, due to:

- its automatic diagnostic functionalities, that allow us to check on its operating status remotely and in real time;
- its energy independence. Each element of the monitoring system is energetically autonomous, thanks to the use of solar panels and batteries that allow us to avoid any possible malfunctions caused by possible blackouts that might occur in the area. ■

As we have already mentioned, the system has been successfully installed and tested, therefore attracting the attention of the local media; particularly, you can find two links of the news reported by the local news (TGR Molise). Enjoy:

[Molise Regional Newscast - May 23, 7:30 pm](#)

[Molise Regional Newscast - May 25, 7:30 pm](#)

## Photogallery





## Earthquake and hydrodynamic balance. The river Torbidone has resurfaced (Norcia)

[BACK TO THE INDEX](#)

The earthquake occurred in this area caused several changes to its geological structure, as well as damages to the cities and, particularly, to houses, transportation, and our cultural and artistic heritage. A subject we have not discussed since this moment is the impact of the earthquake tremors on the groundwater hydrodynamic balance.

After the earthquake occurred on October, 26th and 30th, 2016, that reached magnitude 6.5, the sources of the River Torbidone, near the chief town of Norcia, have reactivated. The watercourse used to flow up to the River Sordo until September, 19th, 1979, when another huge earthquake (magnitude 5.9) made it disappear underground. The intermittent nature of the River Torbidone is historically well-known, even if it is impossible to classify exactly its time

scale, as the activation and deactivation of this phenomenon has very often been associated, within living memory, to the frequent earthquakes that occur in this area.

However fascinating to describe it may be, this “rebirth” caused no little discomfort. Contrary to what its name (“muddy river”) may suggest, the River Torbidone has a forceful flow in some spots and has been increasing considerably the flow of the River Sordo. The Region of Umbria, in collaboration with the National Civil Protection System and other bodies, is working to monitor the critical situations, as well as outline a realistic evolving picture about the future availability of the water resource.

From November, 16th, it became necessary to intervene urgently on the old course of the River Torbidone, in order to

guarantee its complete hydraulic functionality, that has been irreparably compromised during the last forty years, due to the water discontinuance, as well as excessively negligent human interventions. The following interventions became necessary:

- reopening and reshaping of the ditch;
- cleaning of the vegetation;
- building of driveways;
- underground canalization where the river interferes with the built-up areas;
- monitoring of flows, levels and further relevant adjustments.

The average flow value measured at the source during the Sixties was 327 l/s, while today the corresponding values are much higher (you can see below the data collected during the measurement campaign); the interventions allowed a down-

flow higher than 1500 l/s, which means it is almost five times higher than those in the Sixties; the major critical issues have been registered downhill, where the sources of San Martino contributed to determine flows that were higher than 1700 l/s. In such a peculiar environment, where it is essential to monitor waters, CAE wanted to contribute with a hydrometric station that was installed downhill, near the sources of San Martino, aiming at monitoring its impact.

However, the progressive increase of the flows made it necessary to perform as quickly as possible the reopening interventions of the whole course of the River Torbidone, including the State property and the public ones, aiming at further improving its characteristics and, therefore, guaranteeing a flow of 2000 l/s approximately. ■



Below, you can find the flows that were measured near the sources of the River Torbidone, during the measurement campaign sponsored by the Service for Water Resources and Hydraulic Risk of the Region:

DATE	Q l/s	DATE	Q l/s	DATE	Q l/s	DATE	Q l/s	DATE	Q l/s
11/16/2016	350	12/16/2016	1140	01/12/2017	1510	02/14/2017	1600	04/04/2017	1660
11/22/2016	610	12/16/2016	1040	01/17/2017	1470	02/16/2017	1590	04/11/2017	1610
11/25/2016	710	12/20/2016	1160	01/20/2017	1450	02/28/2017	1490	05/09/2017	1780
11/29/2016	770	12/23/2016	1140	01/24/2017	1550	03/09/2017	1480		
12/02/2016	860	12/27/2016	1180	01/31/2017	1540	03/14/2017	1560		
12/06/2016	880	01/03/2017	1380	02/07/2017	1490	03/21/2017	1530		
12/13/2016	1070	01/10/2017	1460	02/10/2017	1660	03/28/2017	1580		



## Safety for citizens first: a new alert system for the underpass in Via Contea, in Rubiera (Reggio Emilia)

[BACK TO THE INDEX](#)

The underpass in via Contea (on the Provincial Road S.P. 51), in the Municipality of Rubiera, has shown some water run-off problems during highly intense raining events which are every day more frequent because of climate change; the evidence of this is the bad weather that, on February 2016, caused several damages all over the province of Reggio Emilia.

For this reason, the public authority decided to equip the above mentioned subway with a **monitoring and alert system** that was opportunely installed and successfully tested on May, 15th, 2017. The aim is to guarantee the safety of all road users by activating several traffic lights in real time near the entrances of the subway which can potentially be flooded.

The system has been

designed to reduce false alarm and/or malfunctions to their minimum; to do so, the system uses 3 different sensors that contribute to the automatic activation of the alert status, according to the instructions of the local authority:

- when the minimal hydrometric threshold is exceeded, the traffic lights will be kept off, but a pre-alert notification will be sent via



SMS to the staff appointed by the local authority;



- in case that the alert threshold is exceeded, apart from sending an SMS to the staff appointed by the local authority, the Mhaster data acquisition station will turn on the traffic lights and change the scenario, therefore acquiring data and photographs every 5 minutes.

The scenario changes can also be implemented manually, in real time, by a qualified staff, in case that they consider it necessary. The staff itself has got the total control over the devices, from a remote location too: **operators can gain access directly to the graphic interface of the station through any web browser, without the need of a software license**, thanks to the web server located on the station.

This system is therefore efficient even in case of electric black-out, as it is not supplied with a

220V supply, but with a solar cell and a battery and it includes:

- 2 capacitive level sensors;
- 1 pressure piezometric sensor;
- 2 traffic lights;
- 1 high-definition camera with its stand;
- 1 GPRS/UMTS communication module;
- 1 Mhaster datalogger.

The high-resolution camera is designed to intensify the shots in case of raining events, and it allows us to record and check them remotely too.

Moreover, the versatility and the power of the Mhaster datalogger allow the station to interface with hydraulic operating devices (electric submersible pumps, level sensors, etc.), as well as to handle the scenario changes, by differentiating pre-alert from alert activation lo-



gics. The datalogger is actually equipped with “CAE Solutions”, which always guarantee quality and reliability and are designed ad hoc in order to help the Mayors and their Municipalities. ■

The system installed at the underpass in Ru-

## Photogallery



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