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## EDITORIAL

# The national alert system: a debate between public administration, academic community and the industry

The invitation-based conference “The national alert system: expertise and technologies for the mitigation of natural risks” was held in Bologna on March 28th, 2019. The event, organized by CAE, was sponsored by Regione Emilia-Romagna, Confindustria Emilia, University of Bologna, AIPO (Interregional Agency for the River Po), AdBPo (Po River Basin Authority), Order of Engineers of Bologna and Order of Geologists of Emilia-Romagna.

Therefore, the aim of the conference was to share the experiences of the public administration, the academic community and the industry, in order to take stock of the present and the future of the national alert system.

Speakers included not only the top prominent figures of the various organizations sponsors of the event, but also representatives of the Central Functional Centre of the Civil Protection National Department (Cacciamani), the National System for Environmental Protection - SNPA (Bortone), the Italian National Association for Land Reclamation and Irrigation - ANBI (Vincenzi), the Italian Hydrotechnique Association (Prof. Brath) and several technical managers of the bodies involved in the national alert system (ARPA, regional departments, etc.).

Among the topics covered during the conference were the critical issues of the territory and of the national alert system, soil protection, environment and civil protection and collaboration between institutions, which - as discussed several times - is instrumental to guarantee efficient and effective preventive actions.

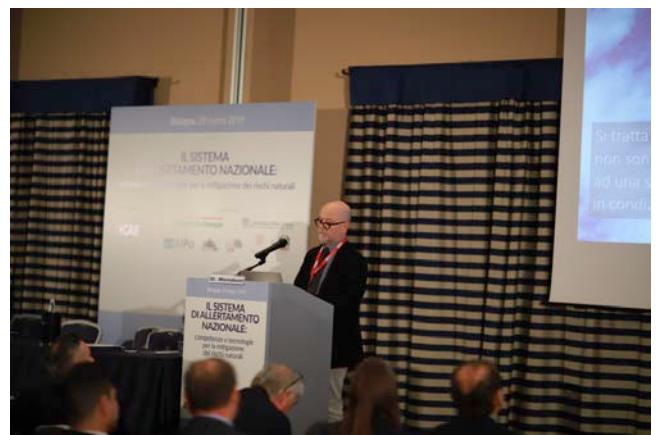
Thanks to the numerous guests and speakers who took part in the initiative, the conference became a unique opportunity for discussion between the various public administrations (to which a consistent part of the conference was dedicated) and to present their best practices in warning systems for natural hazards.

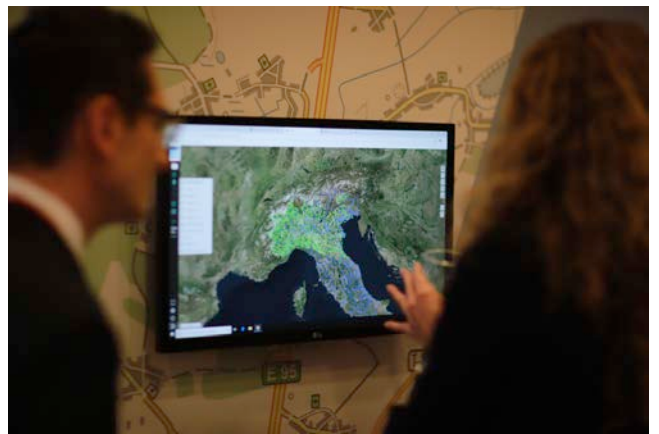
The event was also an opportunity to present the latest innovative technologies for multi-risk alerting and proposals from the academic community.

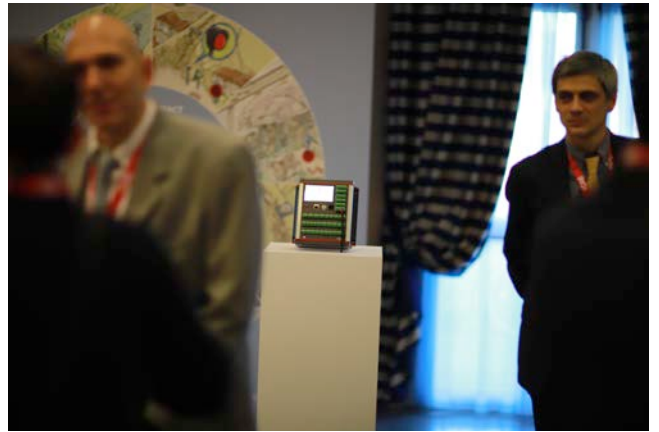
Our hope is that the results of this conference will bring interest, ideas and topics for future debates. ■











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## Flood forecasting and warning system in the South-Central provinces of Vietnam



Floods in Vietnam represent a constant threat that occur throughout the year in different areas of the Country, affect the safety and well-being of the population and cause enormous economic loss, which in turn hamper the social development.

Minimizing flooding damages is among the main target of all Vietnamese institutions concerned, especially the Ministry of Natural Resources and Environment (MONRE). The National Hydro-Meteorological Service (NHMS) of Vietnam has the responsibility to upgrade the specialized **telecommunication system** with **advanced technologies to ensure the timely and accurate data collection and dissemination** of all forecasting information for flood and typhoon preparedness and prevention in Vietnam.

The Project: **“Improving the Flood Forecasting and Warning System in Vietnam - Phase II”** in the South Central region is the successor to, and promote the achievements of, the previous “Improving the Flood Forecasting and Warning System in Vietnam - Pha-

se I” project, implemented by CAE in 2009 in the Middle Central Region.

The present Project is therefore implemented as the most effective way to accomplish and **modernize the Flood Forecasting and Warning System of Vietnam**, under the leadership of MONRE, as an essential part of the Master Plan on the Strategy of Natural Disaster Preparedness and Prevention in Vietnam.

Second phase will be deployed in the Main River basins located in the South Central Vietnam provinces of Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan and Binh Thuan.

There are several rivers along the South Central region, most of them short and very steep, originated from Highlands and west-east oriented. The steepness and shortness of the rivers are the main reasons for rapid changes from droughty to flooding state, and vice-versa.

In order to achieve the **objective of quality and ro-**



**business**, which has always been the outstanding feature of **CAE's monitoring systems**, the detailed **site design**, the **supply and installation of reliable and precise equipment** are strictly required, together with highly **reliable and flexible dedicated software** and necessary elements to provide the client with a system that is capable of:

Improvement of surface water and rain monitoring system;

- Improvement of data collection and processing system;
- Improvement of data communication system;
- Improvement of weather forecast and early warning systems;
- Improvement of preparedness of local staff.

The system will be composed of:

- n. 13 **Meteorological Stations**, measuring wind direction, wind speed, temperature, humidity, air pressure, rainfall and rain intensity
- n. 17 **Hydrological Stations**, measuring water level, rainfall and rain intensity

- n. 83 **Rain gauge Stations**, measuring rainfall and rain intensity
- n. 1 **Oceanographic and meteorological station**, measuring wind direction, wind speed, temperature, humidity, air pressure, water level, wave, water temperature, salinity, rain fall and rain intensity.
- n. 1 **National hydro-meteorological, flood forecasting and warning centre**
- n. 1 **Regional hydro-meteorological and flood forecasting and warning centre**
- n. 4 **Provincial flood forecasting and warning centre**
- **Flood Forecasting and Warning System**

Considering the complexity of this project, in addition to the supply and installation of a comprehensive technological system in the territory, the contract includes also the training activities and the supply of highly value-added services, CAE Magazine will continue to update you over the next few months about the project's developments. ■



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## Region of Emilia-Romagna: the monitoring network reduces by half the cycle time for the acquisition of hydropluviometric data



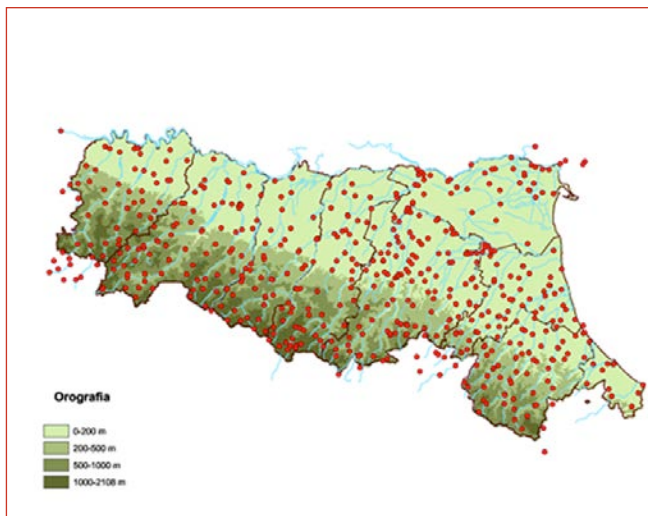
The increase of intense and quick hydro-meteorological phenomena that more and more often affect our territory has led ARPAE to collect more frequent monitoring data in order to guarantee a more effective and timely control. For this reason, we decided to adapt the real-time hydro-meteorological and climate monitoring networks connected to the RIRER network of the Region of Emilia Romagna for Civil Protection purposes, which are managed by the "Servizio Idro-Meteo-Clima" of ARPAE.

Considering that the Region acknowledges the reliability of radio communications in case of emergency, the project involves a series of interventions necessary to reduce the current cycle time

of all the radio-connected stations of the involved networks, from 30 minutes to a maximum of 15 minutes.

Therefore, a dedicated radio network will be set up for UHF band communication, which will be completely centralized managed by the ARPAE control centre in Bologna and will guarantee maximum simplicity and low running costs. In the event of a fault in the main control centre in Bologna, the ARPAE control centre in Parma will be able to take over the entire network as a reserve centre.

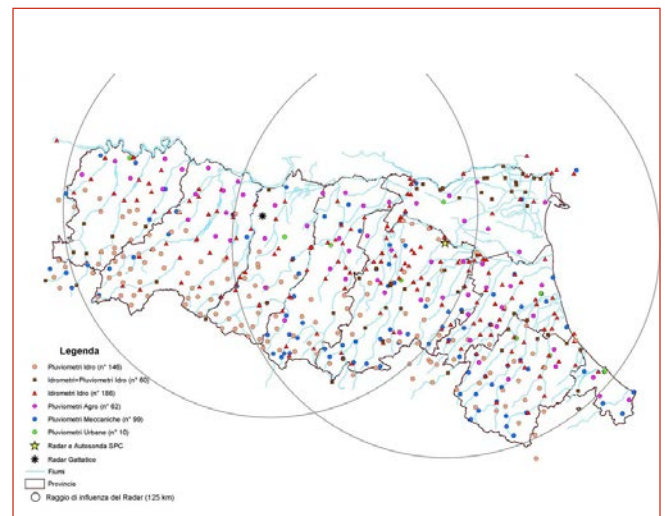
The network will consist of both existing and new equipment; you can find an in-depth analysis of some of the equipment in the following paragraphs.



## Radio

The project involves the adaptation of the existing monitoring network by replacing all the repeaters, repeating stations and already existing radio panels based on a 2400 b/s radio module with the new RCS model of CAE, which is able to increase the transportation speed of the signal repetition up to 9600 b/s, and preserve at the same time all the features offered by the existing repeaters and radio panels.

In order to guarantee the “open” feature required by the Public Administration, CAE will use radios with royalty-free communication protocols; moreover, these protocols will be fully documented, both on the physical access (serial, Ethernet, ...) and the aerial part. As far as the part of the system that uses the TETRA radio network, CAE will perform the reconfiguration of the devices, if necessary, in order to reduce the cycle time from the current 30 minutes to 15 minutes, and to transfer the network management functions to the Arpae control centre in Bologna.



## Stations

The oldest stations will be updated to the Mhas technology, thanks to the Open Log dataloggers, based on [Linux open source operating system](#) and designed in order to ensure the highest level of system openness, with the ability to manage applications in different risk contexts (multi-hazard), in addition to a high level of reliability.

## Control centres

The new DATALIFE management program will be installed and configured at the ARPAE control centre in Bologna, complete with a new Unified Data Base UDB (SQL type) which will allow to unify the storage of all data and system metadata. This will allow the automatic synchronization of various information (surveys, personal data, alarms, ...) between central units, as well as the configuration of user programs with credentials of customized access profiles. Moreover, the regional secondary control centres will be upgraded to all the new features available. For all the existing control centres in the network, data exchange procedures currently in use will be guaranteed. ■

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## CAE inaugurates its new test field - the only in Italy of its kind



CAE inaugurates its new test field - the only in Italy of its kind.

CAE provides **solutions in order to mitigate risks related to extreme natural events**. All the decisions made, from the issuing of a bulletin by a specialized technician, to the automatic switch-on of a traffic light at the entrance to a flooded underpass, depend on the reliability of the

initial measurement and of the whole process of data registration and transmission.

This **reliability** depends on the quality of the **specialist services** related to the technologies, such as **design, installation and maintenance**, as well as on the **robustness** and **accuracy** of the components and new **products** developed and used.

To increase the number, the significance and the





quality of the great number of **tests** which all our new products usually undergo, such as **sensors** or **data recording, processing and transmission devices**, we have recently inaugurated our new test field, which is already in use: 400 square metres equipped with 25 poles, already wired and powered, which will accommodate several tenths of devices to be tested.

Lorenzo Giandomenico, CAE Technical Director, said: *"This new test field allows us to perform much more effective evaluations, useful to increase the level of reliability of the products we put on the market. Moreover it allows us to practically compare CAE products with their equivalents on the market, by installing them in a real environment under equal conditions."*

Thanks to the space at our disposal and the characteristics of the surrounding environment, this test field will allow the new products to undergo more frequent and prolonged tests, giving our technicians the possibility to intervene more easily in order to make changes and control operating conditions, thanks to the proximity to the company headquarter.

This investment is an important step forward for our company, as it allow us to perfect our new products, to better understand the limits and strengths of the technologies we acquire by third parties and include in our integrated solutions, as well as to increase the accuracy of the newly developed sensors. It is an important step forward for CAE, as well as a contribution that our leading company brings to all its customers. ■

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## Autonomous Region of Valle d'Aosta: green light to the flow measurement service



CAE confirms its professionalism in surveys and field environmental analyses by winning the tender for the **“Liquid flow measurement service in riverbeds”** of the **Autonomous Region of Valle d'Aosta**. Seven offers were assessed for the awarding of the tender and the contents of our offer proved to be the most suitable to meet the requirements of the Special Tender Specifications.

CAE will be involved in the task entrusted for the flow measurement for the upcoming three years performing seventy annual surveys on the 24 sites provided for in the Special Tender Specifications. The measures will be carried out under different conditions - low, moderate and full flow - on sites belonging to the **watershed area of the Dora Baltea river and its tributaries**.

The context of the Valle d'Aosta is certainly complex from the flow measurement standpoint and the construction of the resulting down-flow scales. During the winter, due to the combined action of snow and hydroelectric use, the hydraulic heads in the riverbed are particularly low.

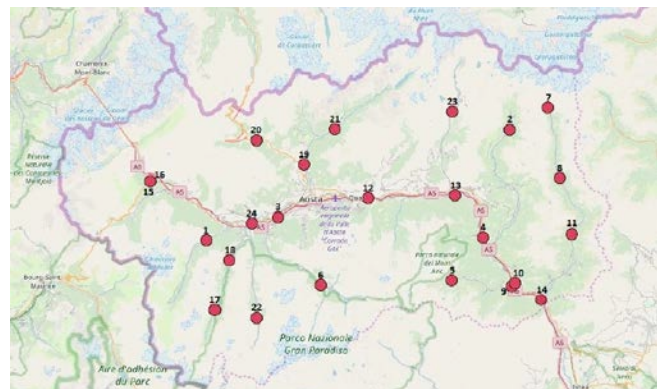




During full or moderate phases, combined with the melting of the snow, the river speeds can be significant and we must always consider the possible presence of solid transport and materials, due to the torrential nature of the river sections to be analysed.

The evaluation commission especially appreciated our **solid business organization**, which allows CAE to simultaneously organize several teams, consisting of operators with a certified experience, as well as our **complete and adequate instrumental equipment**.

Among the most interesting elements of the equipment available to each of the surveying teams of CAE technicians, we can point out hydraulic re-els and sets of propellers of different diameters, sets for suspended measurements with different weighting systems and the essential ADCP sensors on floating supports.



Our tools are completed with the necessary topographic equipment, in order to carry out the geomorphological surveys of a certain section, which is composed of GNSS receivers and total scanner stations for precision surveys.

With this contract, once again CAE proves to be a valid partner for the public administration authorities, and guarantees the supply of **reliable services** and an important **technical know-how**. ■

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