



## INDEX

Farewell to Giancarlo Pedrini, entrepreneur and symbol of flood prevention in Italy and worldwide **PAG. 1**

Georgia and Azerbaijan: groundwater monitoring **PAG. 6**

New investments in technology and training to increase the quality of services **PAG. 8**

Brenner Base Tunnel: geodetic monitoring to detect subsidence **PAG. 10**

Free web platform: the commitment of CAE to its customers during the lockdown **PAG. 12**

# Farewell to Giancarlo Pedrini, entrepreneur and symbol of flood prevention in Italy and worldwide

On April 13th, Italian enterprise lost a real champion, someone who succeeded in doing business while improving the world we live in. Eng. Giancarlo Pedrini, member of the Rotary movement, friendly called Giancarlo by everyone, was one of the four founders of CAE S.p.A. of San Lazzaro di Savena (BO) and vice-president in charge until the last day.

Born in Rome in 1947 and graduated in Engineering in Bologna, he immediately began to make use of his technical skills in research. In those years he crossed the path of his future partners and embarked, body and soul, on a new entrepreneurial adventure with them. In a recent interview, while recalling the founding of the company in 1977, he said: "We were all electronic telecommunications engineers, research enthusias-





sts, scholars and passionate people. We liked being researchers, but we wanted to challenge ourselves by building a company that could go a bit further". And, in all these years, Giancarlo, his partners and CAE as a whole have really gone "a bit further". They have developed and supplied technologies to reduce flood risk and other natural phenomena throughout Italy and half the world. In this market niche, linked to monitoring and warning for the risk of floods and landslides, the company from San Lazzaro is an Italian leader, as well as an important player on the international scene.

Eng. Paolo Bernardi, lifelong business partner and current Chairman of the Board of Directors, describes Giancarlo as an extremely eclectic person: "His deep technical knowledge led him to support in a practical way the professionals of his company in the fields of electronics and engineering, while his great culture, human skills and contagious sociability naturally made him the centrepiece of many operational, technical and even political meetings







where he was called to participate”.

There have been years when Italy has faced one disaster after another, such as the flood of Valtellina (1987), the events of Sarno and Quindici (1998) and the disaster of Soverato (2000). Giancarlo and CAE were not only always on the front line, feet and hands in the mud, but they also contributed to find new solutions to hydrogeological instability: ideas and technological suggestions, projects and initiatives whose slogan became “prevention”. The authority with which he contributed in proposing solutions has been appreciated by entire generations of Civil Protection officials, with particular reference to the periods when this institution was led by Franco Barberi or Guido Bertolaso.

Among his many roles in the international arena, we want to point out that of technical consultant of the Italian Permanent Representatives at the World Meteorological Organization, based in Geneva. General Silvio Cau, Italian member of the Executive Council, remembers him as “An incredibly nice person, of





sound and valid principles, who has always worked to ensure that Italy was recognized a leading role in the field of meteorology at a global level, ready to fight with intelligence and energy for the right battles”.

Among the concepts he promoted on many occasions at international level, there are those of quality and reliability over time of the monitoring and warning systems. Besides being an entrepreneur, Eng. Pedrini was also an individual of high values: he was unwilling to accept that too many projects, especially among those financed by the International Financial Institutions in Developing Countries, ended up with poor quality installations, bad results







and insufficient security for citizens. For this reason, aiming at improving the effectiveness of preventing actions around the world, he used to spread the Italian experience at every level, with meetings and public speeches in many Countries and at many institutions, such as the World Bank (WB), the Asian Development Bank (ADB) and the United Nations Development Program (UNDP).

Remaining in the international context, to which Eng. Pedrini especially dedicated his work in the last 15 years, the activity carried out in Vietnam deserves special mention: there, CAE has won several tenders for major projects and now has a leadership position, also thanks to a network of reliable and capable partners in the territory. Vietnam is a country that Eng. Pedrini loved, in which he had totally immersed himself, working unconditionally and successfully, not only to promote his company, but also to allow Italy to conquer a recognized role as a friendly Country, an example of prevention of hydrogeological instability, an exporter of technologies and good practices at an institutional and technical level.

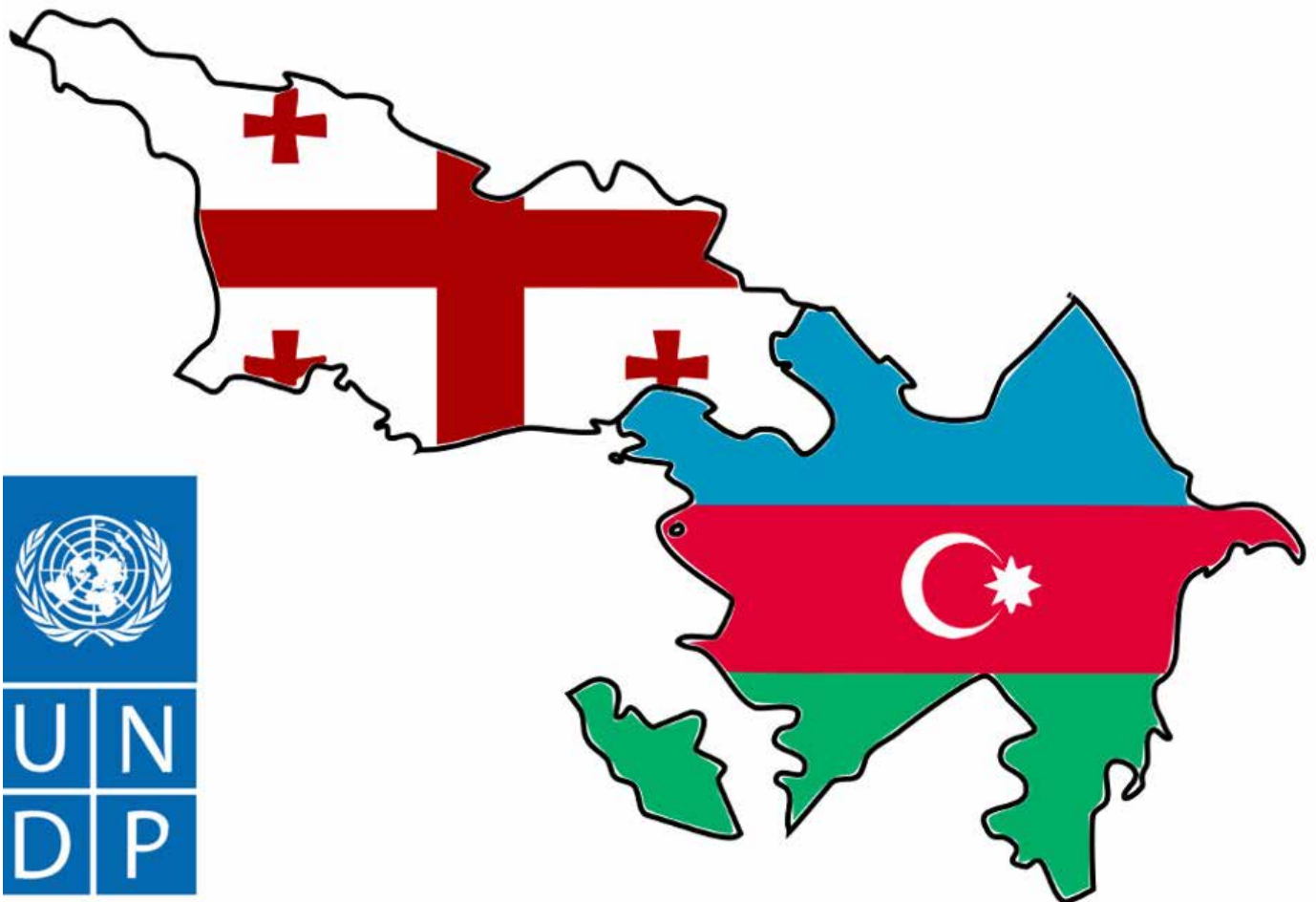
The Italian Ambassador in Vietnam, Antonio Alessandro, testifies all this and writes: "Eng. Pedrini was above all a model of solidarity and quality entrepre-



neurship; thanks to him we were able to carry out very powerful partnership operations in this Country, which have left important and lasting legacies." With his demise, our community loses a man moved by high ideals. In four decades of activity, many of the company's **104 employees have been work** directly with Giancarlo and acquire some of his skills. This is why Eng. Paolo Bernardi, friend as well as partner, is convinced that the values he embodied will continue to represent something special for our company. This will help CAE, which is today a well-structured reality, to successfully sail the stormy seas of modern times for a long time. ■

BACK TO INDEX

## Georgia and Azerbaijan: groundwater monitoring



CAE has won a tender for the construction of a groundwater monitoring system in 6 locations between Georgia and Azerbaijan, which will be carried out with the support of Hydrodiagnostic, a consolidated partner.

The work is part of the UNDP **GEF** Kura Project “Advancing Integrated Water Resource Management (IWRM) throughout the Kura river basin through implementation of agreed national and transnational actions and plans”. The Strategic Action Plan (SAP) for the Kura river basin is based on four objectives which consist in achieving:

- sustainable use of water resources to guaran-

tee access to water and preserve eco-systemic services;

- access to clean water for present and future generations and support for ecosystems functions in the Kura river basin;
- maintain the status of ecosystem under which essential environmental and socio-economic services are sustainably provided in the Kura river basin;
- mitigation of negative impacts deriving from floods and climate change on infrastructures, riparian ecosystems and communities.

To achieve these goals, Georgia and Azerbaijan

will, among other things, need to “Improve the use of science for governance by strengthening monitoring, information management and data analysis systems for IWRM”. This will increase safety applied to water/food/energy/ecosystem, as well as adaptation to climate change, including combined uses of groundwater and surface water.

To do so, a better assessment of the geographical distribution of groundwater and surface water and seasonal fluctuations will be needed; for this reason, a special working group has suggested to install a groundwater monitoring system in the Alazani (Ganik) –Iori basin.

The above-mentioned monitoring system will be used as a pilot to test the efficiency and effectiveness of the use of this technology in groundwater management. Two experts from each of the involved countries have selected the most suitable locations for the implementation of this monitoring

system, which will consist of:

- 6 locations (3 per Country) equipped with a **Mhaster datalogger**, a transmission system, a solar panel and a battery, as well as monitoring sensors such as:
  - ▶ flow measurement sensors;
  - ▶ pressure water level sensors;
  - ▶ water temperature sensors;
  - ▶ Total Dissolved Solids (TDS) meters;
  - ▶ electrical water conductivity meters;
  - ▶ PH measuring sensors.
- 2 workstations (1 per Country) with data collection and analysis software.

Two training days are also planned for 8 representatives of the groundwater management authorities of both countries; the training will focus on the functioning of the proposed system and its maintenance activities. ■



BACK TO INDEX

## New investments in technology and training to increase the quality of services



For some time now, CAE market has expanded adding alerting services to monitoring and targeting multi-hazard realities: not only CAE develops systems for mitigating hydro-meteorological risk, but also deals with forest fire and hydrogeological risk. Particularly, with regard to the management of the latter, over time, it has become increasingly crucial to use specific geotechnical and topographical tools that give us a complete picture of the risk to which a territory is subjected, allowing us to intervene more effectively.

To respond to the growing number of orders requiring the execution of complementary services linked to the world of monitoring and topographic surveys, CAE is keeping on investing in technology and training to further increase the skills of its technicians. Today the challenges in this field are increasingly demanding, and to overcome them it is necessary to be able to measure movements within millimeter accu-



racy; therefore, quality tools are needed, an essential element within the CAE policy. This is why CAE has decided to rely on Leica, a company with 200 years of experience in precision measurement and over 30 years of experience with automatic deformation monitoring systems.

Particularly, 4 new stations were purchased, dedicated both to continuous monitoring and to individual measurement campaigns. In both cases, these te-





chnologies allow a complete characterization of the monitoring environment. In the case of automated monitoring, according to what is traditionally offered in the hydrometeorological sector, tools can operate 24h a day and withstand intense use even in the most demanding environments. For the individual measurement campaigns, a high-performance, fast and precise tool was purchased: a total self-learning station capable of adapting automatically and continuously to any site condition such as rain, fog, dust, sun, thermal glare and reflections. Moreover, this tool is equipped with software capable of transforming complex data into 3D models, so that any type of measurement and project data can be seen in any dimension.

In addition, the following equipment was purchased:

- 8 GNSS receivers: ideal for networks with real-time data, as they are designed for continuous, reliable and precise operations; they offer high quality measurements with particular attention to power consumption;
- 1 basic system complete with Rover RTK GNSS and Smart GNSS antenna with self-learning, suitable for working efficiently in the most adverse environments.

Obviously, the instrumentation is always accompanied by the specific software modules necessary to provide a complete service, including a web portal dedicated to data visualization.

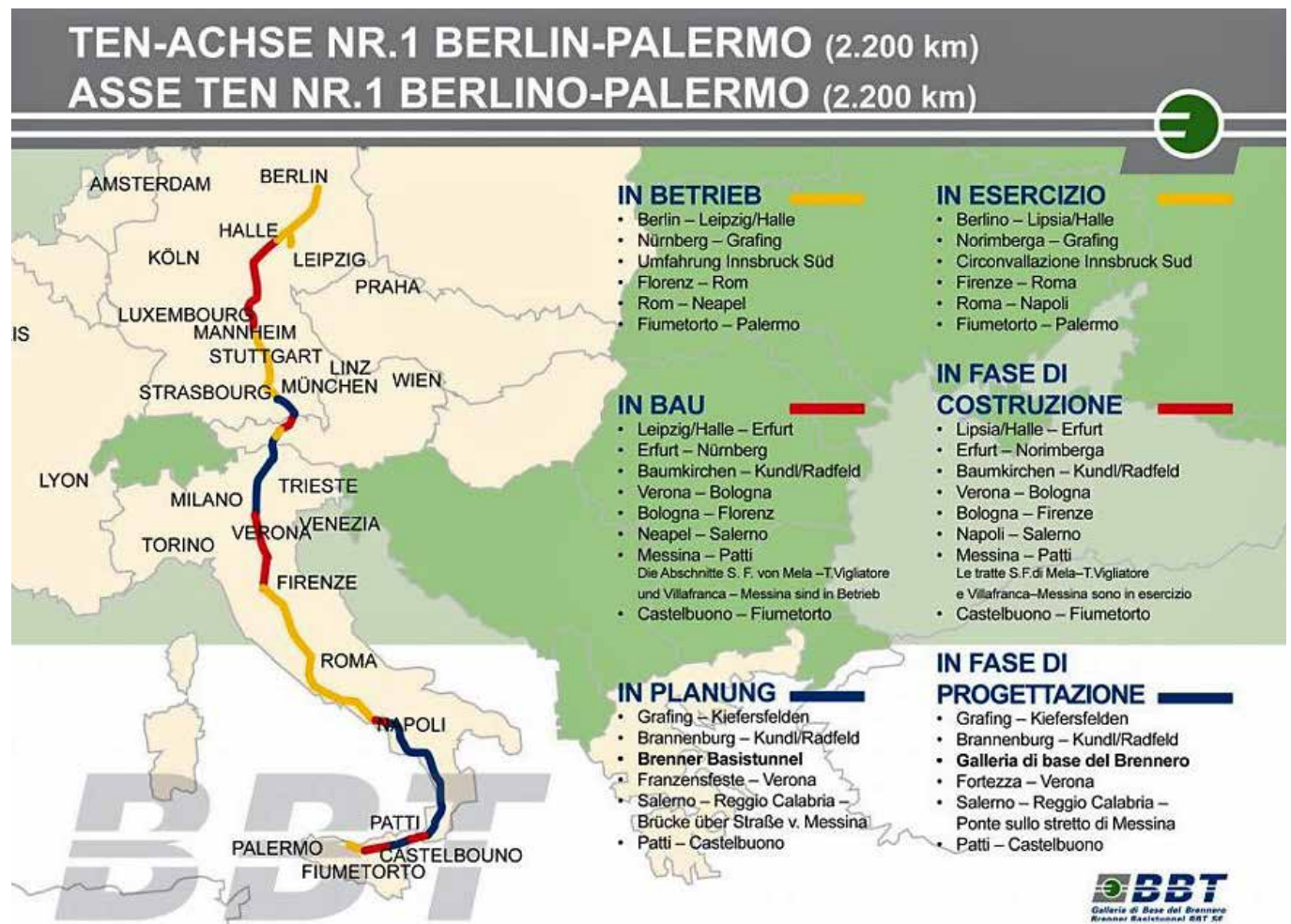
However, hardware and software technology alone is not sufficient, if it is not used by trained technicians; for this reason, training is never enough and the investment has included a dedicated measure to fur-



ther increase the capabilities of CAE technicians. The first training courses held by Leica have already been completed. The theoretical training, which went from the concepts of geodesy and cartography up to the use of the purchased GNSS survey systems, was followed by a practical exercise on the use of these systems and a qualitative survey. Finally, the processing of the collected data was addressed. Further insights studies and courses will follow because, in order to guarantee high quality standards, specialized knowledge is required, which implies continuous updates, further insights and studies. ■

BACK TO INDEX

# Brenner Base Tunnel: geodetic monitoring to detect subsidence



Starting from the end of the 70s, studies and investigations related to the **Brenner Base Tunnel** were started, up to defining the current project configuration, carried out on behalf of the **European Union** and the Republics of **Italy** and **Austria**.

The Brenner Base Tunnel is slightly longer than 55km and forms the central part of the Munich - Verona railway line. This section is included in the North-South railway connection called TEN - Axis n. 1 Berlin - Verona / Milan-Bologna-Naples-Messina-Palermo, envisaged by decision no. 884/2004/EC of the European Parliament and of the Council of April, 29th, 2004. A future-oriented railway

was created with the Brenner Base Tunnel, which crosses the Alps at the base of the mountains and consists of a system of tunnels that develops for a total length of 230km. The enhancement of the overall axis is taking place in stages: some parts of this axis have already been built and are already in operation, while others are under construction and others are still being designed at different levels of detail. As for the Brenner Base Tunnel, 50% of the excavations were completed in November 2019: 115km of the 230km planned ([news BBT SE](#)).

Within this impressive project, CAE has won a ten-





der launched by BBT SE, a European joint-stock company aimed precisely at the construction of the Brenner Base Tunnel, related to the entrustment of the **geodetic monitoring services of the Val di Vizze**, essential to carry out the entire work of the Brenner Base Tunnel.

Generally, geodetic monitoring aims at monitoring tectonic deformations, movements and ground deformations. In this specific case, GNSS (Global Navigation Satellite System) receivers will be used, whose data, when properly processed, allow to determine the 3D distance (in space) between the different measurement points provided with reference to a local target considered stable. The Val di Vizze system was designed to **detect any subsidence phenomena linked to the progress of the tunnel below the valley** and provides for the installation of **5 GNSS receivers** and **2 TPS robotic total stations**.

The GNSS stations will be configured in order to

guarantee permanent operation and continuous acquisition with real-time transmission via GPRS network to the data processing centre.

The operation of the permanent GNSS monitoring network involves calculating the baselines between the Avenes local reference and the remaining GNSS stations. Each station will determine his own position with reference to the satellite constellation and will send its location data to the monitoring centre via GPRS network where the data will be processed, together with the data coming from the two TPS robotic total stations.

The two TPS robotic total stations will be configured in order to guarantee permanent operation, which involves aiming 70 measuring points (prisms) on an hourly basis. For each point, the results of a daily campaign in will be automatically provided to the system. For each prism will be provided a value calculated as the median value of the 24 measurements acquired once per hour. ■

[BACK TO INDEX](#)

## Free web platform: the commitment of CAE to its customers during the lockdown

As we already had the opportunity to discuss, even with the world in lockdown, the risk of extreme natural phenomena does not stop; for this reason, CAE has done everything to stay close to its customers at this difficult times. In particular, the **company has made every effort to facilitate the work of its customers with an active maintenance contract for monitoring activities to be carried out in smart working mode during the COVID-19 emergency period, allowing the free use of AEGIS, a Cloud web platform** useful for this purpose.

It is an advanced software, based on web-based technology useful for decision-making support allowing a real-time geo-spatial display of information from monitoring and warning systems. The platform is developed on an open source architecture and proves to be especially interoperable. AEGIS does not replace the software procedures

already installed at the control centres, which are also available in remote access, but it supports them in order to facilitate and simplify as much as possible the use of data collected by the field monitoring infrastructures; moreover, it has been made **available free of charge for the duration of the emergency and the restrictions on mobility required by the Italian government.**

The DPCM (Prime Ministerial Decree) of March, 11th, 2020, recommended companies to implement as far as possible smart working methods for the activities that can be carried out at home or remotely. CAE wanted to go one step further and, in addition to allowing as many of its employees as possible to work efficiently in smart working, it committed itself to facilitating the work of its customers with an active maintenance contract, which they welcomed with enthusiasm. ■



---

CAE MAGAZINE

Managing Editor: Guido Bernardi

Editor-in-Chief: Enrico Paolini

Editorial Staff: Simone Colonnelli, Alessio De Faveri, Emanuela Pedrini, Virginia Samorini

Editorial Assistant: Virginia Samorini

<https://www.cae.it/eng/magazine-hm-30.html?mId=66>

---

