

» CONTENTS

» special report

Tecnatom strengthens its leadership in laser ultrasonic inspection and forms an alliance with Airbus for the first industrial application

págs. 2-3

» news

Acceptance tests on two new aerospace systems have been completed in Russia and Korea

Tecnatom will hold the III seminar on NDT applied to the aerospace industry in June

Tecnatom technology, at the most important airshows

Inauguration of Ensia Expert S.L.

Over one hundred of experts will meet up at the 6th International Symposium on NDT in Aerospace

Follow us @Tecnatom_Aero

págs. 4-5

» technology

Tecnatom participates in the Cleansky project, Europe's most ambitious commitment to create cleaner skies

pág. 6

» tecnatom group

M2M celebrates its 10th anniversary

pág. 7

» markets

Tecnatom to supply new equipment to COMAC, China's prime passenger aircraft manufacturer

pág. 8

» commentary »

INNOVATION AND CELEBRATION

Adapting to changes is key to reaching our goals. The development of an innovative corporate culture allows, besides other things, a greater capability of adaptation and response to those changes within the environment.

In the aerospace industry, the current competitive environment in which companies are struggling to gain efficiency by means of production cost savings, demands new and quick responses. In Tecnatom, we are aware of this and, so, are committed to innovation and technology as the ways to generate solutions to guarantee the manufacture of more efficient and safer aircraft. From that commitment, we are deploying all our capabilities in R&D and we are forming allies with important players within the sector to be able to meet this technological challenge. Thus, in spring 2015 Tecnatom will set up TecnaLus, Europe's first industrial application of a laser ultrasonic inspection system. We are very much looking forward to providing a preview of its development at the III Seminar on NDT applied to the aerospace industry, to take place in June.

The manufacture of more efficient aircraft is also the goal of the CleanSky project, an initiative encouraged by the European Union and in which we are going to participate to provide our expertise in the area of non-destructive testing in collaboration with a number of institutions and bodies within the aerospace industry and which have become our partners.



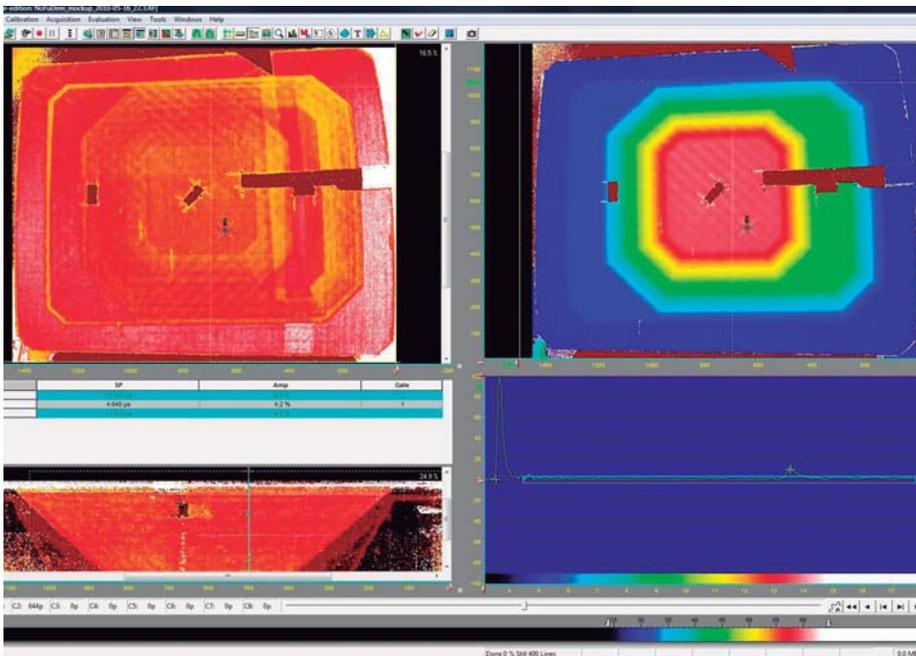
We will be meeting with many of them at the appointments that have been scheduled for us by the aerospace calendar and which we will attend in 2014. Jec Europe, Jec Asia, ILA Berlin, ECNDT or ADM Sevilla, are some of them. But this year, in Tecnatom we are especially excited offering all of our support to hold for the first time in Spain, the International Symposium on NDT in Aerospace, which will, in turn, be celebrating its sixth edition in November.

However, before all this, we marked a very important event on the calendar for us; on February 7th, we joined in for celebrations for M2M's tenth anniversary. Congratulations to all those who contributed to the growth of M2M day-to-day and through such efforts have proven that, in combining solvent projects and high doses of technology, they are capable of meeting industrial necessities. Teamwork is key to achieving innovative and competitive results and, between us, we will enjoy working together for many more years to come.

special report

Tecnatom strengthens its leadership in laser ultrasonic inspection and forms an alliance with Airbus for the first industrial application

NAMED TECNALUS, THE ROBOTIZED SYSTEM, WHICH WILL BE DEVELOPED IN THE FRAMEWORK OF THE PROJECT WITH AIRBUS, WILL ENSURE COMPLETELY AUTOMATED INSPECTION FOR SMALL AND COMPLEX GEOMETRY PARTS WITHIN THE A400M



Laser-ultrasonic of a c scan image and processing software developed by Tecnatom

Laser-Ultrasonic inspection, called LUS technology, increasingly prevails in the aerospace industry due to the many advantages derived from its advanced technology. Since it was discovered in 1963, various attempts have been carried out to introduce this technology on a large scale in the aerospace industry, however, lack of reliability of the first prototypes and high investment to develop these systems have delayed its industrial implementation.

For the time being, Tecnatom is managing itself to become a reference point for the aerospace industry in laser ultrasonic inspection systems. Thus, in 2010, our company in collaboration

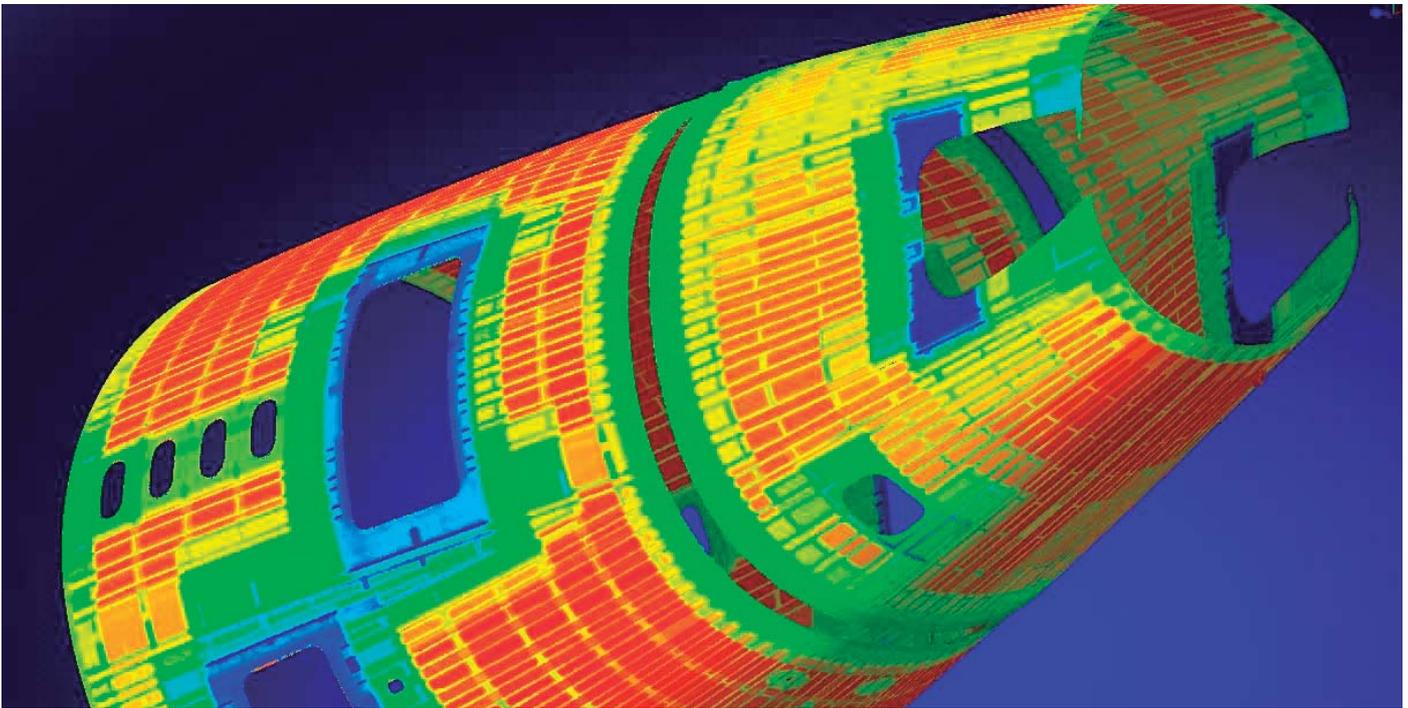
with iPhoton Solutions -with an exclusive representation in Europe and Asia- developed a new approach adapting technologies from the telecommunication, automobile and laser machining industries to produce a reliable, flexible and affordable LUS system, overcoming first problems. This is how Lucie was born, the first articulated robot mounted on a linear track equipped with LUS technology and that was installed for Airbus at the tech centre Tecnocampus EMC2 in Nantes to inspect aerospace components in the development phase. In addition to cost and time savings, the use of Lucie on a cantilevered linear track provides over 6 m. of penetration inside a structure.

As well as becoming a leading company in the area of non-destructive testing, Tecnatom also participates in the European initiative LOCOMACHS, LOW COSt Manufacturing and Assembly of Composite and Hybrid Structures, a project developed together with other 30 partners, aimed to reach faster and more cost efficient assembly of composite structural parts in the aerospace industry. Specifically, in the area of non-destructive testing, the project intends to reduce the NDT lead time by 30%. Investigations also show that this technology is more likely to produce better results to control small and complex geometry parts, that to date can only be inspected manually. Tecnatom's involvement in the

THE PARTICIPATION OF TECNATOM IN THE LUCIE AND LOCOMACHS PROJECTS HAVE LED THE COMPANY TO BECOME A REFERENCE POINT IN LASER ULTRASONIC INSPECTION SYSTEMS

project is related to the application of LUS technology to inspect composite structural components to address the challenge of reducing time, costs and improving efficiency.

This leadership in laser ultrasonic inspection now serves Tecnatom to form an alliance with Airbus and jointly develop the LUSTEAM project, an initiative to set up Europe's first industrial appli-



On the image, visualization of a 3D C-scan by means of ultrasonic inspection performed on the fuselage section of an aircraft

cation of laser technology to aerospace components in the production phase. Called TecnaLus, the robotised system developed within this project, will

be fully operational in spring 2015 and will ensure completely automated inspection for small (up to 1.5 m. x 1.5m.) and complex geometry parts within the

A400M, that to date can only be inspected manually.

“The TecnaLus equipment to be installed at the Airbus Centro Bahía de Cádiz, represent a qualitative technological leap, is quicker so it will in-

TECNALUS WILL BE FULLY-OPERATIONAL AT THE AIRBUS CENTRO BAHÍA DE CÁDIZ SITE IN SPRING 2015 AND WILL ENSURE COMPLETELY AUTOMATED INSPECTION FOR SMALL PARTS WITHIN THE A400M

crease productivity, will improve costs and consequently competitiveness” states Antonio Tanarro, Tecnatom’s manager of diversification and aerospace business development. “We look forward to providing a preview of the system development in the course of the III Seminar on NDT applied to the aerospace industry to be held on June-12th at our headquarters”, says Tanarro.

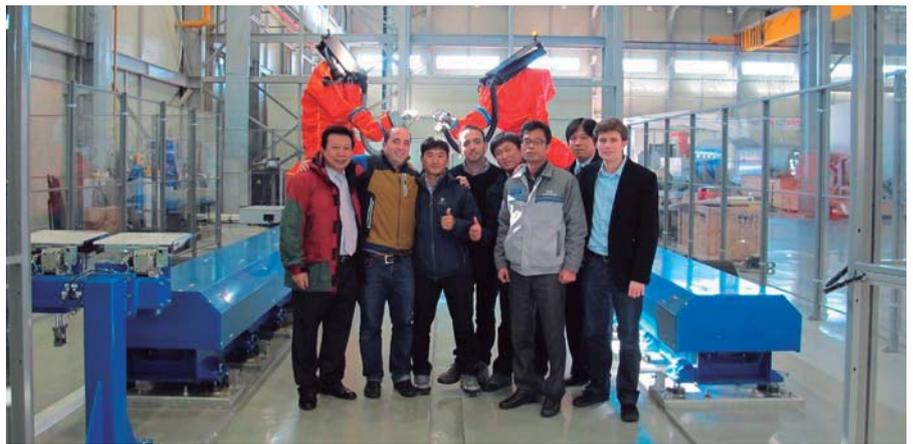


news

Acceptance tests on two new aerospace systems have been completed in Russia and Korea

Last November, Tecnatom successfully completed acceptance test on the system provided to Aerocomposit, the tech centre devoted to the manufacture of aerospace components in composite. Aerocomposit acquired one robotized inspection system mounted on a linear track for PE inspection using phased array. Specifically, after achieving acceptance test, the system is ready to evaluate the spars and wing covering manufactured in composite for the programmes of the Russian company Sukhoi.

Sukhoi is the world's third manufacturer of fighter aircraft and the major one in this country with capability to integrate the entire aircraft manufacturing cycle from engineering to after-sale services. Under the Russian aviation holding JSC and with a workforce of over 26,000 people, the company's business plan intends to expand its portfolio of engineering services towards civil and military aviation.



In addition, the piece of equipment supplied to GNTP, the Research Centre for Composite Materials within the Korean Aerospace Industry, has also achieved acceptance test and gets ready to enter into production.

In early 2013, this tech centre acquired an ultrasonic inspection system based on a twin-robot over linear track for water jet through transmission inspection or independent inspection of

two different products in local immersion. Once the acceptance test has been completed, the system is ready to evaluate complex geometry parts of helicopters and aircraft manufactured in composite.

These performances in Russia and Korea consolidate Tecnatom's business plan towards emerging countries, allowing the firm to keep on diversifying its portfolio of inspection system products.

Tecnatom will hold the III seminar on NDT applied to the aerospace industry in June

Next 12 June, We will hold the "III NDT Seminar, Tecnatom and the Aerospace Industry" at our headquarters in San Sebastián de los Reyes, a technical seminar intended to analyse the latest advances and technologies in the area of non-destructive testing applied to the aerospace industry.

Due to the success of the two previous editions, Tecnatom will hold this meeting for the third time that

now will have an international scope and will be open to customers, partners, and colleagues from all over the world. The aim of the event is to know first-hand the level of development being achieved and future trends within robotised laser inspection system, new phased array equipment and the new applications and benefits of these pieces of equipments and systems, such as non-destructive testing using wireless sensor network.

On the occasion of the seminar, Tecnatom will show the level of development of the new laser ultrasonic system, TecnaLus, within the LUSTEAM project, recently started in collaboration with Airbus, something on which you can find more information in the main report of this bulletin.

For further information on pre-registration, please contact: Antonio Tanarro, tanarro@tecnaTOM.es

Tecnatom technology, at the most important airshows



With the aim of networking with potential customers and focus our efforts on responding to their expectations, our company leading firm in engineering and specializing in non-destructive testing attends this year the most important airshows with our own stand from which we will showcase our state-of-the-art technology for the structural testing of very sophisticated components.

In March and November, Tecnatom will attend the two Jec Composites appointments; Jec Europe, in Paris throughout 11-13 March, and Jec Asia, in Singapore throughout 17-19 November. Both meetings constitute a meeting point and the platform of reference for the composite manufacturing industry in Europe and Asia.

Over one hundred of experts will meet up at the 6th International Symposium on NDT in Aerospace

Over 100 engineers, researchers, scientists and experts within the aerospace industry in the area of non-destructive testing from all over the world will meet up throughout 12-13 November in Madrid on the occasion of the 6th International Symposium on NDT in Aerospace. Tecnatom will support this initiative to take place for the first time in Spain and which is

Tecnatom will also be off to Ila Berlin in May 20-25, when it will meet up with greatest OEMs, tier one suppliers and service companies within the supply chain. In June 3-6, the company has another important appointment in Seville, which will hold the second edition of the Aerospace and Defence Meetings and that will serve Tecnatom to meet prime Andalusian aerospace players.

In addition, the Spanish company has presented its cutting-edge technology in the Aerospace and Defence Meetings Lisbon, Airtec in Frankfurt and Sampe China, as well as in the Seminar on Operational Security: Leadership and Security Culture on High Reliability Organizations”.

spread out over three days including keynote presentations, technical talks by internationally renowned experts within the sector, as well as technical visits.

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Inauguration of Ensia Expert S.L.



The opening ceremony of Ensia Expert S.L, a new company within Airbus Group Testia holding, devoted to non-destructive testing, took place last 4 November.

The event had the attendance of Tecnatom's General Director, Javier Guerra; Ensia Expert's CEO, Vicente Cortés-Testillano and Testia's CEO, Denis Gardin, as well as a number of important aerospace players who joined in to mark the occasion.

Ensia Expert S.L. business activities will be focused on providing non-destructive testing services in the area of training, production support, structural testing support and tear-down, as well as consultancy and equipment.

Tecnatom will collaborate with the new company and will provide its knowledge in the aerospace industry as its main differential asset.

Tecnatom participates in the CleanSky project, Europe's most ambitious commitment to create cleaner skies

More fuel efficient aircraft and cleaner and less noisy skies, this is the goal of the CleanSky programme, one of the most ambitious aeronautical research projects ever launched in Europe through public-private collaboration among a variety of enterprises and bodies. Tecnatom, together with CATEC, will take part in the programme and will provide its knowledge in the area of non-destructive testing.

The programme is intended to unite the aerospace industry in the research of novel methods, materials and systems to be applied to future airlifter types; therefore they have less environmental impact than current airlifters. The project management function will be performed by Clean Sky Joint Undertaking (CSJU), which will deliver demonstrators in all segments of civil air transport, grouped into six technological areas called Integrated Technology Demonstrators (ITD).

Precisely, Airbus, which is leading several ITD, has awarded the DiAAMond proposal within the consortium Tecnatom-CATEC to develop novel inspection approaches and automated systems for monitoring composite damage on line. Thus, our company joins in the project and will provide its expertise in non-destructive testing and in developing innovating inspection techniques such as thermography, shea-rography, air coupled ultrasounds and notably laser ultrasounds, which have turned it into a global reference point in that area. This new collaboration will contribute to strengthen the relationship between Airbus and Tecnatom, which have already developed together other initiatives such as TARGET and LusTeam.

The structural tests on composite components within an aircraft usually require destructive testing during execution in



order to measure resistance damage of panels under shear and compression in the course of the different stages of an aircraft within its operational life. Different types of defects are identified in the prove process (delaminations, rupture of fiber,

AS A RESULT OF THIS JOINT EFFORT, AN INSPECTION AUTOMATED SYSTEM TO PERFORM NON-DESTRUCTIVE TESTING DURING TEXT EXECUTION WILL BE AVAILABLE

etc) so continuous technical assistance and monitoring of the evolution should be provided. Airbus is currently performing structural inspections manually, which presents more difficulty when registering defect data and consequently when evaluating its evolution. In addition, inspections performed manually are also very slow and hence require human presence as test is running 24 hours per day.

This project, which will have a duration of two years, is intended to solve these deficiencies in the field of component inspection, dealing with the feasibility demonstration for a first phase, where suitable NDT technology and automation principles are going to be defined, identifying mechanical and software requirements of this kind of structural tests. This step will be followed by the verification phase, where a prototype will be manufactured and final probes executed. As a result of this joint effort, an inspection automated system to perform NDT during text execution and transmission of the results on-line will be available. The resulting demonstrator will provide many advantages for the manufacturing engineering process: quality, data recording, repeatability, total test time reduction and the saving in hours of human presence, the possibility of a very early detection, because no human presence would be required and, hence, this fact enables a larger number of inspections with a significant cost increase.

tecnatom group

M2M celebrates its 10th anniversary

IN 2004, TECNATOM PARTICIPATED IN THE ESTABLISHMENT OF THE FRENCH COMPANY, SPECIALIZING IN PHASED ARRAY ULTRASONIC INSPECTION SYSTEMS



M2M team at its facilities in Les Ulis, France

This year marks the 10th anniversary of M2M, Tecnatom's French subsidiary specializing in phased array ultrasonic inspection systems.

Encouraged by a strong vocation to provide state-of-the-art technology, M2M has been created from the alliance of two cultures, laboratory and small NDT enterprises, to develop, manufacture and trade in non-destructive evaluation systems.

In the course of all these years, the French company has successfully managed to develop modular and versatile phased array ultrasound systems for NDT, ranging from massively-parallel systems (256+ channels), to small portable and "pocket" systems. Among the users of its equipment there are industrial integrators as well as research laboratories devoted to investigation. M2M systems meet industrial requirements for inspection, including production services, set up and maintenance. Through the launch of PA UT portable

Gekko in late 2013, M2M is widening its market to all NDT operators within the aerospace, metallurgy, oil and gas,

THANKS TO PA UT PORTABLE GEKKO, M2M IS WIDENING ITS MARKET TO ALL NDT OPERATORS WITHIN THE AEROSPACE, METALLURGY, OIL AND GAS, POWER GENERATION AND THE AUTOMOTIVE INDUSTRY WHICH IS HELPING IT POSITION ITSELF AS A REFERENCE POINT IN THE AREA OF ULTRASONIC INSPECTION

power generation and the automotive industry which is helping position itself as a reference point in the area of ultrasonic inspection.

Today, M2M relies on a dozen of worldwide distributors, who have helped the

company sell over 500 systems under its own brand to customers deployed in 25 countries. It took 10 years of constant work and commitment to research and development supported by a team of 42 highly skilled people, including professionals in electronics, software, engineering and non-destructive testing, to get this far.

M2M is a growing company that in 2010 has expanded to Brazil, where the firm has set up a subsidiary, M2M do Brasil, and that continues developing worldwide thanks to a new delegation in Chengdu, China.

The participation of Tecnatom in M2M strongly fostered the international strategy of the company in the European market. Tecnatom thanks to M2M provides cutting edge ultrasonic equipment with capability to provide quick responses to customers as well as ensuring result quality.

markets

Tecnatom to supply new equipment to COMAC, China's prime passenger aircraft manufacturer

THE CHINESE GIANT HAS AWARDED TECNATOM A NEW CONTRACT, WHICH TOOK PART IN A TENDERING PROCEDURE TOGETHER WITH COMPANIES FROM ALL OVER THE WORLD

COMAC, China's prime passenger aircraft manufacturer has awarded Tecnatom a contract to supply ultrasonic inspection equipment. Being an invitation to tender of an international open competition, Tecnatom's proposal was the solution with the highest rating for the Chinese company which has chosen our firm for the procurement of equipment aimed to the Structural Strength and Com-

THIS IS ABOUT AN INSPECTION SYSTEM BASED ON TWO KUKA ROBOTS ON LINEAR TRACKS AND INCLUDING THE ULTRASONIC TECHNOLOGY TO PRODUCE THE TRANSMISSION AND PULSE-ECHO INSPECTIONS

posite Laboratory, within its Research Centre in Beijing. Thus, Tecnatom contributes to the technological development of COMAC in the field of inspection thanks to the introduction of its NDT solutions.

Specifically, this is about an inspection system based on two KUKA robots mounted on linear tracks, including the ultrasonic technology to produce the transmission and pulse-echo inspections, what ensures the complete evaluation of the parts and provides a control able to manage up to 6 axes (A1...A6) of each robot and the additional external movements (X axes) to a complete system of 14 axes. The robots can work in a cooperating way (TTU) as well as performing inspection separately (pulse-echo).

The ultrasonic devices include Water Jet End-Effectors for simultaneous



Image of the inspection system supplied to Shanghai Aircraft, when being assembled at the Tecnatom headquarters

application of through transmission and pulse-echo inspection techniques, thus giving a high flexibility to the system application to different material compositions (laminated, sandwich, etc). In order to improve the inspection system productivity, an automatic tools charger is considered. This element will incorporate the capability to carry out exchange of all the end-effectors in an automatic mode.

In addition, Tecnatom will also supply its Data Acquisition Software, that together with its Gentry software for scan path generation constitutes one of the most powerful UT Inspection suites available in the market.

COMAC first collaborated with Tecnatom in 2010 through Metalscan, one of its French subsidiaries. On that occasion Tecnatom supplied the Asian giant another ultrasonic inspection system based on industrial

robots to evaluate aerial metal bonded structural parts and resin-based composite structural parts. The piece of equipment, operating cooperatively through transmission techniques, was delivered to the plant that the Chinese giant has in Shanghai.

Tecnatom started to trade in its systems in China thanks to the collaboration with the Chinese Research Centre and the Chinese electrical company CGNPC, with which it formed the mixed company CITEC with the goal of becoming the main inspection system supplier of that country.

This new contract awarded by COMAC involves an important recognition for the company that doubtless endorse the years of business effort in China in the framework of a internationalization strategy to operate in the most promising markets.