#### THE DIGITAL TRANSFORMATION IS UNDERWAY

#### CRYOSTAR'S TRAINING CENTER

NEWS

## the CRYCOSTAR CRYCOSTAR DAGAZINE issue #39 - spring 2022



#### Sales of Cryostar's new NeoVP vertical pumps are taking off

"The commercial launch of our new line of multi-stage vertical NeoVP pumps in October 2020 quickly caught the interest of our customers", Simon Hautdidier, manager of Sales and Project Execution with the Process Machinery BU, reported enthusiastically. "We recently received two major orders for the Chinese market for the purpose of equipping our clients' air separation units. We will deliver in summer 2022 no fewer than 15 NeoVP vertical pumps, with a mix of two different frame sizes".

In addition to being easy to install and maintain, the NeoVP vertical pump offers an optimized hydraulic efficiency, resulting in substantial energy savings and reduced CO<sub>2</sub> emissions, reflecting the low electricity consumption of the motor. The NeoVP is safer, more efficient, and more affordable, and each model covers a wide operational range.

Cryostar is a global pioneer in air separation technology.

"We have been offering multi-stage vertical pumps since 1991", said Bruno Brethes, Director of the Process Machinery BU. "In fact, we were the first company in the world to develop and sell these pumps for use in air separation units, enabling a more efficient internal compression process for such plants. The design of the new NeoVP is based on the experience acquired over three decades, as well



The new NeoVP vertical pump

as on the feedback received from our clients who own 2500 vertical pumps sold by Cryostar to date."

Thank you to our customers for their trust and congratulations to the Cryostar teams for this performance!

For further information: https://cryostar.com/centrifugal-pumps/ electric/multi-stage/



#### A firm order for 2 EcoChill plants

Cryostar is pleased to report a firm order for 2 EcoChill plants for vessels for a well-known shipyard! The owner is a large LNG operator and the vessels are 174'000 m<sup>3</sup> LNG carrier.

The EcoChill 250 subcooler is rated for 1.5 t/h of boil-off gas treatment.

"The subcooler plant will be based on our proprietary design of rotating machines incorporating magnetic bearings and high-speed motor technology", Neil Wilson, Marketing, Sales and Project Team Manager, LNG Marine Equipment says. This key reference for Cryostar

places EcoChill firmly in the market! Congratulations to all involved!

For further information: https://cryostar.com/ecochillsubcooler-for-bog-management/





In an ultra-connected world, the digital revolution is changing not only the way we communicate but also the way we work in general, both as individuals and as companies.

Cryostar has taken advantage of current and future advances in digital technology. IFS is now our new ERP system. The GO Live was given in January 2022 after the training of more than 800 users. Its main objectives, in the long term, are to increase the quality of services to customers and to optimise Cryostar's overall performance by improving the daily life and work ergonomics of its users and, consequently, the efficiency of its processes.

Furthermore, the digitalization of our workshops was finalized in 2021 with the deployment of touch PCs in the work areas. This is a new step towards factory 4.0.

Cryostar's news is also rich in other major projects and successes. I would here like to mention, amongst others, our historic investment of 15 million euros in a new assembly and test building which will be completed this autumn, as well as the development of Liquid Hydrogen solutions and our recent commercial successes with new NeoVP and EcoChill orders.

All these challenges and market conquests have been met thanks to the commitment, motivation and professionalism of our staff, who **have won the trust of our customers in the long term.** Let us keep building on this trust without respite! Confidence is also a matter of state of mind... Let us be confident in the future, as Henri Bergson would put it: "The future is not what will happen, but how we plan on shaping it".

#### Samuel Zouaghi PRESIDENT

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## Cryostar's Training

> CRYOSTAR HAS HAD AN IN-HOUSE TRAINING CENTER SINCE 2006, WHICH OFFERS TRAINING FOR ITS CUSTOMERS ALL OVER THE WORLD, WITH TAILOR-MADE CONTENT, ADAPTED TO ALL EQUIPMENT AND SOLUTIONS. THE MISSION OF THE TRAINING CENTER: TO HELP ITS CUSTOMERS, AS WELL AS ALL THE GLOBAL SERVICE TEAMS TO WHICH THE CENTER IS ATTACHED!

hether they are crew members on LNG carriers, customers using distribution pumps or all types of turbines, Cryostar provides a customised educational response.

The training courses are given at Cryostar France's premises in Hésingue, or at the customers' operating sites or in one of Cryostar's Business Centers.

The evaluation of the training courses is excellent with a very high satisfaction rate of 90% on average in 2021.

"Thank you for the excellent service provided, it is much appreciated!" Or: "We would like to thank you for the excellent training you provided to our engineers. The quality of the training reflects the quality of the research, design and construction of the gas compressors and other ancillary equipment by your company".

This kind of customer feedback makes our in-house trainers proud and motivates them.

#### Focus on our trainers

The team comprises a technical group with more than 15 years of experience in the operation of Cryostar machines and installations. The team members have been validated for their expertise but also for their ability to lead interactive sessions close to the needs of the participants.

Theoretical training is provided by Jérome Becourt, training center manager since 2019 and Sebastien Schuh, technical trainer since 2018. A large part of the training takes place in-house at Cryostar, in a dedicated training room and on site in the workshop.

"Our training room has recently been refurbished to offer optimal teaching conditions. It is equipped with an interactive whiteboard and a range of equipment. Customers can also bring in their own equipment for maintenance and receive



training in the maintenance and the repair of their machine at the same time", says Jérôme.

Jérôme and Sébastien are assisted by the Repair Department for the practical training in the Cryostar workshop, as well as by the Field Service teams for the training sessions held at the customers' premises. "They provide us with invaluable support and assistance for all specific international training. We travel all over the world because customer proximity is a strong value that drives us on a daily basis", continues Jérôme.

"The health situation relating to Covid pushed us to innovate in order to adapt the teaching methods to the distance learning format," recalls Sébastien.



Jérôme Becourt, Training Center Manager

"We reviewed the entire process, which was divided into 3-hour sessions instead of 8 hours in order to keep the audience focused. We also favored interaction by reinforcing the time for exchanges, as top-down training courses where a presentation is given are not suited to video conferencing. Although it was successful, we still prefer face-to-face training as the best method. We are returning to face-toface meetings in 2022 for countries that are no longer under health restrictions", says Sébastien.

The team's schedule is divided between the preparation of customised training content, which can take up to 2 months as each piece Cryostar equipment has its own distinct requirements, the days spent running the training sessions and the engineering and follow-up of the training.

"Some customers have a lot of experience; they have been using our equipment for a long time and have very specific questions. These detailed questions can be passed on to our design engineers who will analyze and deal with the request, and then we ensure the fastest possible return to the customer, usually within a few days. It's a real team effort that mobilizes many internal skills", concludes Jérôme.



Sébastien Schuh, technical trainer

**To go further:** Training request form https://cryostar.com/training-sessions/



#### Typical content of a training course:

Module 1: Introduction - Safety rules Module 2: Theoretical principles and applied physics Module 3: Design - Manufacturing - Technology Module 4: Associated Auxiliaries - Electrical Panels Module 5: Instrumentation - Safety Systems Module 6: Installation - Operation Module 7: Maintenance and Failure Diagnosis Module 8: Dismantling - Reassembling - Testing Module 9: Review - Evaluation - Conclusion



#### New offices for Cryostar Automation in Capdenac (France)

The expansion of Cryostar Automation's premises in Capdenac, which started in 2020, was completed at the end of February 2022. The staff were excited to move into their new offices, and use the car park, which has already been operational since last year.



The new offices are comfortable, especially in terms of heat and sound, and offer a large additional working and collaboration space. Cryostar Automation celebrated its 20<sup>th</sup> anniversary in 2021. A beautiful growth adventure symbolized, among other things, by this office extension!





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#### Phoenix project: €15 million in a new assembly and test building

An investment of 15 million euros in a new 1600 m<sup>2</sup> assembly and test building is underway at Cryostar France, on its Haut-Rhin site. The project, named "Phenix", began at the end of 2020. The building, which has been under construction since January 2022, will be completed this autumn.

"The capacity for testing four- and sixstage compressors and turbines will be doubled. This investment is the largest ever in Cryostar's history. It illustrates the company's confidence in the future and in its growth opportunities", says Didier Walch - Cryostar's Director, Information System and Industrial Assets.

Cryostar has chosen an industrial building that respects the environment in terms of energy.



In particular, the building will have a green roof, solar panels and geothermal energy for heating, drawing on the water table up to 20 meters away.

We are also pleased to announce that the official inauguration is already scheduled for 19 December 2022! "This investment will enable us to continue our growth by further strengthening our flexibility and agility, and thus better satisfy our customers in terms of quality and deadlines",

concludes Olivier Werth, Cryostar's Director of Operations.



The 4 cranes were delivered and installed in March 2022. Each of the two halls is equipped with an 80t and a 20t crane.

## CRYOSTAR'S INFORMATION SYSTEM: THE DIGITAL TRANSFORMATION IS UNDERWAY

> "IFS" IS NOW CRYOSTAR'S NEW ENTERPRISE RESOURCE PLANNING (ERP) SYSTEM. THE GO LIVE WAS GIVEN IN JANUARY 2022 AFTER THE TRAINING OF THE 800 USERS BY THE KEY USERS AND FUNCTIONAL EXPERTS.

> he deployment of IFS is part of the Hercules programm, a corporate programm for the digital transformation of our information system.

> Its main objectives, in the long term, are to increase the quality of services to customers, to optimise Cryostar's

overall performance by improving the efficiency of our processes, to standardise our reference systems and tools, and to improve the daily life of the information system users.

By the end of 2021, the IFS project represented an investment of €5.3M including internal costs.

#### Frédéric Chenuet, Information Systems Project Manager

#### the CRYOSTAR MAGAZINE: What is the scope of this new Integrated Management Software Package?

**Frédéric Chenuet:** The scope of IFS integrates the sales, project management, design office, quality, planning, industrialization, purchasing, production, shipping, invoicing, after-sales service, human resources and finance business bricks. Each Cryostar employee will use IFS on a daily basis.

#### CM: What are the advantages and benefits, in particular for customers, in the short and medium term?

**F CH:** The benefits will be numerous! Planning management will be optimized and schedules made more reliable thanks to better monitoring at project level. IFS will also allow a more detailed management of production (scheduling), will give the possibility of grouping needs and will provide a better management of the installed base.

## CM: As IFS Project Manager, what particularly motivated you in this mission?

**F CH** After 10 years' service, I wanted to share my knowledge of Cryostar's business processes. This proposal was also one of the biggest and best professional challenges of my career. And finally, it was the most formative project in terms of functional management of a multidisciplinary team.

### CM: What were the keys to the successful implementation and deployment?

**F CH:** As with all change management, the human element was central to the success. We were able to count on the unfailing involvement and commitment of both the key users and functional experts. The business skills of the team members were invaluable. A project group also supported me in leading the teams, prioritizing activities and preparing for the migration. Finally, we could not have succeeded without the commitment of the management committee, which was very

attentive to the needs arising from the project, and without the flexibility of our employees, who were open to change, supportive and understanding. I would also like to emphasize the responsiveness of our external partners such as Concret and Ootary, who were just as committed to us as our internal teams.

### CM: What is your initial assessment of the Go Live event?

**F CH:** We are aware that there is still room for improvement and optimization, but I should point out that our previous tools were not built in a few months either... and as

our President Samuel Zouaghi regularly reminded us during this project, let's also look at the work we have done and appreciate what we have put in place. We have succeeded in switching two sites representing 800 employees in France to a new system integrating all functions... The project team is of course still in place to support us in this starting phase and to get back to a rhythm that will allow us to satisfy our internal and external customers as well as possible. At the same time as this launch, we have carried out a review of the organization of Information Systems our Department in order to best support these changes by integrating a functional unit within this department.



#### A project team based on key users and functional experts

#### The main tasks of the key user:

- By delegation from the management, he is responsible for the success of the project in his field.
- As the spokesperson for business expertise, he is processoriented, concise, curious, has a vision of what is at stake in his field and is a source of proposals within a context of change.
- As a key player in the definition of the solution, his detailed knowledge of the processes in his area enables him to describe them.
- He collaborates with the internal project management team. He is the business guarantor of the definition of all the processes in his field and their implementation in the chosen solution.
- He is able to challenge the operating methods in order to bring them into line with the ERP standard and best practices.

#### The main tasks of the functional expert:

- He expresses the needs and management rules associated with his business area.
- He is responsible for the proper execution of the internal work assigned to him in the context of the project.
- He actively participates in all the workshops led by his key user.
- He contributes to the drafting of documents related to the configuration.
- He participates in the creation of end-user training materials under the responsibility of the key user.
- He actively participates in the training sessions of the users of his domain according to the valid training plan and modalities.

#### **IFS: What is it?**

IFS is a multinational enterprise software company based in Linköping, Sweden. The company develops and delivers enterprise software to customers around the world who manufacture and distribute goods, maintain assets and manage service-oriented operations. Recognized as a leading software solution provider, it is trusted by more than 200,000 companies.



#### **Project history**

- End of 2018: choice of solution
- Early 2019: scoping of the IFS contract
- Mid 2019: start of the design phase
- Mid 2020: validation of the design and start of the implementation phase
- January 2021: start of the Human Resources scope
- Mid 2021: end of the implementation phase and start of the cross-functional testing and migration phases
- End of 2021: training of 800 users by Key Users and Functional Experts
- 10 January 2022: start-up of the France scope



# NEWS

#### **CRYOSTAR INTENSIFIES THE DEVELOPMENT OF SOLUTIONS FOR LIQUIFIED HYDROGEN (LH2)**

Our sales teams are more and more questioned about Cryostar's activities in the hydrogen sector. Indeed, this gas is increasingly at the center of new policies to curb global warming and reduce greenhouse gases, with some people even believing it to be "the ultimate clean energy" vector.

**Hydrogen storage is a challenge:** due to its low density, it occupies a significant volume so it is necessary to reduce this volume in order for it to be stored and transported efficiently. The most common ways of achieving this is to increase the pressure of the hydrogen (42 kg/m<sup>3</sup>) at 70 Mpa) or to liquefy it (71 kg/m<sup>3</sup> at -253°C). The market is gradually moving towards this last solution of **liquid hydrogen (LH2)**, given that it occupies 1/800th of its volume in the gaseous state (@ 1bar); the US market for example, with its high consumption, practically stores liquid hydrogen only.

"This is where the subject gets interesting for Cryostar. An application with a cryogenic liquid usually involves the use of a pump, our specialty. With nearly 400 hydrogen pumps sold since 2010, our goal is to become the market leader in dynamic LH2



Claire Rivollier, Cryostar Distribution Business Unit Director and Michaël Huss, Hydrogen Business Developer

distribution solutions by 2025", said Claire Rivollier, Cryostar Distribution Business Unit Director.

#### A complete range of high-pressure piston pumps

As of today, Cryostar offers a complete range of high pressure MRP and LDPD piston pumps, providing pressure up to 500 bar with a flow rate of up to 930 kg/h.

Light mobility, and heavy mobility in a very near future, are going to be developed around hydrogen applications where the pumps will be used for bunkering or filling vehicles such as cars, buses, trucks, trains in very short-term, then ships and planes in the medium to long run.

Also, the gas companies producing the molecules require liquid hydrogen vaporization solutions to transfer it into the tube trailers for delivery; our Cryostar Automation entity, specialized in the filling of industrial and medical gas cylinders, already meets this demand with a turnkey solution. These same gas companies will soon be looking for solutions to optimize the loading times of semitrailers used to transport liquid hydrogen; we are therefore in the process of developing a range of centrifugal pumps to address this future need.

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In addition, other energy-related applications such as hydrogen supply to gas turbines and network decarbonization will soon see the light of day, on which Cryostar will need to position itself.

To meet the challenges posed by this booming market, and under the impetus of Claire Rivollier, **Director of the Distribution Business** Unit, a working group was set up, bringing together the company's various strategic activities (sales, purchasing, R&D, technical support product management), and which will be moderated by Michaël Huss, Hydrogen Business Developer. The task of this group is to build and consolidate the overall Cryostar technical and commercial offer and to initiate the product developments that will allow us to achieve the abovementioned objective.

Some may say that hydrogen seems to be a fashion or media thing, however a huge amount of money has been dedicated to the promotion of this ultimate clean energy vector, both at international and local levels. Along with other renewable energy sources, Hydrogen is a key element in solving the global warming equation and is fully part of all greenhouse gas reduction plans. As a technological leader in the world of cryogenics since its creation, Cryostar clearly intends to become a major player in this field in the short term.

### For further information on our Hydrogen solutions, please consult our dedicated website:

www.cryostar-hydrogen-solutions.com



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#### About hydrogen

Hydrogen is the most common element in the universe (75% by mass and 92% by number of atoms constituting the latter), it is destined to occupy a prominent place as a sustainable energy vector, since its use generates only heat and water.

Hydrogen does not exist anywhere on earth in a pure state; always part of another element such as water or a hydrocarbon. It can only be produced through processes such as the electrolysis of water or steam reforming of fossil fuels. We then talk about green or grey hydrogen, pink if the electricity used in electrolysis comes from nuclear energy or blue if the CO<sub>2</sub> produced by the reforming is captured.

Hydrogen also has very specific characteristics which greatly influence its use: it is one of the lightest gases in the table of elements: ~0.09 kg/m<sup>3</sup> at atmospheric pressure, approximately 13 times less than nitrogen, it has a very low boiling point, -252.9°C, and it evaporates and ignites very easily. Very special infrastructures are therefore essential for its use, particularly in terms of materials, insulation and safety.

# NEWS

#### CRYOSTAR'S DISABILITY COMMITTEE GETS DOWN TO WORK!

The Cryostar Disability Committee was officially formed this summer. The 14 members have been meeting for several months; they are committed to helping however they can, depending on their professional skills, in collaboration with Cryostar's disability contact person, Virginie Fillinger.

Their primary role is to act as an intermediary to facilitate discussion about disability through a large number of actions such as accessibility, security, recruitment, disability awareness... "Cryostar is committed to a fundamental approach to inclusion and diversity. Disability is an important element of our CSR policy, and an integral part of our Reason for Being. We believe that having people with disabilities among our ranks enriches our human capital", explains Annie Bonnot, Human Resources Director.

Cryostar is also pursuing its efforts to obtain the "welcoming disabled company" label according to the NF X50-783 standard.

Let's work together to overcome disability! #BeCryostar

### Cryostar strengthens its storage facilities

Two new storage areas on the Hésingue site (France) have been in use since spring 2022. With a total surface area of 750 m<sup>2</sup>, they have the capacity to house some 850 pallets stored on racks under 2 marquees.

"Cryostar rents a component storage service from a logistics specialist located in a neighboring commune. With these new storage areas integrated on the Cryostar site, we gain in reactivity thanks to the speed with which products are made available to production or to our customers, while reducing our carbon footprint by eliminating the need for shuttles", explains Damien Peter, Cryostar's Maintenance and Industrial Infrastructure Manager.



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#### **VERY HAPPY BIRTHDAY TO CRYOSTAR BRAZIL!**



We are very pleased to wish a VERY Happy Birthday to CRYOSTAR BRAZIL, which has had a repair and production center in Vinhedo in the São Paulo region since 2012.

Cryostar's management visited Vinhedo on 21 February. Cryostar's President Samuel Zouaghi thanked Nilson Junior and the entire staff for their commitment, motivation and professionalism without which, the challenges and successes of the Central and South American markets could not have been met and won.

He then retraced Cryostar Brazil's progress and outlined the future prospects. "In just a few years, Cryostar has become a reference in Brazil thanks to its continuous growth. The year 2022 promises to be exciting, with an investment in the modernisation of the liquid nitrogen test bench and the continued growth of the Business Center, especially due to the very promising opportunities in the LNG market".

Samuel Zouaghi took advantage of this Brazilian trip to meet several customers. He noted: "We have had an impressive amount of positive feedback on the quality of our services and the longevity of our equipment, especially our truck pumps. Although we expected to be well received, the praise was heart-warming. Bravo and thank you to all the Cryostar Brazil teams".





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