



# Valinox Nucléaire: Committed to supporting China's nuclear industry

Since its establishment almost forty years ago in Burgundy, France, Valinox Nucléaire has been dedicated to the manufacture of nuclear steam generator tubing. With more than 55% of the world's market share, the company has become a world leader in the steam generator tubing industry. Their references cover 80% of the existing and under construction nuclear projects in China, the world's biggest nuclear new build market and the most significant geographical market for Valinox Nucléaire. As a commitment to the Chinese nuclear industry, Valinox Nucléaire invested above EUR 55 million to build its first Chinese production base in the Nansha District of Guangzhou City. The company's ideology is to serve its Chinese clients even better in the future. The first stone of the new mill was laid on May 26<sup>th</sup> 2011. Two months before the opening ceremony of the new plant on June 6<sup>th</sup>, 2013, Nuclear Exchange visited the new mill to catch up with the company's COO, Mr. Gérard Kottmann, and the General Project Manager of the Chinese plant, Mr. David Bousquet.

*By Sunny Huang, KCI Publishing Shanghai, China*





Valinox Nucléaire was established in Montbard in 1974 when France launched its nuclear program to build 58 nuclear reactors. Since then it has supplied over 360 steam generator tube bundles to every type of Pressurized Water Reactor (PWR) around the globe. “We produce only steam generator tubes and some nuclear environment products, relying 100% on the nuclear industry. This sounds restrictive, but it actually shows that we are highly specialized in these products and allows us to focus completely on the continuous improvement of our production,” says Mr. Gérard Kottmann. Owned by the Vallourec Group, a world leader in premium tubular solutions primarily serving the energy market, Valinox has

flourished under the wing of this powerful parent company. By the end of this year, its manufacturing capacity will have quadrupled in just five years thanks to the strong financial investment from the Vallourec Group.

### Expansions in France

Before 2008 the plant in Montbard maintained a capacity of around 1300 km of tubing a year. In 2008, however, the company decided to expand its capacity to meet both the rising demand from the Chinese new-build market and the French maintenance market. “We first eliminated the bottlenecks by streamlining the handling facilities, which increased production capacity by 30%, and then we moved up to 24 hour, 7 days per week production which added another 10% to our capacity,” continues Mr. Kottmann. “So this first expansion increased our capacity by 40% in 2008. It was a successful investment because we received orders to fulfill the capacity immediately.”

Meanwhile, the company also decided to build a new mill, which became its second expansion phase in France. The first stone of the new mill – on the same site in Montbard – was laid in October 2009. “The reason why we built the new mill on the same site was because we wanted to make sure that the new mill was staffed with the same level of expertise. The proximity of our experienced workers to the existing mill was essential in order to train new workers on the same premises,” explains Mr. Kottmann.

Together with the first expansion, it has increased the company’s annual capacity to 5000 km, and with long-term orders

from customers worldwide, the company now has a solid basis for production for many years to come. Despite the fact that the opening ceremony for the new mill was actually held in April 2011 – only one month after the Fukushima accident – it has, nevertheless, been running at full capacity ever since, especially thanks to the demand from the Chinese market.

### Approvals and products

Both Valinox French mills have been approved by RCC-M and ASME (MM+MS) standards, and the company is also the first manufacturer of its kind to be approved by the Chinese nuclear standard, HAF 604. Today, in its state-of-the-art mills, the majority of the steam generator tubes are U-bent in Alloy 690. The world’s first steam generator tubing bundle made of Alloy 690 was delivered by Valinox back in 1985. In addition, the company can also produce in Alloy 800 and square bent tubes.

“We can produce according to all major specifications” says Mr. Kottmann. “We routinely provide tubes for Generation III EPR and AP1000 reactors. For the AP1000 reactors around the world we have also delivered a very special type of product in Alloy 690, called the “C”-tube bundle”. We are the only suppliers of this type of product. The tubes are doubly bent through 90 degrees, with a large bent part, and short legs. This type of tube will be also used in CAP 1400 projects.”

In addition to the steam generator tubing for which the company is renowned, Valinox also produces nuclear environment products (NEP). Mr. Kottmann explains:

“While every nuclear plant needs hundreds of kilometers of steam generator tubing, it also requires



Valinox Nucléaire’s new plant was inaugurated in the presence of Ding Hongdu, permanent member of PCC’s committee for Guangzhou city and Bernard Bigot, General Administrator of the French Atomic Energy Commission (CEA), Philippe Crouzet, Chairman of the Vallourec Management Board.





*Mr. Gérard Kottmann (left), and the General Project Manager of the Chinese plant, Mr. David Bousquet.*

a great deal of smaller tubular products in the reactor building. These tubes run from the reactor vessel to the instrumentation and control rod drive mechanism, and from above and below the main vessel. NEP are produced to very exact specifications, mainly in Alloy 690. They are required in many different sizes, often in very small quantities such as a few meters or even just a few centimeters, yet every one must be fully documented. We utilize all the resources of the Vallourec Group to supply NEPs as a service to our customers. One of our best known products is the Control Rod Drive Mechanism (CRDM), also known as the Pressure Vessel Head Penetration Tube. This vital tube allows the control rods to be rapidly lowered into the reactor vessel and stop/slow the nuclear reaction. CRDMs are produced to extremely high tolerances. Between 50 and 90 are required per reactor and Valinox is one of only two companies in the world that can produce these tubes, as well as other products such as heater sleeves, vent pipes."

### China experience

The Chinese new-build nuclear market is presently regarded as the most significant market for suppliers. Valinox's first experiences in the Chinese market can be traced back to 1992, when the company supplied steam generator tubes to the Daya Bay Nuclear Power Plant via AREVA (called Framatome at that time). Mr. Kottmann: "After the Daya Bay project, we supplied to a number of projects in China, such as Qinshan Phase II, a CNPE 600 Model, and Phase III (the only CANDU reactor running in China, to which we supplied our steam generator tubes in Alloy 800), the Ling Ao I&II projects, and the Fangchenggang NPP and Ningde NPP. We are very proud that today we have supplied steam generator tubes to 80% of the existing (and under construction) nuclear power plants in China."

### Expansion in China

Building a new mill in France is not the full extent of the Valinox's investment plans, however. "Our strategy is to meet market demand and today the most promising market is in China," continues Mr. Kottmann. "After we had barely started the second expansion in France, we looked at our market survey and realized that we did not have enough capacity – also to achieve a closer service to our Chinese customers and at the same time shorten delivery times. Transportation from France to China normally takes two months, so in 2010 we decided to invest in building a new plant in Guangzhou, China; a well serviced area with a strong French presence and where our biggest local customer is located."

Despite the impact of the Fukushima accident, Valinox laid the first stone of its Chinese mill on May 26<sup>th</sup>, 2011, around two months after the accident, demonstrating its strong commitment to the Chinese nuclear market. He recalls the experience: "We asked ourselves whether to stop the project before the ground-breaking ceremony but chose to uphold our beliefs in the nuclear energy expansion in China. The truth is, after the Fukushima accident, China took time to review its nuclear projects and adjust a number of requirements, especially those with regard to safety, security and the quality of the components used in the NPP. In hindsight it was the right time and the right place for us to continue accompanying the Chinese nuclear program especially since we fully master the compliance to these new safety requirements."

The new plant covering 13000 m<sup>2</sup> of land will host 200 employees. In addition to the workshop and offices, the new mill will be also equipped with a lab functioning as a testing center for customers.

"The only difference between this Chinese mill and our French mills is that it will produce only U-bent tubes, and that it is capable of producing longer tubers than the French mills" says Mr. Bousquet. "The new mill was built to service the Chinese markets better and we have transplanted all the good practices and experience from our French mill, including the type of equipment used, to this new Chinese plant so there will be no difference in the quality of products." To maintain the same level of production know-how, the company has put a lot of emphasize on training the Chinese operators in the new mill through an intensive program. "This year, there will be at least three phases of training apart from regular trainings," explains Mr. Bousquet, "The Chinese workforce here will be trained by our French ex-pats, and the English speaking Chinese engineers we have recruited will be trained in France. They will then come back to train our workforce and overlook the operation of the mill. Training will also continue on a regular basis in the future years. Communication between the teams in China and in France is also kept smooth through a direct video link."

On June 6<sup>th</sup> 2013, Valinox will hold a grand opening ceremony for the new mill, and the first tube is expected to be produced by the end of June. The company is now applying for HAF 601 certification and they expect to start mass production by end of this year.

"Through our local sales office in Beijing, we have always been receptive to the needs of Chinese customers but the bigger team in the new factory will enable us to offer even more premium service to them and not only in terms of lead times. Our ambition is to build the Chinese



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mill into the best steam generator tube manufacturer in the world!" concludes Mr. Bousquet.

### Consistency in Quality

Over the years Valinox Nucléaire has gained an excellent reputation for its performance in the nuclear industry. It is famed for its impeccable track record with regard to quality.

"To maintain such high standard requires an outstanding level of expertise in manufacturing. Our most important asset is the knowledge and experience that our staff bring to our products," explains Mr. Kottmann, "Utilities want an experienced partner they know they can rely on. This industry is restricted to companies who have strong financial, technical, and human resources to support their presence. These are not products you can buy through a distributor; direct communication with the fabricator is essential. Customers choose our products because of our excellence. Additionally, because of our strong customer focus, it is essential that our staff understand our customer's needs and the applications for our products. Twice a year we shut down the whole plant for a day to hold an information day, which every employee attends. We do this because we work for our customers, and we need to give our employees the idea of who they are and what they want."

### To the future

Talking about the future of the nuclear power industry, Mr. Kottmann is confident: "The Fukushima accident definitely had a strong impact on the nuclear industry in Germany, Italy, and Spain, but when you look at the market today, there are still a lot of countries that are choosing nuclear power, such as China, Saudi Arabia, United Arab Emirates, India, even European countries like United Kingdom, Poland, the Czech Republic, and Finland. For these countries, nuclear power is an essential part of their long-term energy



*The company has intensively trained the workforce for its new Chinese plants to maintain the high standard of quality its products demand. The Chinese workforce will be trained by French ex-pats, and english speaking Chinese engineers have been trained in France.*

needs. Nuclear energy is environmentally-friendly as it prevents carbon dioxide emissions. France for instance, generates 75% of its electricity from nuclear power and really meets the call for the reduction of carbon dioxide emissions. He continues: "The Fukushima accident was actually a good reminder that the nuclear industry before anything requires absolute quality, long-term experience and very dedicated facilities. We meet these requirements better than any other."

With the development of new Chinese designs like CAP1400, ACP1000, ACPR

1000, Valinox is set to target itself to the export market. "We understand that China is now building up a very strong nuclear manufacturing base, and that in the future it will venture to export nuclear technology to other countries. With an excellent worldwide reputation, based on our capabilities and experience, we believe that we can be a good asset in this chain. It is a win-win business between Valinox and all our customers who will in the future build nuclear power stations in many countries in the world."

### Valtimet- Brother Company of Valinox

Valtimet has always been supporting nuclear power in China and has supplied welded tubes for most of Chinese Nuclear Power Plants. It initiated a localization process more than 15 years ago to support ambitious Chinese Nuclear development and this process accelerated recently with increased demand for local content and development of specific designs for the Chinese market. Valtimet started to localize part of its production in 1996. Today, it has transferred its technology for High Pressure FeedWater Heaters in its Changzhou plant and for Titanium Condensers in its Xi'an plant, a joint venture with Baoji Titanium. Valtimet has also been collaborating with Chinese engineering companies and institutes to support them designing new nuclear technology, particularly the MSR equipment.

### Facts & Figures

<b>Name:</b>	Valinox Nucléaire
<b>Founded:</b>	1974
<b>Headquarters:</b>	Montbard, Burgundy, France
<b>Products:</b>	Steam generator tubing and nuclear environment products
<b>Materials:</b>	Nickel Alloy 690, 800 and special stainless steels
<b>Size range:</b>	O.D.: 15 mm-25 mm, U-bent tubes with straight length up to 25-27 meters long, Capable to manufacture up to 30 meters long in the Chinese mill.
<b>Production facilities:</b>	Montbard, France; Guangzhou, China
<b>Production capacity:</b>	6800 km/year



*The Guangzhou plant will exclusively produce U-bent tubes for the nuclear industry.*

