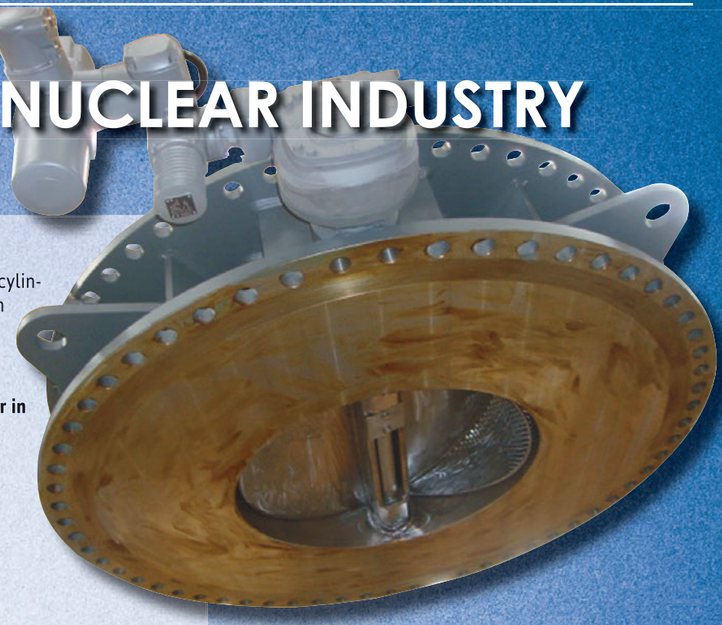
ADVERTORIAL

RINGO VÁLVULAS: YOUR RELIABLE PARTNER IN THE NUCLEAR INDUSTRY



RINGO VÁLVULAS is a valve manufacturer whose activities include all operations relating to valves, including the design, calculations, manufacture, assembly, testing, certification and marketing of the products supplied to a global market. The company has extensive, modern facilities of over 14.000 m² with state-of-the-art installations and equipment for the assembly, testing, inspection, painting and packing of valves.

RINGO VÁLVULAS KEY FACTORS

Some of the main characteristics of **RINGO VÁLVULAS** have been the factors that have driven the company to succeed in different markets and, particularly in the nuclear field:

RINGO VÁLVULAS offers a **wide manufacturing range** that includes Ball valves (Top Entry, Side entry & In-line serviceable), Control valves (Linear, Axial & Rotary type), Gate valves, Globe valves, Check valves, Butterfly valves, Diaphragm valves, and many other special valves manufactured and tested to many different design standards, sizes and ratings. RINGO has the capability to supply all the mentioned valves manual or actuated. This wide scope of valves allows **RINGO VÁLVULAS** to offer complete packages to customers.

RINGO VÁLVULAS products have been, and are continuously being supplied to many different countries and sectors of industry, i.e: Oil Refineries, Petrochemical Plants, Water Treatment Facilities & Desalination Plants, Energy Production (Thermal, Hydro & Nuclear Power Plants), Off-shore Oil Installations (both Topside & Sub-Sea), Oil & Gas Terminal storage, including both overland and subsea transmission pipelines. This variety of specifications and requirements have increased the experience of **RINGO VÁLVULAS** to strength his **flexibility to offer cost effective engineered valves** for critical and/or severe applications in the different industry fields mentioned above.

RINGO VÁLVULAS Engineering Department is formed by a team of more than 15 Engineers, with more than 20 years of experience in valves for the nuclear industry. **RINGO VÁLVULAS** has also the capability to perform and supply to customers any kind of calculation related to the valves: strength, seismic, noise, fluid dynamic and Finite Element analysis (FEA)

In the nuclear sector, **RINGO VÁLVULAS** has designed all kind of valves in all nuclear classes- up to class 1- **for the different nuclear technologies PWR and BWR**, including valves for some of the most critical services in the plant.

It is important to remark the capability of RINGO to **design, manufacture and supply control valves for critical conditions: high temperature, high pressure drops, high flow rates, cavitation, flashing, noise, etc... RINGO VÁLVULAS** has an extensive range of valve trims in order to make the sizing and selection of the most suitable one in order to get a good performance regardless how complex the service is.

RINGO VÁLVULAS working procedures are based in a **very robust Quality Assurance program** that was developed and implemented based in the company policy that is oriented to promote and enhance a **quality and safety culture** which is one of the key to success in nuclear field. All **RINGO VÁLVULAS** staff is aware of this policy and the philosophy of every member of the company is based on that: quality and safety are the key factors to succeed in the nuclear field and this culture has driven **RINGO VÁLVULAS** to get into the Approved Vendor List of some of the main Plant Designers and End Users, as well as to obtain its international certifications, with special mention to the fact that **RINGO VÁLVULAS holds the ASME III "N" and "NPT" Stamp.**

RINGO VÁLVULAS prides itself in having highly qualified personnel in each and every area. All departments are led by personnel with **long experience in the valve business**, with an average of over 20 years in the supply of all kind of valves. This experience makes **RINGO VÁLVULAS** staff to understand the particularity and needs of the nuclear market: such as the **short time response, quick deliveries, importance of deliveries and a good after sales service.**

RELEVANT REFERENCES IN YEAR 2016

During year 2016, **RINGO VÁLVULAS** has completed the supply of different orders through its partner Okan to Rosenergoatom and Atomstroyexport for the nuclear Russian market not only in Russia but also in third countries, such as Belarus, Bulgaria or China. For this particular cases, a common requirement of these contracts is the manufacturing and qualification of a prototype, before producing the complete scope of the order. These prototypes are subject to different tests defined by client and based on the actual function and working conditions of the valves. Two examples of the prototype tests are detailed below:

1) Globe control valves Nuclear Class 3, for the level regulation in Steam Generator for the Belarus NPP (Belarus) - 16 pieces

Scope of this supply is detailed as follows:

Size:	DN400 (8 pieces); DN150 (8 pieces)
Design pressure:	12,9 MPa
Working fluid:	Feed water
Design temperature:	250 °C

Function: Control globe valves DN 400 and DN150 are installed before Steam Generator and the working fluid for these valves is feedwater. The main purpose of these valves is to provide all working modes of Steam Generator during whole NPP lifetime: the valve DN400 is placed on the main pipeline and used for nominal modes of Steam Generator while the DN 150 valve is placed on a by-pass line and making the regulation for the starting and stopping modes of the Steam Generator: this was a technical challenge because the DN150 valve has to regulate more than 17 different cases so minimum required rangeability was 164:1.

RINGO selected its special balanced trim with multicylinder cage and cascade in order to reach the required high rangeability and, as part of the customer inspection, this valve was Cv tested getting a satisfactory result with a rangeability of 200:1

2) Angle Control Valves NC 2 for the Pressure Regulator in Main Steam Pipeline of Belarus NPP (Belarus) – 8 pieces

Valves characteristics are as follows:

Nominal diameter:	DN300 x DN400
Class:	900#
Design Pressure:	8,6 MPa
Max. pressure drop:	8,6 MPa
Design temperature:	300°C
Working fluid:	Steam, water steam mixture, Water on saturation line
Material:	Fully forged valves in A-105

A prototype of these valves was produced for approval and following tests were performed on it:

- Shell, gaskets & seat test
- Cycling test at 295°C (number of cycles: 5 of saturated water + 5 of steam-water mixture + 245 of saturated steam). Records were taken for stroking time, torques and leakage rate.
- Thermal shock resistance test (4 cycles with immediate temperature drop from 295°C to 100°C at 8,6MPa)
- Seismic resistance test
- Cv test to compare with the theoretical curve
- Final cycling test (40 cycles)

All the above mentioned tests were performed with full satisfactory result.

On the other hand, **RINGO VÁLVULAS** is currently manufacturing a contract to Hitachi Nuclear for the supply of 14 pieces of gate, globe and check prototype valves up to nuclear class 2, to be qualified for the pneumatic system of injection of the control rods. Another remarkable milestone is that **RINGO VÁLVULAS** was awarded with the first contracts for the Krsko NPP (Slovenia) including the supply of 5 safety related swing check valves for the Alternate Residual Heat Removal system (ARHR). All these valves are nuclear class 2 and have to be designed, manufactured and inspected to be N-Stamped according to ASME section III. The contract shall be supply through Tecnatom. Moreover, **RINGO VÁLVULAS** is producing a contract that includes more than 1000 valves in nuclear classes 2 & 3 to TVO for the Olkiluoto NPP (Finland) Emergency Diesel Generators (EDG´s replacement project in units OL1 & OL2)

During year 2016, **RINGO VÁLVULAS** has also strengthened its position in the Spanish nuclear market where has made some relevant supplies, like a contract for the CAGE (Alternative Center for Emergency Management) of Ascó and Vandellós NPP's, including gate, globe, check and ball valves. Moreover, **RINGO VÁLVULAS** is currently producing a package of valves for the Contention Filtered Vent of TRILLO and ALMARAZ NPP, including globe valves and high triple eccentric butterfly valves up to DN 400.