



*CONUAR 42 years serving nuclear industry*



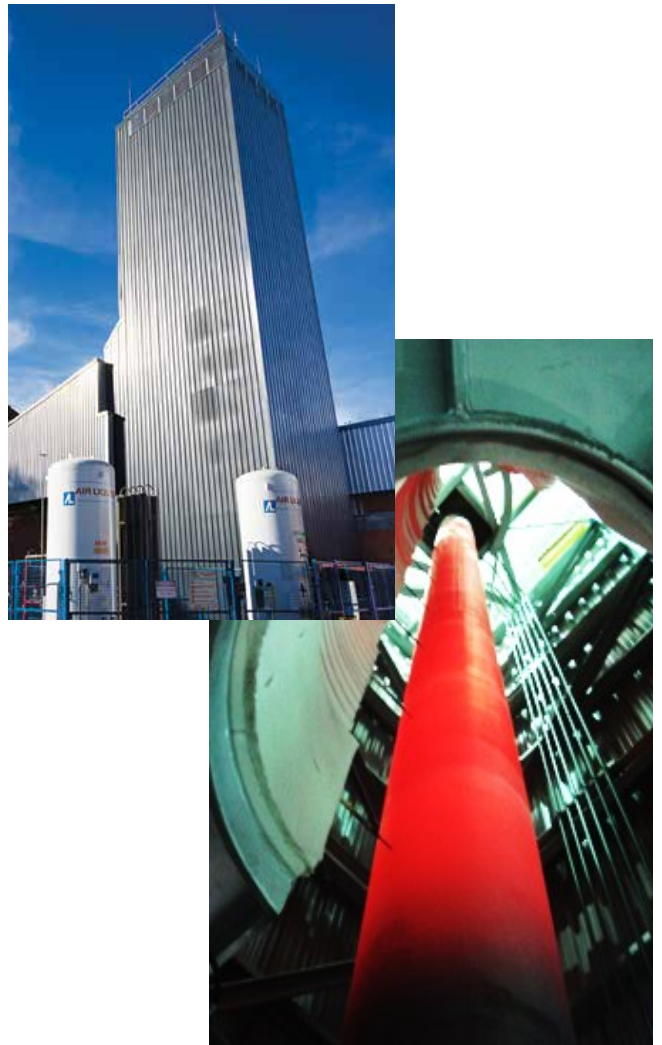
Safety Related Components - Helical-Coil Steam Generators  
CANDU<sup>®</sup> Reactor Internals - Remote Controlled Tools  
Seamless Tubes for Steam Generators  
Engineering, construction, assemblies & services  
Nuclear Fuel Bundles



Headquarters and three tailored facilities to manufacture nuclear components and tubes.



Controlled atmosphere workshops



High-Vacuum Vertical Furnace  
10m high; open muffle view.

## WHO WE ARE

**CONUAR** is a private corporation founded in 1982, our shareholders are since very beginning the National Atomic Energy Commission and Perez Companc Group. Headquarters and manufacturing facilities are located in same site and counts with offices and specialized workshops with a total foot-area of 35,000 m2.

**CONUAR** has three business units:

### **Nuclear Fuels**

NF manufactures since 1982 fuel bundles for PWR, PHWR and Material Test Reactors plate types, from NU, SEU and EU up to 20% enrichment. NF also manufactures Reactivity Control Rods.

### **FAE**

FAE manufactures since 1986 cladding tubes for nuclear fuel bundles and seamless and special welded tubes for nuclear, aeronautical and petrochemical markets, made of alloys, such as: Zirconium, 600, 690, 800, 800H, 825, stainless steel, Duplex and Titanium Gr.9 & 2.

### **SM&S Special Materials & Services**

SM&S manufactures nuclear components since beginning of 90's and also supplies engineering, construction and services.

[CONUAR's 40<sup>th</sup> anniversary video @LinkedIn.](#)

## Special Materials & Services

**SM&S** supplies effective solutions for the local and international nuclear industry, manufacturing reactor's internals, nuclear components and also supplying services, such as:

CANDU®6 Reactor internal components: Pressure Tubes, Calandria Tubes, Shield Plugs, Channel Closure Plugs, End Fitting Assemblies, Feeders & Supports.

Heat exchangers and Helical-coil Steam Generators for Small Modular Reactors.

Dry Storage and Transfer Flasks for spent fuels and radioactive waste.

Tailor made Classes 1, 2 & 3 pressure vessels & supports.

Engineering, construction and assembly services in controlled areas.

Devices & loops for Materials Test Reactors.

Fuel Bundle Coolant Channels for PHWR.

Guide Tubes for Reactivity Control Bars.

Neutronic Fluxmeter Guide Tubes.

Boron Injection Lances.

Remote Controlled Handlers and Tools.

Nuclear fittings and piping spools.

Quality Assurance Program  
ASME BPVC Sec.III, subs. NCA-4000  
10 CFR 50 Appendix B & 10 CFR 21  
CSA N299 & N285.0





Helical-coiled Steam Generator  
alloy 690 - CAREM25 SMR

## SM&S capabilities

Engineering Services.

Clean-Workshops.

4 & 5 axis CNC precision machining.

CNC large diameter double chuck lathes, equipped with specialized boring bars for deep precision machining at ~3m deep within inside diameters of 120 mm.

CNC Milling & Grinding machines.

Several precision CNC Waterjet Cutting machines.

Complex Assemblies.

Special welding services: GTAW, GMAW, SMAW, manual, semi-automated and robotized.

Heat Treatments: High Vacuum Vertical Furnace for pieces of equipment up to 6m length and, H.V. or inert atmospheres horizontal furnace for components up to 35m length.

Cold Rolled Joints: Zirconium alloys and stainless steels.

Surface Treatments: shot peening, autoclave and others, CNC precision tube and plate bending.

Specialized metrology services: several CMM up to 4m.

Mechanical, chemical, metallurgical laboratories.

NDT: X-ray and Gamma, UT, fluorescent MPI and dye-penetrant, Eddy currents, Helium leak tests.

Portable ScanArms for 3D measurements of small to medium size parts and Portable Laser Tracker for measuring large 3D parts and assemblies.

On-Site constructions and assemblies on controlled areas. Watch [@LinkedIn](#) the construction and assembly of the 550 tons [Reactor Liner Contention](#) carry out by CONUAR at the CAREM25 Modular Reactor project-site.

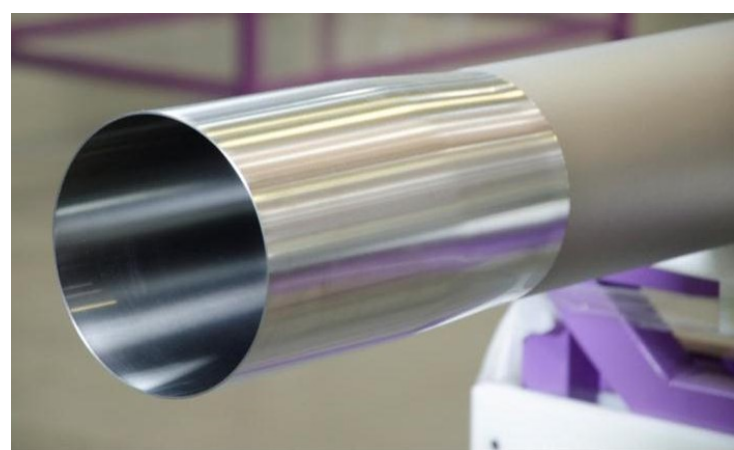


**CANDU®6 EMBALSE NUCLEAR POWER PLANT  
DELIVERING 648MWe OF CLEAN ENERGY TO GRID SINCE MARCH 2019 AFTER REFURBISHMENT**

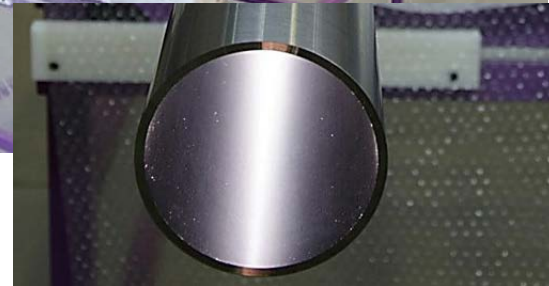
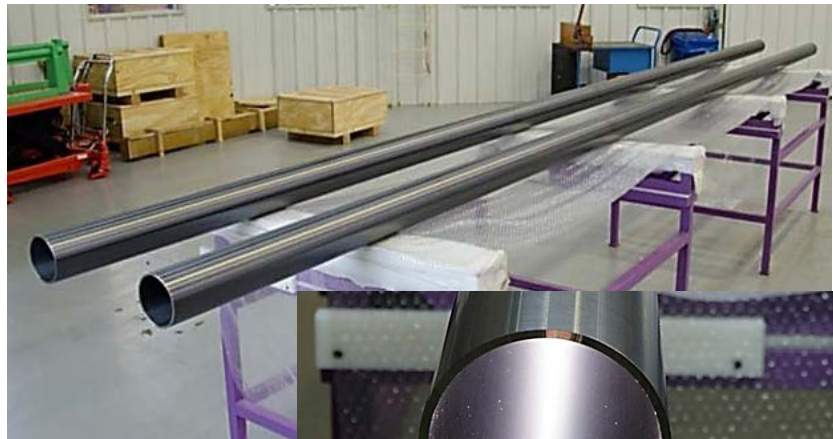
**CONUAR** manufactured and supplied to **Nucleoeléctrica Argentina** practically all Reactor Internal components for the Embalse CANDU®6 Refurbishment:

- . 380 Pressure Tubes
- . 380 Calandria Tubes
- . 760 End Fitting Assemblies
- . 760 Channel Closure Plugs
- . 760 Shielding Plugs
- . Full set of Feeders manufactured @site and Feeders' Supports, including full assembly @site
- . 2 Reactor Moderator Heat Exchangers
- . 4 Sets of alloy 800 U-tubes for the new four Steam Generators

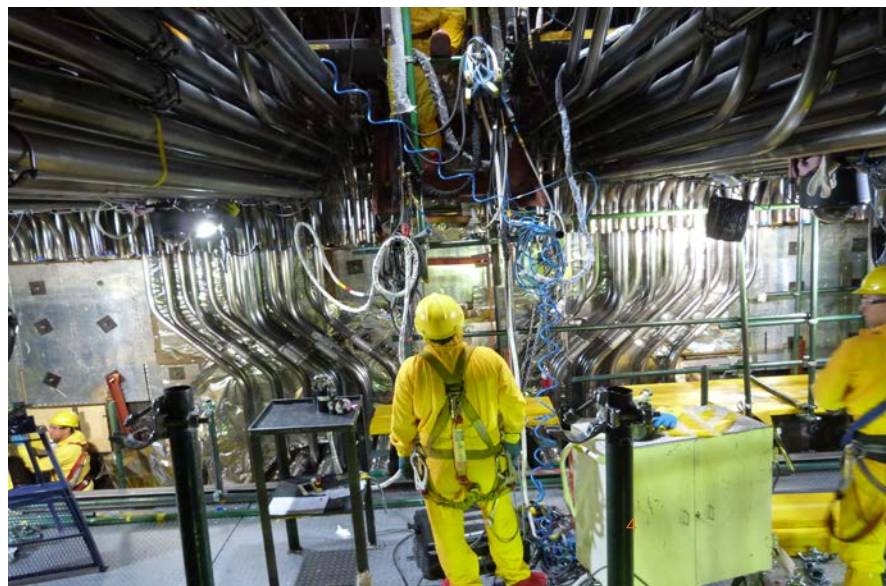
Qualified, Audited and Certified by AECL, CANDU Energy (SNC-Lavalin)  
ASME from USA, TSSA from Canada and Hartford Inspection Agency



Calandria Tubes



Pressure Tubes



Manufacturing and Assembly of Feeders and Supports



Shield Plugs

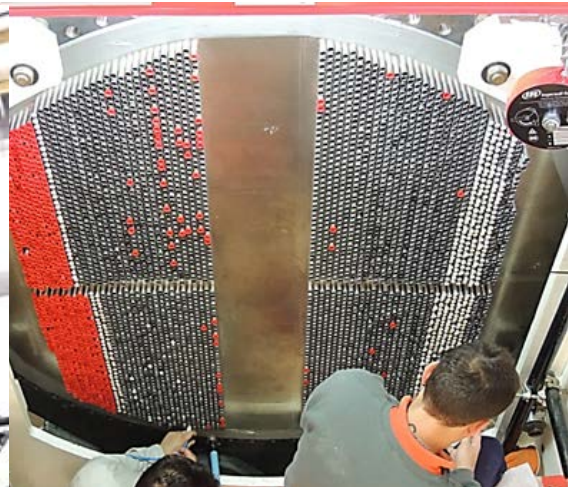


Channel Closure Plug and its components



End Fitting Assemblies

Manufacturing and assembly of two Moderator Heat Exchangers - Embalse CANDU®6 NPP Refurbishment



Moderator HX Tube-Sheet Welding. Process carried out within a controlled atmosphere room.

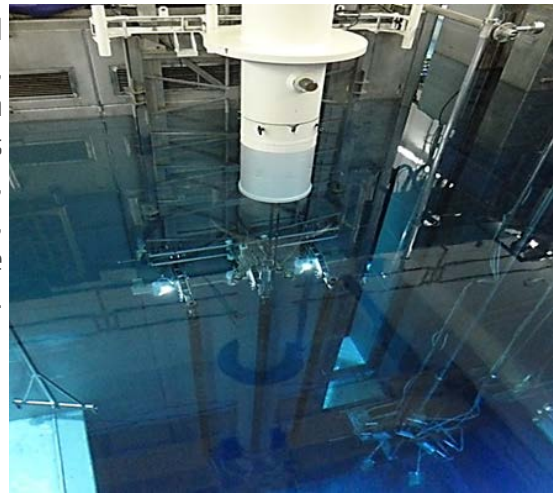


Manufacturing & Assembly of Module 10 from CAREM25 Liner Contention, [see it at Youtube](#).



9 Small Waste Transfer Flasks, ~ 8 tons e.a, exported to CANDU Energy for Point Lepreau NPP Refurbishment Project.

Transfer Flask, toolings and transportation systems, for moving spent fuels from Atucha I & II pools  
Detail engineering, manufacturing, Nuclear Authority practice approval and commissioning.



R.O.B.I.N. "basket" device for testing hi-tech optical fibers at high radiation environments. Belgium BR2 M.T.Reactor - SCK·CEN



Atucha I & II Neutronic Fluxmeter Guide Tubes



Remote Controlled Articulated Tools for performing maintenances inside Atucha I & II reactors.

**SM&S** manufactures remote controlled tools for reactor maintenance services since 1990 and also supplies remote operated devices for handling spent fuels.

On 2023 SM&S manufactured and supplied tailor-made remote controlled tools for repairing Atucha II Reactor. The Gripping-Tool and a Vacuum-Handling-Tool were designed by NA-SA (Nucleoeléctrica Argentina SA) and the FCAW Remote Controlled Welding Tools were designed and manufactured by SM&S including: welding heads, a full remote-control panel, all systems (hydraulic, pneumatic and mechanical actuators), the access-column for guiding those services including gas and filler metal supplies to the bottom of the Reactor.

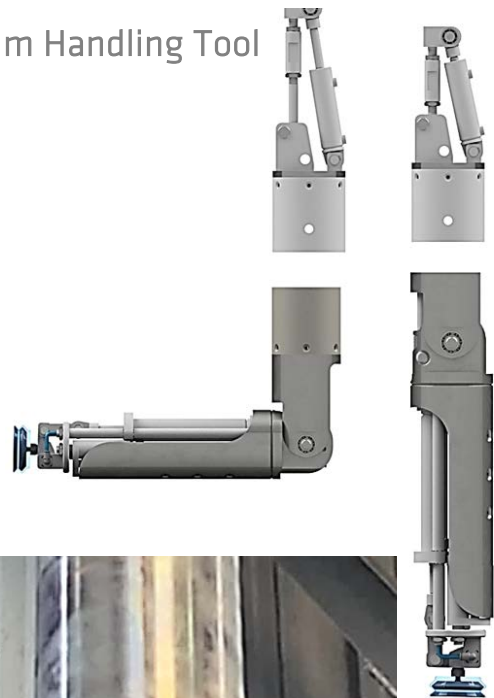
Welding environment: Reactor Lower Plenum, 12 meters below Reactor Head, heavy water, ~0.8 barg, 60°C, accessing through three openings of ~4.5" diameter each.

Watch the actual welding video of Atucha II Reactor repair at YouTube.

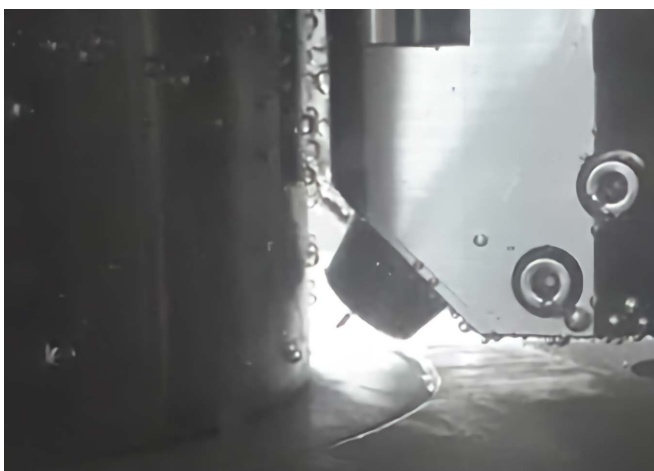
Gripping Handling Tool



Vacuum Handling Tool



Actual welding view at Atucha II Reactor Lower Plenum



Welding Head

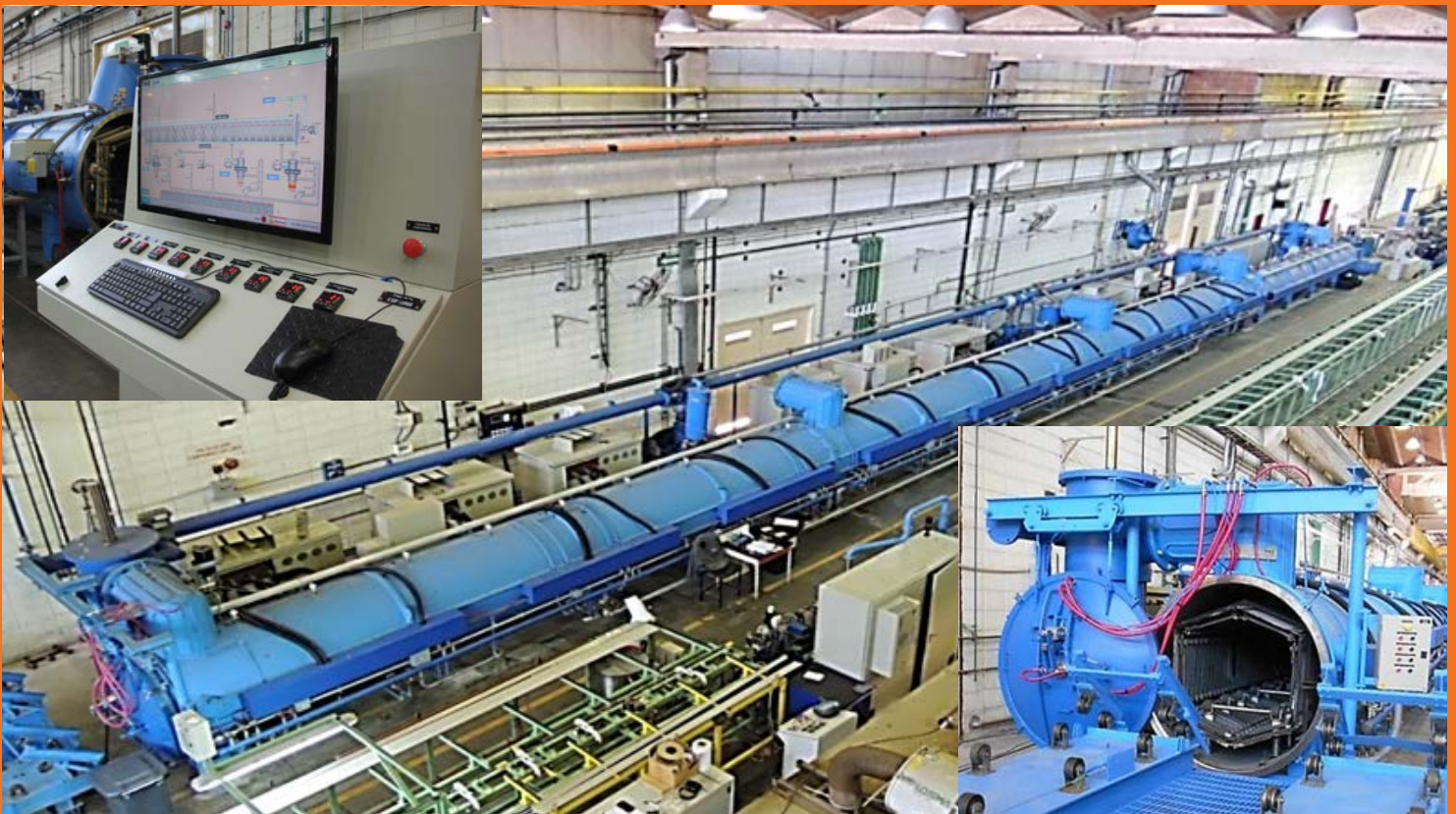


## F&E Seamless Tubes

Alloys 600, 690, 800, 800H, 825, Zirconium, stainless steels, Duplex and Ti Gr.9.  
Cold Pilgering and Cold Drawing production facilities.  
Horizontal furnaces for high vacuum or inert gasses heat treatments.  
Capacity to produce and treat seamless tubes, made in one-piece up to 35m length.  
Vertical high vacuum furnace for pieces up to 7 meter length.  
CNC U-Bend Machine and dedicated heat treatment facilities.  
Clean Workshops.  
Grind Blasting and Glass Bead Peening.  
Eddy Currents (*external coil*), EC Pre-service inspection (*internal coil*).  
Ultrasonic Test.

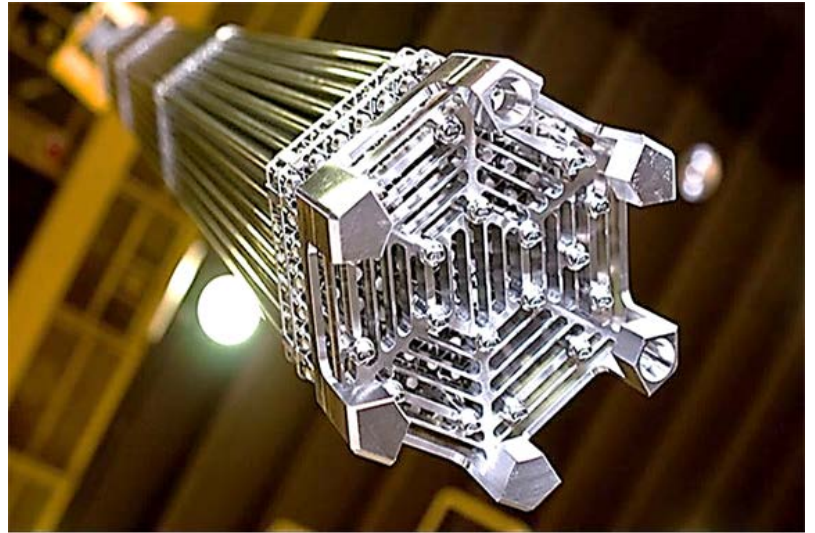
### References:

- **BWXT Canada** for **Bruce Power and Point Lepreau NPPs refurbishments**: TP304L low-Co U-tubes for **Shutdown Coolers** | A825 & A600 U-tubes for **Bleed Condensers** | A800 U-tubes for **Gland Seal HXs**. | A825 U-tubes for **Moderator HXs**.
- **CNEA CAREM25 SMR**: A690 one-piece seamless tubes 35m long for **S.Generators**.
- **BHEL India**: A800 U-tubes for **RAPP-8 NPP Steam Generators** | A800 U-tubes for **GHAVP NPP Steam Generator** and **D<sub>2</sub>O Heat Exchangers**.
- **NA-SA CANDU®6 EMBALSE NPP Refurbishment**: A800 U-tubes for four **Steam Generators** | **Calandria Pressure Tubes** Zr2.5Nb | U-tubes UNS31803 Duplex for **Moderator Heat Exchangers**.
- **Marinha do Brasil-Labgene Submarine Project**: A690 U-tubes for **Steam Generator**.



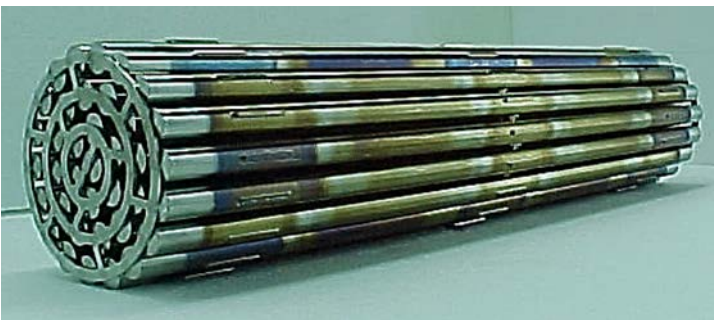
Furnace for high vacuum or inert gasses heat treatments, for tubes or components up to 35m length

**Nuclear Fuels** business unit manufactures since 1982 PHWR nuclear fuel bundles for Atucha I, Atucha II and Embalse CANDU®6, PWR for CAREM25 Modular Reactor and MTR plate type for the RA-3 reactor. Different Uranium enrichments from NU, SEU 0.85%, EU from 1.8 to 3.1% and up to 20% enrichment for the MTR fuel plate types. **NF** also has been manufacturing since more than 30 years Co60 reactivity control bars for Embalse CANDU®6 NPP, made of alloy Silver-Indium-Cadmium and of Hafnium for Atucha I & II NPPs.



CAREM25 SMR - PWR fuel bundle - 1.8% & 3.1% EU

Atucha I NU and Atucha II SEU 0.85% fuel bundles  
6m length - Rigid and Flex-Grids



Embalse CANDU®6 fuel bundle



MTR Plate Type Fuel Bundle - 20% EU



Embalse CANDU®6 Co60 Reactivity Control Bars  
Co60 slugs & pellets

## QUALITY ASSURANCE PROGRAM & MANAGEMENT SYSTEM

CONUAR's Quality Assurance Program is certified by ASME according to ASME BPVC Sec. III, subsection NCA-4000 requirements, being N, NPT, NA and NS active certificate holder and also Material Organization. QAP is also implemented according to NRC 10 CFR Appendix B and 10 CFR 21 and meets the Canadian standards CSA N299 and CSA N285.0.

CONUAR's Integrated Management System is certified by TÜV Rheinland according to requirements: ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018.



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