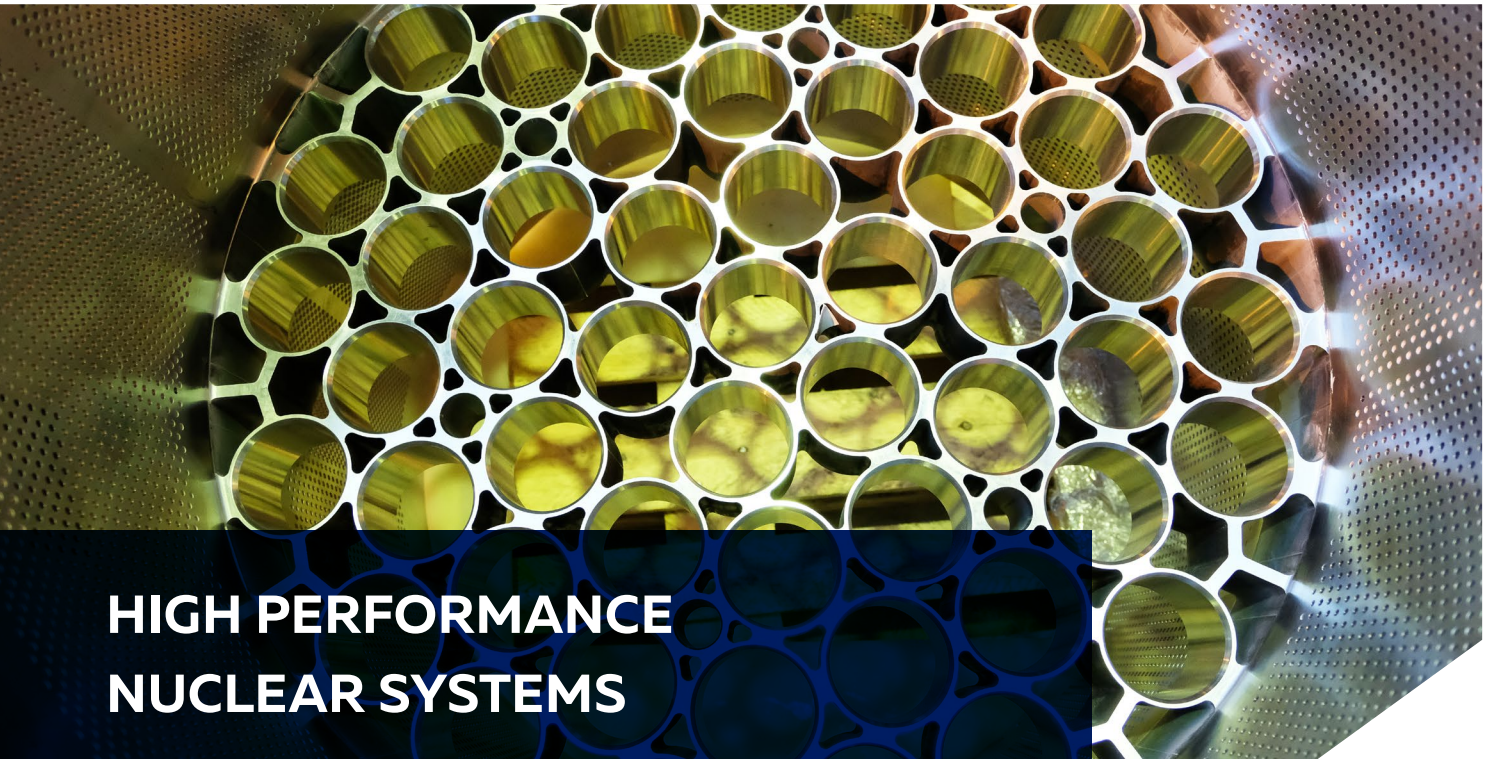


HIGH PERFORMANCE NUCLEAR SYSTEMS

Secure handling systems, sensitive object containers and vacuum chambers

CNIM
Systèmes Industriels

Longstanding expertise to address the issues of the nuclear industry of tomorrow

Cutting-edge expertise...

CNIM Systèmes Industriels (CSI) has been a major nuclear industry player in France and worldwide for 40 years. CSI **designs and integrates nuclear systems and components** based on technological and industrial capabilities that **meet the most stringent normative and safety requirements** of the nuclear industry.
Involved at every stage in the nuclear power cycle, CNIM provides secure handling and remote operation systems for nuclear spent fuels and materials, specialised vacuum chambers and containers, and complex mechanical components for nuclear environments.

360° presence

Nuclear power production
Nuclear research reactors
Military nuclear activities

CNIM PARTICIPATES IN MAJOR CIVILIAN AND MILITARY NUCLEAR ENERGY PROGRAMS.

Load testing of the OL3 EPR's spent fuel cask handling trolley

...serving an evolving industry.

Deep disposal, 4th generation reactors, SMRs, EPRs and dismantling: CSI addresses all the major issues facing the nuclear industry, including **safety**, **quality** and **overall project management**.

Serial production of 35 radial plates for ITER

Fuel **safe handling systems**

Combine precision with safety for handling high-criticality packages

More than 50 handling systems
DELIVERED

Enriched uranium handling system (GBII plant)

High value-added design and manufacturing

Combining strong expertise in electromechanical engineering, control and command systems and compliance with international nuclear standards, CSI designs and delivers **critical handling products** taking into account requirements related to radiation, seismic resistance and life expectancy.

Tonnes positioned to millimetre accuracy

The common factors in all our handling systems are **the safety and the accuracy of operations on radioactive, sensitive, heavy, high-added value packages**.
Our mastery of the complex handling of such packages has been proven.
For example: design and manufacture of a remotely operated system for the maintenance of equipment in the Mégajoule Laser experiment hall, 19 spent fuel cask transfer facilities to transfer spent fuel in 16 nuclear power plants in France and in the Taishan and Olkiluoto EPRs, remote-controlled handling machines for deep disposal in Finland, or even handling systems for several hundred tons superconducting magnets constituting the core of the ITER nuclear fusion reactor.

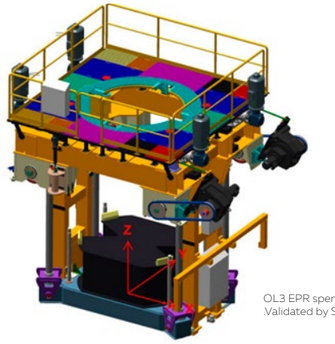
EVERY STAGE OF THE CYCLE

CNIM's systems address the safety, accuracy and remote operation issues associated with handling radioactive packages **from enrichment to deep disposal**.

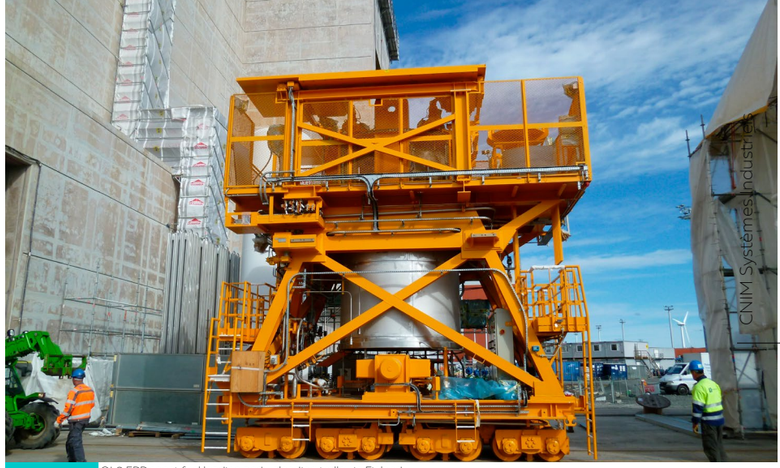
SAFETY FIRST

Our multidisciplinary engineering designs resilient systems.
/ **severe physicochemical environments** (radioactive or neutron fluxes, plasma...)
/ **extreme weather events** (earthquakes, tornadoes...)
Such as class 3 tornadoes in the case of the Chernobyl plant's sarcophagus membrane.

Our products meet the most demanding nuclear and industrial standards (**RCCM, ESPN, CODAP, ASME**...) and meet the requirements of **local nuclear safety and radiation protection authorities**
Such as Finland's STUK for the three machines used to handle fuel transport casks and transfer them to its deep disposal site).



OL3 EPR spent fuel loading and unloading trolley in Finland
.Validated by STUK

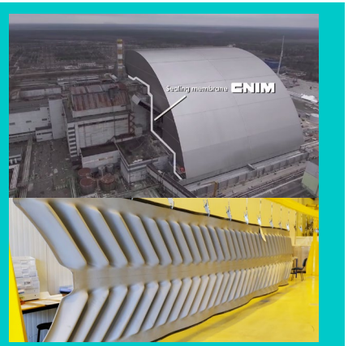


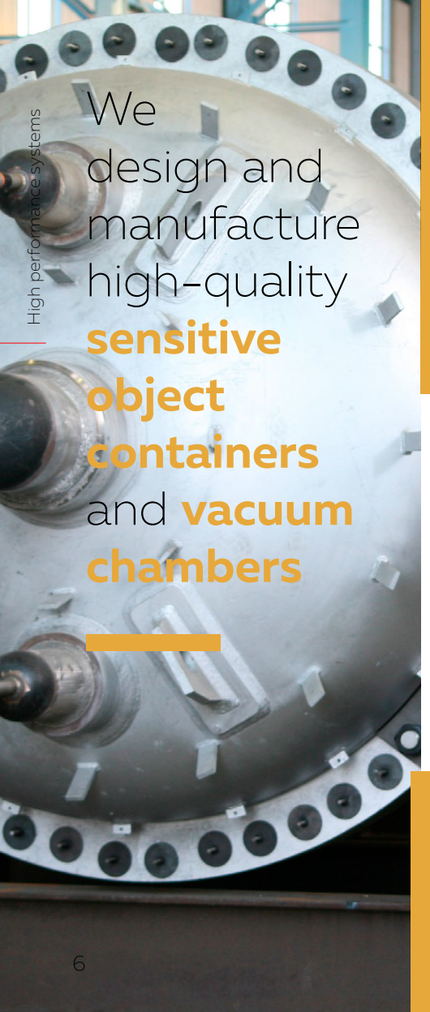
OL3 EPR spent fuel loading and unloading trolley in Finland

Sealing expertise

Thanks to their expertise in military and civilian nuclear research programs, but also in cutting-edge sectors such as Deterrence, our teams, both in the design office and in Manufacturing, put **airtightness at the heart of the challenges.** The integrity of sensitive, high-added value packages is guaranteed.

CNIM Systèmes Industriels manufactured 3 km of waterproof polyurethane membrane to contain radioactive flows from the Chernobyl power plant for several decades (see photos on the right).



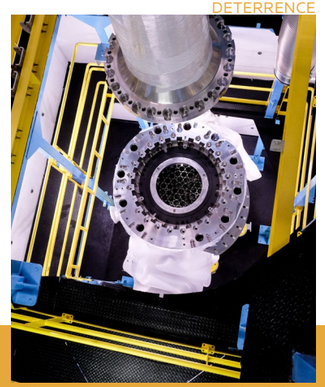


We design and manufacture high-quality **sensitive object containers** and **vacuum chambers**

Deliver quality and reach top performance to ensure packages and material flows are secure.

More than 100 special containers

DELIVERED TO THE CIVILIAN AND MILITARY NUCLEAR INDUSTRY AND DETERRENCE



Ultra-precise assembly of the Jules Horowitz reactor's core in CSI's workshops

Industrialization & manufacturing

CSI adopts a **long-term approach** to meeting **non-standard equipment and sensitive object container** industrialization and manufacturing needs.

Our multi-decade experience in this sphere enables our customers to benefit from our **repeatedly-consolidated skills**.

The strong qualifications of our staff, particularly in welding control, **certify to the quality and reliability** of our products.

Guaranteed performance

Specific tests (hydrotests, leak tests with helium...) for each project are systematically carried out to guarantee the performance of our sensitive object containers and vacuum chambers, in addition to **dimensional and non-destructive controls**.

Our metrological machines enable us to validate highly precise manufacturing tolerances, of **a few micrometres in parts several metres long**.

Electron beam welding of the vacuum chamber of the Heinz Maier-Leibnitz (FRM I) research reactor's neutron source

HIGH PERFORMANCE MATERIALS

Our teams master the machining and welding of advanced materials such as stainless steel, AG3NET, Duplex...

LARGE SIZE METROLOGY

Our experts are qualified at the highest level for three-dimensional controls (COFFMET 3) and weld inspections (COFREND 3).

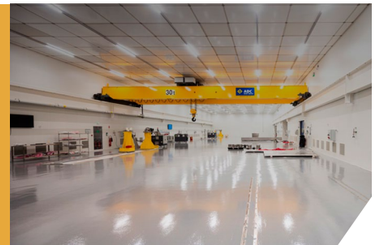
KEY FIGURES clean rooms

2 + 1
TWO CLEAN ROOMS A GRAY ROOM

ISO 5 to 8
CLEANLINESS ACHIEVED ON SITE

2,800 sqm
TOTAL SURFACE OF OUR THREE ROOMS

2
LARGE WASHING MACHINES



Complex metalwork

Large sizes, harsh vacuum or radioactive environments, complex geometries, advanced materials, great thicknesses...
CSI's metal alloys meet the very stringent constraints of nuclear projects.
Thanks to our combination of Engineering, Methods, Manufacture and Metrology, we achieve the **highest quality standards** needed.

Machining of under pressure nuclear equipment for Laue-Langevin Institute

LONGSTANDING WELDING EXPERTISE MAINTAINED AT THE HIGHEST LEVELS

CSI has **over 30 years of experience in electron beam welding** of various materials, including those difficult to weld such as AG3NET or stainless steel, and **welding of very thick parts**.

Our welders master **specific specialised operating** procedures (PQR and WPS), including on very thick parts. They keep a **strict documentation trail** enabling parts to be **certified by approved reporting bodies.**

Let’s imagine and act together today for tomorrow’s nuclear power

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