



Power together

Company Profile



ANSALDO NUCLEAR

Who we are

Ansaldo Nuclear is the brand name under which Ansaldo Nucleare S.p.A (Italy) and its fully owned company Ansaldo Nuclear Ltd (UK) operate, acting as a single enterprise that provides an in-house, integrated capability which includes design, engineering, manufacturing, assembly, testing, commissioning, site installation and integrated logistics through-life support of bespoke solutions.

These core competencies and capabilities allow Ansaldo Nuclear to offer a broad range of products and services to Nuclear power plants from new build and operational services to decommissioning and waste management.

For the UK market only, Ansaldo Nuclear Ltd is also operating in the UK defense sector.

Ansaldo Nuclear strength lies in over sixty years' of international experience in design and manufacture of safety critical engineered products and specialist support and in the technical knowledge, experience and dedication of our team.

We are committed to providing advanced and innovative services for our existing and potential customers across the nuclear energy industry.

From building a new plant, implementing major modifications on operating nuclear plants, to decommissioning an old one, or even handling nuclear waste, we have the expertise to support our clients.

We are committed to continue to grow and enhance

our internal skill set and always strive for the highest industry standards of safety, quality and protection of the environment.

With a total workforce of 600 employees, 250 of which in the Design & Engineering departments, we have the expertise to deliver complex project, for the three business lines, with the quality and safety our clients expects.

As a part of the Ansaldo Energia Group, Ansaldo Nuclear benefits from the financial strength and support provided by the Group. Ansaldo Energia currently employs over 4,500 people and has an international presence through local companies and branch offices.



Where we operate

Our Facilities

Ansaldo Nuclear provides inhouse specialist facilities for manufacturing and assembly and is able to complete a variety of contracts from small hand-held equipment to large electromechanical plant and equipment.

Ansaldo Nuclear operates in the domestic and international nuclear markets, managing the entire business from its headquarters and operational offices in Genova (Italy) and Wolverhampton (UK), directly and through the branches located in Romania, Slovakia, Slovenia, Argentina, France and the representative office in Russia.

We also rely on numerous Representative Offices and branches of our parent company located in over twenty countries in the world. Engineering resources are split across 4 Ansaldo Nuclear sites, Genoa in Italy, Wolverhampton, Risley and Beckermat in the UK.

Manufacturing, assembly and test facilities are located at both Wolverhampton, as well as Beckermat, the closest facility of its type to the Sellafield site.

Wolverhampton, West Midlands

- Office facilities housing engineering, project management and support services
- Manufacturing facility 10,000 m²
- Quality Assurance & Inspection
- Material Preparation
- Machining
- Fabrication
- Assembly and test
- 55t crane capacity (12.5m under hook)
- 30m high test tower
- 6m deep test pit

Beckermat, West Cumbria

- Office facilities housing engineering, project management and support services
- Workshop, 1,500 m²
- 60t crane capacity (12.5m under hook)
- 28m high test tower and test pit

The broad-based presence allows the group to quickly react to customers' needs and to better offer them its rich value proposition.



EPC services and Nuclear New Build

Experience gained through past and current involvement ideally position Ansaldo Nuclear at the forefront of the technological development of new NPPs.

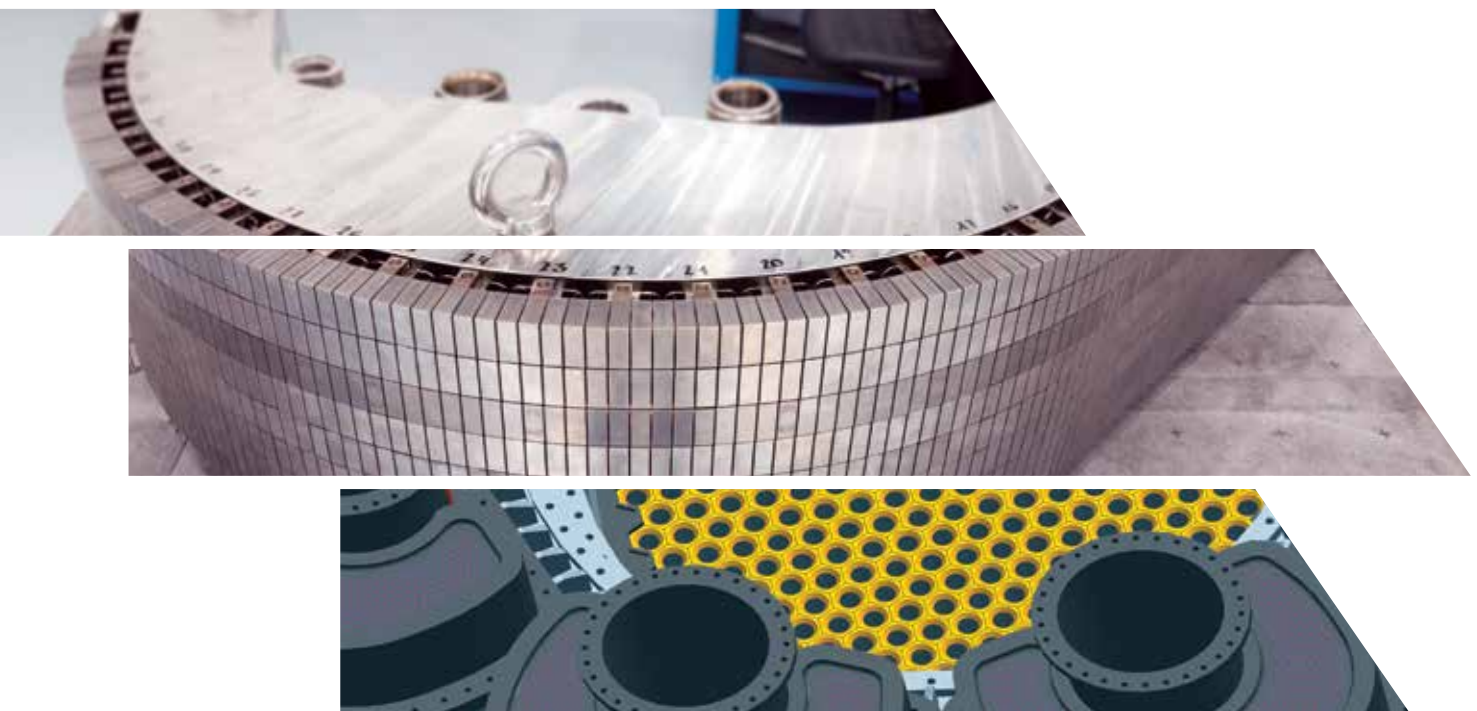
Building on over the fifty years of experience on different types of reactors, from the first Magnox plants in UK and the Italian projects in the seventies, we have developed the Engineering expertise and Project Management skills to provide full EPC services to meet the needs and requirements set out by our Clients, providing a one-stop-shop solution to minimize the risks associated with complex projects.

Ansaldo Nuclear supply systems, components and services for the NSSS (Nuclear Steam Supply System) as well as BOP (Balance of Plant), for various Nuclear Power Plants including PWR, BWR, CANDU and VVER.

We have provided a significant contribution to Generation III+, cooperating with Westinghouse since the early

1980s in the development of Passive Plant Technology. Whilst we have been a key contributor to the Design Certification of AP600 and AP1000 NPPs, we continue to look at the future and we are actively involved in Generation IV international programmes. In this context, we are acting as leader for the Lead-Cooled Fast Reactors development programmes, for the successful completion of the "Advanced Lead-cooled Fast Reactor European Demonstrator" (ALFRED).

Furthermore, we are deeply involved in the nuclear fusion development programme mainly ITER (International Thermonuclear Experimental Reactor) for which we contribute to the supply of fundamental components.



- Ref: Cernavoda Unit 2 Completion Contracts (Societatea Nationala Nuclearelectrica, SNN, Romania) - Ansaldo Nucleare and AECL, as Main Contractors, delivered the plant according to schedule and budget, at the end of 2007. This is the only Nuclear New Build project completed in EU in the last twenty years.
- Ref. AP1000 Design Certification (Westinghouse): Accident analyses for the Design Certification Document, radiation and shielding analyses, radiation zoning, normal operation and accidental conditions skyshine analyses.
- Ref. AP1000 UK GDA Assessment - Complex sequences analyses (ATWS, Station Blackout and MSGTR) to support Probabilistic Safety Analysis and UK licensing.
- Ref: European Passive Plant Program (EU Utilities): Detailed design of the AP1000 Defense-in-Depth Systems (e.g., Residual Heat Removal System, Component cooling System).
- Ref: AP1000 Sanmen Unit 1 (Westinghouse, China) Design Activities for systems and structures inside the Reactor Building. EPC contract for the design and supply of the Passive Residual Heat Removal Heat Exchanger. Detailed design, installation process definition, manufacturing and site technical assistance for the Primary containment vessel, Design transients analyses to support AP1000 Reactor Vessel internals.
- Ref: Mochovce Units 3 & 4 (ENEL/Slovenske Elektrarne, Slovak Republic) - Engineering Services for nuclear and conventional Islands, Design activities and on-site assistance for: Quality Management, planning, and processes, Machinery, Circuits Layout, Electrical, I&C, Erection Quality Surveillance.
- Ref: ITER (Fusion for Energy (F4E), France) - Supply of the EU scope of work of the ITER Vacuum Vessel sectors.



Service to operating plant

Extending the life and implementing safety upgrades of the operating nuclear power plants is vital to support demands for safe and secure energy supply. Internationally, we have provided service support to nuclear power plants in several countries.

Our experience on different plants design provides knowledge and capability to offer to our clients a wide range of service activities in support of operating nuclear power plants.

We offer engineering services and solutions to our Clients to improve reliability and safety of their operating nuclear power plants as well as systems optimization and performance enhancement.

Our offer includes:

- Refurbishment and modification services to extend the life of the nuclear plant (Plant Life Extension, PLEX)
- Balance of Plant (BOP) systems optimisation and power uprating

- Thermal, hydraulic and computational fluid dynamics analysis
- OEM equipment maintenance and spares provisioning
- Stress test analyses and plant safety upgrades services to cope with Post-Fukushima requirements.

We provide service and support to operating plants, examples:

- Ref. Krsko NPP (NEK, Slovenia)- Safety Upgrade Project PHASE 3 BB2 Project - EPC contract for the design, procurement, construction and commissioning of a bunkered building and of the Alternate safety Injection and Feedwater systems to cope with beyond design basis events.





- Ref. Cernavoda Unit 1 & 2 (SNN, Romania) - Plant uprate, optimization of the thermal cycle, increase of plant availability, replacement of pre-heaters, pumps and valves, supervision of installation and commissioning activities.
- Ref. Embalse NPP (NA-SA, Argentina) - BOP condition assessment, residual life evaluation (RLE), Replacement of standby, Diesel Generator (DG) sets and associated auxiliaries (e.g. cooling system, lubrication oil, DG station control boards), PLEX and repowering / modifications to the steam turbine.
- Ref. Existing UK NPPs (Various Sites) - Original Equipment Manufacturer (OEM) for a wide range of safety related components for all AGR, FBR and Magnox power stations including most recently, Flask Leak Test Equipment (FLTE).
- Ref. Tianwan NPP Units 1 & 2 (Atomstroyexport, China) - Modernization and supply of No. 4 control system sets for fuel handling machines.
- Ref. Post Fukushima Beyond Design Basis Event Equipment (EdF Energy) - Mobile emergency spent fuel pond water cooling systems, mobile emergency reactor repressurisation systems.
- Ref. VVER - METSAMOR NPP UNIT 2 (EU Commission / METSAMOR, ARMENIA) Justification of the LBB analysis applicability to Primary Coolant Loop (and Surge lines). Fracture mechanics calculations in elastic or elastic-plastic regime. Definition of new Leak Detection System (LDS) configuration.



Decommissioning and Waste Management of nuclear plants and facilities

Ansaldo Nuclear has a proven track record in nuclear decommissioning and waste management projects and is currently tackling some of the most complex engineering and manufacturing challenges within the UK and European nuclear decommissioning programs.

Offering a complete range of services from concept design, through to on-site installation and operator training, Ansaldo Nuclear is able to draw on 60 years' nuclear experience and apply this to the most challenging decommissioning projects. Retaining all the required engineering skills in-house, our innovative approach ensures the best value option is selected and delivered through highly experienced project teams.

The company delivers decommissioning solutions worldwide, across a wide range of nuclear plants and research sites.

Ansaldo Nuclear is one of the major supplier to Sellafield Ltd and is currently engaged in delivering complex waste retrieval, handling and packaging solutions in support of the site decommissioning programme, currently delivering:

- 10 year Category Management provider for design and manufacture of all modularised shielded doors for the Sellafield Ltd site. Vertical and Horizontal travelling doors with a weight range anticipated from 25t - 90t
- 10 year Category Management JV Partner for design and manufacture of all in-cell high integrity nuclear, modularised cranes for the Sellafield site.

Ansaldo Nuclear is also currently delivering the Manufacture, Testing & Installation of an Immobilisation Line for the Transfer & Processing of Active Waste, for Dounreay Site Restoration Ltd (DSRL).



Decommissioning

We provide solutions for complex decommissioning programs, combining remote handling and waste treatment technologies. With our experience in nuclear construction, and we are able to deliver:

- feasibility studies to analyze alternative solutions and select the optimal ones, according to technical, economic and dose requirements
- design and manufacturing of equipment and tools for the dismantling, packaging and transfer of wastes
- operation on site, where planning, monitoring and control of the work is essential for the safe and efficient execution of the project
- organization of the site activities for waste management, including the installation of Waste Management facilities
- chemical decontamination systems for contaminated materials resulting from dismantling activities.

Decommissioning and Waste Management support provided has included:

Ref: Integrated Decommissioning Management Tool, IDMT (Sogin, Italy) - This tool is conceived and designed to manage the entire lifecycle of the Decommissioning of a Nuclear Plant or Facility from dismantling to management of primary and secondary wastes.

Ref: ISPRA (ISPRA EU JRC, Italy) - Engineering support services for decommissioning projects.

Ref: CISAM, Italy - Research Reactor Decommissioning.

Ref: Caorso NPP (Sogin, Italy) - Caorso Turbine Building & Off-Gas dismantling.

Ref: Caorso/Garigliano NPPs (Sogin, Italy) - Application for overall Decommissioning.

Ref: Gioconda, Cart, Colibri Rigs (ISPRA EU JRC, Italy) - Design and manufacturing of special tools for the Retrieving, dismantling and packing of irradiated rings and Irradiated Nuclear Material (INM) items stored in ADECO and relevant supplies.

Waste management

Waste Management activities include all the activities from the radioactive waste retrieval to the conditioning and final packing. Ansaldo Nuclear can support all of the above phases providing a complete solution to the client. Most significant projects include:

Waste Retrieval and Treatment

Design, construction and commissioning of complex radioactive waste retrieval and waste treatment solutions for solid, liquid and sludge in harsh environment.



Ref: Silo Emptying Plant (SEP) Mobile Caves (Sellafield, UK): Supply of three SEP Mobile Caves for the Remote retrieval of ILW sludge's from multiple vertical silos.

Ref: Ignalina NPP (Nukem, Lithuania) - Retrieval Unit (RU1), Landfill Separation Facility (LSF) and Control Building (CB) technological systems for low level Solid Waste Retrieval Facility.

Ref: Sludges extraction & conditioning at Latina NPP, (Sogin, Italy).

Ref: Berkeley NPP, UK - Chute Silo Retrievals - Equipment and associated control systems for the retrieval of miscellaneous active components from silo storage.

Ref: Trino NPP (Sogin, Italy) - Treatment of spent resins by wet oxidation technology.

Ref: PHADEC (Phosphoric Acid Decontamination) Facility (Sogin, Italy) - Industrial scale plant for carbon and stainless steel decontamination.

Ref: KHMELNITSKY - Turn key delivery of a LILW treatment facility with the purpose to separate sludges by centrifugation and evaporation.

Ref: Stazione Trattamento Effluenti Liquidi, STEL (ISPRA EU JRC, Italy) - Turn key delivery of a LILW treatment facility by co-precipitation and ultra-filtration.

Radioactive Waste Containers

Design, construction and qualification of containers in compliance with requirements of IAEA Regulations, for the temporary storage of radioactive waste.

Ref: LILW Containers for the National Repository (Sogin, Italy): Design, qualification and procurement of stainless steel containers (IAEA-IP2 packaging) for Low & Intermediate Level Waste.

Ref: ISPRA (ISPRA EU JRC, Italy) - Design, qualification and procurement of carbon steel containers (IAEA-IP2 packaging) for Low & Intermediate Level Waste.

Radioactive Waste Storage Facilities

We provide the design of Interim storage facilities for LILW including: civil works, handling systems, radiation monitoring, I&C, HVAC and safety analysis.

Ref: ISPRA INTERIM STORAGE FACILITY ((ISPRA EU JRC, Italy): Development of Safety Analysis and Preliminary Safety Analysis Report.

Ref: Saluggia Nuovo Parco Serbatoi, NPS (Sogin, Italy) - Bunkerized Storage Facility for Intermediate Level Liquid of Waste (ILLW).

Ref: Andreeva Bay (Russia) - Main contractor for Design of Solid & Liquid Radioactive Waste Management & Temporary Storage Facilities for radwaste produced by submarines dismantling.



Services

Ansaldo Nuclear offers a range of products and services which span across 3 market sectors. These include:

Engineering design of safety critical equipment in a Nuclear environment

- Mechanical concept and detail design
- Fluid and piping concept and detail design
- Nuclear and radiation analysis
- Electrical, Control and Instrumentation (EC&I)
- Software design and development
- Civil / Structural analysis
- Design substantiation
- Design for manufacture / design for operations and maintenance
- Category Management Services: Standard, modularised approach for cost and efficiency optimization

Programme Management

- Project management
- Project controls
- Programme Procurement

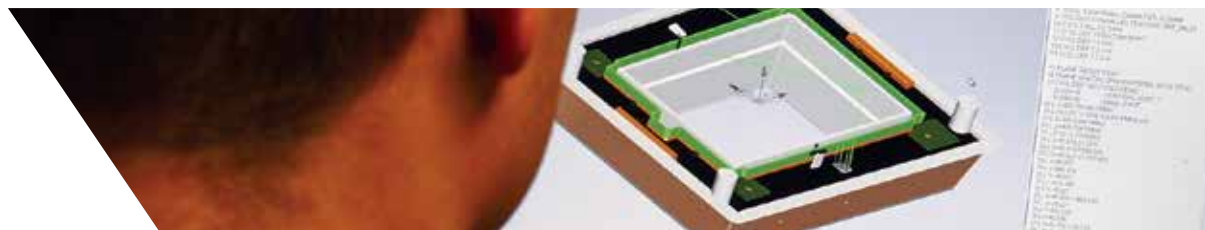
Testing and commissioning

Unique, dedicated facilities support specialist assembly, testing and commissioning:

- Factory Acceptance Tests (FATs)
- Pre operation test and commissioning
- Operating and Maintenance (O&M) manuals
- Training documentation

On Site Specialist Support

- Equipment installation
- Original Equipment Manufacturer (OEM) maintenance and through-life support
- Plant upgrades, refurbishment and repair
- Operational support



Products

Nuclear material handling equipment

- Waste material retrieval and handling
- Substantiated, modularised cranes
- Lifting and handling equipment
- Fuel route and fuel handling tools

Nuclear containments

- Shield doors and gamma gates
- Gloveboxes
- Nuclear Low and Intermediate Levels storage and transport containers

Nuclear process equipment

- Control systems
- Fuel and waste package integrity
- Modular packages
- ASME III, pressure components and heat exchangers





Certification

Our goal is to continually improve the quality, safety and efficiency of our services and products, fostering the Nuclear Safety Culture among our employees and supply chain.

Ansaldo Nuclear companies perform their activities in accordance with Quality and Environment Management Systems in compliance with the International standards.

In addition, we operate a Continuous Sustainable Improvement Plan (CSIP), which drives improvement in our people, process facilities and equipment.



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COMPANIES PARTECIPATED

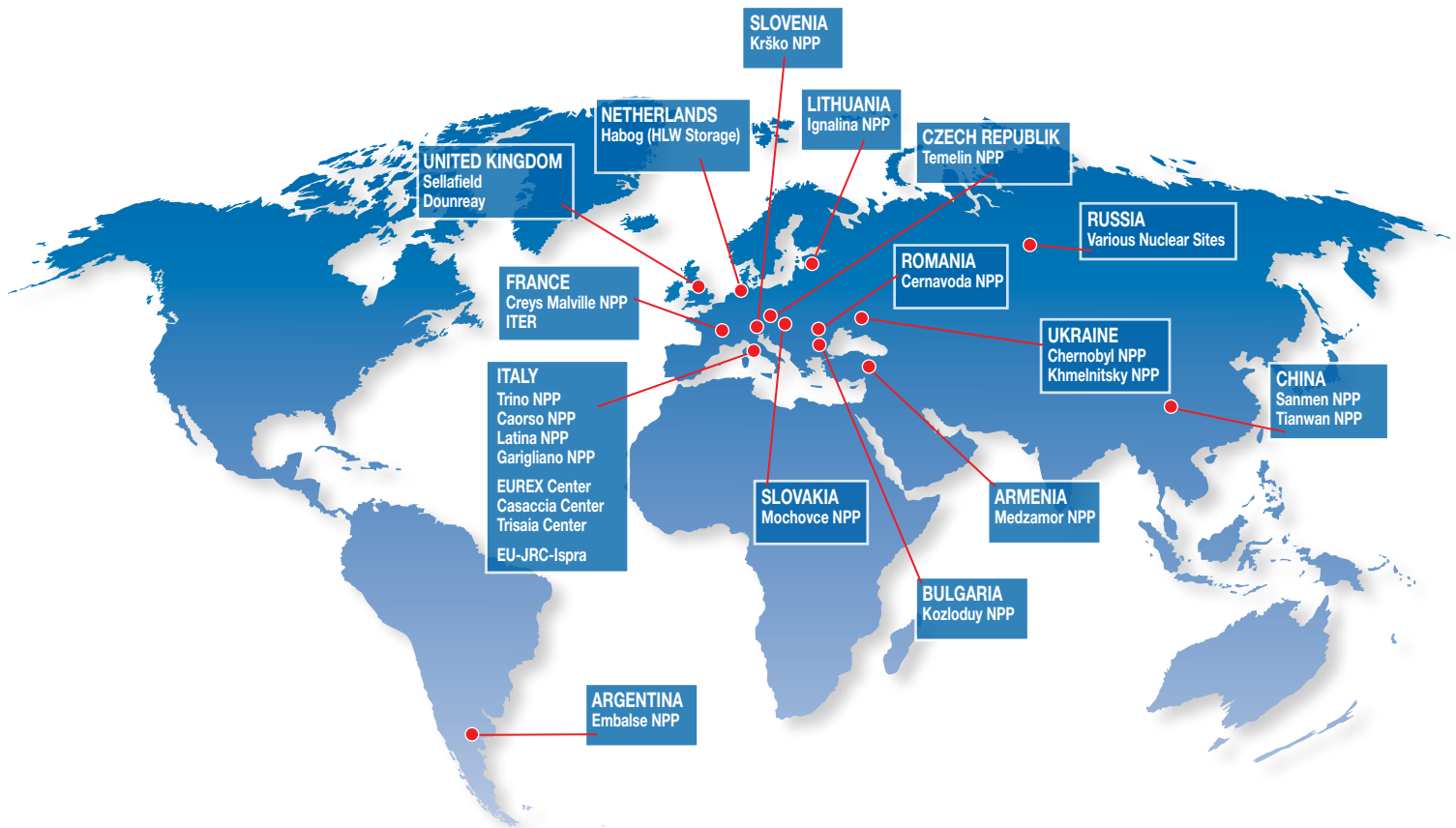
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Nuclear Power Plants and Research Reactors Nuclear Facilities

Main References in the world





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