

Britain's Nuclear Power Company

The businesses of Nuclear Power Company Limited are now transferred to National Nuclear Corporation Limited.

NNC

NUCLEAR POWER COMPANY LIMITED

Risley nuclear power centre



FORMATION

Nuclear Power Company Ltd. (NPC) is the operational arm of the National Nuclear Corporation Ltd. (NNC). NNC was formally established at Government instigation in June 1973 to consolidate and strengthen the nuclear power station design-and-construction sector of the British nuclear power industry into a single unit. This superseded a competitive type of nuclear reactor industrial structure shown over the years to be not in the best interests of the country or of the nuclear industry in either the home or export sectors.

By its inheritance of the combined staff, resources and know-how of its long-established forerunners, NPC is unquestionably one of the world's most experienced nuclear power plant design and construction contractors.

The origins of NPC go back to substantial involvement by its member companies in the manufacture and construction of Calder Hall, the first-ever commercial sized nuclear electricity generating plant, operational as far back as 1956.

Reactor training simulator at a large UK nuclear power station.



RESOURCES

NPC has its principal office and laboratory sites at Risley and Booths Hall, Cheshire, and Whetstone, Leicester. The Company employs some 2500 people of whom two thirds are managerial, professional and technical staff covering principal engineering sectors; mechanical, electrical, chemical, nuclear and civil. Particular strengths of the Company are in design engineering, project management and planning, quality control, and on-site construction and commissioning capability.

NPC's own capacity has the back-up as necessary of the technical and international commercial resources of its world-renowned member organisations.

NPC is well used to working overseas and has been responsible for nuclear power stations in Italy and Japan while it has worked alongside Westinghouse of USA on a nuclear power station in Korea.

Over the years NPC has sent teams to survey and advise in Finland, Greece, Mexico, Brazil, Spain, Australia, South Africa, Yugoslavia, Belgium and Korea.

Irradiated fuel in a shielded container leaving the Latina (Italy) nuclear power plant.



ACTIVITIES

NPC specialises in the development, design and construction of industrial power generation plants, and in particular nuclear power stations.

The Company can offer a complete power generation package from feasibility studies of the project and site investigations, design and project management, through to final setting-to-work of a project. Alternatively, a fully commissioned nuclear powered steam supply system for integration into overall projects to the customer's own specifications and supply authorisation can be supplied in a range of outputs, as for example, electricity/desalination schemes.

Over 20 years' evolution, NPC and its antecedents have carried out complete design-construction contracts for 17 major power stations ranging in size from 160 Megawatts up to 2000 Megawatts output.

Although nuclear power is its mainstream activity, the Company has very successfully extended its expertise into the fossil-fuelled power station field.

Dounreay 250 Megawatts Prototype
Fast Breeder Reactor (PFR) power
station.



LOOKING AHEAD

NPC has carried out an exhaustive examination of three principal thermal reactor types* towards identifying the best choice for the UK in the interests both of future nuclear programmes at home and as export potential. This culminated in a report to the Department of Energy and summarised in a public announcement by Government in July 1977.

Looking further ahead to the necessity for more efficient use of the world's restricted nuclear fuel resources, NPC has played, and is continuing to play, a leading role in the development, design and construction of the Fast Breeder Reactor (FBR) which makes more efficient use of uranium fuel by a factor of 50 times or more.

As well as being deeply involved through design and construction management of the UK's Dounreay Prototype Fast Reactor (PFR) of 250 Megawatts output (which has operated at full power), NPC is well advanced on the development of a commercial-scale reactor of 1300 Megawatts.

* Advanced Gas Cooled Reactor (AGR).
Pressurised Water Reactor (PWR).
Steam Generating Heavy Water Reactor (SGHWR).



NUCLEAR ACHIEVEMENT

NPC and its antecedents have designed and constructed all present 11 operational gas-cooled nuclear power stations (nine Magnox two AGR) for the UK Generating Boards and have also similarly been responsible for two stations for overseas utilities. A further three large AGR stations are under construction in Britain.

The nine Magnox stations (so called 'Magnox' because of the name of the metal used for canning the natural uranium fuel rods) are a series of developments of the Calder Hall prototype. Heat from the reactor is circulated to the boilers by carbon dioxide gas under pressure, hence 'gas-cooled' reactors.

Nuclear energy is providing at the present time (1980) 13 per cent of the total UK electrical needs and by the early 1980s the proportion will have risen to 20 per cent.

NPC design teams are also at work on the Pressurised Water Reactor (PWR), to British safety and operational requirements, with a projected start-on-site date of 1982. The PWR is in widespread and successful use in many countries.



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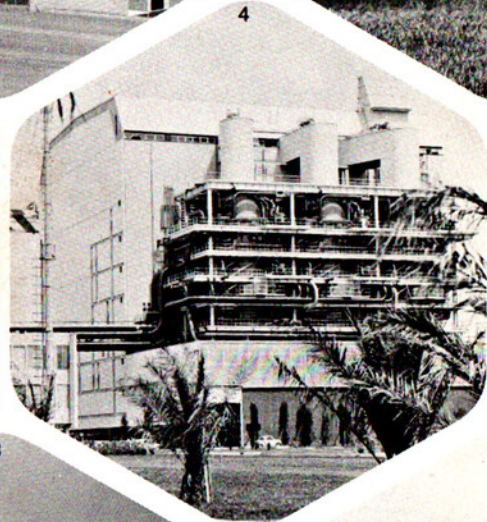
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MAGNOX STATIONS

| | Design Output (MWe) | On-load Date | | Design Output (MWe) | On-load Date |
|----------------------|---------------------|--------------|---------------|---------------------|--------------|
| 1 Berkeley | 290 | 1962 | 6 Hinkley A | 500 | 1965 |
| 2 Bradwell | 300 | 1962 | 7 Trawsfynydd | 550 | 1965 |
| 3 Tokai Mura (Japan) | 160 | 1963 | 8 Dungeness A | 550 | 1965 |
| 4 Latina (Italy) | 150 | 1964 | 9 Sizewell A | 580 | 1966 |
| 5 Hunterston A | 320 | 1964 | 10 Oldbury A | 600 | 1968 |
| | | | 11 Wylfa | 1180 | 1971 |



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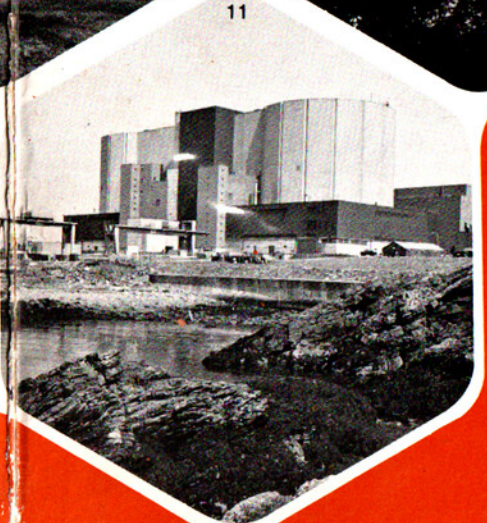
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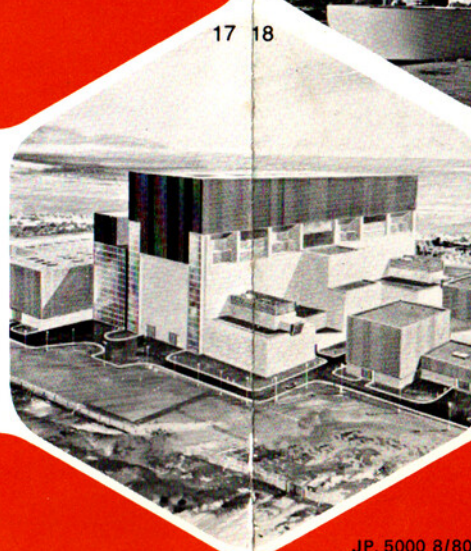
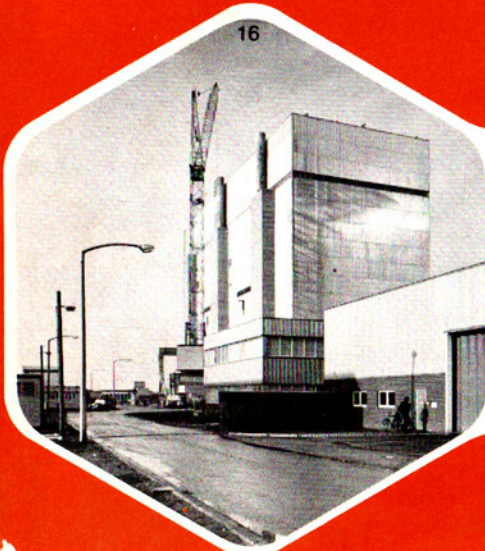
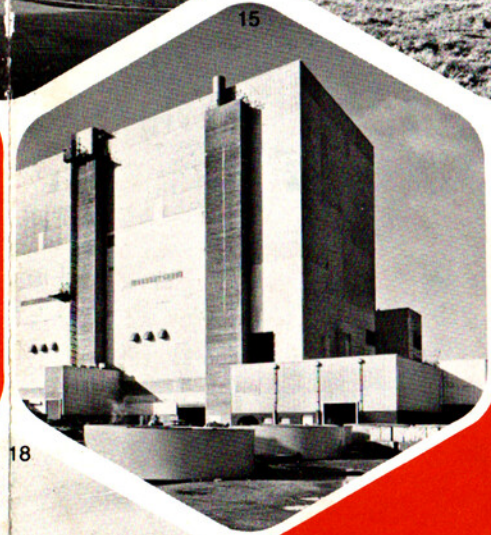
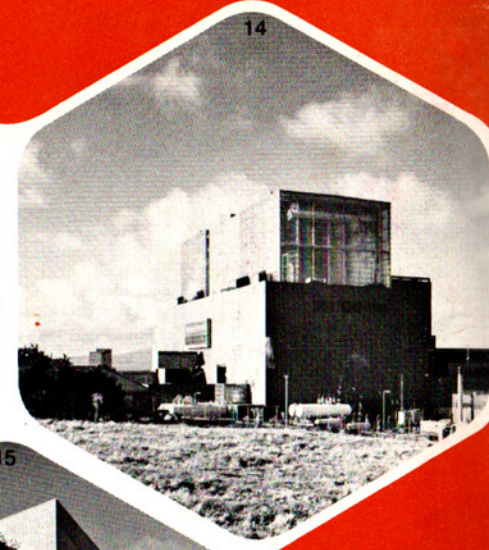
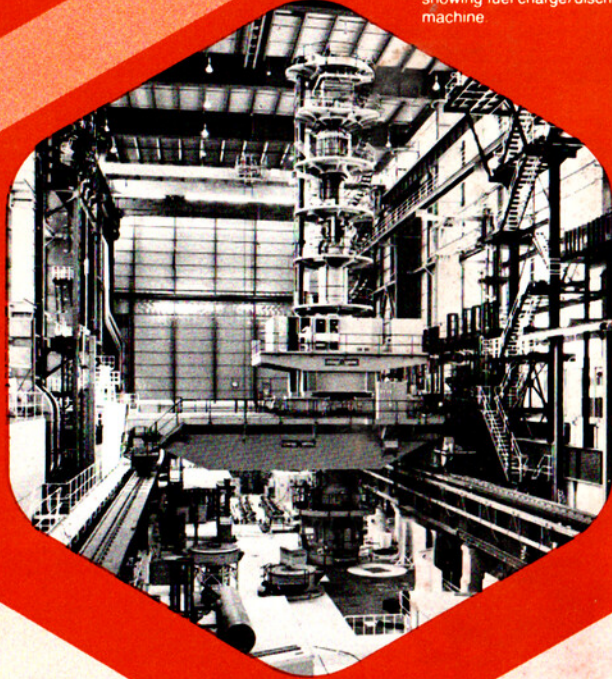


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11

Hinkley Point 'B' AGR reactor floor showing fuel charge/discharge machine



AGR STATIONS

| | Design Output (MWe) | On-load Date |
|-----------------|---------------------|--------------|
| 12 Dungeness B | 1200 | 1981 |
| 13 Hinkley B | 1250 | 1976 |
| 14 Hunterston B | 1250 | 1976 |
| 15 Hartlepool | 1250 | 1981 |
| 16 Heysham | 1250 | 1981 |
| 17 Heysham II | 1250 | 1987 |
| 18 Torness | 1250 | 1987 |

NUCLEAR ACHIEVEMENT

AGR STATIONS

Britain's present nuclear programme is based on the Advanced Gas Cooled Reactor (AGR) and comprises five twin-reactor stations each of 1250 Megawatts design output.

The AGR is a logical design progression of the gas-cooled technology from the well-proven Magnox design. Full exploitation of nuclear engineering developments was made possible by using a new fuel – uranium dioxide pellets encased in stainless steel tubes – allowing reactor operational temperatures to be increased by up to 300°C. As a result, AGR's are only half the size of a Magnox reactor for a similar output and have a thermal efficiency better than the most modern coal or oil-fired stations.

The Government has authorised the installation of two further AGR stations to NPC designs like those in operation since 1976. They are at Heysham (next to the existing AGR) and at Torness in Scotland and are scheduled for operation in 1986/7.

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