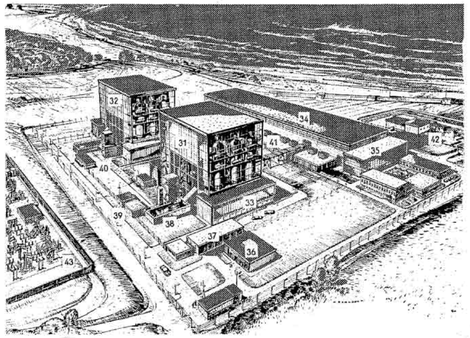
The World's Reactors

No. 19 Hinkley Point Power Station

KEY

1. Blowers
2. Expansion bellows
3. Gas outlet from heat exchanger
4. Circulating pumps
5. Stud-tube elements
6. Heat exchangers (six per reactor)
7. L.P. steam drum
8. H.P. steam drum
9. Gas inlet to heat exchanger
10. Main-gas valves
11. Main biological shield
12. Gas outlet from reactor
13. Thermal shield
14. Charge tubes
15. Charge floor
16. Hole-preparation machine
17. Charge—discharge machine
18. Emergency discharge chute
19. Spent fuel element skip hoist
20. Cooling pond
21. Storage skips and grid
22. Skip loading bays
23. Graphite core
24. Control rod
25. Pressure vessel
26. Gas monitoring pipes
27. Gas inlet to reactor
28. Ducts for debris removal
29. Shield cooling ducts
30. Secondary biological shield
31. Reactor No. 1
32. Reactor No. 2
33. Blower house
34. Turbine house
35. Workshop
36. Diesel house
37. Fuel store
38. Irradiated element pond
39. Laundry
40. Decontamination
41. Control block
42. Pump house, forebay screens, sewage, etc.
43. Outdoor sub-station



Under construction by the English Electric, Babcock & Wilcox, Taylor Woodrow Atomic Power Construction Co., Ltd.

Drawn by Giles and reproduced by courtesy of Babcock and Wilcox, Ltd.

The World's Reactors

No. 19 HINKLEY POINT POWER STATION

(Provisional Data)

TYPE: Thermal heterogeneous.

PURPOSE: Power production.

LOCATION: Hinkley Point, Somerset.

OPERATION:
Access to Site: December, 1957.
First reactor on load: mid-1961.
Second reactor on load: end of 1961.

CAPACITY:
Station installed capacity: 551 MW+99 MW auxiliaries.
Guaranteed net output: 500 MW.
Reactor heat ratings: 966 MW each.

FUEL:
Material: natural uranium.
Dimensions: approx. $1\frac{1}{8}$ in. diameter, 36 in. long.
Density: 18.7 g/cm³.
Weight of U per reactor: 370 tonnes.
Number of elements per channel: eight.
Number of fuel-element channels: 4,500.
Mean diameter of channels: 3.85 in.

CANNING:
Material: magnesium alloy, A.12.
Construction: machined or extruded extended surface.
Method of element support: stacked.

MODERATOR:
Material: graphite.
Core size: 49 ft dia. × 25 ft high.
Total weight per reactor: approx. 3,500 tonnes.
Method of support: ball bearings.

LATTICE: Regular square, $7\frac{3}{4}$ in. pitch.

CONVERSION: 0.85.

BURN-UP: Minimum 3,000 MWD/tonne.

CONTROL:
Number of channels per reactor: 120.
Diameter: as fuel elements.
Control rods: 108.
Shut-off: 12.
Drive: variable-frequency induction motors.

SHIELDING:
Biological: concrete. 7 ft main, 4 ft secondary.
Cooling: induced draught, air.

PRESSURE VESSEL:
Material: silicon-killed boiler-plate.
Shape and dimensions: sphere 67 ft dia.
Thickness of shell: 3 in. nominal.
Support: skirt 30 ft dia.

COOLANT:
Carbon dioxide at 185 p.s.i.
Inlet temperature: 180°C.
Outlet temperature: 375°C.
Number of ducts: six inlet and outlet.
Diameter of ducts: 6 ft 6 in.
Mass flow: 10,000 lb/sec.

PUMPING:
Number and type: six axial blowers.
Drive: variable-frequency motors fed from variable-speed auxiliary turbo-alternator.

BOILERS:
Number per reactor: six.
Main shell dimensions: 21 ft 6 in. dia. × 90 ft long.
Element construction: stud tubes.
H.P. steam conditions: 650 p.s.i. (685°F).
L.P. steam conditions: 180 p.s.i. (670°F).
Feed temperature: 160°F.
Evaporation: 460,000 lb/h.

TURBO-ALTERNATORS:
Number and type: six impulse-reaction.
Maximum continuous rating: 93.5 MW.
Speed: 3,000 r.p.m.
Generator voltage: 13.8 kV.

Data sheets in this series already published in "Nuclear Engineering" are:

No. 1. *BEPO* (*April*, 1956)
No. 2. *CP5* (*May*, 1956)
No. 3. *NRX* (*June*, 1956)
No. 4. *DIMPLE* (*August*, 1956)
No. 5. *ZEUS* (*September*, 1956)
No. 6. *CALDER HALL* (*October and December*, 1956)
No. 7. *RUSSIAN 5 MW* (*November*, 1956)
No. 8. *DIDO* (*January*, 1957)
No. 9. *THE SOUTH OF SCOTLAND ELECTRICITY BOARD STATION* (*February*, 1957)
No. 10. *BERKELEY POWER STATION* (*March*, 1957)
No. 11. *BRADWELL POWER STATION* (*April*, 1957)
No. 12. *DOUNREAY FAST REACTOR* (*June*, 1957)
No. 13. *EBWR* (*July*, 1957)
No. 14. *RWE* 1 (*September*, 1957)
No. 15. *LIDO* (*November*, 1957)
No. 16. *PLUTO* (*April*, 1958)
No. 17. *MERLIN* (*May*, 1958)
No. 18. *G1* (*June*, 1958)