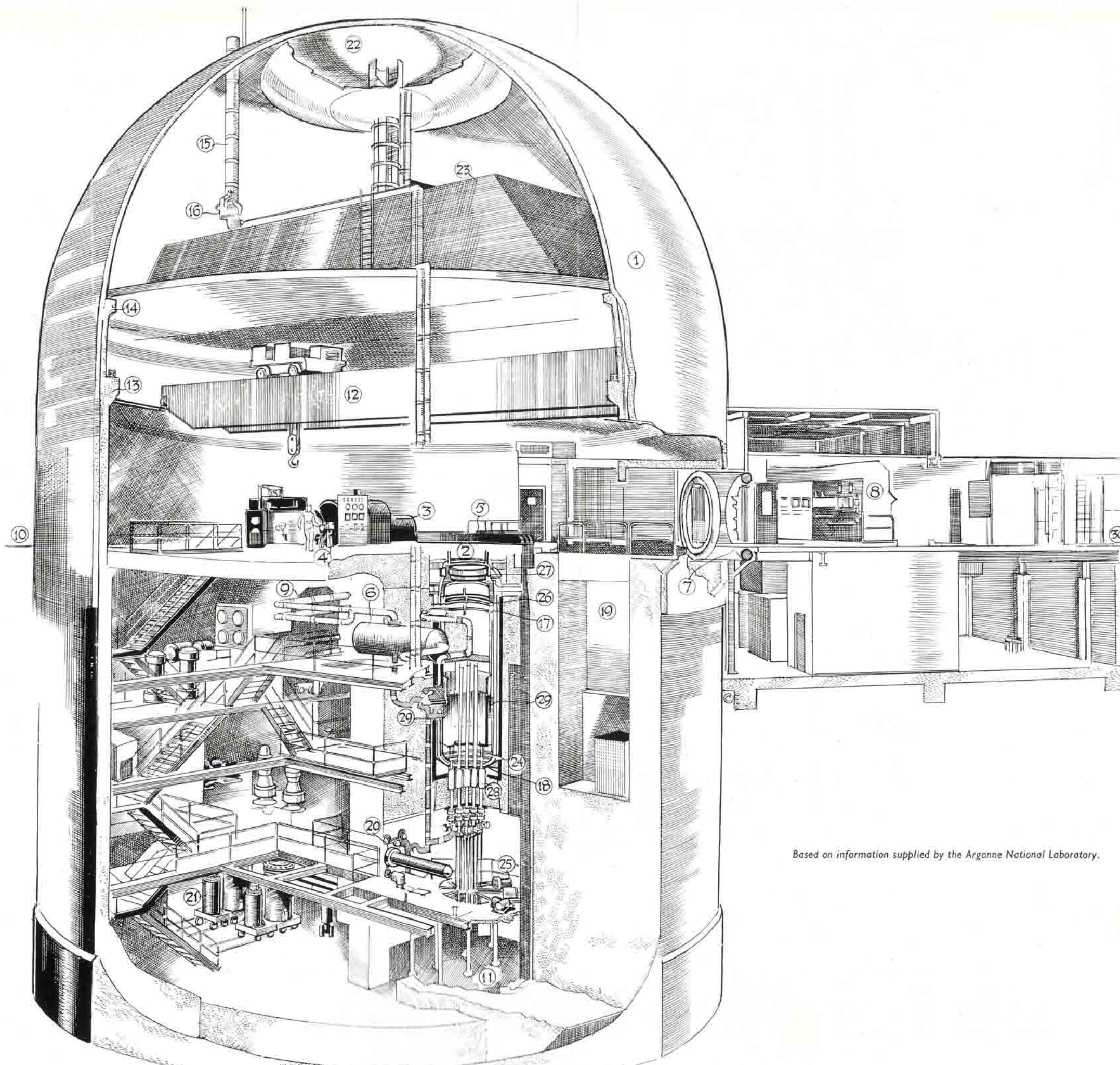


The World's Reactors

No. 13 EBWR

KEY

1. Containment shell
2. Reactor
3. Turbo-generator
4. Turbo-governor control
5. Fuel replacement assembly
6. Dryer, and emergency cooler
7. Air-lock doors
8. Control room
9. Main condenser, cooling (booster) pumps and filters
10. Ground level
11. Steel supporting columns and reactor vessel
12. Rotating crane (20-ton)
13. Concrete haunch (supporting crane rail)
14. Concrete haunch supporting reservoir
15. Air conditioning exhaust stack
16. Automatic damper for 15
17. Boric acid l.p. injector ring
18. Boric acid h.p. injector ring
19. Mortuary (storage for irradiated elements)
20. Start-up heater
21. Water purification plant
22. 15,000-gal water tank (sprinkler system)
23. Overhead water reservoir
24. Control rods (reactor vessel)
25. Control rods (motors)
26. Steam ring
27. Shield plug
28. Integral shielding
29. Feedwater ring
30. Main entrance



Based on information supplied by the Argonne National Laboratory.

The World's Reactors

No. 13 EBWR

TYPE : Thermal heterogeneous.

PURPOSE : Experimental power reactor using live steam.

LOCATION : Argonne National Laboratory, Lemont, U.S.A.

OPERATION : Diverged : Dec. 1, 1956.
Opened: Feb. 9, 1957.

RATING : 20MW (heat), 5 MW (electrical).

FUEL : Enriched and natural uranium.
Average U235 content: 1.4%.
U235 content of enriched elements: 1.44%.
Total investment: 6.1 tons.
Assembly composition: 6 plates of U-Zr-Nb alloy.
Cladding: Zircaloy-2, 0.020 in. thickness.
Plate dimensions: 54 in. x 3 $\frac{5}{8}$ in. x 0.214 in. and 54 in. x 3 $\frac{3}{8}$ in. x 0.279 in.

CORE : Volume: 4 ft dia. x 4 ft 6 in. high.
Fuel element assemblies: 106 enriched, 8 natural.

MODERATOR : Light water.

PRESSURE VESSEL : Material: Al killed steel, SA-212 Grade B.
Cladding: 0.109 in. stainless steel type 304.
Dimensions: 7 ft i.d. x 23 ft high.
Wall thickness: 2 $\frac{3}{8}$ in.

COOLANT : Light water.
Inlet temp.: 110°F.
Outlet temp.: 488°F.
Top pressure: 600 p.s.i.g.
Flow: 60,600 lb/h.

CIRCULATION : Pumps: two vertical shaft, 8-stage centrifugal.
Rating: 90,000 lb/h, 730 p.s.i.g., 190°F, 150 h.p. 3,550 r.p.m.

CONTROL : Number of rods: 9, 5 hafnium, 4 boron.
Hafnium rods: Hafnium-Zircaloy-2 alloy, cruciform shape.
Dimensions: 10 in. x 10 in. x $\frac{1}{4}$ in. thick, 46 in. long.
Weight with end pieces: 97 lb.
Boron rods: 2% in stainless steel.
Dimensions: similar to hafnium but $\frac{1}{4}$ in. thick.
Weight: 141 lb.

STEAM DRYER : Material: Stainless steel type 304.
Dimensions: 3 ft i.d. x 6 ft long.
Wall thickness: 1 $\frac{5}{16}$ in.

SHIELDING : Thermal shield in p.v.: 1 in. borated stainless steel.
3 in. stainless steel wool and concrete.
Overall radial thickness: 8 ft 3 $\frac{1}{2}$ in.

EMERGENCY SHUT-DOWN : 160 gal sat. boric acid soln. at 1,600 p.s.i.g., injected into bottom of vessel.
Boric acid spray at top.

TURBINE : Pressure at T.S.V.: 560 p.s.i.g.
Temp.: 482°F.
Flow: 62,700 lb/h.

ALTERNATOR : Rating: 5,000 kW, 60 c/s, 3,600 r.p.m.,
4,160 V, 6,250 kVA at 0.8 p.f.

CONTAINMENT : Steel shell ellipsoidal in shape.
Dimensions: 80 ft dia. x 119 ft high.
Design pressure (internal): 15 p.s.i.g.
Leakage: <100 ft³/day.

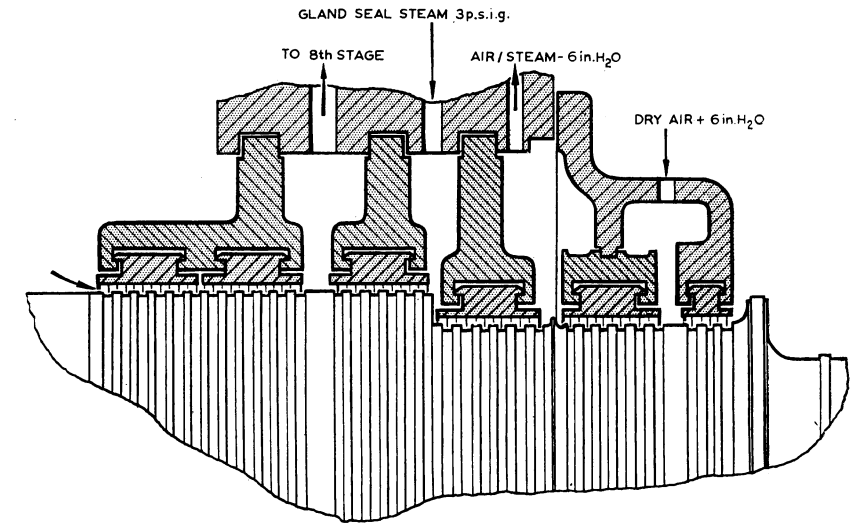
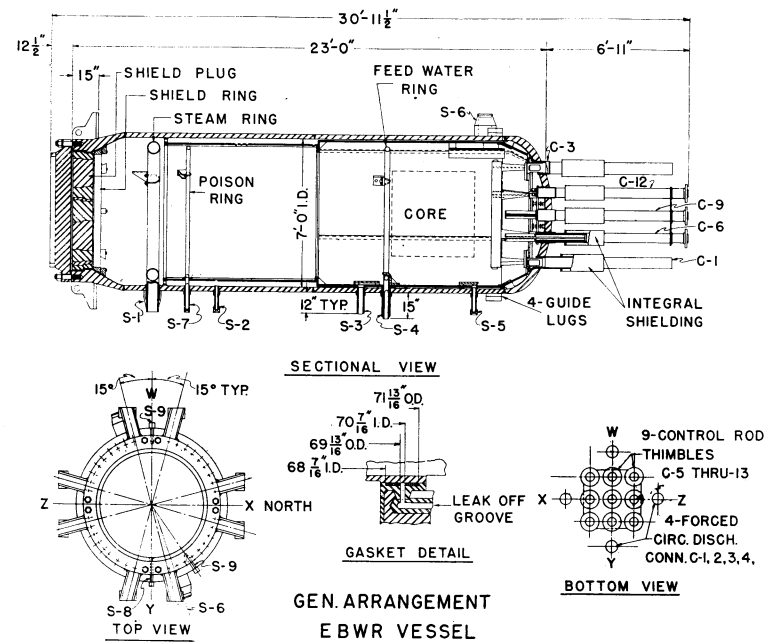


Diagram showing gland sealing arrangements for h.p. end of turbine shaft.

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)