8 and 15 metres long respectively, of 76 mm molybdenum alloyed steel. lined with 5 mm stainless steel welded in ringe to the inner wall of the vessel. The two pieces will be held together by a new type of flange joint designed for the purpose by AB Atomenergie,

The vessel, including the moderator tank of stainless steel and the top of the reactor core top frame, will be delivered in mid-1966. The Marviken power station will employ a boiling heavy water reactor to provide 140 MW(e), with the possibility of increasing the power to 200 MW(e) by installing Internal nuclear superheat.

POWER REACTORS OF THE WORLD

The following table shows the power reactors – in operation and under construction – in June 1965.

POWER REACTORS IN OPERATION

Name	*Location*	*Type*	*Net Output (MWe)*	*Criticality*
(1) *Belgium*				
BR-3	Mol	Press. H_2O, 3.7 + 4.4 % U	10.5	Aug 1962
(2) *Canada*				
NPD	Rolphton	Press. D_2O, nat. U	20	Apr 1962
(3) *France*				
G-1	Marcoule	Nat. U, graphite, air	1.7	Jan 1956
G-2 (G-3)	Marcoule	Nat. U, graphite, CO_2	2 × 35	Jul 58/June 59
EDF-1	Chinon	Nat. U, graphite, CO_2	68	Sep 1962
EDF-2	Chinon	Nat. U, graphite, CO_2	198.5	Aug 1964
(4) *Germany, Federal Republic of*				
KAHL	Grosswelzheim / Kahl/Main	Boiling H_2O, 2.6 % U	15	Nov 1960
(5) *Italy*				
LATINA	Latina	Nat. U, graphite, CO_2	200	Dec 1962

Name	*Location*	*Type*	*Net Output (MWe)*	*Criticality*
SENN	Sessa Aurunca	Boiling H_2O, 2 % U	150	June 1963
SELNI	Trino Vercelleze	Press. H_2O, 2.6 % U	270	June 1964
(6) *Japan*				
JPDR	Tokai-Mura	Boiling H_2O, 2.5 % U	11.7	Aug 1963
TOKAI-MURA	Tokai-Mura	Nat. U, graphite, CO_2	158	May 1965
(7) *Sweden*				
R-3 / ADAM	Agesta	Press. D_2O, nat. U	9	Jul 1963
(8) *United Kingdom*				
CALDER HALL	Calder Hall	Nat. U, graphite, CO_2	4 × 45	May 56 / Dec 1958
CHAPELCROSS	Chapelcross	Nat. U, graphite, CO_2	4 × 45	Oct 58 / Dec 1959
DFR	Dounreay	Fast breeder 45.5 % U, NaK	15	Nov 1959
BERKELEY	Berkeley	Nat. U, graphite, CO_2	2 × 138	Aug 61 / Mar 1962
BRADWELL	Bradwell	Nat. U, graphite, CO_2	2 × 150	Aug 61 / Apr 1962
AGR	Windscale	2.5 %U, graphite, CO_2	31.9	Aug 1962
HUNTERSTON	Hunterston	Nat. U, graphite, CO_2	2 × 170	Sep 63 / Apr 1964
HINKLEY POINT	Hinkley Point	Nat. U, graphite, CO_2	2 × 250	May 64 / late 1964
SIZEWELL	Sizewell	Nat. U, graphite, CO_2	289	June 1965
TRAWSFYNYDD	Trawsfynydd	Nat. U, graphite, CO_2	2 × 250	Sep 64 / Dec 1964
(9) *United States of America*				
EBWR	Lemont	Boiling H_2O, 1.5 + 90 % U	4.5	Dec 1956
SM-1	Fort Belvoir	Press. H_2O, 93 % U	1.9	Apr 1957
SRE	Santa Susana	Graphite-sodium, 90 % U + Th	5.1	Apr 1957
VBWR	Pleasanton	Boiling H_2O, 2-5 % U	shut-down '63	Aug 1957
SHIPPINGPORT	Shippingport	Press. H_2O, nat. + 93 % U	60	Dec 1957
DRESDEN	Dresden	Boiling H_2O, 1.5 % U	208	Oct 1959
YANKEE	Rowe	Press. H_2O, 3.4 % U	175	Aug 1960
PM-2A	Greenland	Press. H_2O, 93 % U	1.5	Oct 1960

Name	*Location*	*Type*	*Net Output (MWe)*	*Criticality*
BORAX-5	Idaho Falls	Nucl. superheat, 5 + 93% U	2.7	Feb 1962
PM-1	Sundance	Press. H_2O, 93% U	1.0	Feb 1962
PM-3A	Antarctica	Press. H_2O, 93% U	1.5	Mar 1962
SM-1A	Alaska	Press. H_2O, 93% U	1.7	Mar 1962
SAXTON	Saxton	Press. H_2O, 5.7% U	3.3	Apr 1962
INDIAN POINT	Indian Point	Press. H_2O, 93% U + Th	255	Aug 1962
HNPF	Hallam	Sodium-graphite, 3.6% U	75	Aug 1962
BIG ROCK POINT	Charlevoix	Boiling H_2O, 3.2% U	75	Sep 1962
ERR	Elk River	Boiling H_2O, 93% U + Th	20	Nov 1962
HUMBOLDT BAY	Eureka	Boiling H_2O, 2.6% U	50	Feb 1963
CVTR	Parr	Press. D_2O, 1.5 + 2.0% U	17	Mar 1963
PNPF	Piqua	Organic, 1.9% U	11.4	June 1963
ENRICO FERMI	Lagoona Beach	Fast breeder, 25% + nat. U	60.1	Aug 1963
EBR-2	Idaho Falls	Fast breeder 49% + nat. U, Na	16.5	Nov 1963
NPR	Richland	0.9% U, graphite, H_2O	776	Dec 1963 [a]
PATHFINDER	Sioux Falls	Nucl. superheat, 2.2 + 93% U	58.5	Mar 1964
BONUS	Punta Higuera	Nucl. superheat, nat. + 3% U	16.3	Apr 1964
(10) *Union of Soviet Socialist Republics*				
APS	Obninsk	5% U, graphite, H_2O	5	May 1954
SIBERIAN	Troitsk	Nat. U, graphite, H_2O	600 (6 × 100)	Sep 58 / Dec 1962
URAL I.	Beloyarsk	Nucl. superheat, 1.3% U	94	Sep 1963
WWER I.	Novo Voronezh	Press. H_2O, 1.5% U	196	Dec 1963
TES-3	Obninsk	Press. H_2O, enr. UO_2	1.5	1961
ARBUS	Melekes	Organic, 36% UAl_4 + Al	0.75	June 1963
VK-50 (Ulyanovsk)	Melekes	Boiling H_2O 1.5% U	70	Apr 1965

[a] Reactor critical, power generation scheduled for late 1965 or early 1966.

POWER REACTORS UNDER CONSTRUCTION

Name	*Location*	*Type*	*Net Output (MWe)*	*Criticality*
(1) *Canada*				
CANDU-PHW-200	Douglas Point	Press. D_2O, nat. U	203	1966
(2) *Czechoslovakia*				
HWGCR	Bohunice	Nat. U, D_2O, CO_2	150	1968
(3) *France*				
SENA [b]	Chooz	Press. H_2O, 3.1 % U	266	1965
EDF-3	Chinon	Nat. U, graphite CO_2	375	1965
EL-4	Monts d'Arrée	Enr. U, D_2O, CO_2	80	1966
EDF-4	Saint Laurant des Eaux	Nat. U, graphite, CO_2	480	1967
(4) *Germany, Federal Republic of*				
AVR	Jülich	Pebble bed, 90 %, Th graphite, He	13.2	1965
KRB	Gundremmingen	Boiling H_2O, enr. U	237	1966
MZFR	Karlsruhe	Nat. U, Press. D_2O	50	1965
KWL	Lingen	Boiling H_2O, fossile superheat, enr. UO_2	250	1968
KBWP	Obrigheim	Press. H_2O, 3 % UO_2	283	1968
HDR	Grosswelzheim / Kahl/Main	Boiling H_2O, nuclear superheat, enr. UO_2	25	1968
(5) *India*				
TARAPUR	Tarapur	Boiling H_2O	2 × 190	1968
RAJASTHAN (first unit) (CANDU type)	Rana Pratap Sagar	Press. D_2O, Nat. U	200	1969
(6) *Netherlands*				
GKN	Dodewaard	BWR ("direct cycle")	47	1968
(7) *Spain*				
ZORITA DE LOS CANES	Zorita de los Canes	Press. H_2O	140	1968

b) Electricity production is equally shared between Belgium and France.

Name	*Location*	*Type*	*Net Output (MWe)*	*Criticality*
(8) *Sweden*				
R-4/EVA	Marviken	Boiling D_2O, nat. U	200	1968
(9) *Switzerland*				
LUCENS	Lucens	1%U, D_2O, CO_2	7.5	1966
(10) *United Kingdom*				
DUNGENESS A	Dungeness	Nat. U, graphite, CO_2	2 × 275	1965
SIZEWELL	Sizewell	Nat. U, graphite, CO_2	289	1965
OLDBURY	Oldbury	Nat. U, graphite, CO_2	2 × 300	1966
SGHWR	Winfrith	1.4% U, D_2O, boiling H_2O	93	1967
WYLFA	Wylfa	Nat. U, graphite, CO_2	2 × 590	1968/69
(11) *United States of America*				
EGCR	Oak Ridge	2.5% U, graphite, He	21.9	1965
HTGR	Peach Bottom	93% U + Th, graphite, He	40	1965
LACBWR	Genoa	3.4% U, boiling H_2O	50	1965
SAN ONOFRE	Camp Pendleton	3.6% U, press. H_2O	375	1967
CONNECTICUT YANKEE	Haddam Neck	3-4% U, press. H_2O	462	1967
JERSEY CENTRAL	Oyster Creek	Boiling H_2O, enr. UO_2	515	1968
NINE MILE POINT	Oswego, N.Y.	Boiling H_2O, enr. UO_2	500	1968
(12) *Union of Soviet Socialist Republics*				
WWER-II	Novo-Voronezh	Press. H_2O, 1.5% U	365	1965
URAL-II	Beloyarsk	Nucl. superheat, 1.3% U	200	1965
BN-350	Shevchenko (Caspian Sea)	Fast breeder, 23% UO_2 + Pu, Na	350	