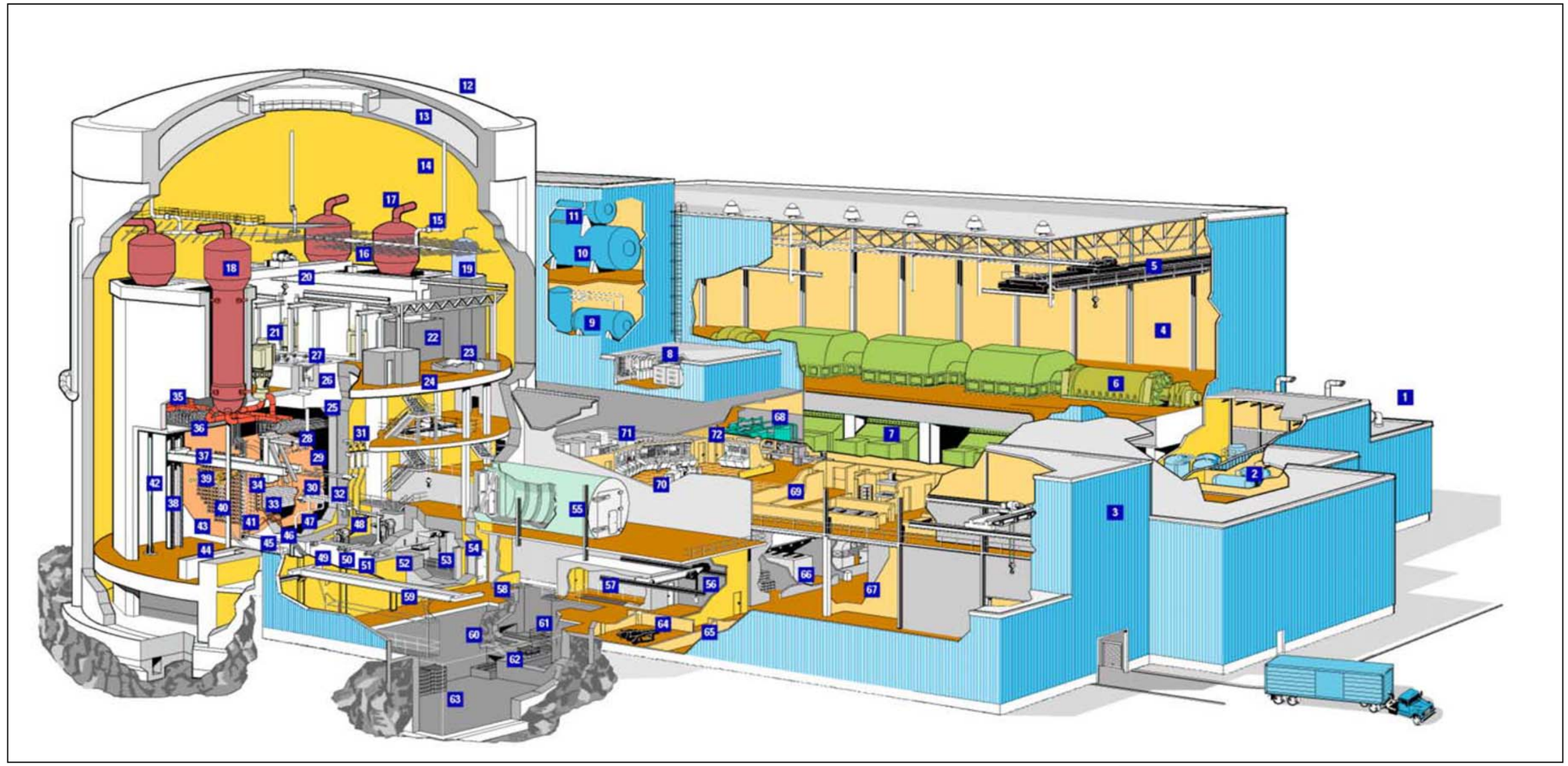
AECL EACL

CANDU 6
Nuclear Power Plant

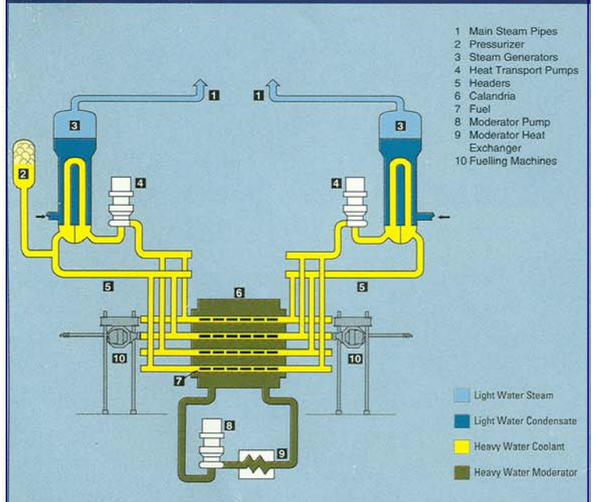
CANDU 6 Cutaway Key

1. Diesel room
2. Water treatment plant *
3. Crane hall
4. Turbine building
5. Turbine building crane
6. Generator
7. Condenser
8. Battery room
9. Boiler feed water tanks
10. Deaerator storage tank
11. Deaerator
12. Reactor building
13. Dousing tank
14. Dousing water supply pipes
15. Dousing water valves
16. Dousing water spray nozzles
17. Main steam pipes
18. Steam generators
19. Pressurizer
20. Crane
21. Heat transport pumps
22. Bleed condenser
23. Bleed cooler
24. Hatch
25. Reactor vault
26. Pressure relief pipes
27. Reactivity mechanism deck
28. Reactivity mechanism guide tubes
29. Calandria
30. Poison injection nozzles
31. Poison tanks
32. Ion chambers
33. Fuel channel assemblies
34. End shield
35. Headers
36. Feeder pipes
37. Fuelling machine bridge
38. Bridge support column
39. Fuelling machine
40. Fuelling machine catenary
41. Fuel channel end fittings
42. Steam generator support column
43. Feeder pipe insulation cabinet
44. Fuelling machine shielding door
45. End shield cooling
46. Fuelling machine track
47. Moderator inlet pipe
48. New fuel transfer mechanism
49. New fuel port
50. Fuelling machine service ports
51. Rehearsal facility
52. Spent fuel port
53. Spent fuel elevator
54. Entrance to spent fuel area
55. Airlock
56. Crane
57. Spent fuel shipping area
58. Spent fuel handling area
59. Spent fuel bay gantry
60. Spent fuel bay
61. Spent fuel storage trays
62. Storage tray conveyor
63. Storage tray stack
64. Fuelling machine maintenance area
65. Decontamination room
66. New fuel storage
67. Tool crib
68. Vapour recovery equipment
69. Office
70. Control room *
71. Control equipment room
72. Computer room

* Some items have been moved for clarity



CANDU System Schematic



Technical Data

Reactor

Type		PHWR
Thermal output	(PHTS)	2064 MW(th)
Coolant flow rate	(PHTS)	7.7 Mg/s
Design temperature	(RIH)	279° C
Design pressure	(RIH)	12.9 MPa(g)
Operating temperature	(RIH)	266° C
Operating pressure	(RIH)	11.75 MPa(abs)
Design temperature	(ROH)	316° C
Design pressure	(ROH)	10.7 MPa(g)
Operating temperature	(ROH)	310° C
Operating pressure	(ROH)	10.0 MPa(abs)

Fuel Channels

Pressure tube inside diameter (cold, unpressurized)	103.38 mm
Core Length (between Calandria tubesheets)	5.94m
Number of pressure tubes	380
Coolant flow (nominal)	24 kg/s
Est. pressure drop-12 bundles	838 kPa

Fuel

Length of bundle	495.3 mm
Outside dia. of bundle (over bearing pads)	102.5 mm
Weight of bundle (nominal)	24.17 kg
Weight of uranium per bundle (nominal)	19.36 kg
Sheath outside dia. (cold)	13.1 mm
Sheath thickness (average)	0.4 mm
Sheath material	Zircaloy - 4
Elements per bundle	37
Fuel material	Natural UO_2
Fuel bundles in core	4560
Fuel bundles per channel	12

Primary Heat Transport

Number of loops	2
Primary coolant	D_2O
Reactor inlet temperature	266° C
Reactor outlet temperature	310° C

Reactivity Control Units

Number of assemblies		85 vertical 19 horizontal
Materials	(out of core)	Stainless steel
	(in core)	zircaloy/stainless steel/cadmium

Steam Generators

Type, number	Vertical U-tube, 4
Steam flow for 4 steam generators	1033.0 kg/s
Steam pressure at full power	4.7 MPa(abs)
Steam temperature at full power	260° C
Maximum moisture	0.25%
Feedwater temperature	187° C

Heat Transport Pumps

Number	4
Motor/ type	AC vertical, TEWAC induction
Rated capacity	2228 l/s
Rated head	215.0m

Containment

Type	Prestressed cylindrical concrete
Inside diameter	41.46m
Height Above Grade	46.02m
Total Inside Containment	65,500m^3

Turbine

Single shaft tandem compound steam turbine directly coupled to 828MVA generator. Steam turbine consists of one double flow high pressure cylinder, two external moisture separators/reheaters and three double flow low pressure cylinders.

Generator

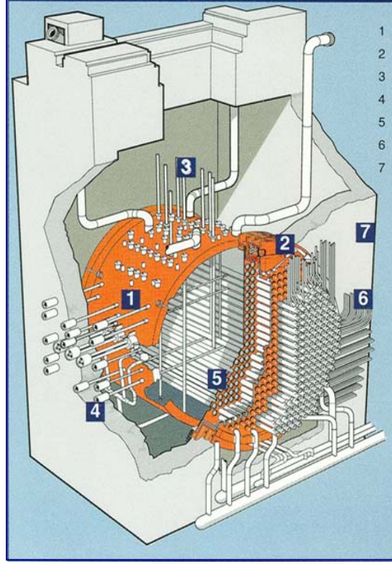
Rated 828 MVA at 0.9 power factor and 414 kPa(g) hydrogen pressure 1800 rpm with terminal voltage of 22,000 volts, 60 Hz.

Condenser

Single tube sheet shells. Each shell is connected to the three LP turbine exhausts.

Two 100% main condensate extraction pumps and one auxiliary condensate extraction pump. Three 50% main steam generator feedwater pumps and one auxilliary steam generator feedwater pump.

Calandria and End Shield Assembly in Reactor Vault



1 Calandria
2 Calandria End Shield
3 Shut-off and control rods
4 Poison injection
5 Fuel channel assemblies
6 Feeder pipes
7 Vault