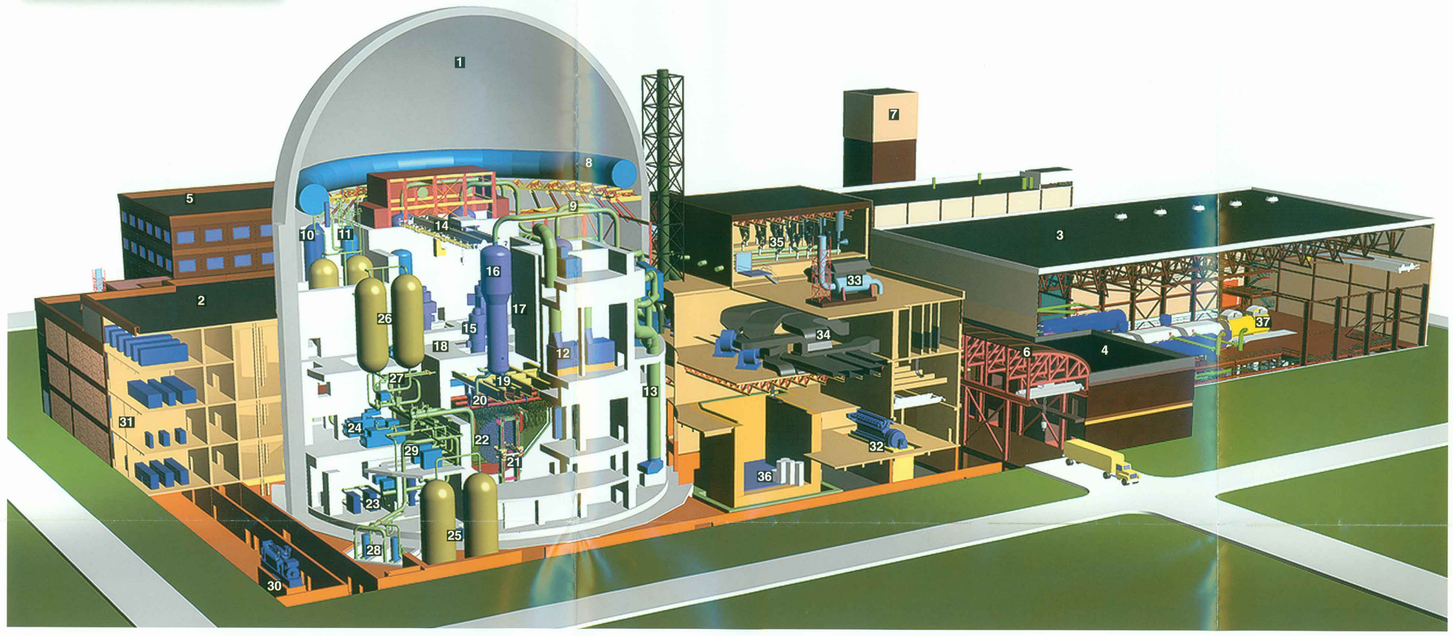
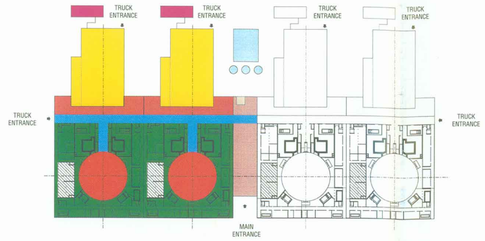
CANDU 9 NUCLEAR POWER PLANT



Site Layout



- Reactor Building
- Reactor Auxiliary Building
- Turbine Building
- Main Control Room
- Maintenance Building
- Station Service Building
- Crane Hall
- D_2O Upgrading Tower
- Water Treatment Plant & Demineralized Water Tanks
- Transformer Area

Technical Data

Reactor

Type		PHWR
Thermal output	(HTS)	2716 MW (th)
Coolant flow rate	(HTS)	11 Mg/s
Reactor inlet header design temperature		279˚ C
Reactor inlet header design pressure		12.7 MPa (g)
Reactor outlet header design temperature		318˚ C
Reactor outlet header design pressure		11.0 MPa (g)

Fuel Channels

Pressure tube inside diameter (cold, unpressurized)	103.4 mm
Core length (between calandria tubesheets)	5.94 m
Core diameter (calandria)	8.458 m
Number of pressure tubes	480
Flow in maximum power channel	26 kg/s
Est. pressure drop across 12 bundles	830 kPa

Fuel

Length of bundle	495.3 mm
Outside dia. of bundle (over bearing pads)	102.4 mm
Weight of bundle (nominal)	24.1 kg
Weight of uranium per bundle (nominal)	19.1 kg
Sheath outside dia. (cold)	13.08 mm
Sheath thickness (average)	0.42 mm
Sheath material	Zirconium alloy
Elements per bundle	37
Fuel material	Natural UO_2
Fuel bundles in core	5760
Fuel bundles per channel	12

Heat Transport System

Number of loops	one
Primary coolant	D_2O
Reactor inlet header operating temperature	267˚ C
Reactor inlet header operating pressure	11.3 MPa (abs)
Reactor outlet header operating temperature	310˚ C
Reactor outlet header operating pressure	10.0 MPa (abs)

Reactivity Control Units

Number of assemblies		81 vertical 28 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	1328 kg/s
Steam pressure at full power	5 MPa (g)
Steam temperature at full power	265˚ C
Maximum moisture	0.25 %
Feedwater temperature	177˚ C

Heat Transport Pumps

Number	4
Motor/ type	AC vertical squirrel cage induction
Rated capacity	3200 l/s
Rated head	263.5 m

Containment

Type	Prestressed concrete with steel liner
Inside diameter	57 m
Height above grade	67.5 m
Total free volume inside containment	124,000 m^3

Turbine Generator

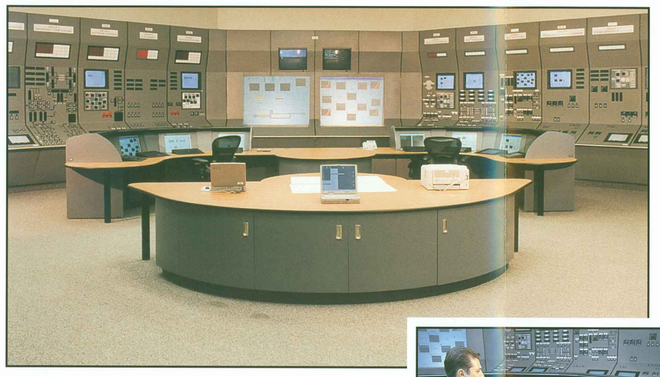
Single shaft tandem compound steam turbine directly coupled to 935 MWe * generator. Steam turbine consists of one double flow HP cylinder, two external moisture separators/ reheaters and three double flow LP cylinders.

* Dependent upon the supplier and site conditions.

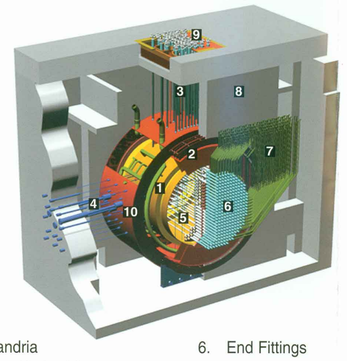
CANDU 9: Cutaway Key

1. Reactor Building
2. Reactor Auxiliary Building
3. Turbine Building
4. Maintenance Building
5. Station Service Building
6. Crane Hall
7. D_2O Upgrade Tower
8. Reserve Water Tank
9. Main Steam Line
10. Pressurizer
11. Bleed Condenser
12. Reactor Vault Coolers
13. Hydrogen Mixing Duct
14. Crane
15. Heat Transport Pump
16. Steam Generator
17. Steam Generator Enclosure
18. Reactivity Mechanism Deck
19. Heat Transport Pipe Whip Support Steel
20. Reactor Inlet & Outlet Headers
21. Fueling Machine and Carriage
22. Calandria and Shield Tank Assembly
23. Moderator Pump and Heat Exchangers
24. Dryers
25. Emergency Core Cooling Gas Tanks
26. Emergency Core Cooling Water Tanks
27. Emergency Core Cooling Valve Station
28. Emergency Core Cooling Pumps
29. Emergency Core Cooling Heat Exchangers
30. Group 2 Diesel Generator
31. Group 2 Electrical Support Systems
32. Group 1 Diesel Generator
33. Diesel Generator Silencer
34. Reactor Auxiliary Building HVAC
35. Main Steam Safety Valves
36. Spent Fuel Storage Bay
37. Turbine Generator

Control Centre



Calandria and Shield Tank Assembly



1. Calandria
2. Calandria End Shield
3. Shut-off and Control Rods
4. Poison Injection
5. Fuel Channels
6. End Fittings
7. Feeder Pipes
8. Reactor Vault
9. Reactivity Mechanism Deck
10. Shield Tank

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