

## 4.2 Current Nuclear Reactors

Typical data on some of the principal types of Generation II reactors is listed in table 1. These differ primarily in terms of the nuclear fuel being utilized and therefore the nuclear fuel cycle involved (see section 2.2) and this distinguishes the LWRs from the HWRs and the FBRs. The two LWR types are then distinguished by the strategy used to handle the possibility of the cooling water boiling and therefore by the pressure of the primary cooling water system and the corresponding safety systems. Each of these features will be a focus in the sections that follow.

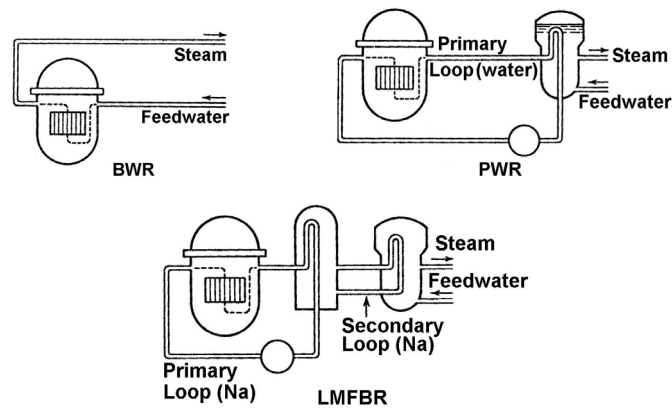


Figure 1: Schematics of a boiling water reactor, BWR, a pressurized water reactor, PWR, and a liquid metal fast breeder reactor, LMFBR. From Duderstadt and Hamilton (1976).

Table 1: Some typical nuclear power plant data for Generation II reactors (see figure 1). Extracted from Duderstadt and Hamilton (1976), Todres and Kazimi (1990).

Type of Reactor	PWR (LWR)	BWR (LWR)	CANDU (HWR)	LMFBR (FNR)
Electrical Output (MW)	1150 – 1300	1200	500	1000
Efficiency(%)	33 – 34	33	31	39
Fuel	$U_2O$	$U_2O$	$U_2O$	$U_2O, PuO_2$
Primary Coolant	$H_2O$	$H_2O$	$D_2O$	$Na$
Moderator	$H_2O$	$H_2O$	$D_2O$	None
Coolant Pressure ( <i>atm</i> )	155	72	89	1.4
Coolant Inlet ( $^{\circ}C$ )	296 – 300	269	249	380
Coolant Outlet ( $^{\circ}C$ )	328 – 333	286	293	552
Flow Rate ( $10^6$ <i>kg/hr</i> )	65	47	24	50
Max. Fuel Temp. ( $^{\circ}C$ )	1788 – 2021	1829	1500	2000