

**Table-1 Description of the SMR-220 MWe power plant**

Parameter	Units	Value
Thermal Power	(MWt/MWe)	705/235
Pressure	(MPa)	15.7
Coolant flow through reactor	(m <sup>3</sup> /hr)	20210
Core average inlet temperature T <sub>inlet</sub>	(°C)	291
Core average outlet temperature T <sub>outlet</sub>	(°C)	321
No. of fuel assemblies		55
Active core height	(mm)	3700
Fuel Assembly pitch	(mm)	236
Fuel Assembly across flat	(mm)	234
Fuel pin outer diameter (also Gd pins)	(mm)	9.1
Fuel clad inner diameter	(mm)	7.73
Pellet inner diameter – air gap (also Gd pins)	(mm)	1.2
Pellet outer diameter (also Gd pins)	(mm)	7.6
Fuel pin hexagonal / triangular pitch	(mm)	12.75
Fuel clad material		Alloy E110 or Zr-Nb (1%)
Effective core diameter	(mm)	1838
Circumscribed diameter	(mm)	1965
Height to diameter ratio of active core		2.01
Reactor core baffle outer diameter	(mm)	2120
No. of surveillance thimbles		138

Diameter of thimbles vary as	(mm)	40 to 101
Core barrel diameter	(mm)	2240
Reactor Pressure vessel internal diameter	(mm)	2640
Pressure vessel wall thickness	(mm)	160
Reactor Pressure vessel outer diameter	(mm)	2960
Fuel pins per FA (Central water GT is now a fuel pin, unlike initial fuel types of VVER-KK core)		312
No. of fuel pins in core (including Gd pins)		17160
No. of guide tubes for control (RCCA)		18
Guide tube for incore instrumentation tube	(off central)	1
Guide tubes (ID/OD)	(mm)	10.9/12.9
Guide tube material		Zircalloy
Absorber rod outer diameter with SS clad	(mm)	8.2
Absorber diameter ( $B_4C$ or $Dy_2O_3$ $TiO_2$ )	(mm)	7.1
Absorber Material in top 3200 mm		$B_4C$
In bottom 500 mm		$Dy_2O_3$ $TiO_2$
No. of Absorber rods in RCCA in one FA		18
No. of RCCAs in core		37
No. of control groups		6
No. of FAs with no RCCAs (Outermost FAs)		18
No. of FAs with SPND detectors located		27
No. of SPNDs in one FA (axially equally spaced)		7
No. of SPNDs in one control channel		9x7

No. of independent control channels (A, B, C)		3
No. of FAs with no SPND detectors		28
Average linear heat generation rating (ALHGR)	(w/cm)	111
Heat transfer surface area	(m <sup>2</sup> )	1815.14
U-mass per pin	(kg)	1.4889
U-mass per FA	(kg)	464.5328
Total U-mass in core	(T)	25.5493
Average fuel power density	(KW/KgU)	27.594
Average core power density	(MW/m <sup>3</sup> )	71.824
Fuel cycle duration	(m)	18
No. of FAs refueled in a batch		18
Fuel cycle energy for 540 days	(MWD)	380700
Average burnup in a fuel cycle	(MWD/T)	14900
Average discharge burnup after 3 fuel cycles	(MWD/T)	44700
Maximum fuel enrichment for equilibrium core	(%)	4.9