Nuclear power plans would also create huge water problems

In thermal power stations the water is turned into high pressure steam by a boiler or nuclear reactor to turn the turbines of the power stations that drive the generators. The amount of water used in a power station and its consumption depends on the cooling technology. Some power stations use large quantities of water, but most of this water is returned to the source and can be used again. All power stations do consume some of the water they use. This is generally water that is lost as evaporation.

Hence, with water resources availability already under pressure with domestic, industrial and irrigation demands growing rapidly it is highly recommended to undertake a comprehensive water availability audit before going in for the inland nuclear plants

There are two types of cooling systems:

⇒ Closed cycle: the steam is cooled in towers or ponds and the water that is not lost to evaporation, it is recycled through the plant again.

⇒ Once-through: the steam is cooled by more water that is pumped from an outside source in pipes through a condenser.

Of the two systems, the closed cycle uses about 2-3% of the water volumes used by the once-through system. However, the two systems consume about the same amount.

Cooling Water Withdrawal and Consumption Rates for Common Thermal Power Plants and different Cooling System Types

Cooling System	Plant Type	Water Withdrawal (litres/MWh)	Water Consumption (litres/MWh)
once-through cooling	Fossil/ biomass/ waste	75708-189270	~1136
	Nuclear	94635-227124	~1514
pond cooling	Fossil/ biomass/ waste	1136-2271	1136-1817
	Nuclear	1893-4164	1514-2725
cooling towers	Fossil/ biomass/ waste	1893-2271	~1817
	Nuclear	3028-4164	~2725

Source: *Water & Sustainability (Volume 3): U.S. Water Consumption for Power Production—The Next Half Century,* EPRI, Palo Alto, CA: 2002 viewed on 261108)

Nuclear power plants need more cooling water than fossil-fired power stations. This is because the steam in nuclear power stations is designed to operate at lower temperatures and pressures, which means they are less efficient at using the heat from the reactor and thus require more water. A study on water and sustainability for power production in the US by the Electric Power Research Institute compared the water needs and consumption rates of existing power stations by type of fuel and cooling technology.

The EPRI analysis showed that existing nuclear power stations used and consumed significantly more water per megawatt hour than electricity generation by fossil fuels. Nuclear 'once-through' systems use about 20-25% more water and nuclear 'closed systems' can use up to 83% more water. Furthermore actual water consumption rates are higher. The data shows that for once-through systems nuclear consumes about 33% and closed systems 50% more than fossil fuel power stations. Assuming that a power station ran 24 hours a day and based on the lower end of the estimates in above mentioned table, annual usage of water (million liters) and its consumption per MW would be as follows.

		Withdrawal ML/MW	Consumption ML/MW
Once Through	Fossil/ biomass/ waste	663	10
	Nuclear	829	13
Pond Cooling	Fossil/ biomass/ waste	10	10
	Nuclear	17	13
Tower Cooling	Fossil/ biomass/ waste	17	16
	Nuclear	27	24

The existing nuclear power stations use and consume more per MW water than power stations using other fuel sources. Depending on the cooling technology utilised, the water requirements for a nuclear power station can vary 20-83% more than for other power stations.

In Case of Nuclear power plant with 1000 MW capacity proposed in Haryana near Kumaria, District Sirsa, the water requirements are to be met by a 310 cusecs channel from Bhakra through the Bhakra Main Line Canal. Emergency standby arrangements have to be made through the Rajasthan Feeder. This would ensure the availability of 280 million liters of water per MW annually to satisfy the need of the plant requirements.

Hence, with water resources availability already under pressure with domestic, industrial and irrigation demands growing rapidly it is highly recommended to undertake a comprehensive water availability audit before going in for the inland nuclear plants. Thus a review of India's nuclear power plans is required in view of a number of serious problems such a plan would create. (http://www.aph.gov.au/library/pubs/rn/2006-07/07rn12.pdf 251108, THE TRIBUNE 211108)