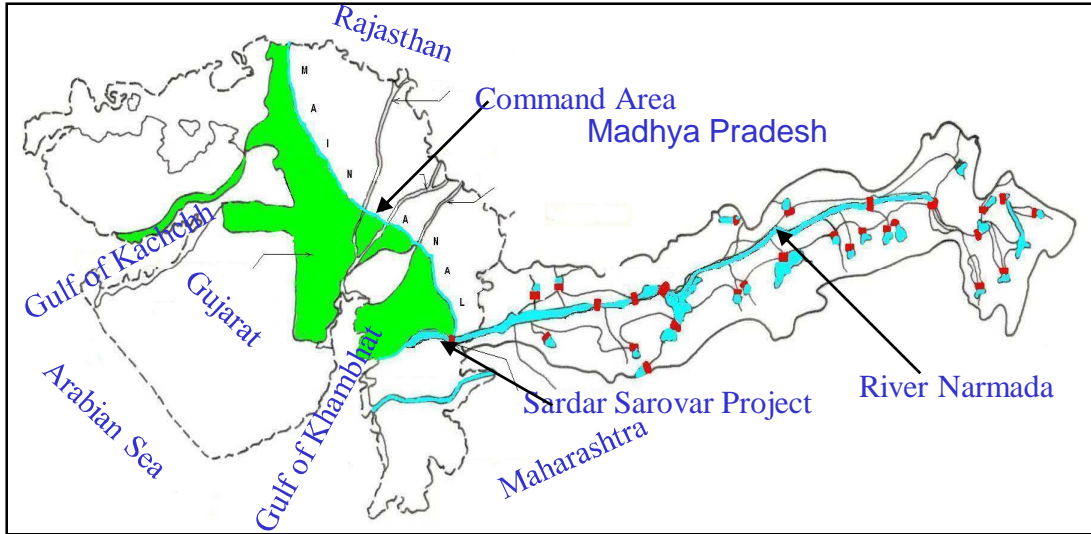


# SARDAR SAROVAR DAM SPILLWAY, GUJARAT



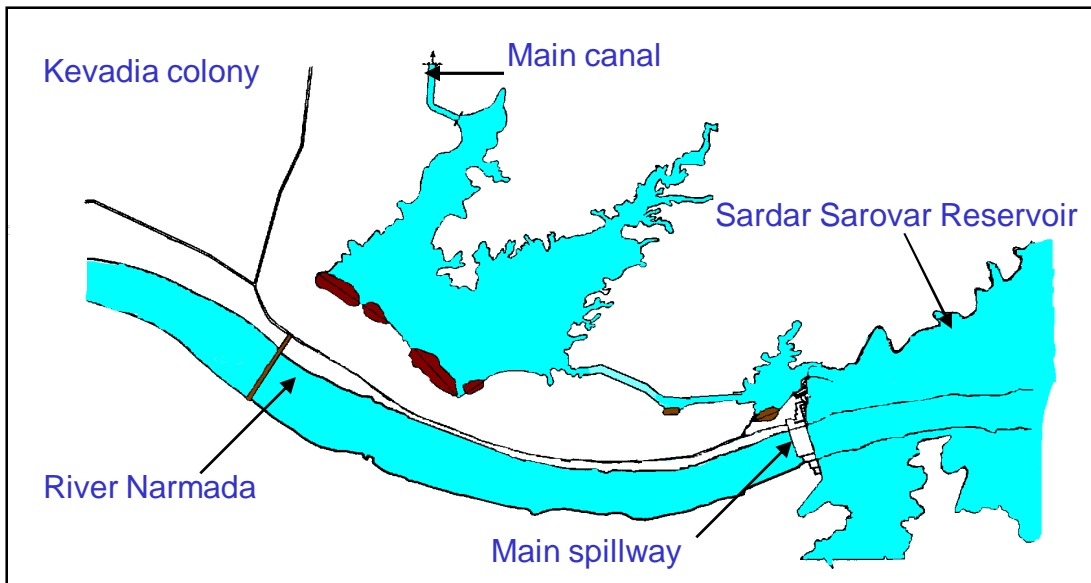
CENTRAL WATER AND POWER RESEARCH STATION

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## INDEX MAP OF NARMADA VALLEY

- ❖ Narmada, the largest west flowing river length 1312 km, meets Gulf of Khambhat
- ❖ 19 tributaries, 8 on right, 11 on left bank
- ❖ The Irrigation potential 4.45 million hectares
- ❖ Power potential more than 2000 MW
- ❖ 30 major projects under construction/proposed



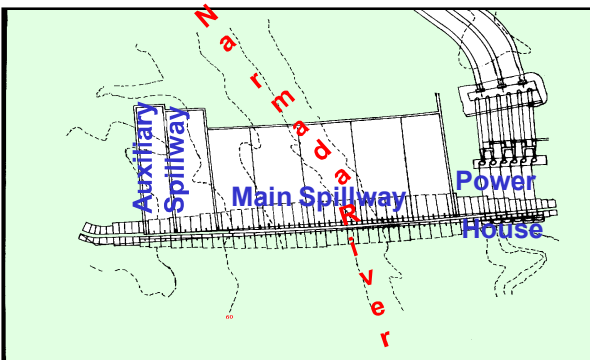
## LAYOUT PLAN OF THE PROJECT

- ❖ largest water resources project in India in terms of concrete volume
- ❖ Third highest concrete dam (163 m)
- ❖ Length of dam . 1.21 km
- ❖ Two Power Houses -
  - Main Power House . 1200 MW
  - Canal Power House . 250 MW
- ❖ Largest Irrigation Canal . Length 468 km, carrying capacity 1133 m<sup>3</sup>/s, 35 branches

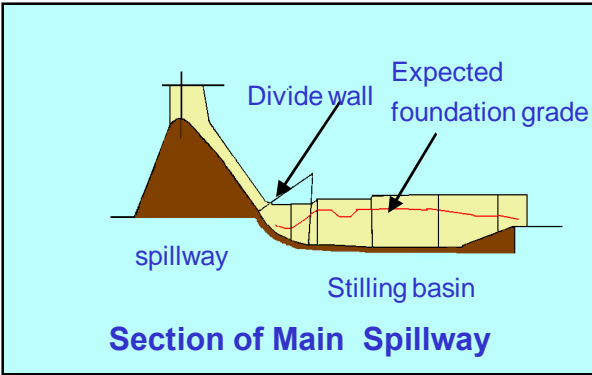


- ❖ Project under consideration
- ❖ Auxiliary spillway completed
- ❖ Main spillway completed upto El. 90 m
- ❖ Canal Power House completed
- ❖ Main Power House under construction

- ❖ Max. spillway discharge 1,41,000 m<sup>3</sup>/s ( 50 lakh cfs)
- ❖ Design construction stage discharge 69,376 m<sup>3</sup>/s (24 lakh cfs)
- ❖ Maximum flood passed in 1994  
Q = 69,000 m<sup>3</sup>/s

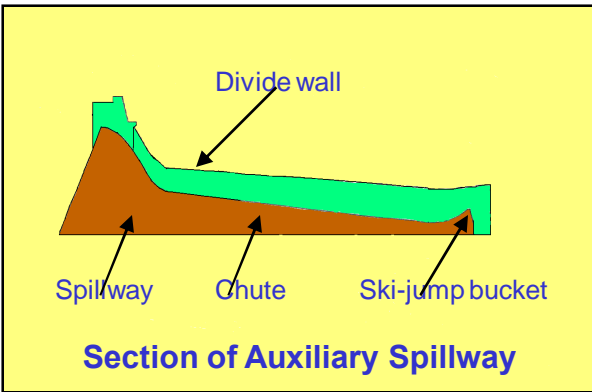


- ❖ Main Spillway . 23 Spans : Energy dissipator sloping - cum - horizontal hydraulic jump stilling basin
- ❖ Auxiliary Spillway - 7 Spans : Long chutes . Energy dissipator ski-jump bucket



❖ Studies conducted at CWPRS since 1978

- \* Two comprehensive models
- \* Two sectional models
- \* Finalised the arrangement of main and auxiliary spillway



- ❖ Finalised the design of appurtenances like training and divide walls in the stilling basin and aeration grooves
- ❖ Most interesting studies for estimation of hydrodynamic bending moments on divide walls, pullout forces on right training wall, uplift forces on stilling basin aprons.

- ❖ Hydrodynamic parameters measured using sophisticated electronic transducers connected with PC based data acquisition system.
- ❖ Significant contribution . revealed the fact that the conventional design may be unsafe.



- ❖ Various stages of construction studied on comprehensive and sectional model
- ❖ Evolved suitable design of low level hump through model studies



## SALIENT FEATURES

### MAIN DAM

▪ Length of main concrete gravity dam	:	1210.00 m
▪ Max. height above deepest foundation level	:	163.00 m
▪ Top elevation of dam	:	146.50 m
▪ Catchment area of river above dam site	:	88,000 sq.km
▪ Gross storage capacity	:	9497.07 M.cum
▪ Live storage capacity	:	5859.80 M.cum
▪ Length of reservoir	:	214 km
▪ Maximum width	:	16.10 km
▪ Average width	:	1.77 km
▪ Spillway		
➤ Chute spillway . 7 Nos.	:	18.30 m x 18.00 m
➤ Service Spillway . 23 Nos.	:	18.30 m x 16.75 m

### DISTRIBUTION SYSTEMS

▪ No. of branches (Gujarat)	:	42
▪ Length of distribution system network	:	75,000 km
▪ Annual irrigation	:	
➤ Gujarat	:	1.792 Mha.
➤ Rajasthan	:	0.073 Mha.

### POWER GENERATION

▪ River bed power house ( 6 x 200 MW)	:	1200 MW
▪ Canal head power house (5 x 50 MW)	:	250 MW

### MAIN CANAL

▪ Full capacity level (FSL) at H.R.	:	91.44 m
▪ Length upto Gujarat . Rajasthan border	:	458.00 km
▪ Length in Rajasthan	:	74.00 km
▪ Base width in head reach	:	73.01 m
▪ Full supply depth (FSD) in head reach	:	7.60 m
▪ Design discharge capacity	:	
(a) In head reach	:	1133 m <sup>3</sup> /s (40,000 ft <sup>3</sup> /s)
(b) at Gujarat . Rajasthan border	:	71 m <sup>3</sup> /s (2,500 ft <sup>3</sup> /s)