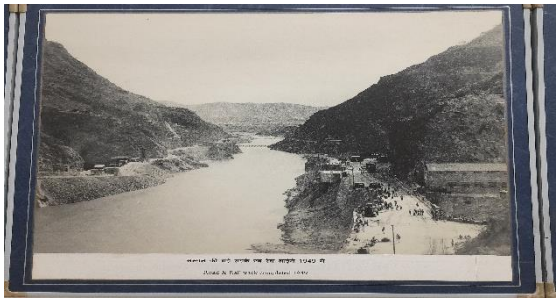
Name of the Event: BHAKRA DAM TRIP

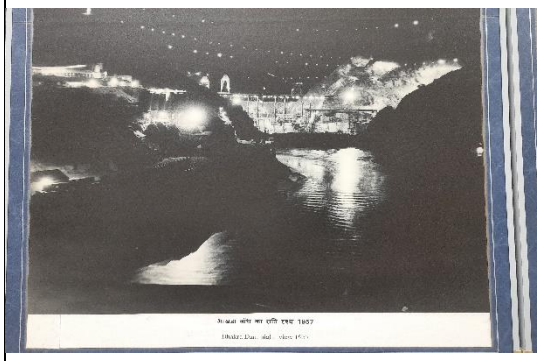
Name of department/ Section/ cell conducting the activity	B. Tech Electrical 6th semester
Date of conduct	19th May 2022- 21st May 2022
Activity Coordinator	Dr. Poonam Singhal
Amount Spent	Rs. 37200
Funding/ grant from (University/ Industry/ UGC/ AICTE/ DST/ TEQIP/ Outside Society/ agency/others (mention)	Rs. 37200
Target audience:	47 students, 4 faculty members
No. of beneficiaries	47
Brief Description of the event	**DATE**- 19TH MAY 2022 To 21st MAY 2022 **MODE OF TRANSPORT**- Train **NUMBER OF STUDENTS**- 47 **FACULTY NAMES**- 1. Dr. Poonam Singhal 2. Dr. P.R Sharma 3. Mr. Atmaram 4. Mr. Avinash

	The main aim of this trip was to give exposure to the students about the hydroelectric powerplants. This trip was solely planned to provide knowledge to the students about the construction and working of the Bhakra Dam. During this trip, students visited various places near Bhakra Dam and they were taught about the functioning of the dam by various experts there. Students also visited VIRASAT-E-KHALSA which is a museum of Sikhism.  **DEPARTMENT OF ELECTRICAL ENGINEERING,** **J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD**
Attach Brochure of the event	
Attach two/ three good quality photographs	

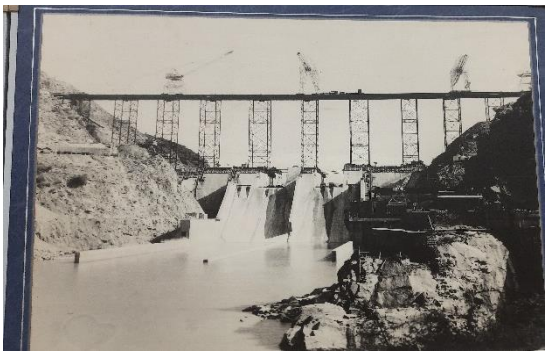
	 
Attach certificate of the event	---
Any other information	**HISTORY OF BHAKRA DAM-** Bhakra Dam is a concrete gravity dam on the Sutlej River in Bhakra Village near Bilaspur in Bilaspur district, Himachal Pradesh in northern India. Construction of this dam started in 1948. The first purpose of this dam was to control floods in Punjab.  Virgin George 1908  Road & Rail track completed 1949

Foundation excavation progress (1953-1955)

Concreting operation started 1956



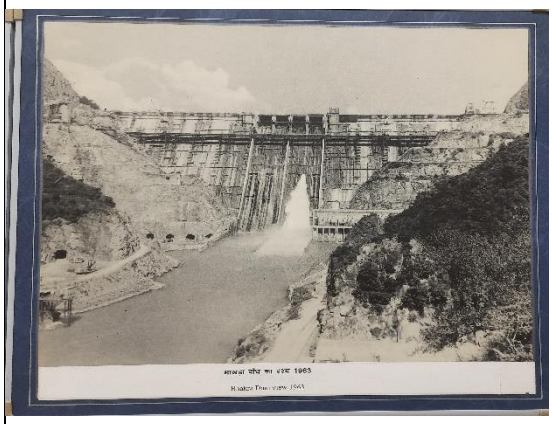
Bhakra Dam night view 1957



First stage completed 1958

EL’1320 Irrigation Outlet in Operation 6th august 1959

water flowing over temporary spillway 11 October 1961



Bhakra Dam view 1963

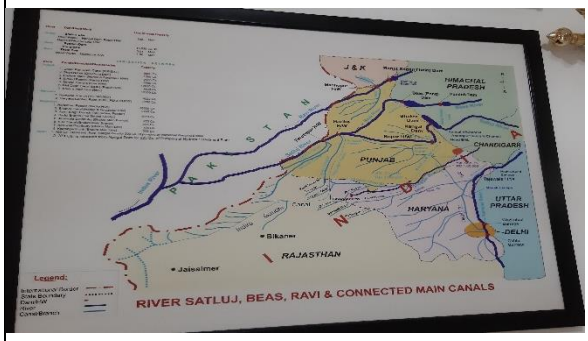
Downstream view of completed Bhakra Dam 1963

FEATURES OF BHAKRA DAM-

- Height= 1700 feet, Length= 741 feet
- Surface area = 168.035 km^2
- Supply water to Delhi through NCR channel
- Turbines – 5X 157MW, 5X 126MW
- Storage 1530 feet after 1630 feet height, water is spilled out from the spillway
- Two types of turbines are used – Francis and Reactive turbines
- Installed Capacity upto 2000MW
- Total 10 Penstocks are installed in this dam
- Around 4-5 Penstocks are used during morning. Length of each penstock = 600 feet.
- **Triangulation Survey-** surveying method that measures the angles in a triangle formed by three survey control points. It is done to determine the change in angulation (civil work) with pressure.
- There is 1.41 inches angle change when pressure is maximum.
- Steep slopes are made so as to avoid landslides. These rocks are filled with reinforced steel and concrete to make them strong enough to withstand the pressure of the water.

- Guide vanes are used to control the speed by controlling the amount of flow of water.
- If guide vanes fail, the amount of water flowing will be uncontrollable, so the machine speed will become very high and uncontrollable then, the valve of the penstocks have to be controlled.

- Maximum pressure of water in dam is 1.25 MPa .
- **Francis Vertical shift –** has 36 poles and speed 166.7 rpm.
- Distance between sea level and water- 1560 feet , distance between sea level and dam 1073 feet. Therefore, 487 feet is water. At 1389 feet there is a penstock.
- In Bhakra dam, Beas river has more water than Satluj river. Therefore , the water from Beas is divided using underground tunnel and sent to reservoir and electricity is produced at two different locations. The rest excess water is sent to Satluj and when there is extremely high water, then water is released in Pakistan.

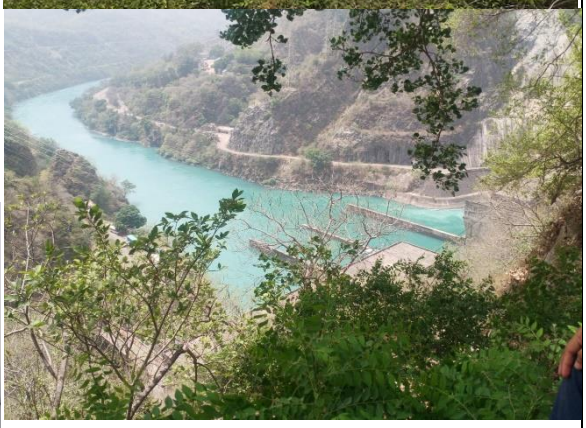


Map showing River SATLUJ, BEAS, RAVI and connected channels

Model of BEAS SATLUJ LINK PROJECT

MODEL OF BHAKRA DAM PROJECT

PICS TAKEN NEAR BHAKRA DAM-



VIRASAT-E-KHALSA

- Virasat-e-Khalsa is a museum of Sikhism, located in the holy town, Anandpur Sahib, near Chandigarh, the capital of the state of Punjab, India. The museum celebrates 500 years of the Sikh history and the 300th anniversary of the birth of Khalsa, based on the scriptures written by the tenth and last Guru Gobind Singh Ji. It serves to attract tourists and pilgrims. This results in a consultation between religion and emerging need in the building environment. One side it promotes hand crafts to locals as well as nurturing a sense of heritage, besides it recalls to infinity by the volumetric interference of existing skyline is another phase of a visible Urbanism dilemma.

- This was established in 13 April 1999 and completed on 25 November 2011.

	
Outcome Of the Trip	The overall experience of this trip was very nice. We enjoyed a lot as well as learnt and explored many new things. We now understand the working of hydroelectric power plant. We are very thankful to department of Electrical Engineering and Poonam mam for organizing this wonderful trip and we wish our department organize such trips in future also.