

are highly intricate questions relating to science and engineering. This Court does not possess the requisite expertise to render any final opinion on the rival contentions of the experts. The court can only investigate and adjudicate the question as to whether the Government was conscious to the inherent danger as pointed out by the petitioners and applied its mind to the safety of the dam. [613E-G]

A

ORIGINAL JURISDICTION: Writ Petition No. 12829 of 1985.

B

(Under Article 32 of the Constitution of India).

Kapil Sibal, Additional Solicitor General, P.S. Poti, S.P. Garg, Ms. Malini Poduval, R. Venkataramani, Harish N. Salve, Mrs. S. Dikshit, B. Parthasarathi, R.P. Srivastava, R.P. Wadhvani, A.S. Pundir and Ms. Sushma Suri for the appearing parties.

C

The following Order of the Court was delivered:

SINGH, J. This petition under Article 32 of the Constitution of India has been filed in public interest by Tehri Bandh Virodhi Sangarsh Samiti and others. The petitioners have prayed that the Union of India, State of Uttar Pradesh and the Tehri Hydro Development Corporation be restrained from constructing and implementing the Tehri Hydro Power Project and the Tehri Dam.

D

The main grievance of the petitioners is that in preparing the plan for the Tehri Dam project the safety aspect has not been taken into consideration. It is asserted that the dam if allowed to be constructed poses a serious threat to the life, ecology and the environments of the entire northern India as the site of the dam is prone to earthquake. After this petition was filed a number of persons have intervened and the parties have filed affidavits and counter affidavits. The matter was heard by this Court at various stages. The controversy relating to the project has not only been debated in this Court but has also taken a good deal of Parliament's time.

E

F

Shri P.S. Poti, learned senior advocate appearing for the petitioners has argued that the seismic experts in India and abroad are of the view that past records of earthquake show that the likely length of fracture along the convergence boundary is of the order of 200-300 kilometer. According to him, it is thus possible that a segment of such a length along the Himalayan belt covering the region from approximately Dehradun on the west and India-Nepal border in the east,

G

H

A could be the fracture area of a future large earthquake of magnitude 8 or so. According to him, the Government of India has not applied its mind to this very important aspect in preparing the project.

B Shri V.K. Khanna, Joint Secretary, Ministry of Energy, Department of Power, New Delhi has filed an affidavit dated November 5, 1990 wherein relevant material has been placed before this Court showing that the Government of India, through its various departments and ministries has at every stage considered all relevant data and fully applied its mind to the safety and various other aspects of the project.

C The project was initially considered by the Environment Appraisal Committee of the Ministry of Environment and Forests and the said Committee, taking into consideration the geological and seismic setting, the consequence risks and hazards, ecological and social impacts accompanying the project and the costs and benefits expected, came to the unanimous conclusion that the Tehri Dam Project did not merit environmental clearance and should be dropped.

D The report submitted by the Environmental Appraisal Committee was considered and discussed in the meeting of the Committee of Secretaries held on March 20, 1990. The Committee of Secretaries came to the conclusion that the Environmental Appraisal Committee ought to have concerned itself with the environmental parameters within which the opinion of the said Committee was relevant. It was also opined by the Committee of Secretaries that the safety aspect of the design and earthquake engineering could be best looked into by the scientific and specialised organisations such as Geological Survey of India, National Geological Research Institute, Central Water Commission and Earthquake Engineering Department of the Roorkee University. In this context the Committee of Secretaries further observed that the safety aspect relating the project ought to be resolved and in this regard directed the constitution of a High Level Committee of Experts to examine the issue relating to the safety aspects of Tehri Dam Project.

G Pursuant to the decision of the Committee of Secretaries the Government of India constituted a High Level Committee consisting of Shri D.P. Dhoundial, Director General, Geological Survey of India as Chairman, Prof. V.K. Gaur, Secretary, Department of Ocean Development, Dr. D. Guptasarma, Director, National Geological Research Institute, Dr. C.D. Thatte, Member Central Water Commis-

H

sion, Prof. L.S. Srivastava, Head Department of Earthquake Engineering, University of Roorkee and Shri S.K. Shrone, Director, Geological Survey of India as members of the said Committee. The Committee was directed to examine the safety aspect of the project.

The High Level Committee of Experts under the Chairmanship of Shri D.P. Dhoundial, Director General, Geological Survey of India rendered its report on April 6, 1990. The affidavit filed by the Government of India stated as under regarding the said report:

“The said Committee considered all safety aspects of the Tehri Dam and opined with reference to all the issues that were to be decided upon. The said Committee assumed the worst scenario of the possible occurrence of a large magnitude earthquake in the area and rendered an opinion to the effect that the design of the Tehri Dam incorporated adequate defensive measures in accordance with the recommendations of the International Congress of Large Dams on seismic design of dams made from time to time and that additional safety measures had been inbuilt to ensure an adequate and well evolved seismic design for this high dam.”

The affidavit further gave details of the report of the High Level Committee in the following words:

“The conclusions culled out from the said report of the High Level Committee are set out hereunder for the purpose of convenience:

CONCLUSIONS OF HIGH LEVEL COMMITTEE:

1. Whether the Earthquake potential of the zone in which the dam is being located has been fully taken into account in designing the dam:

(a) Modern researches are being directed towards refining models of seismic potential in seismically active belts of the world. Different models suggesting probable source potentials in the Himalayan geotectonic setting around Tehri have been examined. In the absence of any definitive model the worst scenario of a Mag 8+ earthquake has been considered. The

- A probable locale of such earthquake has been considered to be at a depth of 15 km below the dam site;
- B b. The seismic potential at a project site is characterized by the maximum intensity of ground motion due to earthquake occurrence on the likely seismic sources surrounding the site. The effective peak ground acceleration, considering earthquake events upto Mag 8+ has been evaluated at the dam site to be 0.22g.
- C c. The effective peak ground acceleration for which the design of the dam has been checked for stability is 0.25g. Thus, the seismic potential of the dam site has been fully taken into account in the design.
- D II. Whether the proposed dam would be safe as designed vis-a-vis earthquake potential of the area.
- E a. Cross Section of the proposed dam would be safe vis-a-vis the maximum earthquake potential as indicated by the estimated effective peak ground acceleration (EPA) of 0.22g. on the following counts:
- F b. The design side slopes are stable with adequate factor of safety.
- F c. Settlement likely to occur in the height of dam, when subjected to an EPA of 0.25g will be within permissible limits and is taken care of by way of liberal free board provided in the design.
- G d. The shell material proposed to be used in the construction of the dam when subjected to an EPA of 0.25g does not show potential for liquefaction.
- H III. Whether there would be any threat posed by Reservoir Induced Seismicity (RIS) to the Dam or Civilian Structures in the vicinity.
- H a. Seismicity induced by a large artificial reservoir can only act as a trigger to initiate a natural earthquake that would have occurred otherwise. There-

fore, the presence of a reservoir does not increase the size of an earthquake event. A

b. Since the design is considered safe for the worst case earthquake no additional consideration for RIS is necessary. B

c. Earthquake vulnerability of the existing civil structures would depend upon the earthquake resistance built in the same. The construction of the dam would not in any way add to the vulnerability of the existing structures or affect the design requirements for the future constructions. C

IV. Have all potential dangers arising out of seismicity been taken note of and adequate precautions taken in planning all aspects of the Project? If there are any lacunae in these respects, the same may be elaborated upon and action required in this regard spelt out. D

All dangers arising out of seismicity have been taken note of and taken care of in the planning of the Tehri Dam Project.

On the basis of the said conclusions the following recommendations were made by the High Level Committee, which are also set out for the purposes of convenience: E

'Recommendations made by High Level Committee'

V. Any other matter relating to safety aspects of the Project or incidental to the above issue. F

a. All other appurtenant structures should be designed in consistence with the seismic parameters evaluated by this Committee for the dam site. G

b. As the construction proceeds, non-linear analysis should be concluded at the earliest for refining the construction, details and got vetted by the Govt. of India "Standing Committee for Seismic Forces" and by the Central Water Commission. H

A c. Detailing of all engineering defensive measures and instrumentation in the body of the dam should be got vetted by the Central Water Commission.

B d. An independent standing "Project Review Panel" incorporating multi-disciplinary specialists of relevant discipline is recommended to be set up for review of all designs and plans for the project.

e. The planned expansion of the radio telemetered array of seismic stations around the project area should be completed at the earliest."

C The report of the High Level Committee was again considered by the Committee of Secretaries in its meeting dated April 23, 1990. The Committee of Secretaries found on a consideration of the report of the High Level Committee that the Tehri Dam as designed was safe and seismic potential of the site was taken into consideration by the experts. Meanwhile Dr. V.K. Gaur, a member of the High Level Committee of Experts, who had earlier agreed with the unanimous report, later on sent a note of dissent on May 12, 1990 wherein he questioned the conclusion of the High Level Committee of Experts in respect of the safety aspects of the project.

E In the light of the letter of dissent sent by Dr. Gaur the Government of India decided to revive the High Level Committee of Experts and referred the points raised by Dr. Gaur for further consideration of the Committee. The High Level Committee thereafter on July 20, 1990 rendered a supplementary report endorsing its earlier views rendered unanimously on April 6, 1990. This endorsement, however, was a majority view since Dr. V.K. Gaur this time issued a note of dissent stating that the opinion of the High Level Expert Committee was based on questionable grounds and formulations and that because of his dissent the entire matter ought to be referred to an independent seismological expert of international repute.

G The Committee of the Secretaries met again on August 10, 1990 and considered the recommendations of the High Level Committee along with the dissent of Dr. V.K. Gaur and in the circumstances requested the Department of Mines of refer the matter to an independent expert seismologist whose opinion should be taken as final. Pursuant to the said decision Prof. Jai Krishna a renowned expert of international repute examined the report of the High Level Committee

dated April 6, 1990, July 20, 1990 and also the dissenting note of Dr. V.K. Gaur. Prof. Jai Krishna submitted its report to the Department of Mines, Government of India on September 8, 1990 wherein he concurred with the conclusions arrived at by the High Level Committee of Experts. He did not agree with the view expressed by Dr. V.K. Gaur in his dissenting note. Prof. Jai Krishna confirmed that the recommendations of the High Level Committee of Experts were in accord with international experience and practice. He also opined that the design of the Tehri Dam as suggested by Indian and Russian experts was quite safe against the strongest expected earthquake in the region.

The aforesaid facts clearly show that the Union of India considered the question of safety of the project in various details more than once. It satisfied itself by obtaining the reports of experts and also took into consideration the dissenting view of Dr. V.K. Gaur. The project has been finalised after obtaining the expert report of Prof. Jai Krishna. In the circumstances, it is not possible to hold that the Union of India has not applied its mind or has not considered the relevant aspects of safety of the Dam.

Learned counsel for the petitioners have urged that the report submitted by Prof. Jai Krishna should not have been relied upon, instead the matter should have been referred to a seismologist and that the safety of the dam is still in danger. In this connection he referred to the opinion given by Prof. James N. Brune to Dr. V.K. Kaur as well as to his dissenting opinion. The questions relating to the design of the dam, the seismic potential of site where the dam is proposed to be constructed and the various steps which have been taken for ensuring the safety of the dam are a highly intricate question relating to science and engineering. This Court does not possess the requisite expertise to render any final opinion on the rival contentions of the experts. In our opinion the Court can only investigate and adjudicate the question as to whether the Government was conscious to the inherent danger as pointed out by the petitioners and applied its mind to the safety of the dam. We have already given facts in detail which show that the Government has considered the question on several occasions in the light of the opinions expressed by the experts. The Government was satisfied with the report of the experts and only thereafter clearance has been given to the project. The petitioners contend that project has not as yet been cleared.

Mr. N.D. Jayal appearing for the intervenor—INTACH also

- A** referred to the various technical aspects of the matter and urged that the safety of the dam is still in danger having regard to the seismological aspects of the area where the dam is to be constructed. We need not discuss this matter any further, as in our opinion, the Government has already fully considered every aspect of the project including its safety.
- B**

We appreciate the petitioners concern for the safety of the project which is of prime importance to the general public, however, in view of the material on the record we do not find any good reason to issue a direction restraining the respondents from proceeding ahead with the implementation of the project. The petition, therefore, fails and is accordingly dismissed with no order as to costs.

C

R.S.S.

Petition dismissed.