

REGULATION OF WATER FOR UTILIZATION FROM THE TUNGABHADRA RESERVOIR

PRELIMINARY

By virtue of the provision contained in Sub-paragraph (ii) (b) of Paragraph 4 of the Government of India Notification No.DW.VI/(4) (9) OF 10TH March, 1955 the Tungabhadra Board has resolved to adopt the following rules for regulation of water in the Tungabhadra Reservoir.

RULES

Extent

Rule 1

a) These rules will apply to the withdrawal of water for utilization from the Tungabhadra Reservoir by the following ways.

- i) Over Spillway
- ii) Through the Left Bank Main Canal
- iii) Through the Left Bank High Level Canal
- iv) Through the Left Bank Power House
- v) Through the Right Bank High Level Canal.
- vi) Through the Right Bank Raya and Basavanna Channel
- vii) Through the Right Bank Low Level Canal.
- viii) Through the Right Bank Power House
- ix) Through the River Sluices on either side.

However, these rules do not cover flood operation of the spillway gates for releasing flood discharges for which separate guidelines have been issued.

b) Withdrawals from the Right Bank High Level Canal and the Right Bank Low Level Canal through distributaries or direct pipes or by any other method whatsoever, whenever and wherever such withdrawals is made from the reach of the canal under the control of the Board. This will also apply to any system losses due to breaches in the canal or otherwise.

c) Withdrawals directly from the reservoir or by lift irrigation schemes situated on the periphery of the reservoir.

d) Withdrawals directly from the reservoir for industrial use and for domestic water supply or for any other purpose.

e) Withdrawals from the Right Bank High Level Canal and Low Level Canals for industrial use, for domestic water supply or for any other purpose, whenever and wherever such withdrawal is made from the reach of the canal under the control of the Board.

f) Withdrawals by evaporation. Provided that the withdrawals mentioned © and (d) are accountable to the Tungabhadra Board.

Jurisdiction

Rule 2

For the purpose of these rules the jurisdiction of the Board will extent to the whole of the Tungabhadra Reservoir and its foreshore area upto 1635 ft. contour, all the 33 spillway gates, all the sluices on the right side, the Right Bank Power Canal, the Right Bank Low Level Canal upto 250.580 Km and the Right Bank High Level Canal upto 105.437 km, the Right Bank Power House, the Power House at Hampi, the River Sluices on the right side, Gundlakere Escape and all other escapes and all kinds of outlets upto 250.580 Km on Low Level Canal and upto 105.437 km on High Level Canal, and the Thurtha Channel regulator at Gundlakere. The jurisdictions of the Board will also extent to the regulation of the discharge into the Raya and Basavanna Channel and the assistance taken to the Vijayanagar Channels through the Low Level Canal and the measurement thereof. In the case of the Left Bank Main Canal and the Left Bank High Level Canal the jurisdiction of the Board will be to the extent of preparing working table and ensuring that the canals are operated accordingly and in accordance with these rules.

Definitions

Rule 3

a) Award, also referred as KWDT Award, means ‘The Report of the Krishna Water Disputes Tribunal with the Decisions’ and ‘Further Report of the Krishna Water Disputes Tribunal under Section 5(3) of the Inter-State Water Disputes Act, 1956’.

b) Board means the Tungabhadra Board constituted by the President of India by virtue of powers vested in him under sub-section 4 of section 66 of the Andhra State Act, 1953 (30 of 1953).

c) The following shall have the meaning as under.

1. High Level Canal means the High Level Canal taking off from the Right Bank of the reservoir at the sill level of 1585 ft.
2. Low Level Canal means the Low Level Canal taking off from the Right Bank of the reservoir at the sill level of 1550 ft.
3. R.B.C. means the Raya and Basavanna Channel.
4. R.D.S. means Rajolibunda Diversion Scheme.
5. K.C.Canal means Kurnool-Cuddapah Canal.
6. ROFS means River Out Fall Sluices
7. Chairman means the Chairman of the Tungabhadra Board appointed under Sub-Clause 1 of the notification No.DW VI 4 (9) dated 10th March, 1955 in terms of Sub-Section 4 of Section 66 of the Andhra State Act, 1953 (30 of 1953)
8. Secretary means the Secretary, Tungabhadra Board appointed in terms of para 5 (i) of the above notification.
9. Water year means the year commencing from 1st of June and ending on 31st May of the following year.

10. Reservoir means the Tungabhadra Reservoir formed by the Tungabhadra Dam on the river Tungabhadra.
11. Utilization means consumptive and non-consumptive use of water from the reservoir.

The Award

Rule 4

The Tungabhadra Board shall at all times regulate the release of water in accordance with the provision of the Krishna Water Disputes Tribunal Award and the provision in these Rules shall deemed to be supplementary to the Award. In case of conflict between the provisions contained in these Rules and those contained in the Award, the provisions under the Award will prevail. Final Order of the Tribunal as it contained in the Further Report of the Krishna Water Disputes Tribunal under Section 5 (3) of the Inter State Water Disputes Act, 1956 is at Annex 4.1.

Functioning of the Board

Rule 5

a) The Chairman is empowered to take decisions in relation to water regulation whenever such decision cannot wait for the next meeting of the Board. Such decision shall be put to the Board for ratification in the next meeting.

b) The Secretary of the Board will be responsible for ensuring that the water regulation is carried on in accordance with the Rules and for bringing to the notice of the Board any deviation there-from.

c) The Superintending Engineer, Irrigation Branch will be fully responsible for.

- 1) the preparation of working table for the approval of the Board;
- 2) arranging for the operation of the gates of sluices and outlets under the control of the Board;
- 3) arranging for the operation of the spillway gates during flood operation;
- 4) preparation of the periodical statements and reports with regard to water regulation; and
- 5) preparation and putting up before the Board the water account for every year.

The Superintending Engineer, Irrigation Branch will have full and final executive responsibility in this connection. For this purpose he will work under the overall supervision of the Secretary.

Measurements

Rule 6

a) Reservoir capacity survey shall be conducted as often as may be considered necessary by the Board, either through the Officers and staff of the Board or through any other agency, considered appropriate by the Board. Land survey, Hydrographic Survey, Arial Survey, Satellite Photography or any other method may be used for this purpose. Any one or more of these methods may

be used simultaneously. The results of the surveys carried out shall be put up to the Board for approval. The capacity curves so approved shall be the basis for preparation of working table and operation of the reservoir. The Board may however make such modification in the capacity curve as may be found necessary in the light of past experience pending the next reservoir capacity survey.

b) The gauge discharge curves required for measuring the discharges in all the canals to which these rules apply shall be jointly worked out by the KERS and APERL, or CWPRS, Pune, or any agency as decided by the Board as and when required, and approved by the Board. In respect of the Low Level Canal and the High Level Canal there shall be one such curve for discharge at the head and one for discharge at the end of Board's jurisdiction over the canal. The Superintending Engineer, Irrigation Branch is also authorized to carryout current meter measurements in all the canals to which these rules apply whenever necessary. These gauge discharge curves shall be approved by the Board and will be the basis for measurement of discharges in various canals. Joint gauging shall be conducted once in five years to re-verify the gauge discharge curves.

c) The discharge from the spillway shall be measured in accordance with the following formula.

$$Q = 5.8 \sqrt{h}$$

Where

A is Area of waterway in sward feet

h is the head of water from reservoir level to the center of gate opening in feet, and

Q is discharge in cusecs.

d) The discharges into the outlets of the canals shall be measured by the following formula.

i) If the discharge is more than one cusec.

$$Q = 6 A \sqrt{h}$$

ii) If the discharge is once cusec or less

$$Q = 5A\sqrt{h}$$

Where,

A represents the area of the opening in square feet and

h represents the difference between the upstream and downstream gauges in feet.

Q is discharge in cusecs.

iii) For the purpose of cross check, Flumes or V notches shall be constructed wherever technically feasible.

e) The discharge from the River Out Fall Sluices (R.O.F.S) shall be measured in accordance with the following formula.

$$Q = 3.33 LH^{1.5}$$

Where,

L is length of opening in feet.

H is head of water from sill level to the center of the gate opening in feet and

Q is discharge in cusecs.

f) The discharge into the Power Canal and the Low Level Canal should be occasionally cross –checked with the records of the Dam Power House and the Hampi Power House respectively to ensure their accuracy.

g) The evaporation from the reservoir shall be measured by means of a standard pan evaporation observation and applying appropriate correction factor.

Flood Operation Rule 7

The Central Water Commission will give flood warning daily during the monsoon season. During the flood season the water level in the reservoir shall be maintained 6’ below F.R.L. of 1633 ft. by suitable operation of the spillway gates. Before the operation of the spillway gates telegraphic warning should be given by the Superintending Engineer, Irrigation Branch to all concerned authorities downstream of the reservoir. The emergency diesel generator sets shall at all times be kept in working condition. The spillway gates shall be operated for releasing the flood water as per the guidelines issued in this regard. The Superintending Engineer, Irrigation Branch will be responsible for the proper operation and maintenance of the spillway gates.

Power House Operation. Rule 8

The power houses at the dam, both on the right bank and left bank except during flood season shall draw discharges only to the extent of irrigation requirement as shown in the approved working table with such modifications as may be authorized. During the period the reservoir is surplussing or is likely to surplus as much water as may be possible should be drawn for Extra Power Generation by the two Dam Power Houses. The Secretary in consultation with the Chairman, will decide whether the Dam Power Houses shall draw water for Extra Power Generation in anticipation of surplussing of the reservoir and if so when. The releases for such Extra Power Generation will be as decided in the 127th meeting of the Board and appended as Annex 8.1. Secretary will have full powers to direct both power houses to reduce their drawals to irrigation requirements and the power houses shall comply with such direction forthwith.

Preparation of Working Table **Rule 9**

a) the entitlement of the States of Karnataka and Andhra Pradesh under various canals/Irrigation Systems exclusive of evaporation losses in accordance with the provisions of the Award are as follows.

Irrigation System	Entitlement of the state (TMC ft)	
	Karnataka	Andhra Pradesh
Right Bank Low Level Canal	19.00	24.00
Right Bank High Level Canal	17.50	32.50
Left Bank Canals	93.00	--
Raya & Basavanna Channel	7.00	--
Other Vijayanagar Channel	2.00	--
Rajolibunda Diversion Scheme	0.49	6.51
Kurnool Cuddapah Canal	--	10.00
	138.99	73.01

b) (i) In case there is deficiency or excess of availability of water than the total quantity of water required for all the projects as mentioned in sub rule 9 (a) the entitlements for each projects will be worked out as per sub-clauses (b), (c) and (d) of E (1) of clause IX of Final Order of the report of KWDT appended as Annex 4.1 of these rules.

(ii) The RB HLC was designed to utilize 50 TMCft with a carrying capacity of 4000 cusecs and allocation of 1375 cusecs for Karnataka upto Board limit and 2575 cusecs at Board limit for Andhra Pradesh considering 50 cusecs as transmission losses from dam to board limit. However, HLC is not in a position to pass a maximum discharge of more than 3500 cusecs at its head. Considering about 200 cusecs as transmission losses upto Board limit, as decided in the meeting of the Board held on 22nd October 1974, the maximum discharge available for distribution between Karnataka and Andhra Pradesh will be 1150 cusecs and 2150 cusecs respectively.

(iii) Similarly in the RB LLC considering the approved transmission loss at the rate of 4 cusecs per Million Sq.ft. of wetted area and permitted provision towards system loss not exceeding 120 cusecs whenever found necessary, the maximum discharge for Karnataka and Andhra Pradesh to be allowed simultaneously shall be 620 cusecs and 828 cusecs (725 at Board's limit + 103 above Board's limit) respectively.

c) In the months of April and November, the Superintending Engineer, Irrigation Branch will estimate with reference to the past data the likely inflow into the Reservoir on 75% dependability basis for every ten-days block for the water year. On the basis of availability of water for the year he will workout prorate entitlement for each canal or irrigation system for the States of Andhra Pradesh and Karnataka in the proportion of entitlements as per sub-rule 9 (a) and (b) and intimate the estimates to the concerned officers of the respective

States. The concerned officers of the two States shall, without delay, furnish their requirements under each canal or irrigation system, and communicate it to the Superintending Engineer, Irrigation Branch. In case, transfer of water from one canal or irrigation system to another canal or irrigation system is suggested, this shall be specifically mentioned. The Superintending Engineer, Irrigation Branch will draw up the working table based on the requirements communicated by the concerned authorities of the two States. If the requirements communicated by any State exceeds the entitlement or (and) permissible discharges given under sub-rule 9 (a) and (b) as worked out by the Superintending Engineer, Irrigation Branch he will make such modification as may be necessary to limit the requirement to the entitlement. The same procedure will be followed whenever revision of working table will become necessary.

d) The Secretary shall whenever necessary call for a meeting of the officers of the two States and of the Board to sort out differences, if any, in the estimated availability of water and the entitlement of each State.

e) The working table shall be reviewed with reference to the actually obtained inflows during the monsoon period, the prevailing reservoir level and other relevant information in the month of November and a modified draft working table shall be prepared and put up to the Board for approval. The approved revised working table shall be the basis for the operation of the reservoir from the date of such approval to 31st May of that year. The Board may again revise the working table from time to time if considered necessary. The working table shall be prepared in Form 1 (Annex 9.1) to these Rules.

f) The working table so prepared shall be placed before the Board in its next meeting for approval. Whenever it is necessary to do so the Chairman may approve the working table subject to ratification by the Board and upon such approval the working table so approved by the Chairman will be the basis for operation of the reservoir subject to ratification by the Board.

g) The approved working table shall be communicated by the Secretary to all the concerned officers for their information and record.

Opening and Closing of the Canals.

Rule 10

a) Subject to Sub rule (b) & (c) below the Secretary shall issue gazette notification for the information of the public intimating the date of opening and closing of the Right Bank High Level Canal, the Right Bank Low Level Canal and the Raya and Basavanna Channel.

b) The date of opening and closing of the below mentioned canals will be subject to the decision taken in the meeting of the Irrigation Consultative Committee of Karnataka and the meeting of the Irrigation Development Board of the State of Andhra Pradesh duly considering the status of the reservoir prior to the date of the meetings.

Name of the canal	Date of Opening	Date of Closing
R.B.L.L.C.	1 st June	10 th May
R.B.H.L.C.	10 th July	10 th February
R.B.C.	1 st January	30 th November

c) The date of opening shall be postponed if the reservoir does not fill up as anticipated in the working table until such date the reservoir builds upto the levels indicated in the working table. Further, it shall be seen that while opening of the LBMC and the RBLLC for irrigation a minimum storage of 10 TMCft shall be available in the reservoir with level at 1590 ft and also the inflow into the reservoir at least in the order of 5000 cusecs. Similarly the closing date shall be advanced when the reservoir is depleting faster than anticipated.

d) The procedure indicated in (a) & (b) above shall be followed by Karnataka authorities in respect of the LBMC and the LB High Level Canal under their control and intimated to the respective States.

e) The working table shall be deemed to have been modified as above automatically.

f) The Secretary may in consultation with the Chairman, permit deviation from the above procedure to the extent possible, to ensure drinking water supply and for saving standing crops.

g) All the canals shall be closed down when the water level in the reservoir corresponds to an storage of 2 TMCft irrespective of the date of closing.

Water Release Procedure Rule 11

a) The authorized indenting officers of Karnataka and Andhra Pradesh not below the rank of Superintending Engineer shall requisition to the Superintending Engineer, Irrigation Branch, TB Board for withdrawal of water through the RB HLC, the RBLLC, the RBC and for river releases for each ten day period at least one week in advance. These requisitions from Karnataka in respect of the High Level Canal and the Low Level Canal shall show the discharges required for each distributory / outlet under the control of the Board. It shall also include the discharges at the Karnataka border for the distributories which are common to both the States of Andhra Pradesh and Karnataka. The total of these discharges shall not be in excess of what is provided in the working table for the corresponding period and subject to the provisions in sub rule 9 (a) and (b). Similarly, requisition from Andhra Pradesh shall show the distributory wise discharges in respect of common distributaries and discharge required at the Board's limit namely 250.580 Km of the Low Level Canal and 105.437 km of the High Level Canal.

b) The Superintending Engineer, Irrigation Branch after satisfying himself that the requisitions are not in excess of what is provided in the working table shall issue an order for the release of water.

c) The Superintending Engineer, Irrigation Branch shall issue detailed instructions to all concerned including the officers of the Power Houses for release of water. The instructions of the Superintending Engineer, Irrigation Branch shall be implicitly carried out by every one concerned and compliance shall be reported to him. While issuing these instructions, Superintending Engineer, Irrigation Branch shall ensure that increase or decrease of discharge in the canals is carried out gradually to avoid slips and breaches in the canal.

d) If at any time the actual reservoir level is below the level provided in the working table proportionate reduction shall be effected in all the canals and irrigation systems automatically and the working table shall be deemed to have been amended to this extent.

e) The Chairman will be empowered to allow the drawals in excess of the working table provision, under intimation to both the Governments subject to ratification by the Board. However, no excess drawals shall be permitted which are unlikely to be covered by future savings in the water year.

f) In the absence of approved working table releases shall be made according to the provisions made in the working table submitted for approval.

g) Any requisition received from indenting officers for lesser discharges than provided for in the working table will be honoured immediately by the Superintending Engineer, Irrigation Branch. Whereas all requisitions above the provision made in the working table, restricting to the maximum permissible discharges for the State in the canal as laid down in sub rule 9 (a) and (b), duly endorsed by the respective Member, shall be got approved by the Secretary from the Chairman for modifying the working table subject to ratification by the Board.

Records and Reports

Rule 12

a) The Section Officer, Dam line Section / Sub-Divisional Officer, Head Works Sub-Division shall maintain the following records and furnish the following reports.

I Records.

- i) Hourly reading of Reservoir level.
- ii) Hourly reading of discharge through spillway
- iii) Discharge through the RB HLC.
- iv) Daily inflow.
- v) Discharge through RBLLC
- vi) Discharge through the RBC.

- vii) Discharge through Right Bank ROFS.
- viii) Daily evaporation.

II Reports

Daily Report in Form 2 (Annex 12.1) to these Rules duly signed by the Executive Engineer, HW & HLC Division once in every Monday.

b) The Executive Engineer, No.I TR Division, Munirabad, shall send the data in respect of releases made from the reservoir in the left bank canals inclusive of power house and ROFS, to Section Officer, Dam Line Section. The releases through Power House on Right Bank shall be based on details provided by TBHES authorities. The data regarding releases made through right bank ROFS shall be sent by Section Officer, Power Canal Section to the Section Officer, Dam Line Section.

c) All Section Officers incharge of canal shall read daily the discharges into each distributory / outlet and inform the Executive Engineer, Head Works and HLC Division or the Executive Engineer, Low Level Canal Division, as the case may be, the reading in Form 3 (Annex 12.2).

d) The Section Officer incharge of Gundlakere Escape shall keep a register showing / the hourly gauge reading in respect of the discharges at head of the Low Level Canal and the discharge through Gundlakere Escape. He shall send daily average readings of these to the Section Officer incharge of Dam Line Section and to the Executive Engineer, Low Level Canal Division. Similarly readings in respect of Thurtha Channel will be sent to the Superintending Engineer, Irrigation Branch every day.

e) The Section Officer incharge of Low Level Canal at 250.580 km and of High Level Canal at 105.437 km shall maintain hourly gauge readings of discharges flowing into Andhra Pradesh and send daily reports to their respective Executive Engineers and the Section Officers, Dam Line Section.

f) The Executive Engineer, HW & HLC Division and the Executive Engineer, Low Level Canal Division shall prepare and send to the Superintending Engineer, Irrigation Branch at the end of every 10 day a statement showing the scheduled total discharge and the actual discharge in Form 4 (Annex 12.3).

g) On the basis of reports received from the Executive Engineers, the Superintending Engineer, Irrigation Branch, shall maintain an account of water drawn from the reservoir and savings account in respect of drawals by the States of Karnataka and Andhra Pradesh in Form No.5 and 6 (Annex 12.4 and 12.5) respectively. While preparing these accounts, the Superintending Engineer, Irrigation Branch shall take all necessary steps to obtain information in respect of water drawn for industrial use or for domestic water supply or for lift irrigation schemes from the periphery of the reservoir and debit to the respective

States of Karnataka or Andhra Pradesh as the case may be, the water drawn for this purpose. The extract of these accounts shall be sent by the Superintending Engineer, Irrigation Branch to the following officers.

1. Chairman, Tungabhadra Board.
2. Members Tungabhadra Board.
3. Secretary, Tungabhadra Board.
4. Chief Engineer, Irrigation Central Zone, Munirabad.
5. Chief Engineer, Major Irrigation, Hyderabad.

He may send extracts of these accounts to such other officers as he may consider necessary.

Water Accounting

Rule 13

a) The evaporation losses shall be accounted as per clause XI (D) of the Final Order of the KWDT appended as Annex 4.1 of these Rules. As per this clause the reservoir evaporation losses shall be shared equally by the works of the state of Karnataka on the left side and the works on the right side. The half share of the right side in the reservoir evaporation loss shall be shared by the states of Andhra Pradesh and Karnataka in the ratio of 5.5 to 3.5. The entire reservoir evaporation loss on the right side is to be charged to the RB LLC for both the states in accordance with the 'Chapter V Disputes Concerning Tungabhadra' of Vol.I of the Report of KWDT.

b) The transmission losses in the Power Canal, the Low Level Canal and in the High Level Canal shall be apportioned between the States of Karnataka and Andhra Pradesh in accordance with the following formula.

$$LA = L \times \frac{2A}{2A + K}$$

$$Lk = L \times \frac{K}{2A + K}$$

L represents the transmission losses arrived at by deducting from the discharge at the head the net releases made to Andhra Pradesh and Karnataka.

A represents total releases made to Andhra Pradesh excluding losses.

K represents total releases made to Karnataka excluding losses.

LA represents loss debit to Andhra Pradesh.

Lk represents loss debit to Karnataka

c) In respect of the Bella Channel a debit of 50 cusecs shall be raised against Karnataka State whenever the discharge into the river from the reservoir through the right bank ROFS is 800 cusecs or more.

d) In respect of the Thrutha Channel a debit of 60 cusecs shall be raised against Karnataka whenever there is a discharge of 800 cusecs in the river from Gundlakere escape.

e) Out of the water released for the K.C.Canal and the Rajolibunda Diversion Scheme, 1/34th part shall be debited to Karnataka as its share towards Rajolibunda Diversion Scheme.

f) In respect of the other Vijayanagar Channels the debit to the State of Karnataka shall be as decided by the Board from time to time.

g) In preparing these accounts full debit shall be given to the States of Karnataka and Andhra Pradesh as the case may be in respect of water drawn for industrial use and for domestic supply.

h) In preparing the water accounts full debit shall be given to the State of Karnataka in respect of the quantity of water drawn from the reservoir by pumping for irrigation and / or drinking water supply.

i) In view of the uncontrollable unauthorized drawals all along the RB LLC both in the States of Karnataka and Andhra Pradesh a maximum provision of 120 cusecs shall be made, wherever necessary, and shall be accounted as system losses, charging directly to the reservoir water account. The emergency releases made through canal escapes along the RB LLC and the RB HLC, shall also be accounted as system losses and treated in similar manner.

**Report to
The Board**

Rule 14

At the end of each water year the Secretary shall prepare a detailed statement showing the working of the reservoir during the water year, the actual quantities of water drawn by each State compared to their entitlement in terms of the Award and specifically bring to the notice of the Board any deviations from the provisions of the Award or of these rules for ratification by the Board.

**Right of
Inspection**

Rule 15

Officers of the Board authorized by the Secretary shall at all times have right of inspection of records relating to the water regulation and of the gauging sites in respect of canals and the irrigation systems of the Right Bank as well as the Left Bank. Upon authorization by the Board so authorized shall have the right to conduct current meter readings of the canals and irrigation systems both on the Right Bank and on the Left Bank to determine or check gauge discharge curves. Officers of the States of Karnataka and Andhra Pradesh shall have similar rights when authorized by the respective

Governments in respect of canals or irrigation systems in which they are interested.

Amendments

Rule 16

The Board shall be competent to amend these Rules whenever necessary and to interpret these Rules if called for. Board also shall be competent to relax any of the provisions of these Rules. All actions taken prior to adoption of these Rules shall be deemed to have been carried out under these Rules. These Rules supersede all the previous resolutions of the Board in connection with water regulation for utilization, in respect of which these Rules make specific provisions. Those resolutions of the Board in respect of which no specific provisions have been made in these Rules, if any, will continue to be operative.