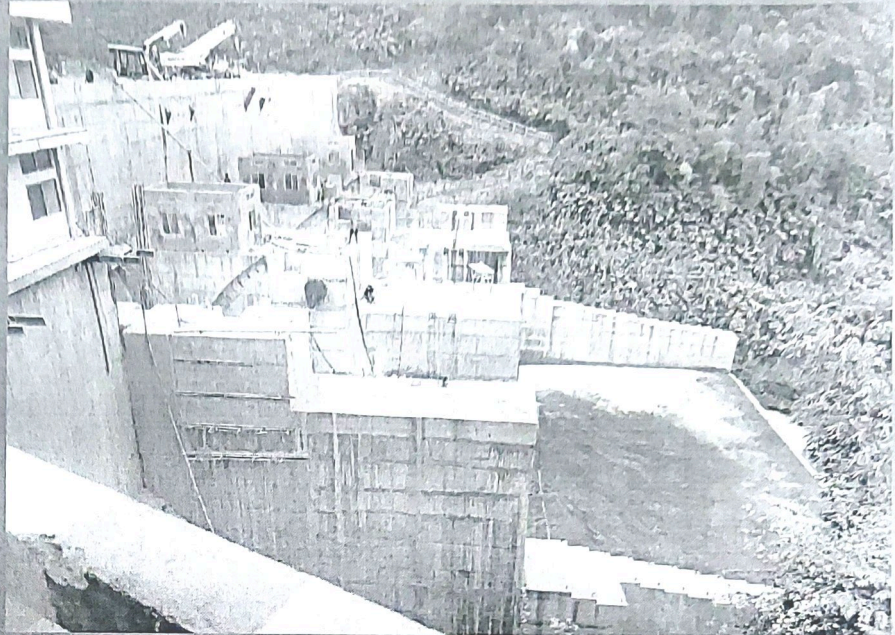




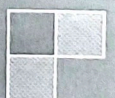
MePGCL

MEGHALAYA POWER GENERATION
CORPORATION LIMITED



**DRAFT GUIDELINES FOR
RELEASE OF WATER
THROUGH THE
GATES OF THE
GANOL CONCRETE DAM**

2023



GUIDELINES FOR RELEASE OF WATER THROUGH THE GATES OF THE GANOL CONCRETE DAM

1.0- Introduction

1.1- Dams have been constructed across the rivers to create artificial lakes/reservoirs for storing of water which is being utilized for generation of electricity, irrigation, drinking water etc. Sometimes due to heavy rain during rainy season, the discharge in the river can be so high that the water level in the reservoir, if not controlled, can rise beyond the FRL. In such cases, the excess water from the reservoir has to be released in a gradual and regulated manner through the Radial Gates of the dams, to ensure that people on the downstream are not affected by the sudden rise of water level. This will also safeguard the dams from being overtopped, which may endanger the abutments from being washed out, thereby causing loss of lives and properties due to flooding.

Water from the reservoir may also be required to be released through the Radial Gates at any time of the year as may be required by the owner or due to emergency/crisis that may arise due to many reasons.

In view of this, all Radial Gates of dams are required to be in operational mode 24x7.

2.0- Requirement of Guidelines for Radial Gates

2.1- The Guidelines for Operation of Radial Gates is needed by all entities/owner of dams and reservoirs as it is the guiding instrument at any time whenever gates are required to be operated to release water from the reservoir due to flood, sabotage, natural disaster or any other crisis. The Guidelines for Operation of Gates also guides the operator of the Radial Gate in the process of releasing of water from the reservoir in such a manner that:

- (i) The Dams and other related Hydraulics Structure are not put in any danger.
- (ii) The Reservoir is allowed to impound optimum quantity of water for economic generation of electricity.
- (iii) It mitigates the damage of flood downstream of the Dam.

2.2- The Guidelines help the owner to maintain the Radial Gates in operational mode 24x7.

2.3- The Guidelines for Operation of Radial Gates provide:

- (i) Technical details of the Dam, Reservoir and Radial Gates.
- (ii) Mode of inspection, monitoring and reporting of the healthiness of the Dam, Reservoir and Radial Gates.
- (iii) Instruction to the Engineer-in-Charge in regard to maintenance of the Gates, including Operation of the Gates to facilitate release of water from the Reservoir whenever required.
- (iv) It also contains names, addresses and contacts of all Stake holders of the Dam.

3.0- Ganol Reservoir and requirement for Control Release of Water through the Gates:-

The Ganol (Concrete Gravity) Dam is the first major dam impounding water hydro project in Garo Hills, Meghalaya. It is a Run of River (ROR) scheme with a limited storage capacity of about 0.85 MCM of water and a PMF discharge capacity of 1750 cumecs. During monsoon due to high rainfall in the catchment area and limited storage capacity of reservoir, the water level

may rise up suddenly and could overtop the dam, for which 24X7 monitoring is required. There are two main reasons for the controlled release of water through the gates of dam. Firstly, there are many villages downstream of the Concrete Dam, who are directly and indirectly dependant on this river. The important thing to consider here is that most of the villages lie very close to the banks of the river. Secondly, there is an existing water supply scheme from PHE which draws water from the Ganol River from a weir constructed about 2km downstream of the dam and about 1 km upstream of the Power Station. It is for these reasons that any release of water from the Ganol Dam has to be properly planned, estimated, and regulated so as to avoid any un-toward incidents on the downstream of Dam along the Ganol river.

4.0- Name, Address & Contacts of the Owners of the Dams

4.1- Name & Address : Meghalaya Power Generation Corporation Limited,
Lumjingshai, Shillong-793001,
East Khasi Hills District, Meghalaya.

4.2- Contacts of responsible Persons:-

Proforma-1

Sl. No	Names & Designation	Address		Telephone No.	Mobile No.	E-mail ID
		Office	Residence	Office	Residence	
1	2	3	4	5	6	7
1.	Shri. Sanjay Goyal , IAS, Chairman-cum-Managing Director	Me.E.C.L, Lumjingshai, Shillong 793001.	-	0364-2590367 0364-2590638 (F)	9436313316	sanjaygoyalias.office@gmail.com
2.	Smti.I.Majaw, MCS, Director Corporate Affairs	Me.E.C.L, Lumjingshai, Shillong 793001.	-	0364-2591992		
3.	Shri. R. Majaw, Director (Generation) MePGCL, Shillong.	Me.P.G.C.L, Lumjingshai, Shillong 793001.	-	0364-2591406	9436110871	pce_meecl@yahoo.co.in
4.	Shri. H.W.Lyngdoh Mawnai Chief Engineer(C), M&SH, MePGCL, Shillong.	Me.P.G.C.L, Lumjingshai, Shillong 793001.	-	0364-2590262	8787855549	Chiefengineer.msh@gmail.com
5.	Shri. E. Marap Chief Security Officer	Me.E.C.L, Lumjingshai, Shillong 793001.	-	-	8974158543	-
6.	Shri. K. Shangrit, Executive Engineer (C), Dam Safety Cell, MePGCL, Shillong.	O/o Chief Engineer(C), M&SH, Me.P.G.C.L, Shillong 793001	Umlyngka, Shillong-793005	0364-2590226	8837057162	eedamsafetymsh@gmail.com
7.	Shri H. Bareh, Superintending Engineer (C)	O/o Superintending Engineer (C), Ganol SHP, MePGCL, Tura.			7005214826	
8.	Shri P. Laloo, Executive Engineer (C)	O/o Superintending Engineer (C), Ganol SHP, MePGCL, Tura.			8416072336	

5.0- SALIENT FEATURES:-

5.1 LOCATION:

Dam:Latitude	25° 34' 46.74"N
Dam:Longitude	90° 13' 1.86" E
Power House: Latitude	25°33'50.31"N
Power House: Longitude	90°12'19.65"E

5.2 HYDROLOGY:

Catchment Area	113.00 Sq Km
90 % dependable inflow	1458.00 mm(204.50 MCM)
75 % dependable inflow	1810.00 mm (164.80 MCM)
Average annual inflow	2117.00 mm (239.20 MCM)
Average Annual Rainfall	3000.00mm
Standard projected Flood discharge (SPF)	730 Cumecs
Probable Maximum Flood discharge (PMF)	1750 Cumecs

5.3 RESERVOIR:

Full Reservoir Level (FRL)	352.00 m
Minimum Draw Down Level (MDDL)	346.00 m
Live Storage	0.85 MCM
Maximum stretch of the reservoir	2.45 Km
Area of submergence at FRL	19.59 Ha

5.4 DAM

Type	Concrete Gravity
Top level	EL 354.00 m
Full reservoir level	EL 352.00 m
Crest level	EL 330.00 m
Dam foundation	EL 320.00 m
Dam Height from Foundation Level	34.00 m
Total Length of dam	98.37 m

5.5 RADIAL GATES:

Gate No.	3 nos
Size (m)	7.50 m x 8.0 m
Mode of operation:	Electrically operated (Hydraulic system)

Gate Operation:-

Minimum:	1 gate and 0.30 minitial opening
Maximum:	2 gatesOperational and8.0 m opening (each)
	1(one) Standby and 8.0m opening

5.6 POWERHOUSE

Type	Surface Powerhouse
Dimensions (l x w)	38mx12.5m
Turbine Type	Francis, Horizontal
Number of units	Three (3)
Turbine Setting Elevation	EL 187.50m
Rated Discharge per unit	5.56 Cumecs

Turbine Speed	750 rpm
Min. Tail Water Level	EL 190.00 m
Normal Tail Water Level	EL 192.00m
Maximum Tail Water Level	E.L. 195.00m
Max. / Min. Gross Head	158 m/153 m
Net Rated Head	148 m
Installed Capacity	3x7.5 MW
Plant Load Factor	0.56
Inlet Valve Type	Butterfly Valve

6.0- Inspection, Testing of Sluice Radial Gates including Gate Reporting

6.1- Components of Radial Gates

I) GATES:

- | | |
|---------------|---|
| a) Gate leaf: | StainlessSteel Curve Skin Plate(18mm thick) |
| b) Seals: | Synthetic Rubber |
| Bottom Seals | Wedge Rubber Seal (5mm pre-compression) |
| Side Seals | Musical Note Type Seal (Teflon cladded) |
| Top Seals | Double Stem Type seal(Teflon cladded) |
| c) Seal seat: | Stainless Steel |

II) HOISTING ARRANGEMENT:

- | | |
|---------------------|---|
| a) Hydraulic Hoist | Twin Cylinder Hydraulic Hoist
Suspended at D/s of Gate |
| b) Hoist Capacity | 90MT X 2 Nos |
| c) Trunnion Bearing | Self-Lubricating Bush Make. |

- 6.2- All the Sluice Radial Gates including its components and accessories are to be inspected and tested at least once in a month.
- 6.3- All the Sluice Radial Gates are to be operated at least once in a month.
- 6.4- All Electrical components of the SluiceRadial Gates are to be checked and tested at least once in a week.
- 6.5- All the inspection and testing cited above are to be done according to the Operation& Maintenance(O&M)Manualof the Radial Gates or as directed by the Engineer in Charge. The inspection period should be periodical.
- 6.6- The Dam Safety Cell shall inspect all Gates and their components at least once before the monsoon period, and during operation of the Gates as per the Guidelines of the Central Water Commission (CWC), Government of India.
- 6.7- All the reports of inspection and testing are to be forwarded to the Engineer in Charge for his/her necessary action as may be required.
- 6.8- All materials, equipment required for Gate Operation are to be kept in good and working condition. They are to be checked and inspected at least once in a month from time to time.

7.0- Maintenance and Upkeep:-

7.1- All Radial Gates are to be in operational mode 24x7.

7.2- All repairing and maintenance work including changing of hydraulic fluids, filters, seals, valves, pump, motor, greasing, oiling etc. related to the Radial Gates ,Hydraulic hoists and Power Packs are to be taken up on top priority.

7.3- All reports of inspection and testing of Radial Gates and its components indicating any needs of repairing, refurbishing, renovation, modification etc. are to be taken up by the Engineer in Charge without delay.

8.0-Guidelines of Recording of Informations:-

8.1- All messages incoming and outgoing relating to release of excess water through the Gates are to be recorded in the Register as per the following Performa.

8.1.1- In coming Message:-

Proforma - 2

Sl. No.	Date	Time	Senders name including Contact No.	Content of the Message	Whether the Message was send to higher authority	Name & Sign of receiver	To whom forwarded	Remarks
1	2	3	4	5	6	7	8	9
1.								
2.								
3.								
4.								
5.								

8.1.2- Outgoing Message:-

Proforma - 3

Sl. No.	Date	Time	To whom sent including Contact No.	Content of the Message	Name & Signature of sender	Remarks
1	2	3	4	5	6	7
1.						
2.						
3.						

The messages both incoming and outgoing are to be compiled and forwarded to the Higher Authority on daily basis.

9.0- Contact Persons for Ganol SHP Reservoir:-

The following persons are to be contacted through telephone, SMS, e-mail before the release of water from the reservoir.

9.1- Incharge of the Dams:-

Proforma - 4

Sl. No.	Names & Designation	Address		Telephone No.	Mobile No.	E-mail ID
		Office	Residence	Office		
1	2	3	4	5	6	7
1.	Shri H. W. Lyngdoh Mawnai, Chief Engineer (C)	O/o the Chief Engineer (C), Maintenance & Small Hydro, MePGCL, Shillong			8787855549	
2.	Shri B. M. War, Additional Chief Engineer (C)	O/o the Chief Engineer (C), Maintenance & Small Hydro, MePGCL, Shillong			9402150325	
3.	Shri H. Bareh, Superintending Engineer (C)	O/o the Superintending Engineer (C), Ganol SHP, MePGCL, Tura.			7005214826	
4.	Shri P. Laloo, Executive Engineer (C)	O/o the Superintending Engineer (C), Ganol SHP, MePGCL, Tura.			8416072336	
5.	Shri. Andrea Saljrak K Marak, Assistant Executive Engineer (C)	O/o the Superintending Engineer (C), Ganol SHP, MePGCL, Tura.	Chandmari, Tura		8258893895	

9.2- Contacts of important State Government, Officials including Police & Other Stake Holders.

Proforma - 5

Sl. No.	Names & Designation	Address		Telephone No.	Mobile No.	E-mail ID
		Office	Residence	Office		
1	2	3	4	5	6	7
1.	Shri. Thomas A. Sangma, Speaker & Local MLA, North Tura.	Meghalaya Legislative Assembly, M.G. Road, Shillong-793001			6003167563	assembly-meg(at)nic(dot)in
2.	Shri. Bernard R. Marak Local MDC	GHADC, Hawakhana, Tura			94361-12975	
3.	Shri. D. P. Wahlang, IAS, Chief Secretary and State Vigilance Commissioner	Room no 316 Meghalaya Secretariat Building Shillong 793001		0364-2224801 0361-225978 (Fax)		cso meg@ nic.in
4.	Shri. Jagdish Chelani, IAS, Deputy Commissioner, West Garo Hills District	O/o the Deputy Commissioner, Tura, West Garo Hills District			8586088567	dc-wgh@nic.in
5.	Shri Abraham T Sangma, MPS, Superintendent of Police	O/o the Superintendent of Police, Tura, West Garo Hills		03651-223820		

6.	Smt A.V.D. Shira, MCS, Additional DC	O/o the Deputy Commissioner, Tura, West Garo Hills District			9436160250	
7.	SmtTangchiring K Sangma, MCS, Additional DC	O/o the Deputy Commissioner, Tura, West Garo Hills District			8787544839	
8.	ShriDolrich B G Sangma, MCS, Additional DC	O/o the Deputy Commissioner, Tura, West Garo Hills District			6909239981	
9.	SmtWinje R G Momin, MCS, Additional DC	O/o the Deputy Commissioner, Tura, West Garo Hills District			9862179249	
10.	SmtLeena Daring, MCS, Additional DC	O/o the Deputy Commissioner, Tura, West Garo Hills District			9436113323	
11.	ShriSaljong R Marak, MCS, Additional DC	O/o the Deputy Commissioner, Tura, West Garo Hills District			8787667096	
12.	SmtReziaChSangma, MCS, Additional DC	O/o the Deputy Commissioner, Tura, West Garo Hills District			9862047406	
13.	ShriDaplin D Sangma, MCS, Additional DC	O/o the Deputy Commissioner, Tura, West Garo Hills District			9612606005	
14.	SmtTadingchi N Sangma, MCS, BDO, Rongram	O/o the Rongram Development Block Officer, Rongram, West Garo Hills			8259016593	

9.3- Contacts of Prominent Persons residing along the River Downstream of the Dam who may be affected due to release of excess water through the Gates of the Dam.

Proforma – 6

Sl.No.	Name of Villages	Designation	Contact No.
1.	ElberthChMarak	Nokma, Edenbari	6009529286
2.	Starson A Sangma	Nokma, Masumatagre	8730064929
3.	Picheng A Sangma	Son of Nokma, Soragre	7005269580
4.	Westal T Sangma	Nokma, Asibra	6909234162
5.	Senora ChMarak	Nokma, RinggiSonggital	9612720086
6.	Crunchwell M Marak	Nokma, Gambagre	7005897418
7.	MentilChMarak	Son of Nokma, Dalmagre	8787893099
8.	BrenathChMarak	Son-in-law of Nokma, Dalmagre	8787424861
9.	Hewbirth R Marak	Nokma, Damalgre	7005225857

10.0- Preparation, Warning & Release of Water:-

Preparation, Warning and release of water from the Reservoir may be done under two conditions i.e., Normal condition and emergency/crisis condition.

10.1- **Under Normal condition:-** Under this condition the water may have to be released during Monsoon Period due to high flood or during Non - Monsoon Period as may be required.

10.1.1-During Monsoon Period:-

- (a) Since the Ganol Dam is a ROR scheme, the release of water will depend on the inflow of water. However, prior notifications should be issued on the onset of monsoon i.e. April-May and warning of likely release of water is to be issued.
- (b) The warning will be notified by the Engineer In Charge through sms and in writing (if possible) to District authorities and stakeholders.
- (c) The general warning of the likely release of water from Ganol Dam should be sent to all the Officers concerned within MeECL, MePDCL, MePGCL, MePTCL and also to (1) Deputy Commissioner, Tura (2) Superintendent of Police, Tura (3) BDO, Rongram (4) DIPR (5) Print & Electronic Media, and (6) All Concerned and stake holders residing or undertaking activities along the Ganol River downstream of the Ganol Dam, notifying the imminent and frequent release of excess water as required, depending on the inflow of water.
- (d) The notification is to be issued by the Engineer In Charge.
- (e) In addition to the official notification, information of the release of excess water may be disseminated through announcement in the villages downstream of the Ganol Dam.
- (f) All materials, equipment required for Gate Operation are to be checked and made ready for operation including DG sets.
- (g) 24- hours Operational duty is to be enforced as soon as the pre-monsoon rain starts.
- (h) Preparation for release of excess Water when water level reaches 350.00 m**
- (i) Information of likely release of water either during the day or night should be sent through Telephone, SMS, Whatsapp, etc. to all concerned and stake holders as recorded in **Proforma 1, 4, 5 & 6** and record the same as indicated in **Performa 2 & 3**. All messages are to be sent to all concerned before 6.00 p.m. so as to enable the Headman to announce the same to the public.
- (ii) The inflow of the water into the reservoir is to be calculated every hour and the same is to be informed to the Higher Authority through SMS, Whatsapp, Phone etc.
- (iii) If the inflow is very high, the inflow calculation should be done in halfhourly basis.
- (i) Release of Excess Water:-**

When the concerned authority authorized release of water through the Gates the following actions are to be taken:

- (i) The decision to release water shall be taken at least one hour before the actual operation of the Radial Gates and actual release of water. The first initial decision to release water through the Gates is to be taken by the Engineer In Charge, after consultation with the Higher Authorities.

- (ii) One hour before release of water through the Gates, Siren installed on the deck of the gates is to be blown for duration not less than 30 (thirty) minutes.
- (iii) Simultaneously, information of likely release of water either during the day or night should be sent through Telephone, SMS, Whatsapp, etc. to all Concerned and Stake holders as recorded in Proforma 1, 4, 5 & 6 and record the same as indicated in Performa 2 & 3. All messages are to be sent to all concerned before 6.00 p.m., so as to enable the Nokma/ Headmen to announce the same to the public.
- (iv) One hour after blowing the Siren, initially one gate can slowly be opened and may be raised up to the maximum height of 0.30 m.
- (v) In case, there is requirement to enhance the release of water due to high inflow, another gate may be opened. The Gate openings may be increased by 0.30 m for one gate every half an hour or hourly as the case may be and as decided by the concerned authority.
- (vi) In case of the decrease of inflow into the Reservoir and other consideration the size of opening of the Gates should be reduced accordingly.
- (vii) The decision to increase or decrease the size of opening of the gates or closing the gates may be taken by the Engineer In Charge of the Dam in the consultation with the Higher Authority.
- (viii) In all circumstances, water should not be allowed to overtop the Dam.
- (ix) The water level of the Reservoir should not be allowed to go beyond the maximum water level (MWL/FRL) of the Ganol Dam.

10.1.2- During Non - Monsoon Period

10.1.2.1- Under Normal condition the water is usually not required to be released through the gates during Non-Monsoon Period. However, there may be times that release of water may have to be done during this period. This may be required due to following reasons:

- (i) to enable the owner to take up necessary repairs of any Hydraulic Structures.
- (ii) to supply water required for PHE, Tura.
- (iii) during shutdown of power generation.

Only the Chairman cum Managing Director, MePGCL is authorized to allow release of water through the gates at Ganol Dam, under normal condition, during Non-Monsoon Period.

When the authority concerned decided to release water through the Gates under this condition, the following action is to be taken:-

- (a) The quantity of water to be released, including the rate of discharge through the gates and the time period of release, is to be properly calculated and planned to avoid unwanted submergence along the river course in the downstream of the Dam.
- (b) All materials, equipment required for Gate Operation are to be checked and made ready for operation.
- (c) One hour before release of water through the Gates, a warning is to be sounded by blowing the Siren installed on the Deck of the Gates. Simultaneously information of release of water

- should be sent through Telephone, SMS, Whatsapp, etc. to all concerned and stake holders as recorded in **Performa 1, 4, 5& 6** and record the same as indicated in **Proforma 2 & 3**
- (d) One hour after blowing the siren, initially one gate can slowly be opened and may be raised up to the maximum of 0.30 m.
 - (e) After the initial release of one hour, another gate may be opened. The size of opening of the Gate may be increase by 0.30 m for 1 (one) Gate every one hour up to the required size of opening as per schedule.
 - (f) All Gates should be closed as soon as the targeted quantity of water is released or the required water level of water in the Reservoir is achieved.

10.2.0- Under Crisis/Emergency condition: - Water may be released at any time of the year in case of the emergency/crisis situation that may arise due to;

- (a) Sudden and unprecedented heavy and very heavy rainfall in the catchment causing very high and unexpected flooding of the Reservoir.
- (b) Breaking of the Dam due to structural failure, earthquake, sabotage and other.
- (c) Failure of other hydraulics structure like Tunnel, etc.
- (d) Any other reasons that require urgent release of water.

10.2.1- The Engineer in Charge, after satisfying his/her self that the crisis/emergency condition warranted urgent release of water through the Gates of the Dams will immediately inform the Controlling Officers and Chief Engineer (C), M&SH, who will order for immediate release of water and inform the same to the Higher Authority of the Corporation. When the decision to release water is communicated (verbally or officially) the following steps are to be taken;

- (i) The Siren installed on the deck of the gates is to be blown for duration not less than half an hour.
- (ii) Simultaneously information of release of water should be sent through Telephone, SMS, Whatsapp, etc. to all concerned and stake holders as recorded in **Performa 1, 4, 5& 6** and record the same as indicated in **Performa 2 & 3**
- (iii) One hour after blowing the siren, initially one gate can be opened and may be raised up to the maximum of 0.3m.
- (iv) Depending on the situation of emergency/crisis the size of opening of the Gates, the number of gates and the discharge of water to be released will be decided by the Engineer -In -Charge in consultation with Higher Authorities.
- (v) During emergency/crisis situation the Engineer -in-Charge and other Higher Officials are to be present at the place/site of event (Ground Zero).


DIRECTOR (GENERATION)