

# **Standard Operating Procedure for Outage planning in State of Maharashtra**

In line with the MSLDC Outage Circulars vide Letter No. MSLDC/TECH/CO/No.01389 Dated 18.06.2018 and Letter No. 00281 Dated 05.02.2021, a Standard Operating procedure (SOP) for Outage Planning in the State of Maharashtra has been developed at MSLDC. This outage procedure is developed for the preparation of outage schedule for Generating Units and Transmission elements of the Maharashtra State in coordinated and optimal manner keeping in view the Maharashtra system operating conditions and maintaining Load-Generation balance in the system.

## **A. Outage Management System for Transmission elements at MSLDC: -**

MSETCL transmission system is integrated with Inter State & Intra State transmission companies like PGCIL, BDTCL, MEGPTCL, ATIL, APTCL, TPCL, VIPL, AEML-T and APTCL etc. Complete power system in India is operating as single National Grid. Outage of any element in any part of the system has impact on loading of other related elements in an integrated system. Hence, any outage needs to be approved with due consideration to maintain system integrity and avoid corridor congestion in any part of the system at anytime.

**Web based Outage Management System (WBOMS)** developed at MSLDC from 01<sup>st</sup> August 2018 in order to automate the outage management system except emergency outages which includes web submission of outage proposals, online processing and acknowledgement of status of outage proposal to the applicant.

The Web-based Outage Management System link is available on MAHASLDC website.  
**<http://58.84.25.20/outage/> or <http://114.79.149.133/outage/>**

User Id and Password are allotted to each Superintending Engineer EHV O&M Circle, MSETCL and Other transmission users in Maharashtra to access the System. Authorized MSETCL EHV O&M circle engineer and other transmission user upload the outage proposal in the system as per the defined time lines. After receiving the proposal, based on the system conditions, the outage get processed and approval is conveyed in the Report Menu which is generated in program daily by 16:00 Hrs. The applicant or Guest users can view the approval status of the proposed outages on the system.

As per the MERC State Grid Code regulations,2020 PART D, Sr.No.42 and IEGC Code 2010 Chapter 5.7, the objective of Outage planning is as below: -

1. *To produce a coordinated generation and transmission outage programme for the State grid, considering all the available resources and considering transmission constraints, as well as, irrigational requirements.*
2. *To minimize surplus or deficits, if any, in the system requirement and operate the system within Security Standards.*

3. *To optimize the transmission outages of the elements of the State grid without adversely affecting the grid operation but considering the Generation Outage Schedule, outages of user/STU systems and maintaining system security standards.*

As per Indian Electricity Grid Code-2010, outages of all 765kV, HVDC,400kV & Interstate elements and inter-state grid lines are to be approved by Western Regional Power Committee (WRPC) one month ahead basis.

Outages covered under this procedure

- 1) 765 kV, HVDC, 400kV Lines and associate grid elements
- 2) 765 kV & 400kV ICTs
- 3) Inter State Lines of all voltage levels
- 4) 765 kV & 400kV Bus & Busbar protection
- 5) Single / Double ckts Auto Re-closure

All 765kV, HVDC, 400kV Intrastate and Inter State grid lines are categorized by WRLDC as important grid elements, with exception, called as – Other Grid elements are those elements owned by STU and are less sensitive to parallel CTU elements. The list is prepared by WRLDC annually as per provision in IEGC-5.2 (C). The exemption is awarded after discussion with SLDC. The latest list is published by WRLDC on 31.05.2021 & available on following WRLDC link-

**[https://www.wrldc.in/content/364\\_1\\_ImportantDocuments.aspx](https://www.wrldc.in/content/364_1_ImportantDocuments.aspx)**

The category of outages for above is classified are as below: -

**Types of Outages: -**

1. Annual Outages (400kV and above and Inter State lines)
2. Monthly Outages (400kV and above and Inter State lines)
3. Day Ahead Outages (All types of planned outages)
4. Opportunity Outages
5. POST OCC Outages (Constructions and Project work)
6. Emergency Outages

**1. Annual Outages (400kV and above and Inter State lines): -**

As per the MERC State Grid Code regulations, 2020 PART D, Sr.No.42, All users including buyers and sellers and transmission licensees shall provide SLDC with their proposed planned outage programmes in writing for the next financial year by 31<sup>st</sup> October of each year. These shall contain identification of each Generating Unit / Transmission Line / Interconnecting Transformers for which outage is being planned, reasons for the outage, the preferred date for each outage and its duration and where there is flexibility, the earliest start date and latest end date.

SLDC shall prepare the outage programme for the next financial year by 30<sup>th</sup> November of each year for Intrastate / Interstate transmission elements on the basis of outage programme submitted by buyers, sellers and shall submit to WRPC. Annual Transmission lines and Generation unit outage plan is formulated by WRPC for entire region *as per IEGC-2010*. These outages are reviewed on monthly basis. Further annual outage plan for forth coming financial year is being prepared by WRPC by December and review of planned outages is carried out on monthly basis during Operation Co-ordination Committee meeting (OCCM).

## **2. Monthly Outages (400kV and above and Inter State lines): -**

As per standard procedure of WRPC, approval for outage of all EHV elements which have been listed under the list of important grid elements of Western Region required OCCM approval. The outage more than 48 hrs on the non-important grid element also required OCCM approval. All such proposed outages of interstate and 400 KV transmission elements of next month should get approved in the OCCM of WRPC in the current month. All the constituents of WR shall inform to the WRLDC for readiness for availing outage of such transmission elements on D-3 basis.

The list of important grid elements of Maharashtra grid which have a bearing on the network security are available on MSLDC Website.

The outages for all 765kV, HVDC, 400kV Intra state and Inter State grid elements of Maharashtra state for next calendar month are required to be uploaded on Web-based outage Management System (WBOMS) at MSLDC by all transmission users up to the last date of previous month for getting the approval from OCCM WRPC. After receiving all the outage proposals, MSLDC formulate the monthly outage list by studying each and every outage element and forward the important grid element list to WRPC for OCCM approval by the 5<sup>th</sup> day of every month.

For example- Planned outages for the month of August' 21 shall be submitted to MSLDC on or before 30<sup>th</sup> June and MSLDC will formulate a final list of outages till 05th Jul'21 and forward only list of important grid elements to WRPC.

After receipt of outage list from all constituents and all transmission companies in Western region, WRPC prepares final list incorporating all outage proposals for final discussion during WRPC OCCM (Operation Co-ordination Committee) forum and the outage list is approved.

WRPC OCCM is held between 15<sup>th</sup> to 20<sup>th</sup> of every month and chaired by Member Secretary, WRPC (Govt.of India) for approval of all the outages proposed on month ahead basis.

WRPC Secretariat issues the outage plan i.e., a consolidated list of approved and deferred outages of western region, as decided in OCCM meeting to all the constituents. A list of approved outages issued by WRPC every month after detail discussions based on system study among all members, published on MSLDC Website with the following mentioned link:

<https://mahasldc.in/home.php/monthly-outages/>

Before availing the approved outage, the officer concerned who has proposed the outage has to confirm four days prior to actual date of outage (i.e., on D-4 basis) regarding their readiness to avail the same to MSLDC through Web-based outage Management System (WBOMS) to convey the readiness to WRLDC on D-3 basis.

Based on above inputs and real time system conditions MSLDC finalizes a final list on day ahead basis at 16:00hrs.

Outage shall be permitted by WRLDC / SLDC depending on real time system condition. Outages under SLDC purview shall be given by SLDC with code.

**Rescheduling/cancellation/Deferment of outages after monthly schedules: -**

In the event of any requirement to re-schedule the planned shutdown, the concerned constituent shall forward request to SLDC / WRLDC indicating the reasons of deferment. SLDC/WRLDC would approve rescheduling of an already planned outage based on the exigency vis-à-vis system conditions with intimation to WRPC.

In addition to above, if planned outages get deferred due to real time system condition shall be rescheduled in consultation with the concerned field officers.

**3. Day Ahead Outages (All types of planned outages): -**

Based on the final day ahead outage approved list by WRLDC for the outages approved in WRPC OCCM and real time system conditions, outages are approved by MSLDC on Day ahead basis.

The non-important grid element outages (Up to 48 hrs.) and 220kV element outages are approved by MSLDC on day ahead basis. Proposals of the same should be received at MSLDC on D-2 basis through Web-based outage Management System (WBOMS).

Outages approved by WRLDC/SLDC on day ahead basis permitted by SLDC in real time depending on real time system condition. Outages under SLDC purview will be given by SLDC with code.

MSLDC shall finalize and publish a final list on day ahead basis on Web-based outage management system at 16:00 hrs daily.

**4. Opportunity Outages: -**

Opportunity outages are given by MSLDC in real time in co-ordination with field officers.

## **5. POST OCC Outages (Constructions and Project work): -**

As per WRPC outage procedure, OCC forum agreed that for seeking consent from WRPC for the post OCC outages, the concerned agency shall have to submit application duly signed by their ED /Director /CEO (whichever is applicable) & CE MSLDC in case of MSETCL to WRPC prior to 5 working days before the proposed outage date.

Outages which are not submitted in monthly outage proposal, like project related outages etc. getting approved by WRPC prior to five working days before the proposed outage date.

The outage proposal shall be submitted by field officers to CE, MSLDC duly signed by the concerned Chief Engineer mentioning the reasons of non-consideration in the earlier OCC and urgency of carrying out the work seven days before the proposed outage date.

A signed proposal by Chief Engineer, MSLDC is sent to Member Secretary, WRPC (Govt. of India) for approval. Within 12 hours, WRPC shall forward the same to all concerned agencies/organizations for suggestion/comments (if any). If, no objection is received within 12 hours, the proposed outage shall be considered as deemed approved by WRPC; thereafter the approved outage would be forwarded to WRLDC for further processing and issuing outage code subject to realtime grid conditions for ensuring stability and security of the grid. Priority is given to OCC approved outages in comparison to the POST OCC proposals, if outage is in same corridor.

## **6. Emergency Outages: -**

Emergency outages like Hotspot, flashover of insulators, ICT/Transformer issues requiring immediate shutdown etc. are covered under this category. For Important grid element outages, code from WRLDC is required in real time, while the other grid elements are cleared by SLDC. MSLDC has developed Emergency outage system in OMS and now Emergency outage proposal can also be processed through '**Web-based Outage Management System**' at MSLDC.

Emergency outages shall be allowed subject to the system conditions and its severity. In this case, if required, planned outages may be deferred, and deferred planned outage may be rescheduled if necessary.

The methodology for operating the Web-based Outage Management System for Emergency outage processing is mentioned as below: -

a. 400kV and above emergency outages shall be incorporated through Chief Engineer EHV PC O&M Zone account whereas, 220kV and below emergency outages shall be incorporated through Superintending Engineer EHV O&M Circle account.

b. A **User-id & Password** allocated to each CE EHV PC O&M Zone and SE EHV O&M Circle (with existing User-Id & Password) to access the system. The link is available on **mahasldc.in**

c. Emergency outage proposal can be incorporated in the system within 12 hours of the required outage time. Prior to 12 hours, System not allow to incorporate the same in the Software.

d. Along with the Proposals, necessary images are required to be uploaded in the system while incorporating the outage entry

e. The applicant received the mail and SMS regarding approval or deferment of outage.

**Task & Authorities:-**

Sr.No	Role	Task
1.	Zonal CE (for 400kV & Above) / SE EHV O&M Circle (for 220kV & below for KTRT Region)	Enter Emergency Proposal (alongwith attachments) and Submit to SLDC through software.
2.	Shift Incharge, MSLDC	Raise Query
3.	Shift Incharge, MSLDC	Recommend / Defer
4.	Shift Incharge, MSLDC	Generate PDF / Excel Report and will send to WRLDC
5.	EE (OP), MSLDC	Approval of Emergency Outage
6.	SE (OP), MSLDC	Approval of Emergency Outage
7.	CE MSLDC	Approval of Emergency Outage in case if element is 400KV, 500KV, 765KV
8.	Shift Incharge, MSLDC	Will Send Approval Email to Field office

**Time lines for each outage type: -**

Sr. No.	Type of Outages	Time line
1.	Annual Outages	Submitted to WRPC for the next financial year by 30 <sup>th</sup> November of each year
2.	Monthly Outages	Submitted to WRPC on 5th day of each month for OCCM Approval
3.	Day Ahead Outages	Proposal to be submitted by field on D-2 Basis and approval by MSLDC on day ahead basis
4.	Opportunity Outages	Real time condition
5.	POST OCC Outages	To be submit to WRPC on D-5 basis
6.	Emergency Outages	Proposal to be submitted by field within 12 hours of the required outage time

### **Requisite for submission of outage proposal: -**

While proposing outage on any transmission elements for maintenance work, all works shall be carried out at both ends and associated line partners. All the outages shall be proposed by EHV (O&M) authority for MSETCL / Head Transmission for other transmission licensees. Proper co-ordination between concerned authorities shall be observed for inter-circle and inter-zone lines.

As per the MYT Regulations 2019, the target level of EHV AC system availability is 99% and above. Therefore, it is felt necessary that all outages should be well structured and managed in an optimum manner so that duration of outage, mitigation of risk involved and interruption to consumers should be minimized.

All field officers are hereby requested to strictly follow the procedure of outage planning for smooth working of Power System grid and enhancing the monthly as well as annual availability.

All feasible outages processed through the procedure shall be approved by SLDC with utmost efforts.

In case of critical element outages like Mumbai related outages / where revision of ATC/TTC revision carried out, the field officers should give updates and status of outage work to MSLDC time to time.

### **Isolation in extreme emergency: -**

As per the MERC State Grid Code regulations, 2020 PART D, Sr.No.42 and as per 5.2(b) of IEGC, the transmission element can be isolated by site under the following conditions; -

- 1) *under an emergency, and conditions in which such isolation would prevent a total grid collapse and/or would enable early restoration of power supply.*
- 2) *when serious damage to a costly equipment is imminent and such isolation would prevent it*
- 3) *When such isolation is specifically instructed by the SLDC.*
- 4) *On the operation of under frequency / islanding scheme as approved by SLDC.*
- 5) *for safety of human and / or animal life*

Utility may follow their own safety protocol under extreme emergency in view of safety of human life or costly equipment.

However, after such isolation, the same shall be reported to MSLDC & WRLDC immediately. The facts of the incident shall be explained in the OCC meeting by utility.

**B. Outage Management System for Generating Units at MSLDC: -**

The Generating unit outages approved in annual plan of WRPC, reviewed on monthly basis in OCCM. For these planned generation unit outages, WRLDC and concerned beneficiaries' consent is required. After receiving the consent from WRLDC and concerned beneficiary, and depending on real time system condition, outage may be given.

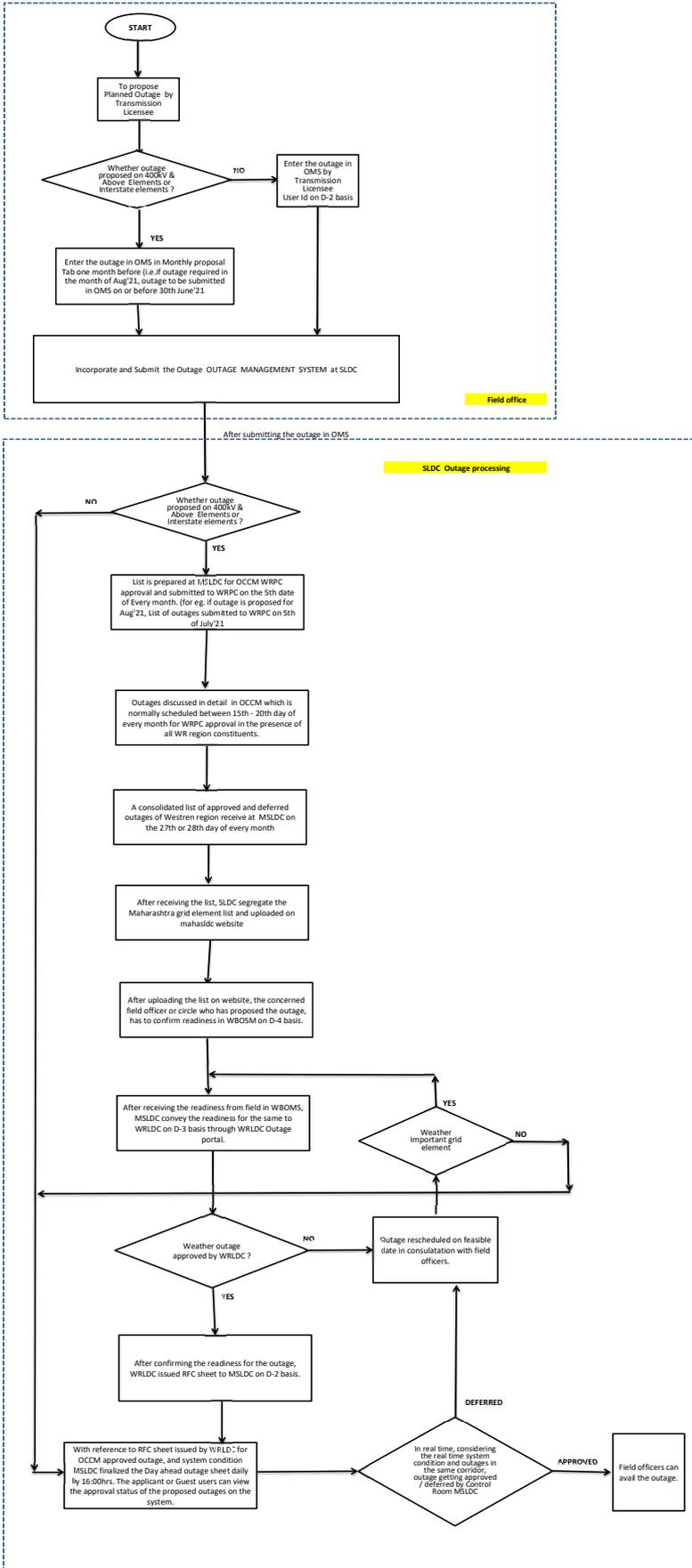
In case of deferment of outage due to real time system condition, outage may be postponed and may be given in the feasible time period.

The flow chart for Monthly/Day Ahead outages & Emergency outages is enclosed herewith as Annexure 1 &2 respectively.

.....

ANNEXURE - 1

**FLOWCHART FOR MONTHLY/DAY AHEAD OUTAGE PROCESSING AT MSLDC**



ANNEXURE - 2

**FLOWCHART FOR EMERGENCY OUTAGE PROCESSING AT MSLDC**

