

## Clarification of the use of MLP in EDAC and Real-time

This paper has been written to address EDAC Design Working Group members in response to an action item with a comprehensive view of how the minimum loading point is used in the various time frames.

### Background Information

Minimum Loading Point (MLP) is defined in the Market Rules as the minimum output of energy specified by the Market Participant that can be produced by a generation facility under stable conditions without ignition support.

When EDAC goes into service, the MLP can be derived from two sources;

- 1) the registered value for MLP, or
- 2) the daily value for MLP, which can be updated on a daily basis for use in the EDAC scheduling process only.

The daily value for MLP is not used in the Pre-Dispatch scheduling process however it can be used to apply constraints in Pre-Dispatch as a result of EDAC schedules. The registered value for MLP is used by MIO and Unit Commitment Manager in real-time.

The daily value for MLP is a single value for each hour of the EDAC day. The EDAC Calculation Engine uses the daily value for MLP as the minimum generation level of *energy* that a *generator* at bus *b* is willing to produce in hour *h*, if scheduled to operate.

PCG eligible resources receiving an EDAC schedule will be constrained in the Pre-dispatch schedule to the daily value for MLP for the hours in which they received an EDAC schedule.

Changes to daily value for MLP can be made in the EDAC Submission Window which is open from 6:00 to 10:00. After 10:00, changes driven by forced equipment limitations will also be accepted to be included in the next EDAC run if one is required after the change has been

accepted. That is, changes to daily value for MLP will not in itself cause the EDAC Re-run criteria to be triggered. However, if a subsequent run of EDAC is to be performed through the normal process or through the execution of the rerun criteria the revised daily value for MLP will be used.

The revised daily value for MLP will be carried over to all future EDAC days to be used as the default until it is over-written at a future update. Changes of long duration should be updated in the Registration database.

Revisions to the daily value for MLP that do not exceed the EDAC MLP Limit will be automatically approved within the submission window. Revisions to the daily value for MLP that exceed the EDAC MLP Limit will automatically be flagged for EDAC operator approval, as will all changes submitted between 10:00 and 14:00. These submissions will be accepted in EDAC by the operator, but will be flagged for compliance follow-up.

### **Real-Time – Unit Scheduled in Pre-dispatch only to EDAC Scheduled Hours**

When the daily value for MLP has been revised in the submission of Data for the EDAC day, the day-ahead schedule produced by the EDAC Calculation Engine will respect the revised MLP. Constraints passed on to Pre-dispatch for a generator's EDAC commitment will be to the daily value for MLP used in EDAC for Day 1.

If Pre-dispatch only schedules the unit to run in the EDAC scheduled hours, there will be minimal impact. When ramping up in real time, MIO (Multi-Interval Optimization) will ramp the unit up to the registered MLP, not the daily value for MLP provided from the EDAC Constraints. Assuming the revised daily value for MLP is greater than registered data, Control Room staff will implement a constraint, where necessary, to dispatch the unit up to the daily value for MLP following start-up.

When the constraint to the daily value for MLP comes to an end and the unit is no longer scheduled in Pre-dispatch, Unit Commitment Manager would signal a unit shutdown based on the Pre-dispatch schedule going below the registered MLP. Control Room staff would then confirm the shutdown of the unit through Unit Commitment Manager and the unit would be dispatched off according to the offered ramp rate.

## Real-Time – Unit scheduled in Pre-dispatch in Non-EDAC Scheduled Hours

If the unit is scheduled in Pre-Dispatch to run outside the hours committed through the EDAC schedule, based on real-time offers, MIO would respect the registered MLP.

If starting earlier than the constraint, then MIO would dispatch the unit to the registered MLP not to the daily value for MLP provided through the EDAC scheduling process EDAC. Therefore if the unit is coming on earlier than scheduled in EDAC and the daily value for MLP is greater than the registered MLP, the Market Participant must advise the Control Room Operator in advance so that a constraint can be implemented to dispatch the unit up to the daily value for MLP provided in the EDAC schedule for that day following synchronization. The constraint would stay in place until the constraint for the EDAC scheduled hours begins.

Similarly, the registered MLP will be used to determine when a unit is to be considered for shutdown. When the constraint to the daily value for MLP due to the EDAC schedule for the day comes to an end and the unit remains scheduled economically, the Unit Commitment Manager would signal a unit shutdown based on the schedule going below the registered MLP.

The Control Room staff would be aware of the daily value for MLP, however they would not take any action to constrain the unit to the daily value for MLP. The Market Participant will need to monitor for scheduling/dispatches below the daily value for MLP and notify the IESO Control Room to determine if a shut-down is desired.

If the decision by the IESO is to keep the unit in service for reliability needs, a constraint would be put in place to daily value for MLP for the required duration. If the decision is to shut down the unit, then Control Room staff would confirm the shutdown of the unit through Unit Commitment Manager. The unit would then be dispatched off according to the offered ramp rate.

## Revisions to MLP in Real-time

Changes to MLP that occur in real-time are to be reported to the IESO Control Room. The revised MLP will be entered as a constraint for the remaining EDAC scheduled hours or the duration of the change whichever is less. Offers should be revised to reflect the new MLP and these changes will be accepted in the Mandatory Window.

When a change is made to the Minimum Loading Point of a generator, and the change will continue into the next EDAC scheduling day an update should also be made, by the Participant, to the daily value for MLP for that EDAC scheduling day. This change will be accepted in EDAC to be incorporated into the next run. If the EDAC Schedule of Record has already been determined for that day the change to MLP will have to be managed in real time again in the following day, as it was not implemented by EDAC.

## **Settlements Treatment of Revisions**

The daily value for MLP used in the EDAC Schedule of Record will always be used in the Settlements process.

The daily value for MLP is required by Settlements only for those times when a unit is running across midnight into the next scheduling day to fulfill its MGBRT. The fulfillment of MGBRT in the following day, by virtue of the escalating offer at day's end requires the PCG for the second day to be reduced by offered costs to keep the unit at MLP.

Therefore, the PCG will be based on the difference between the daily value for MLP of the previous day and the EDAC schedule for those hours fulfilling MGBRT.

## **MACD Follow-Up**

Revisions to EDAC MLP that exceed the EDAC MLP Limit may be investigated by MACD to determine their legitimacy.