

ELECTRICITY INDUSTRY ACT

ELECTRICITY INDUSTRY (WHOLESALE ELECTRICITY MARKET) REGULATIONS 2004

WHOLESALE ELECTRICITY MARKET RULES

Power System Operation Procedure: Facility Outages

Commencement: This Market Procedure is to have effect from 8:00am (WST) on the same date as the Wholesale Electricity Market Rule, in which this Procedure is made in accordance with, commences. [Isn't this retrospective with subsequent revisions?]

TABLE OF CONTENTS

| | |
|---|-----------|
| 1. FACILITY OUTAGE PROCEDURE | 4 |
| 2. RELATIONSHIP WITH MARKET RULES | 4 |
| 3. SCOPE | 4 |
| 4. ASSOCIATED PROCEDURES AND OPERATING STANDARDS | 4 |
| 5. APPLICATION OF OUTAGE PROCEDURE TO FACILITIES | 4 |
| 5.1 System Management must compile and maintain a list of all equipment on the SWIS | 5 |
| 5.2 Content of equipment list | 5 |
| 5.3 Application of Procedures for part of year | 5 |
| 5.4 List of equipment covered may be varied | 5 |
| 6. COMMUNICATIONS AND CONTACTS | 6 |
| 6.1 Participant Contacts | 6 |
| 6.2 System Management Contacts | 6 |
| 7. COMMUNICATION AND PUBLICATION OF OUTAGE PLANS, SCHEDULES AND APPROVALS | 6 |
| 8. OUTAGE SCHEDULE | 6 |
| 9. OUTAGE PLANS - GENERAL | 7 |
| 9.1 Information required for outage plans | 7 |
| 9.2 Timing of submission and acknowledgment | 7 |
| 9.3 Changes to an Outage Plan | 7 |
| 9.4 Outage Plans lodged within the final six weeks | 7 |
| 9.5 Grouping of Associated Outage Plans | 8 |
| 9.6 Outages and Commissioning | 8 |
| 10. ACCEPTANCE OF OUTAGE PLANS | 8 |
| 10.1 Assessment of Outage Plans | 8 |
| 10.2 Adequacy criteria for assessing the acceptability of Outage Plans | 8 |
| 10.3 Processing of Outage Plans after Evaluation | 8 |
| 10.4 Criteria for selection of Outage Plans in event of conflicting Outage Plans .. | 9 |
| 10.5 Acceptance of non-complying Outage Plan for reasons of System Security .. | 9 |
| 10.6 Reassessment by IMO of System Management's decision | 9 |
| 11. CHANGES TO POWER SYSTEM CONDITIONS AFFECTING SCHEDULED OUTAGES | 9 |
| 12. PRE-ACCEPTED OUTAGES | 9 |
| 13. APPROVAL OF SCHEDULED OUTAGES | 10 |
| 14. APPROVAL OF DAY-AHEAD OPPORTUNISTIC MAINTENANCE ('DAOM') REQUESTS | 10 |
| 15. APPROVAL OF ON-THE-DAY OPPORTUNISTIC MAINTENANCE ('ODOM') REQUESTS | 11 |
| 16. COMPLIANCE WITH SYSTEM MANAGEMENT'S DECISION | 12 |
| 17. OUTAGE RECALLS | 12 |
| 18. CALCULATION OF PLANNED OUTAGE, FORCED OUTAGE AND EQUIPMENT TEST RATES | 13 |

19. SUBMISSION OF FORCED OUTAGES AND CONSEQUENTIAL OUTAGES13

**20. FORCED OUTAGE AND CONSEQUENTIAL OUTAGE INFORMATION FOR
IMO13**

1. FACILITY OUTAGE PROCEDURE

The Power System Operation Procedure: Facility Outages Procedure ('Procedure') details procedures that System Management and Rule Participants must follow when planning for an outage of a network, generation, load or Ancillary Service Facility.

2. RELATIONSHIP WITH MARKET RULES

1. This Procedure has been developed in accordance with, and should be read in conjunction with clauses 3.18 to 3.21 of the Wholesale Electricity Market (WEM) Rules (Market Rules).
2. References to particular Market Rules within the Procedure in bold and square brackets **[MR XX]** are current as at 7 October 2008. These references are included for convenience only, and are not part of this Procedure.
3. In performing its functions under the Market Rules, System Management may be required to disclose certain information to Market Participants and Network Operators. In selecting the information that may be disclosed, System Management will utilise best endeavours and act in good faith to disclose only the information reasonably required by the application of the Market Rules.

3. SCOPE

The Facility Outage Procedure details the processes that enable Market Participants and Network Operators to gain agreement with System Management on the timing of outages of facilities; to resolve possible conflicts between Outage Plans of different participants and assist System Management in the management of system security.

4. ASSOCIATED PROCEDURES AND OPERATING STANDARDS

The following Power System Operation Procedures are associated with this Power System Outage Procedure.

- a) Power System Operation Procedure – Communications and Control Systems
- b) Power System Operation Procedure – Power System Security
- c) Power System Operation Procedure – Commissioning and Testing

5. APPLICATION OF OUTAGE PROCEDURE TO FACILITIES

The requirements for Market Participant or Network Operator Facilities to be subject to the Facility Outage Procedure set out in this document are specified in the Market Rules **[MR 3.18.2(f)]**.

5.1 System Management must compile and maintain a list of all equipment on the SWIS

1. The requirements for System Management to compile and maintain a list of all equipment in the SWIS that is required to be subject to outage scheduling by System Management are specified in the Market Rules **[MR 3.18.2(a)&(b)]**.
2. System Management will compile and maintain the list of equipment covered by this Procedure, where its maintenance will be reviewed from time to time.
3. System Management will provide the list for publication in accordance with the Market Rules **[MR 3.18.2(e)]**.

5.2 Content of equipment list

1. Notwithstanding requirements of the Market Rules **[MR 3.18.2(c)]** the list of equipment should, where applicable, include:
 - (a) all network circuits that could limit output from a generating facility during a planned outage of that circuit;
 - (b) all EGC generating units;
 - (c) all circuit breakers, switches and transformers operating at 330kV and 220kV;
 - (d) all Non-EGC generating facilities with output ratings in excess of 10MW; and
 - (e) any facilities contracted to provide Ancillary Services that are not covered by the above.
2. System Management may determine that generators and loads with a name plate capacity rating less than 10MW may be included in the equipment list, where outage scheduling is required for the maintenance of Power System Security and Power System Reliability, as specified in the Market Rules **[MR 3.18.2A]**.

5.3 Application of Procedures for part of year

1. System Management may specify a piece of equipment to be part of the list at a particular time of the year in accordance with the Market Rules **[MR 3.18.2(d)]**.
2. In determining whether a piece of equipment should be subject to outage scheduling at specified times of the year, System Management may utilise the equipment list as guidance in exercising its discretion.

5.4 List of equipment covered may be varied

1. Before utilising the process set out in the Market Rules **[MR 3.18.3]** a Market Participant or Network Operator who wishes to have an item of equipment included or excluded from the list must contact System Management and set out the reasons for the request.
2. System Management must consider the following factors in making a decision on including or excluding the equipment:

- a. the safety of equipment, personnel and the public; and
 - b. Power System Security and Power System Reliability.
3. If, after following the process in section 5.4.1 above, then a Market Participant or Network Operator may request that the Independent Market Operator ('IMO') reassess the inclusion of the Facility or item of their equipment on the list in accordance with the Market Rules **[MR 3.18.3]**.

6. COMMUNICATIONS AND CONTACTS

6.1 Participant Contacts

1. Depending on the circumstances, System Management may communicate directly with participants or request participants to seek resolution amongst themselves.
2. Market Participants and Network Operators must provide System Management with the communication details of the operating person(s) authorised to submit Outage Plans and outage cancellations for each of their facilities.
3. System Management will maintain a record of details as advised above and make them available to Market Participants and involved parties on an as needs basis.

6.2 System Management Contacts

1. System Management will from time to time advise Market Participants and Network Operators of its contact details and modes of communication, of persons who should be communicated with concerning outages.

7. COMMUNICATION AND PUBLICATION OF OUTAGE PLANS, SCHEDULES AND APPROVALS

Communication of outage notices and schedules shall be made through System Management's Market Information Technology System web interface or as directed by System Management from time to time. This system shall be referred to as 'SMMITS' within this Procedure.

8. OUTAGE SCHEDULE

1. The requirements for System Management to maintain an outage schedule, containing information on all Scheduled Outages are specified in the Market Rules **[MR 3.18.4]**.
2. The Outage Schedule shall contain a list of all accepted and approved outages.
3. The Outage Schedule must contain the identity of the item of equipment and the planned starting and completion times of each Outage Plan accepted by System Management, up to three years ahead.

4. As specified in the Market Rules **[3.18.5D]** System Management may disclose information from the Outage Schedule to a Network Operator to coordinate outage timings.

9. OUTAGE PLANS - GENERAL

1. The requirements for Market Participants to submit Outage Plans to System Management are specified in the Market Rules **[MR 3.18.4A]**.

9.1 Information required for outage plans

1. Market Participants and Network Operators must submit all outage plans and requests for on-the-day and day-ahead Opportunistic Maintenance through SMMITS or as otherwise directed from time to time, and include the information specified in accordance with the Market Rules and this Procedure **[MR 3.18.6]**.
2. System Management may require the Participant to clarify or provide additional information in the outage plan.

9.2 Timing of submission and acknowledgment

1. The time of lodgement of the Outage Plan shall be deemed as the time when the outage plan is transmitted to System Management and an acknowledgement of the submission has been provided.

9.3 Changes to an Outage Plan

1. The requirements for Market Participants or Network Operators to confirm or revise plans to remove from service or de-rate an item of equipment are specified in the Market Rules **[MR 3.18.7, MR 3.18.8 and MR 3.18.9]**.
2. A Market Participant or Network Operator must inform System Management by telephone and must provide confirmation through SMMITS.
3. If changes in outage plans are minor and do not materially impact power system security or other outage plans, and do not change the timing of the outage, System Management may accept these changes without requiring the plan to be resubmitted.

9.4 Outage Plans lodged within the final six weeks

1. The requirements applying to an Outage Plan first submitted within 6 weeks of the commencement time of the outage are specified in the Market Rules **[MR 3.18.7A]**.
2. System Management must take into account the following factors contributing to a submission made within 6 weeks of the commencement time:
 - a. the Market Participant or Network Operator has just become aware of a need to carry out relatively urgent and unforeseen maintenance on its facility; and
 - b. the nature of the work to be carried out on the facility makes it difficult to plan times accurately ahead, or the work is contingent on actions outside the control of the Market Participant or Network Operator.

3. When System Management is unable to assess an Outage Plan in the time available, System Management will require the Market Participant or Network Operator to resubmit the Outage Plan.

9.5 Grouping of Associated Outage Plans

1. The requirements for Market Participants and Network Operators to coordinate outages are specified in the Market Rules **[MR 3.18.5C]**.
2. In the situation where a close interdependency exists between facilities, System Management must assess these together and may approve, review or reject the group as a whole.

9.6 Outages and Commissioning

Outages that require commissioning should conform to the requirements of the Market Rules and the Power System Operation Procedure: Commissioning and Testing.

10. ACCEPTANCE OF OUTAGE PLANS

10.1 Assessment of Outage Plans

1. A Market Participant or Network Operator must make application for the acceptance of an outage plan via SMMITS or as otherwise directed. For the purposes of this Procedure the Proposed Outage Plan is deemed a request for acceptance.
2. System Management must use reasonable endeavours to respond to a request for a Proposed Outage Plan received from a Market Participant or Network Operator within 10 business days of receipt of a generation plan and within 20 business days of receipt of a transmission plan.
3. System Management must take all reasonable steps to expedite assessments of all submitted Outage Plans.

10.2 Adequacy criteria for assessing the acceptability of Outage Plans

1. The criteria that System Management must apply when assessing the acceptability of Outage Plans are specified in the Power System Operating Procedure: Power System Security and the Market Rules **[MR 3.18.11 and MR 3.18.12]**.
2. System Management may undertake this assessment by examining one or more representative trading periods in the period covered by the Outage Plan(s).

10.3 Processing of Outage Plans after Evaluation

The requirements for processing a new Outage Plan, or an Outage Plan or group of Outage Plans that System Management has previously accepted unconditionally or subject to conditions, are specified in the Market Rules **[MR 3.18.13]**.

10.4 Criteria for selection of Outage Plans in event of conflicting Outage Plans

1. System Management must adhere to the criteria for the selection and prioritisation of outage plans as specified in the Market Rules **[MR 3.18.14]**.
2. System Management must notify all affected Market Participants and Network Operators of any decision made under this section of the Procedure via SMMITS or as otherwise directed, and will use reasonable endeavours to confirm its decision by telephone.

10.5 Acceptance of non-complying Outage Plan for reasons of System Security

1. The Market Rules provide for System Management to permit an Outage Plan to proceed even if it does not meet the criteria for acceptance as specified in the Market Rules **[MR 3.18.11(e)]**.
2. System Management will take account of situations where the advantages to ongoing Power System Security are considered to exceed the reduced security risk that extends over the period of the outage.
3. System Management must document its estimation of the extent of the risk including the likelihood and consequences, and ongoing advantages that arise over the longer term of accepting an Outage Plan.

10.6 Reassessment by IMO of System Management's decision

The requirements for Market Participants and Network Operators to apply to the IMO to reassess a decision by System Management to not include or to remove an Outage Plan from the Outage Schedule are specified in the Market Rules **[MR 3.18.15]**.

11. CHANGES TO POWER SYSTEM CONDITIONS AFFECTING SCHEDULED OUTAGES

1. SWIS conditions can change from the forecast .Where a change in expected power system conditions occurs for a future time period after System Management has accepted an Outage Plan for an outage during that time period, such that the Outage Plan would no longer be acceptable, System Management may withdraw its acceptance of the Outage Plan and deem that that the Outage Plan is unacceptable.
2. Where System Management makes such a decision, it must inform the relevant Market Participant or Network Operator of its decision via SMMITS or as otherwise directed, and where sufficient time exists, System Management will use reasonable endeavours to confirm its decision by telephone.

12. PRE-ACCEPTED OUTAGES

- 1 No earlier than 8am on the 7th day prior to the trading day in which the outage commences, a Market Participant may make a request via telephone for an

outage where this communication may be deemed as a request for Acceptance ('Pre-Accepted Outage').

2. Where requesting a Pre-Accepted Outage, a Market Participant must first telephone System Management, where contact details will be advised from time to time, and obtain a verbal agreement that there is a likelihood that the request can be approved.
3. Following the telephone call in section 12(2) or as otherwise directed, the Market Participant must provide the Proposed Outage Plan via SMMITS.
4. System Management will apply the approval framework in accordance with clause 13 of this Procedure to the Proposed Outage Plan. Where System Management approves the request, the telephone conversation seeking approval to submit the Pre-Accepted Outage will be deemed as satisfying the request for Acceptance.

13 APPROVAL OF SCHEDULED OUTAGES

1. The requirements for a Market Participant or Network Operator to request approval of a Scheduled Outage Plan are specified in the Market Rules **[MR 3.19.1]**.
2. A Market Participant or Network Operator must make application for approval for a Scheduled Outage Plan via SMMITS or as directed.
3. At the time the request is made the Market Participant or Network Operators must also advise System Management of any change to the information contained in the Outage Plan.
4. The criteria that System Management must adhere to when assessing whether to grant approval of Scheduled Outage requests are specified in the Market Rules **[MR 3.19.6]**.
5. Before approving a Scheduled Outage request, System Management may at its sole discretion require a Market Participant's or Network Operator's authorised personnel included in the relevant contact list to make a written declaration that the unit is available prior to the outage commencing. System Management will reject any Scheduled Outage request where the relevant Market Participant or Network Operator does not comply with such a request.
6. Notification by System Management of either an approval or rejection of a Scheduled Outage must be made via SMMITS or as otherwise directed, in accordance with the Market Rules **[MR 3.19.4]**.

14 APPROVAL OF DAY-AHEAD OPPORTUNISTIC MAINTENANCE ('DAOM') REQUESTS

1. The requirements for a Market Participant or Network Operator to request approval of a day-ahead Opportunistic Maintenance Outage are specified in the Market Rules **[MR 3.19.2(a)]**.

2. A Market Participant or Network Operator must make application for the approval of a day-ahead Opportunistic Maintenance outage request by telephone and via SMMITS, or as otherwise directed. System Management will advise its contact details from time to time.
3. The criteria that System Management must adhere to when assessing whether to grant approval of a day-ahead Opportunistic Maintenance Outage requests are specified in the Market Rules **[MR 3.19.6]**.
4. The request for approval of a day-ahead Opportunistic Maintenance Outage must be received by System Management no later than 8:00am of the day that the request for approval is due.
5. System Management must either approve or reject the day-ahead Opportunistic Maintenance Outage and inform the Market Participant and Network Operator of its decision before 8:00am of the Scheduling Day, ie. by 8:00am of the day immediately prior to the day the outage commences. This decision must be made before 8:00am to enable System Management to conform to the Market Rules **[MR 7.3.4]**, whereby System Management is required to send a schedule of all outages for each Registered Facility which System Management is aware of to the IMO between 8:00am and 8:30am on the Scheduling day prior to the Trading Day.
6. System Management will not approve a request for a day-ahead Opportunistic Maintenance request after 12pm on the Scheduling Day.
7. Before approving a day-ahead Opportunistic Maintenance request System Management may at its sole discretion require a Market Participant's or Network Operator's authorised personnel included in the relevant contact list to make a written declaration that the unit is available prior to the outage commencing in accordance with the Market Rules **[MR 3.19.3A(c)]**. System Management will reject any day-ahead Opportunistic Maintenance request where the relevant Market Participant or Network Operator does not comply with such a request.
8. System Management must provide confirmation of its approval or rejection via SMMITS or as otherwise directed, as soon as practicable. The relevant Market Participant or Network Operator may confirm via telephone the decision of System Management.
9. System Management must not approve a day-ahead Opportunistic Maintenance request which will require any change in scheduled energy or ancillary services. This means a Non-EGC generator cannot have a day-ahead Opportunistic Maintenance request approved that would result in the generator being unable to comply with its Resource Plan.

15 APPROVAL OF ON-THE-DAY OPPORTUNISTIC MAINTENANCE ('ODOM') REQUESTS

1. The requirements for a Market Participant or Network Operator to request approval of an on-the-day Opportunistic Maintenance Outage are specified in the Market Rules **[MR 3.19.2(b)]**.

2. A Market Participant or Network Operator must make application for the approval of an on-the-day Opportunistic Maintenance outage request by telephone and via SMMITS, or as otherwise directed. System Management will advise its contact details from time to time.
3. The criteria that System Management must adhere to when assessing whether to grant approval of an on-the-day Opportunistic Maintenance Outage requests are specified in the Market Rules **[MR 3.19.6]**.
4. Before approving an on-the-day Opportunistic Maintenance request System Management may at its sole discretion require a Market Participant's or Network Operator's authorised personnel included in the relevant contact list to make a written declaration that the unit is available prior to the outage commencing in accordance with the Market Rules **[MR 3.19.3A(c)]**. System Management will reject any on-the-day Opportunistic Maintenance request where the relevant Market Participant or Network Operator does not comply with such a request.
5. System Management will advise a Market Participant or Network Operator of the decision to approve or reject a request for an on-the-day Opportunistic Maintenance outage by telephone or as otherwise directed.
6. Subsequently System Management shall log an approval and note a written notation reflecting the outcome.
7. System Management must not approve an on-the-day Opportunistic Maintenance request which will require any change in scheduled energy or ancillary services. This means a Non-EGC generator cannot have an on-the-day Opportunistic Maintenance request approved that would result in the generator being unable to comply with its Resource Plan.

16. COMPLIANCE WITH SYSTEM MANAGEMENT'S DECISION

The requirements for Market Participants and Network Operators to comply with System Management's decision to reject an outage are specified in the Market Rules **[MR 3.19.8]**.

17. OUTAGE RECALLS

1. When a situation arises where the power system security is at risk and the cancellation of outages could potentially alleviate the situation, System Management must consider all current Planned Outages and outages in progress and assess whether rejecting one or more Planned Outages or recalling equipment will assist the situation.
2. If in the view of System Management there is benefit in this action, it may contact the Market Participant or Network Operator and discuss the impact of rejecting the outage or recalling the equipment to service.
3. The Market Participant or Network Operator must cooperate with System Management and determine when the equipment can be returned to service and the best way of proceeding with such action. The Market Participant or

Network Operator must give this information to System Management as soon as practical.

4. Market Participants and Network Operators must comply with the direction of System Management.

18. CALCULATION OF PLANNED OUTAGE, FORCED OUTAGE AND EQUIPMENT TEST RATES

1. The requirement for System Management to provide for the calculation of Planned Outage, Forced Outage and Equipment Test rates within this Power System Operation Procedure is specified in the Market Rules **[MR 4.11.1(h)]**. The calculation of the Planned Outage, Forced Outage and Equipment Test rates are set out in Appendix 1.
2. In considering setting a quantity of Certified Reserve Capacity to a Facility for the Reserve Capacity Cycle, the IMO must take account of the Planned Outage, Forced Outage and Equipment Test rates in Appendix 1 **[MR 4.11.1(h)]**.

19. SUBMISSION OF FORCED OUTAGES AND CONSEQUENTIAL OUTAGES

1. The requirements for Forced or Consequential Outages are specified in the Market Rules **[MR 3.21]**.
2. Where equipment is unavailable or de-rated, the relevant Market Participant or Network Operator experiencing the unavailability or de-rating should communicate the nature of that unavailability or de-rating by telephone to System Management as soon as practicable, using contact details that are advised from time to time **[MR 3.21.7]**.
3. The relevant Market Participant or Network Operator should regularly inform System Management of the equipment's status and likely return to service time.
4. The Market Participant or Network Operator must provide a full and final description of the outage to System Management, via SMMITS or as otherwise directed, including whether the equipment has suffered a Forced Outage or a Consequential Outage, by midnight on the date specified in the Market Rules **[MR 3.21.7]**.

20. FORCED OUTAGE AND CONSEQUENTIAL OUTAGE INFORMATION FOR IMO

1. System Management must record the information provided by a Market Participant or Network Operator relating to each Forced Outage and Consequential Outage in accordance with the Market Rules **[MR 3.21]**.
2. System Management will communicate this information and any additional information relevant to the event to the IMO in accordance with the timelines specified in the Market Rules **[MR 7.13.1A and MR 7.3.4]**.

3. System Management will only transmit to the IMO Forced Outage and Consequential Outage information it has been advised by a Market Participant or Network Operator in accordance with the Market Rules.

APPENDIX 1 Calculation of Planning Outage rate, Forced Outage rate and Equipment Test rate

The Planned Outage Rate, Forced Outage rate and Equipment Test rate calculations are made in accordance with the Wholesale Electricity Market Rules (Market Rules).

The relevant Market Rule is clause 4.11.1(h):

“the IMO may decide not to assign Certified Reserve Capacity to a Facility if:

i. the Facility has operated for at least 36 months and has had a Forced Outage rate of greater than 15% or a combined Planned Outage rate, Forced Outage rate and Equipment Test rate of greater than 30% over the preceding 36 months; or

ii. the Facility has operated for less than 36 months, or is yet to commence operation, and the IMO has cause to believe that over a period of 36 months the Facility is likely to have a Forced Outage rate of greater than 15% or a combined Planned Outage rate, Forced Outage rate and Equipment Test rate of greater than 30%,

where the Planned Outage rate, the Forced Outage rate and Equipment Test rate for a Facility for a period will be calculated in accordance with the Power System Operation Procedure. (The IMO may consult with System Management in deciding whether or not to refuse to grant Certified Reserve Capacity under this paragraph); and”

1. Forced Outage Rate Calculation

Definition Basis

The Forced Outage Rate is based on the Equivalent Forced Outage Factor used by the North American Electricity Reliability Council (NERC). The definitions are given in the Document “*Generating Availability Data System Data Reporting Instructions*”

The “Equivalent Forced Outage Factor” definition is chosen as it accounts for partial Forced Outages as well as full Forced Outages.

| Outage Rate Calculation basis | Definitions |
|--|--|
| <p>Equivalent Forced Outage Factor:</p> $\frac{(\text{FOH} + \text{EFDH})}{\text{PH}} \times 100\%$ | <p>FOH (Forced Outage Hours) = Sum of all hours experienced during Forced Outages (U1, U2, U3) + Startup Failures (SF).</p> <p>EFDH (Equivalent Forced Each individual Forced Derated Hours) = Derating (D1, D2, D3) is transformed (D1, D2, D3) into equivalent full outage hour(s). This is calculated by multiplying the actual duration of the derating (hours) by the size of the reduction (MW) and dividing by the Net Maximum Capacity (NMC). These equivalent hour(s) are then summed:</p> $\frac{\text{Derating Hours} \times \text{Size of Reduction}}{\text{NMC}}$ <p>PH (Period Hours) = Number of hours in the period being reported that the unit was in the active state.</p> |

Definition used in the WEM

For the purpose of this PSOP the following Forced Outage rate calculation applies.

| Outage Rate Calculation | Definitions |
|---|---|
| <p>Forced Outage Rate:</p> $\frac{(\text{FOH} + \text{EFDH})}{\text{PH}} \times 100\%$ | <p>FOH (Forced Outage Hours) = sum of all Trading Intervals, Where: Outage MW = Capacity Credit (MW) and the Outage Reason is Forced and during the period as required by clause 4.11.1(h) of the Market Rules, multiplied by 0.5.</p> <p>EFDH(Equivalent Forced Derated Hours) = sum of all Trading Intervals, Where: Outage MW < Capacity Credit (MW) and the Outage Reason is Forced and during the period as required by clause 4.11.1(h) of the Market Rules, multiplied by 0.5 multiplied by Outage MW/Capacity Credit (MW).</p> <p>PH (Period hours) = as required by clause 4.11.1(h) of the Market rules.</p> |

2. Planned Outage Rate Calculation

Definition Basis

The Planned Outage Rate is based on the Equivalent Planned Outage Factor used by the North American Electricity Reliability Council (NERC). The definitions are given in the Document “*Generating Availability Data System Data Reporting Instructions*”

The “Equivalent Planned Outage Factor” definition is chosen as it accounts for partial outages as well as full outages.

| Outage Rate Calculation basis | Definitions |
|--|--|
| <p>Equivalent Planned Outage Factor:</p> $\frac{POH + EPDH}{PH} \times 100\%$ | <p>POH (Planned Outage Hours) = Sum of all hours experienced during Planned Outages (U1, U2, U3) + Startup Failures (SF).</p> <p>EPDH (Equivalent Planned Each individual Planned Derated Hours) = Derating (D1, D2, D3) is transformed (D1, D2, D3) into equivalent full outage hour(s). This is calculated by multiplying the actual duration of the derating (hours) by the size of the reduction (MW) and dividing by the Net Maximum Capacity (NMC). These equivalent hour(s) are then summed:</p> $\frac{\text{Derating Hours} \times \text{Size of Reduction}}{\text{NMC}}$ <p>PH (Period Hours) = Number of hours in the period being reported that the unit was in the active state.</p> |

Definition used in the WEM

For the purpose of the PSOP the following calculation applies:

| Outage Rate Calculation | Definitions |
|---|---|
| <p>Planned Outage Rate:</p> $\frac{(POH + EPDH)}{PH} \times 100\%$ | <p>POH (Planned Outage Hours) = sum of all trading intervals</p> <p>Where: Outage MW = Capacity Credit (mW) and the Outage Reason is Planned and during the period as required by clause 4.11.1(h) of the Market Rules, multiplied by 0.5.</p> <p>EPDH (Equivalent Planned Derated Hours) = sum of all trading intervals</p> <p>Where: Outage MW < Capacity Credit (mW) and the Outage Reason is Planned and during the period as required by clause 4.11.1(h) of the Market Rules, multiplied by 0.5 multiplied by Outage MW/Capacity Credit (in MW).</p> |

| | |
|--|---|
| | PH (Period hours) = as required by clause 4.11.1(h) of the Market Rules. |
|--|---|

3. Equipment Test Rate

Definition Basis

There is no equivalent NERC definition for the Equipment Test Rate. The definition chosen for the PSOP matches that used for a Planned Outage rate. It is noted that a partial Equipment Test is not contemplated and so the equivalent definition is not required.

Definition used in the WEM

For the purpose of the PSOP the following calculation applies:

| Outage Rate Calculation | Definitions |
|--|--|
| Equipment Test Outage Rate: (Equipment Test Hours) / Period hours x 100% | Equipment Test Hours = sum of all trading intervals multiplied by 0.5, Where the Equipment Test is recorded and a Forced Outage is not recorded during the period as required by clause 4.11.1(h) of the Market Rules. Period Hours = as required by clause 4.11.1(h) of the Market Rules. |