

705 SHORT TERM ADEQUACY ASSESSMENTS

1. Purpose

To define the policy and procedures for the System Controller (SC) when determining the short-term adequacy (STA) of available supply to meet the Alberta Interconnected Electric System (AIES) demand requirements and requesting for or directing available supply.

2. Background

On occasion there has been insufficient energy offers in the energy market merit order to meet the load requirements of the AIES. The SC follows the steps identified in [OPP 801](#) Supply Shortfall to manage this condition. [OPP 801](#) identifies a number of steps to be taken to reduce the possibility of shedding firm load.

In order to further reduce the possibility of having to shed firm load during a supply shortfall event and to comply with NERC's Capacity and Energy Emergencies Standard (EOP-002-0), ISO Rules have been added to ensure that all available capability (AC) is offered into the energy market. Participants with a generating unit 5 MW or greater will enter their AC for each asset on an hourly basis into the Energy Trading System (ETS) for the next trading day. Generating assets, except for Rosssdale, with start-up times greater than 1 hour that have not provided an indication of their intention to start, will be included in the long-lead-time energy list or Table 2. Table 2 includes assets that have long lead times greater than 1 hour that may not be able to declare all their generation as AC in the ETS. If the anticipated supply shortfall is significant enough, generating assets from the long-lead-time energy list and available generation from Table 2 will be requested to start by the SC. Energy acquired from directing Rosssdale generators is referred to as out-of-market energy.

Due to the long start-up times of some generating assets, it is necessary to forecast the requirement for this energy by performing a STA assessment. If the STA assessment indicates additional energy is required, then sufficient notice needs to be given to allow for the start-up times of the generating assets in the long-lead-time energy list, assets from Table 2 and the Rosssdale generators. STA assessments will look ahead for a period of 7 days.

Generating assets that have a start-up time greater than 1 hour and have not entered a start time in automated dispatch and messaging system (ADAMS) that is earlier than the period being assessed, except for Rosssdale generators, will be prioritized in the long-lead-time energy list or included in Table 2. The SC will request generating assets to start from the long-lead-time energy list and available generation in Table 2 according to the requirements of the supply adequacy assessment. If it is anticipated that the AIES will be in a supply shortfall after requesting these generating assets to start and including ILRAS load as a factor for determining import ATC on the Alberta-BC interconnection, then the SC will direct Rosssdale generators to start. The SC will direct energy from Rosssdale generators in accordance with [OPP 801](#).

Routine System Operations
OPP 705 Short Term Adequacy Assessments

3. Policy

- To the extent possible, impacts on the market, of SC out-of-market actions, will be minimized.
- STA assessments will be performed to determine if there will be a shortfall in supply to meet AIES demand that may require:
 - Issuing a message to participants that a supply shortfall is anticipated and wait for voluntary commitment of generation.
 - Requesting generating assets in the long-lead-time energy list and available generation in Table 2 to start.
 - Directing Rossdale generators to start.
- If the amount of out-of-market energy required changes due to such things as a change in operating conditions or an inaccuracy in the load forecast and Rossdale generators that were directed to start are no longer required, then directives issued by the SC to start Rossdale generators will be cancelled.
- Generating assets in the long-lead-time energy list and Table 2 will not be requested to start if the required start-up time of the generating asset is greater than the time remaining to when the generating asset is forecast to be required during a forecasted supply shortfall event.
- Rossdale generators will only be directed to start if their start-up time is less than the time remaining to when the energy will be required during a forecasted supply shortfall event.
- If a generating asset is directed on by the SC, the generator will remain at its minimum stable load level until further directed by the SC.
- The following energy will be taken into account when making a short-term adequacy assessment of available supply to meet AIES demand that could lead to requesting generating assets from the long-lead-time energy list, Table 2 or directing Rossdale generators to start:
 - AC from all generating assets in Alberta > 5 MW with a start-up time \leq 1 hour or with a start time at or before the period being assessed.
 - Estimated output from wind generators (Table 1).
 - Estimated amount of price responsive load that will reduce demand (Table 1).
 - Estimated amount of Demand Opportunity Service (DOS) load that will be curtailed (Table 1).
 - Estimated amount of on-site generation that supplies behind the fence load and submits AC as a net to grid value (Table 3).
 - Import to forecast available transfer capability (ATC) level on the Alberta-BC Interconnection. When considering to start Rossdale generators, ILRAS load will be used as a factor for determining import ATC on the Alberta-BC interconnection.
 - Import to forecast ATC level on the Alberta-Sask Interconnection.
 - Reducing exports on the Alberta-BC and Alberta-Sask Interconnections to 0 MW.

Routine System Operations

OPP 705 Short Term Adequacy Assessments

- All supplemental and excess spinning reserves delivered.
- Generation or import ATC that can be obtained by cancelling transmission maintenance.
- Unavailable energy from generation due to transmission constraints will be subtracted.
- Generating assets in the long-lead-time energy list are sorted according to the following priority order:
 - Shortest start-up time
 - Largest incremental AC
 - Minimum run time
 - Loss factor
 - Alphanumeric order based on asset id
- Requests for energy from the long-lead-time energy list, available energy from assets in Table 2 and directives for energy from Rossdale generators, will be made commensurate with the longest lead time of these generating assets, that are available to deliver energy by the time the energy is required, plus 1 hour if conditions permit.
- The STA assessment will use the peak forecast load (10 minute average) in each hour.
- When a generating asset from the long-lead-time list decides to start or agrees to a request by the SC to start, they will submit their start time through ADAMS and will be dispatched according to their offer(s) in the energy market merit order.
- When a generating asset in Table 2 decides to start or agrees to a request by the SC to start, they will restate their AC and will be dispatched according to their offer(s) in the energy market merit order.
- When a Rossdale generating asset, that was directed on to provide out-of-market energy, synchronizes to the system, it will ramp up to its minimum stable load level and remain there until a directive is made by the SC to provide energy at a higher level.

4. Responsibilities

4.1 ISO

- The ISO will update the ISO Rules and the Operating Policy and Procedure (OPP) as required.

System Controller

- The SC will perform STA assessments to determine, if generating assets in the long-lead-time energy list or Table 2 need to be requested to start or Rossdale generator assets need to be directed to start.
- The SC will request generating assets in the long-lead-time-energy list to start according to the prioritization order and if generating assets identified in Table 2 are available to start he will include them in the prioritization order with the assets in the long-lead-time-energy list.

Routine System Operations

OPP 705 Short Term Adequacy Assessments

- If a supply shortfall condition is forecast, then the SC will request the required amount of generating assets in the long-lead-time energy list and in Table 2 to start and then if required, direct Rossdale generators to start.
- If operating conditions unexpectedly change or the load forecast is inaccurate and Rossdale generators that were directed on are affected, then the SC will cancel or adjust directives to Rossdale generators as required.
- The SC will not request a generating asset from the long-lead-time energy list or from Table 2 to start or direct a Rossdale generator to start, if the required start-up time of the generating asset is greater than the time remaining to when the generating asset is forecast to be required during a forecast supply shortfall event.
- The SC will direct energy from Rossdale generators in accordance with [OPP 801](#).

4.2 Generating Assets

- If a participant decides to start a generating asset or agrees to a request from the SC to start a generating asset from the long-lead-time energy list, then the participant will submit a start time for their generating asset in ADAMS equal to or greater than the required lead time to start the generator.
- If a participant with an aggregated asset decides to start a generating asset(s) or agrees to a request from the SC to start a generating asset and the available capability of their offer in the ETS does not include the amount of generation being started, then the participant will restate their available capability for the applicable hours and submit the restatement equal to or greater than the required lead time to start the generator(s).
- If a Rossdale generator is directed on by the SC, in accordance with OPP 518, to provide out-of-market energy, then a start time will not be submitted in ADAMS, but the Rossdale plant operator will notify the SC prior to synchronizing the generator to the AIES. When the generator comes on-line it will ramp to its minimum stable load level and remain there until further directed by the SC.

5. System Controller Procedures

5.1 STA Assessment

When the STA program issues an alarm, the SC will perform the following STA assessment to determine the amount of energy required from the long-lead-time energy list, assets in Table 2 and Rossdale generators:

1. If there is a change to the import ATC on either the BC or Saskatchewan interconnection then repost ATC.
2. Ensure that a transmission limiter has been entered in the dispatch tool (DT) for any generation that has been limited due to a transmission constraint.
3. From the Dispatch Tool (DT) open the on demand supply adequacy report and observe the supply adequacy value provided for each hour that is calculated based on the following:
 - The AC from all available generating assets greater than 5 MW in Alberta with a start-up time ≤ 1 hour or with a submitted start time at or before the period being assessed, minus;

Routine System Operations

OPP 705 Short Term Adequacy Assessments

- 3.5% of forecast load to account for ancillary service requirements and directing supplemental and excess spinning reserves, plus;
 - Estimated amount of price responsive load ([Table 1](#)), plus;
 - Estimated amount of DOS load ([Table 1](#)), plus;
 - Estimated amount of wind generation ([Table 1](#)), plus;
 - Estimated amount of behind the fence load supplied by on-site generation that provides AC as a net to grid value ([Table 3](#)), plus;
 - Import ATC on the BC and Saskatchewan interconnections, minus;
 - The peak forecast load (10 minute average) from the day ahead forecast AIES demand.
4. If all of the hourly supply adequacy values calculated in the supply adequacy report are positive then no additional generating assets are required.
 5. If any of the hourly supply adequacy values from the supply adequacy report are negative then notify the AESO personnel as per Table 1 in [OPP 1303](#) that a supply shortfall is forecast.
 6. Issue the following message from ADAMS corresponding to the first hour that has a negative supply adequacy value: “A supply shortfall is forecast starting at hh:mm on yyyy-mm-dd. Any generator that is planning to start, notify the SC as soon as possible. Refer to supply adequacy report on the AESO website.”
 7. If any of the hourly supply adequacy values from the supply adequacy report are negative and transmission maintenance can be canceled as per Section 5.1 in OPP 801, then add the amount of increased generation and/or increase in import ATC to the supply adequacy value.
 8. If it is forecast that all energy from the long-lead-time energy list, the assets identified in step 9 below, incremental import ATC available on the AB-BC interconnection by arming available ILRAS and Rosedale will be required, then refer to [Section 5.1 in OPP 801](#) to ensure the planning steps for managing a supply shortfall are completed. To determine the incremental Alberta-BC import ATC using ILRAS load as a factor for the period being assessed perform the following:
 - multiply the forecast load by 0.023 to get an estimated ILRAS load value.
 - Refer to Table 1 in OPP 312 to determine the import ATC level corresponding to the combined ILRAS and LSS value and forecast system load.
 - Refer to OPP 304 and take the lesser of the import ATC transfer limit and the import ATC limit determined with the use of ILRAS and LSS and subtract the forecast import ATC limit for the period being assessed.
 9. Go to Table 2 and look up the EMS display for each plant as indicated in Table 2 and if any of the generators listed in Table 2 are off-line then phone the plant and ask if they have any additional energy available above their offered available capability in the energy market merit order. Advise them that this is not a request to start available generation. If additional generation is available, then ask:
 - What amount of additional energy would be available;
 - What lead time is required to start the generator(s); and

Routine System Operations

OPP 705 Short Term Adequacy Assessments

- What is the minimum run time of the generator(s)?

If there is sufficient time to start the generator(s) to assist in the anticipated supply shortfall, then include this amount when making the assessment in step 8.

10. Wait a reasonable amount of time as conditions permit for any voluntary response to the ADAMS message issued in step 6. If a participant notifies the SC that it is planning to start a generating asset, then request the participant to enter the generating asset start time in ADAMS as soon as possible with the exception of aggregated assets identified in Table 2. If a participant with an asset identified in Table 2 is planning to start a generator with a start-time greater than 1 hour, then the participant will restate their AC as applicable for the appropriate hours to reflect their new offer amount. When a generating asset has submitted a start time or restated their AC, then their AC will be used in the supply adequacy calculation and a new supply adequacy value will appear in the supply adequacy report.
11. If there is sufficient response from participants and the supply adequacy values become positive, or at any time the supply shortfall is no longer forecast, then:
 - Issue the following message in ADAMS to all participants and enter it into the SC Shift Log and select the post to web option: “A supply shortfall is no longer forecast.”
 - Go to step 21 below.
12. If there is insufficient response from participants and the supply shortfall is still anticipated, then in the supply adequacy report double click on the line of the first hour with a negative supply adequacy value to open the long-lead-time energy list of generating assets.
13. Select generating assets to request to start from the long-lead-time energy list that is prioritized according to the order in which they are to be requested to start (from bottom to top). If additional energy is also available from the aggregated assets identified in Table 2, then request these assets and the assets in the long lead time energy list to start based on the following prioritization order indicated below:
 - Shortest start-up time
 - Largest incremental AC
 - Minimum run time
 - Loss factor
 - Alphanumeric order based on asset id
14. Perform the following when selecting and requesting a generating asset to start:
 - Make requests to start generating assets equal to 1 hour plus the longest start-up time of the available generating assets to start (including Rosssdale generators) before the forecast supply shortfall. If conditions do not allow time for the additional 1 hour notice, then immediately make requests to start generating assets that can deliver energy during the forecast supply shortfall.
 - Only request to start a sufficient amount of generating assets to turn the supply adequacy value to a positive number.
 - Request the generating asset(s) to start at the time they are required, in order of priority according to step 13 above.

Routine System Operations

OPP 705 Short Term Adequacy Assessments

- If the participant chooses to start a generating asset, request the participant to either enter the start time in ADAMS for generators in the long-lead-time-energy list or restate their available capability for generators identified in Table 2 as soon as possible.
 - If the participant rejects the request to start their generating asset then select the next generating asset according to the priority order in step 13 above.
15. Make a note in the Shift Log of the generating assets that were requested to start and their reply and do not post it to the web.
 16. If insufficient generating assets are committed to start from the long-lead-time energy list and Table 2, then add the incremental import ATC available on the Alberta-BC interconnection by including ILRAS load as a factor, as determined in step 7, to the supply adequacy number.
 17. If the supply adequacy number is negative, then plan to direct on the number of Rossdale generators required commensurate with their start-up time plus 1 hour, to turn the supply adequacy value to a positive number.
 18. Immediately before directing on a Rossdale generating asset(s) (refer to step 17) issue the following message in ADAMS to all participants and enter it into the SC Shift Log and select the post to WEB option: “A directive will be issued to start Rossdale generation for a forecasted supply shortfall starting at hh:mm on yyyy-mm-dd.”
 19. At the determined time, as identified in step 17 above, issue directives for the selected Rossdale generating asset(s) to start. (Note: When the Rossdale generating asset(s) synchronize to the AIES they will ramp to minimum stable load and remain there until further directed by the SC in accordance with OPP 801 Supply Shortfall.)
 20. Record in the Shift Log the Rossdale generating assets that were directed to start, but do not post it to the web.
 21. In the supply adequacy report double click on the line of the next hour with a negative supply adequacy value and repeat steps 12 to 21.
 22. Dispatch the generating assets that are started according to their in-merit offer(s) in the energy market merit order.
 23. Direct out-of-market energy from the Rossdale generators in accordance with OPP 801.
 24. Make a note in the Shift Log identifying the time, assets and amount of out-of-market energy directed from Rossdale generators, but do not post it to the web.
 25. If there is an unanticipated reduction in supply then repeat the short term adequacy assessment.
 26. If there is an unanticipated increase in supply, such as a large thermal generator coming back on-line earlier than expected, and if generating asset(s) from the long-lead-time energy list were requested to start or Rossdale generator(s) were directed to start and are no longer required, then:
 - Cancel directives issued to start Rossdale generators.
 - If directives were issued to start Rossdale generators, then issue the following message in ADAMS to all participants and enter it into the SC Shift Log and select the post to WEB option: “The directive for Rossdale generating assets has been cancelled and the supply shortfall event is no longer forecast.”

Routine System Operations

OPP 705 Short Term Adequacy Assessments

- Notify the AESO personnel in accordance with Table 1 in [OPP 1303](#) that the directive to start Rossdale generators was cancelled.
 - If generating assets from the long-lead-time energy list were requested to start and directives were not issued to start Rossdale generators, then issue the following message in ADAMS to all participants and enter it into the SC Shift Log and select the post to WEB option: “A supply shortfall is no longer forecast.”
27. If the STA assessment for the next day requires Rossdale generators to be on-line again, then direct the asset to its minimum stable load level according to the procedure step in [Section 5.3 of OPP 801](#).
28. Cancel directives for out-of-market energy from Rossdale generators when this energy is no longer required in accordance with Section 5.3 of OPP 801.

6. Revisions and Approval

| Issued | Description |
|------------|--|
| | Supersedes 2007-01-17 |
| 2007-01-17 | Approved for interim implementation; supercedes 2005-03-30 |
| 2005-03-30 | Supersedes 2004-12-22 |
| 2004-12-22 | New Issue, approved for interim implementation 2004-12-21 |

Table 1

Values to use in short term adequacy calculation

| Item | Value (MW)* |
|-----------------------|-------------------|
| Price Responsive Load | 200 ¹ |
| DOS Load | 20 ^{1,2} |
| Wind Generation | 80 ¹ |

1. These values are based on experience or best judgment and will be changed if values closer to actual are identified.
2. Most DOS loads are price responsive therefore; this number is less than the actual amount that is normally on the system.

Table 2

Aggregated assets that have long lead times greater than 1 hour that may not be able to declare all their generation as AC in the energy trading system.

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Table 3

Behind-the-fence load supplied by on-site generation that provide AC as a net-to-grid value.

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Routine System Operations
OPP 705 Short Term Adequacy Assessments

[View confidential tables](#)