



OPERATING RESERVES

Technical Requirements

**Technical Requirements for Provision of
Supplemental Reserves by Generation Units**

Version 3.0

C h a n g e H i s t o r y

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TABLE OF CONTENTS

CHANGE HISTORY	2
TABLE OF CONTENTS	3
1.0 INTRODUCTION	4
2.0 TECHNICAL REQUIREMENTS	4
2.1 Supplemental Reserve Resource and SURP.....	4
2.2 Telemetry and communications	5
3.0 OPERATIONAL REQUIREMENTS	5
4.0 DUE DILIGENCE REVIEW.....	6
5.0 TEST REQUIREMENTS.....	7
5.1 Test for Supplemental Reserve Resource synchronized to the AIES.....	7
5.2 Test for a Supplemental Reserve Resource not synchronized to the AIES	8

1.0 INTRODUCTION

A party offering any Supplemental Reserve Resource(s) to the Alberta Electric System Operator (AESO) must satisfy the technical requirements outlined in the Sections below. A party offering a Supplemental Reserve Resource, whether from a single Facility or from an aggregation of Facilities, is hereinafter referred to as a SURP. If a SURP is located outside the Alberta Control Area it is required to comply with the AESO's *Technical Requirements for the Provision of Supplemental Reserves from Resources that are External to the Alberta Control Area*.

For the definition of the meanings of capitalized words in this document please refer to the Glossary of Terms for Technical Requirements for Ancillary Services.

2.0 TECHNICAL REQUIREMENTS

2.1 SUPPLEMENTAL RESERVE RESOURCE AND SURP

1. The Supplemental Reserve Resource, a Facility or aggregation of Facilities must provide a minimum of five (5) MW of Supplemental Reserve.
2. The SURP must submit a completed form to the AESO (see *Technical Characteristics and Contact Information Form* in the Due Diligence Review section of this document).
3. The maximum volume of Supplemental Reserves offered must be within the maximum Real Power capacity and the minimum Real Power capacity of the Facility or aggregation of Facilities offered by the SURP..
4. Upon receipt of an AS Dispatch to Activate a volume of Supplemental Reserves, the SURP shall, within fifteen (15) minutes, Position the Real Power of the Supplemental Reserve Resource(s) to supply the volume of Supplemental Reserves.
5. If the offer for the Supplemental Reserve is Flexible, the SURP shall accept an AS Dispatch for a portion of the Supplemental Reserve volume offered.
6. Upon receipt of an AS Directive to Deploy the volume of Supplemental Reserves, the SURP shall, within ten (10) minutes, deliver the Real Power of the Supplemental Reserve Resource(s). The volume of Real Power change within ten (10) minutes shall be:
 - a. at minimum, 100% of the AS Directive volume; and
 - b. at maximum, 110% of the AS Directive volume.
7. The Supplemental Reserve Resource(s) shall be capable of maintaining the Supplemental Reserve Resource(s) Deployed for up to sixty (60) minutes following the AS Directive.
8. Following the first ten (10) minutes of an AS Directive, the Supplemental Reserve Resource must be capable of continuously maintaining the Real Power output for the duration of the AS Directive to a volume the greater of either:
 - a) 95% of the AS Directive volume; or

- b) within 1 MW of the AS Directive volume.
9. During the period of time from ten (10) minutes to sixty (60) minutes following an AS Directive to Deploy the Supplemental Reserves, the SURP must be willing to accept a cancellation of the AS Directive. The System Controller may issue a new AS Dispatch to re-Activate and re-Position the Real Power of the Supplemental Reserve Resource(s).
 10. If after sixty (60) minutes, the System Controller has not cancelled the AS Directive, then the SURP may return the Supplemental Reserve Resource(s) to a Real Power level that it had prior to the AS Directive.
 11. Supplemental Reserve Resources that participate in Remedial Action Schemes (RAS) may be ineligible to provide Supplemental Reserves while the RAS is in effect. The AESO will advise the SURP when any Supplemental Reserve Resource(s) are ineligible to provide Supplemental Reserves because of a RAS.

2.2 TELEMETRY AND COMMUNICATIONS

1. The Supplemental Reserve Resource, Facility or the SURP must have telemetry of the quantities listed below to the Energy Management System (EMS) operated by the System Controller. The telemetry provided must have the update rate indicated for each quantity:
 - a) Gross Real-Power (MW) (60 second refresh rate or faster , or report by exception¹) from a single Supplemental Reserve Resource, Facility or from the aggregated Supplemental Reserve Resources.
2. The accuracy of the analog telemetry must be at least +/- 2% of the full scale value.
3. The resolution of the analog telemetry must be 0.5 % or better of the full scale value.
4. The availability of the telemetry system must be 99.8% or better.
5. The SURP shall maintain a “control centre” for the Supplemental Reserve Resource(s) being offered that is staffed 24 hours a day, 7 days a week.
6. Both primary and backup voice communications between the control centre of the System Controller and the control centre of the SURP must be provided by the SURP.
7. The SURP shall communicate with System Controller using voice or electronic means, as set out in the AESO’s Operating Policies and Procedures (OPP’s).

3.0 OPERATIONAL REQUIREMENTS

The SURP must follow all applicable ISO OPP’s published by the AESO with respect to the operation of Supplemental Reserve.

¹ Report by exception may be used instead of 60 second interval poll when appropriate analog dead band exists of no greater than 0.5% of the full-scale value.

4.0 DUE DILIGENCE REVIEW

The following form shall be completed by the SURP and provided to the AESO.

Technical Characteristics and Contact Information

Technical Characteristic	To be Filled In	Comment/Example
Supplemental Reserve Resource(s) Identification		Keephills Unit 1, or Brazeau plant
Asset ID from AESO	____ _	Maximum of a 4-digit code provided to the SURP from the AESO. (e.g. BRA)
Maximum Reserve Capability	_____ MW	The maximum MW value from which the Supplemental Reserve Resource(s) can be ramped up to and sustained for 60 minutes during an AS Directive.
Minimum Real Power Reserve Capacity	_____ MW	The minimum MW value from which the Supplemental Reserve Resource(s) can be in position to provide the Supplemental Reserves.
Maximum Supplemental Reserve Capability	_____ MW	The maximum MW volume of Supplemental Reserves that could be provided from Resource, Facility or Facilities.
Remedial Action Schemes		A short description of any Remedial Action Schemes effecting the Supplemental Reserve Resource(s) or Facility.
	Contact Person	Name
Primary Contact for AS Dispatches	_____ name _____ email	_____ Tel. _____ Fax
Backup Contact for AS Dispatches	_____ name _____ email	_____ Tel. _____ Fax
Primary Contact for AS Directive (fill out only if different than that for AS Dispatches)	_____ Tel. _____ Fax	_____ Tel. _____ Fax
Backup Contact for AS Directive (fill out only if different than that for AS Dispatches)	_____ Tel. _____ Fax	_____ Tel. _____ Fax

5.0 TEST REQUIREMENTS

In order to conduct a test as described in the contract for the provision of the Ancillary Services Supply, the Supplemental Reserve Resource(s) shall be made available to the System Controller for Supplemental Reserve according to a pre-arranged schedule with the System Controller for at least an 8-hour period. The System Controller will issue an AS Dispatch to the SURP to Activate the Supplemental Reserve Resource(s). The Supplemental Reserve Resource(s) shall within fifteen (15) minutes be Activated and ready to deliver the AS Dispatch volume of Supplemental Reserves. During the 8-hour period, the System Controller shall issue a random AS Directive for the Supplemental Reserve Resource(s) to deliver the Real Power corresponding to the declared volume of Supplemental Reserve.

The response of the Supplemental Reserve Resource(s) shall be monitored and the following characteristics shall be monitored and recorded by the SURP and System Controller:

- The initial Real Power of the Supplemental Reserve Resource(s);
- That Supplemental Reserve Resource(s) has Positioned itself to provide Supplemental Reserve within fifteen (15) minutes of the AS Dispatch;
- Delay to start Real Power response from the Supplemental Reserve Resource(s) from the time of the AS Directive;
- That the maximum Real Power from the Supplemental Reserve Resource(s) is delivered within ten (10) minutes of the AS Directive; and
- The maximum and minimum Real Power from the Supplemental Reserve Resource(s) during the ten (10) to sixty (60) minute time period following the AS Directive.

5.1 TEST FOR SUPPLEMENTAL RESERVE RESOURCE(S) SYNCHRONIZED TO THE AIES

A possible response for a Supplemental Reserve Resource(s) that is synchronized to the AIES prior to being Activated is shown in Figure 1. The meaning of the labelled points is as follows:

A - represents the Real Power of the Supplemental Reserve Resource(s) prior to the beginning of the test.

B – represents the SURP being dispatched by the System Controller to Activate the Supplemental Reserve volume. Within fifteen (15) minutes the Supplemental Reserve Resource(s) will be at a Real Power level to provide the Supplemental Reserve volume requested by the System Controller.

B to C – At this point there may be up to an 8-hour delay before the System Controller issues an AS Directive.

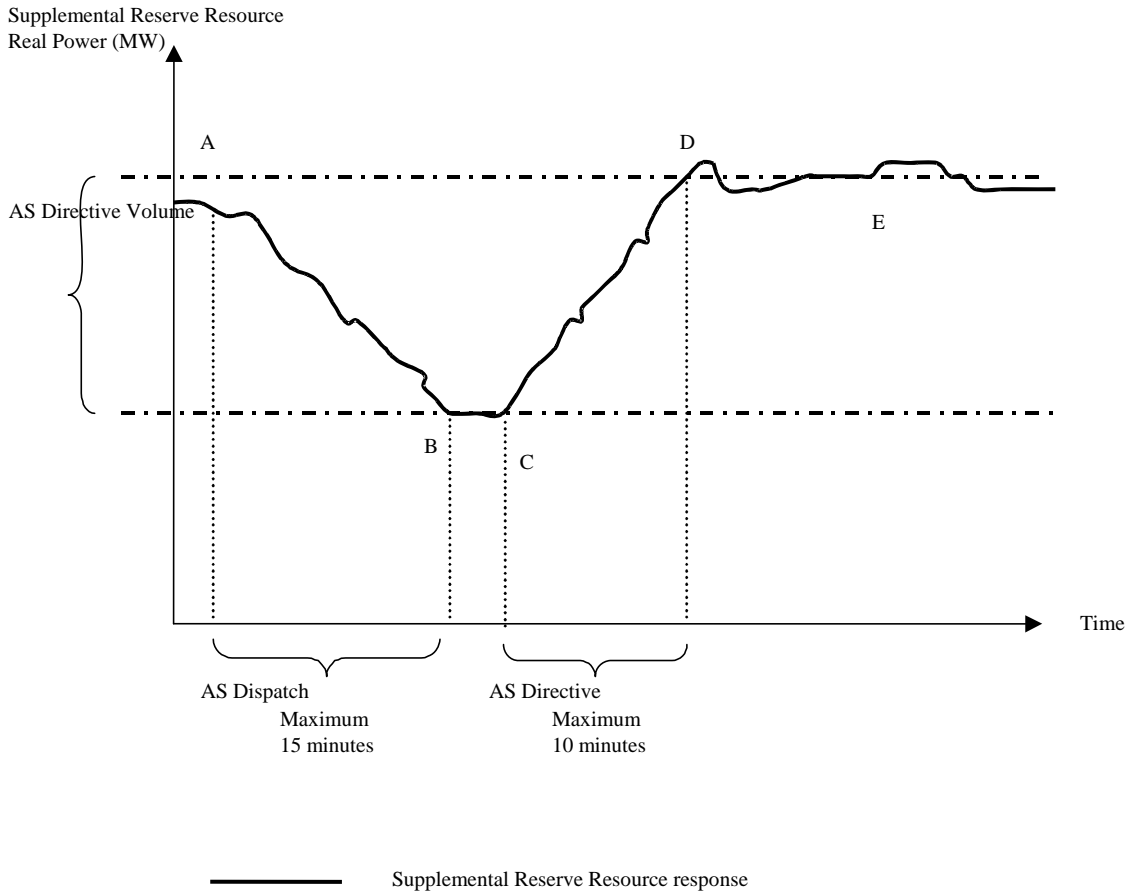
C to D – The System Controller will issue an AS Directive to Deploy the volume of Supplemental Reserve corresponding to the volume of the AS Directive.. Within ten (10)

minutes of the AS Directive, the Real Power increase must meet or exceed 100% of Supplemental Reserve volume issued in the AS Directive.

D-E – The Real Power of the Supplemental Reserve Resource(s) shall remain at the greater of;

- a. at or above 95% of the Supplemental Reserve volume issued in the AS Directive.
- b. within 1 MW of the Supplemental Reserve volume issued in the AS Directive.

Figure 1 - Test curve for a Supplemental Reserve Resource(s) synchronized to the AIES



5.2 TEST FOR A SUPPLEMENTAL RESERVE RESOURCE(S) NOT SYNCHRONIZED TO THE AIES

A possible Supplemental Reserve Resource(s) response is shown in the curve of Figure 2. The labelled points have the following meaning:

A - represents the off-line state of the Supplemental Reserve Resource(s) prior to the beginning of the test;

B – represents the point at which the System Controller issues an AS Directive requesting Deployment of the offered volume of Supplemental Reserve;

B to C – represents a delay in synchronizing to the AIES;

C to D – represents the Supplemental Reserve Resource(s) ramping to deliver the volume of Supplemental Reserve directed. Within ten (10) minutes of the System Controller’s AS Directive the Real Power of the Supplemental Reserve Resource(s) must meet or exceed 100% of the Supplemental Reserve volume of the AS Directive.

D to E – The Real Power of the Supplemental Reserve Resource(s) shall remain at the greater of;

- a. at or above 95% of the Supplemental Reserve volume issued in the AS Directive.
- b. within 1 MW of the Supplemental Reserve volume issued in the AS Directive.

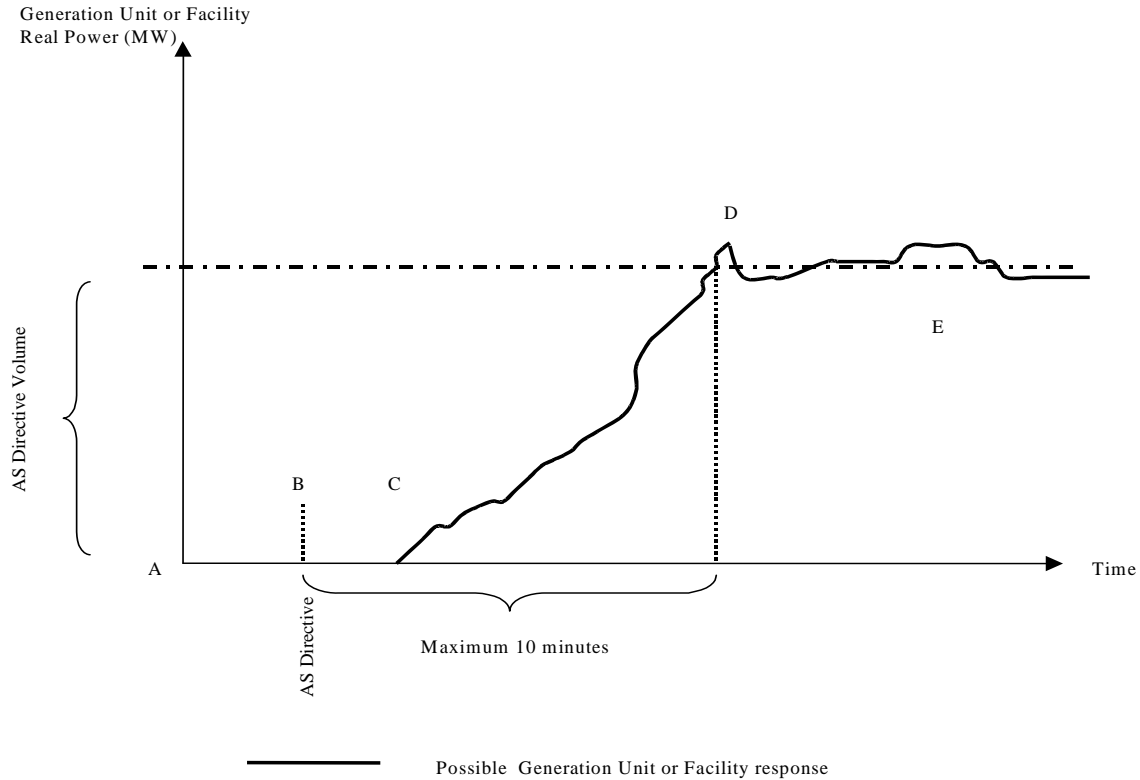


Figure 2 - Test curve for a Resource(s) not synchronized to the AIES