Preliminary Assessment Report
P[0000] [Project Name]

[Market Participant Name]

Date: Click here to enter a date.

Version: Click here to enter version number.

Classification: Choose an item.

Role	Name	Date	Signature
Prepared	[CAS Engineer, P. Eng.]		
Reviewed	[CAS Engineer, P. Eng.]		
Approved	[CAS Manager, P. Eng.]		

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1 Introduction

[Market Participant Legal Name (Market Participant Short Name)] has submitted a System Access Service Request (SASR) to the Alberta Electric System Operator for [Demand Transmission Service and/or Supply Transmission Service] of XXX MW at the AESO planning area of [AESO Planning Area Name (Area No.)], part of [specific cluster]. (the Project). The Maximum Authorized Real Power (MARP) and Maximum Capability (MC) of the Project are XXX MW and XXX MW respectively.

The requested In-Service Date for the Project is [Month DD, YYYY as per the SASR request].

This report presents the results of the preliminary connection studies that were completed by Alberta Electric System Operator (AESO) to assess the impact of the Project (as defined in the AESO's Study Scope) on the performance of the Alberta interconnected electric system (AIES). The preliminary studies were performed in accordance with the AESO's Study Scope titled "[Insert title]" dated [Insert date], Version [#].

The power system network analysis tool that was used for the studies in this connection assessment was [e.g., PSS/E version 34].

2 Connection Alternatives

1.1 Connection Alternatives Studied

List the alternatives that are selected for study as described in the AESO's Study Scope. If any additional alternatives were added during the studies, please include the additional alternatives and explain why the alternatives were proposed. Describe each connection alternative separately.

The following alternatives were examined in this report.

Alternative 1: [brief description of connection method]

Alternative 2: [brief description of connection method].

3 Study Results

This section provides a summary of the results of the preliminary power flow studies. The study results are provided in the [Attachment A].

2.1 Individual Project Assessment

2.1.1 Alternative [3]

Repeat this level of heading for as many alternatives as were studied.

Category A Conditions

Adapt the following text to explain your findings.

No Reliability Criteria violations were observed under the Category A conditions (i.e., all elements in service) for any of the pre-Project and post-Project scenarios.

OR

[Thermal and/or voltage] criteria violations on [##L, ##L, and ##L] were observed under the Category A conditions for the [2028 SP or SL or WP High Solar or High Wind] [Pre-Project and/or Post-Project] study scenarios. The connection of the Project [has no material impact on, or materially increases/decreases, or maginally increases/decreases] those observed criteria violations.

The study results under the Category A conditions are provided in [Table A-#] of [Attachment A].

To mitigate the observed thermal criteria violations, [Generation A, Project A, Generation in area 1] were reduced by [XXX MW] from the dispatches provided in the AESO's Study Scope. The generation dispatches before and after the curtailment are provided in [Table C-#] of [Attachment C].

Remove the word "Selected" if all Category B contingencies in the Cluster are studied.

[Selected] Category B Conditions

Adapt the following text to explain your findings.

No Reliability Criteria violations were observed under [the selected] Category B conditions for any of the pre-Project and post-Project scenarios.

OR

The pre-Project and post-Project power flow studies identified [thermal and/or voltage] violations on [##L, ##L, and ##L] under [the selected] Category B conditions for the [2028 SP or SL or WP High Solar or High Wind] [Pre-Project and/or Post-Project] study scenarios.

If numerous violations are identified, please modify and use the following example text.

The pre-Project and post-Project power flow studies identified a number of [thermal and/or voltage] violations under [the selected] Category B conditions. The most critical ones are [thermal and/or voltage] violations on [##L, ##L, and ##L] for the [2028 SP or SL or WP High Solar or High Wind] [Pre-Project and/or Post-Project] study scenarios. The connection of the Project [has no material impact on, or materially increases/decreases, or maginally increases/decreases] those observed criteria violations.

The study results under the Category B conditions are provided in [Table A-#] and [Table A-#] of [Attachment A].

2.2 Cluster Assessment

As required in the AESO's Study Scope, the Project was assessed in a cluster with [P### Project Name and P### Project Name].

Repeat the following paragraph for as many projects included in the Cluster Assessment.

The following connection alternatives were considered for [P### Project Name]:

Alternative 1: [brief description of connection method]

Alternative 2: [brief description of connection method].

Repeat the following section for as many projects/alternative' combinations included in the Cluster Assessment.

2.2.1 Alternative [3] with P### - Alternative 1 and P### - Alternative 2

Category A Conditions

Repeat and adapt the text under the section of Individual Project Assessment to explain your findings.

[Selected] Category B Conditions

Repeat and adapt the text under the section of Individual Project Assessment to explain your findings.

4 Mitigation Measures

3.1 Individual Project Assessment

3.1.1 Alternative [3]

Repeat this level of heading for as many alternatives as were studied.

Please describe how to mitigate the identified Reliability Criteria violations in these post-Project studies.

If there are Category A violations,

[Pre-contingency generation curtailment including generators A, B and the Project under the Category A conditions, transmisison upgrade, etc.] is required to mitigate the observed criteria violation on [##L, ##L, and ##L] under Category A conditions.

The generation effective factors of the Project on the [##L, ##L, and ##L] under the Category A conditions are [10%, 15%, and 20%] respectively. The effective factors of the other local generators are provided in Attachment B.

If there are Category B violations,

[Real time operation practice, Planned/new/modified RAS, transmisison upgrade, etc.] is required to mitigate the observed criteria violation on [##L, ##L, and ##L] under Category B conditions.

If applicable,

The total amount of generation tied to [planned RAS #] exceeds the Most Severe Single Contingency (MSSC) limit of 466 MW. Therefore, Pre-contingency generation curtailment under the Category A condition may be required using real-time operational practices to prevent generation curtailment by RAS action above the MSSC level.

The full list of real-time operational practices and the RAS required to mitigate system performance issues will be identified at the Detailed Cluster Study stage.

3.2 Cluster Assessment

Repeat the following section for as many projects/alternative' combinations included in the Cluster Assessment.

3.2.1 Alternative [3] with P### - Alternative 1 and P### - Alternative 2

Repeat and adapt the text under the section of Individual Project Assessment to explain your findings.

5 Project Interdependencies

Discuss if there are any interdependencies between this project and other system projects and customer connection projects. Indicate the impact of such interdependencies between the projects. Below are some examples of the write up:

Example for no project independency

[The Project is not dependent on the future developments of the AESO system projects for the region or the connection of other projects.]

Example for system project dependency

[Transmission voltage criteria violations identified both pre- and post-Projects indicate the need for the Irish Creek 706S capacitor addition, as identified in the 2015LTP, prior to the 2017WP.]

Another example

[The Project is dependent on line 7L44 relay tele-communication upgrade to mitigate instability of Lowe Lake (NPP1) generator on a fault on line 7L44. The existing relay upgrade at Flyingshot 749S and Big Mountain 847S substation is scheduled for completion in the first quarter of 2016 (ATCO capital maintenance project). This upgrade will incorporate tele-communication functionality, i.e. communications assisted tripping, and will allow for reduced fault clearing times of 8 cycles for a remote fault on line 7L44.

Upon the completion of this capital maintenance project, the NPP1 request to increase its STS contract from 93 MW to 105 MW can be realized.]

Example for cluster project dependency

[If both the Project and P### Project Name proceed, the thermal ratings of 123L (between A substation and B substation) would need to be upgraded to no less than 120 MVA normal rating.]

[If both the Project and P### Project Name proceed, the AESO may select Alternative 3, in place of Alternative 1, as the preferred connection alternative for the Project.]

6 Connection Alternatives Selection

A summary of the connection alternatives considered is provided in the table below.

Table 8-1: Connection Alternatives Considered

Criteria	Alternative 1	Alternative 2	Alternative X
Alternative Name	[e.g. 138 kV T-tap connection to 749L]		
Scope	[e.g., kilometers of Tx/Dx lines, # of breakers, # of transformers]		
Studied	[yes/no]		
Selected	[yes/no]		

If more than one connection alternative is selected,

[Alternative X would be selected if the Project proceeds without P###, and Alternative Y would be selected if if both the Project and P### proceed].[If applicable, provide a summary of the rationales for connection alternativs selection].

Therefore, The AESO has selected [Alternative X or Alternatives X and Y] as the connection [alternative or alternatives] for the Project moving to the AESO Detailed Cluster Study stage, at which stage the AESO will further re-evaluate connection alternatives for the Project and select the preferred connection alternative.

Alternative [X] involves…

If applicable,

Considering [the identified Category A violations on ###L and ###L] [or total generation added to RAS # exceeding the current MSSC], the Project may be subject to pre-contingency generation curtailment using the AESO's real time operation practices, [[if both the Project and P### Project Name proceed].

7 Congestion Estimate

If a congestion estimate is conducted, please include this section and Attachment D. Otherwise, this section and Attachment D can be deleted.

The AESO has conducted a congestion estimate using a probabilistic methodology, the high-level assumption and results of which is included in the Attachment D.

Attachment A: Constraints Summary Table – Loading and Voltage Performance

Table A-1: Remedial Action Scheme

RAS Name	RAS Description
New PXXX RAS #1	*7L760 Thermal Protection Scheme- Oyen Wind Power Runback/DTT of WAGF*
New PXXX RAS #2	*O/L detections on 7L224 at Monitor 774S to trip 7L224 breaker*
Planned RAS 749L-899S	*The Project to be required to participate in and modify the future 749L-899S RAS to alleviate 749L flow above the emergency rating*
Existing RAS #138	*The Project to be required to participate in and modify the existing ISO RAS #138 for 7L50 overload mitigation scheme*

Table A-2: Constraints Summary Table for Alternative [3] – Thermal Criteria Violations and Potential Mitigation Options under Category A conditions (Project Individual Assessment)

Details of Violation (Violation Observed On)	Details of Constraint (ex. %I of MVA loading of nominal rating, nominal and short-term emergency rating, and direction of flow)						Assumed System Conditions (ex. Summer peak, year, and other critical project assumptions)	Mitigation options			
	Thermal							Thermal - post curtailment			
	Normal Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)		Post-Project Results		Project Effectiveness Factor (%)	Required Curtailment (MW)
		Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading			Observed Power Flow (MVA)	% Loading		
xxxL (xxx xxxS - xxx xxxS)	85	84	98.8	89	104.7	5.9	20xx Summer Peak (Scenario 1)	84	98.8	20	300

Table A-3: Constraints Summary Table for Alternative [3] – Thermal Criteria Violations and Potential Mitigation Options under [Selected] Category B conditions (Project Individual Assessment)

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Details of Constraint (ex. %I of MVA loading of nominal rating, nominal and short-term emergency rating, and direction of flow)						Assumed System Conditions (ex. Summer peak, year, and other critical project assumptions)	Mitigation options
		Thermal							
		Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)	
				Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading		

xxxL (xxx xxxS - xxx xxxS)	xxxL (xxx xxxS - xxx xxxS)	85	94	84	98.8	89	104.7	5.9	20xx Summer Peak (Scenario 1)	*New PXXX RAS #1*

Table A-4: Constraints Summary Table for Alternative [3] – Voltage Criteria Violations and Potential Mitigation Options under [Selected] Category B conditions (Project Individual Assessment)

Contingency (System Element Lost)	**Details of Violation** (Violation Observed On)	**Details of Constraint** (ex. %I of MVA loading of nominal rating, nominal and short-term emergency rating, and direction of flow)							**Assumed System Conditions** (ex. Summer peak, year, and other critical project assumptions)	**Mitigation options**
		Thermal								
		Emergency Minimum Voltage	**Emergency Maximum Voltage**	**Pre-Project Results**		**Post-Project Results**		**Voltage Difference (kV) (Post-Pre)**		
				Initial Voltage (kV)	**Post-contingency Steady State (kV)**	**Initial Voltage (kV)**	**Post-contingency Steady State (kV)**			
xxxL (xxx xxxS - xxx xxxS)	XXXS-240 kV bus								20xx Summer Peak (Scenario 1)	*New PXXX RAS #1*

Please repeat the above tables for the results for different alternatives and the cluster assessments conducted.

Table A-#: Constraints Summary Table* for Alternative [#] – *Thermal Criteria Violations and Potential Mitigation Options under Category A /* [Selected] Category B *conditions (Cluster Assessment with P### /Alt 1)

Inset the CST table here

Attachment B: Constraint Effective Factor (if necessary)

Regarding Generator Effectiveness Factor analysis, please address generator types and created effectiveness analysis table for N-0 and N-1 contingencies.

Table B-1: Generator Types

Plant	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***
Type	*Wind*	*Wind*	*Wind*	*Gas*	*Gas*	*Hydro*	*Hydro*	*Coal*	*Coal*	*Coal*

Table B-2: 20xxSL (Post-Project), Generators Effectiveness Factors under Category A Conditions (N-0)

Plant / **Line**	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***

Table B-3: 20xxSL (Post- Project), Generators Effectiveness Factors under Category B Conditions (N-1)

Contingency	**Plant** / **Line**	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***	***xxx***

Attachment C: Generation Dispatch Conditions Adjustment (if necessary)

Please provide the generation dispatch before and after the curtailment.

Table C-1: Generation Dispatch Conditions Adjustment for [Pre-Project Scenario 1 and Post-project Scenario 3]

Facility Name and Code	Bus No.	MC (MW)	AESO Planning Area No.	Planned ISD	Unit Net Generation[s] (MW)	
					Pre-curtailment	Post-curtailment

Attachment D: Congestion Estimate (if necessary)

1. Introduction

This attachment summarizes the Congestion Estimate for the Project. The Congestion Estimate forecasts the congestion that may occur if all the projects in the cluster were to energize. The Congestion Estimate results are a preliminary assessment. The congestion results will be refined in the Congestion Assessment in Stage 2 - Detailed Cluster Studies.

2. Assumptions and Methodology

The Congestion Estimate studied each hour in the study year of 20XX to forecast the number of hours with congestion. The estimate assumes forecasted generating units are in-service prior to 20XX. The transmission system topology and connection project assumptions followed the Preliminary Assessment Study Scope.

The Congestion Estimate forecasts congestion for the Project under the assumption that all the other projects in the cluster are energized. Each of the other projects in the cluster may also have multiple feasible connection alternatives; however, the preferred alternative will not be determined until the Stage 2 studies. To manage this uncertainty, the congestion estimate assessed the most stressed combination of connection alternatives for each selected alternative for the Project.

The Congestion Estimate used a methodology that estimates the forecasted congestion for the Project. The Congestion Estimate approximated the congestion by:

1. Conducting a pre-project cluster congestion assessment with existing generating units, connection projects (i.e., forecasted generation) that met the project inclusion criteria, forecasted load, and system transmission projects.
2. Modelling the hourly production profiles of the projects within the cluster. Each project's production profile was modelled by scaling the production profile of a similar generating unit according to maximum capability.
3. Calculating the congestion by considering the hourly production profiles and their effectiveness factors to each transmission line in the cluster, and incorporating the results of the pre-project cluster congestion assessment.

3. Results

Modify the first paragraph if the estimate did approximate congestion for criteria violations beyond Category A thermal violations.

The Congestion Estimate forecasts the potential congestion resulting from Category A[1] thermal criteria violations only. This estimate does not forecast the potential Category A congestion caused by pre-

[1] Category A congestion refers to congestion that occurs when all system elements are in service. Refer to Alberta Reliability Standard TPL-001-AB-0 available on the AESO website.

contingency curtailment, nor does it include most severe single contingency limits, or congestion associated with voltage or transient stability criteria violations.

The Congestion Estimate provides forecasted congestion frequency for each alternative, provided in Table 1.

Table 1 - Congestion Estimate Results

Alternative	Congestion Frequency (%)[2]
Alternative 1 - [Name from Study Scope]	xx

The results are sensitive to the underlying assumptions and are subject to change. The forecasted congestion may be impacted by the preferred alternative selected for each project in the cluster, as well as project cancellations or change proposals from other projects in the cluster. The forecasted congestion will be refined in the Congestion Assessment in Stage 2 as these inputs and assumptions become more certain.

[2] Congestion frequency is the number of distinct hours with Category A thermal violations divided by the total number of hours in the assessment.