

Transmission Cost Causation Update

June 29 2006

AESO Stakeholder Meeting

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PS Technologies

Agenda

- Purpose of the Update
- Bulk System Classification
- Interprovincial Interconnections
- Local System
- POD Costs
- CIAC
- Dual Use
- Operations, Maintenance and Administration

Purpose of the Update

- AESO and various stakeholders identified activities for further study,
 - Further study of Classification of Bulk System
 - Refinement of CIAC

Classification of Bulk System

- TCCS classified 81.5% of Bulk System as Demand Related, and 18.5% as Energy Related
- Demand Related was based on Coincident Load to Maximum Stress
- Coincident Load to Maximum Stress is not well understood
- AIL Coincident Peak suggested by interveners and adopted for purpose of rates.

Classification of Bulk System

- Interview with transmission planners to identify driving force to Bulk System expansion
- Test correlation between Bulk System loading and AIL load
- Test correlation between Bulk System thermal capacity stress and AIL load

Classification of Bulk System

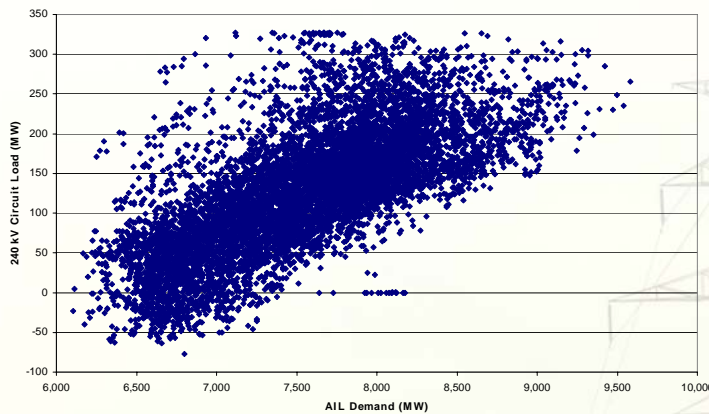
- Transmission planners will consider Bulk System expansion to address concerns over
 - Voltage
 - Thermal capacity
 - Stability

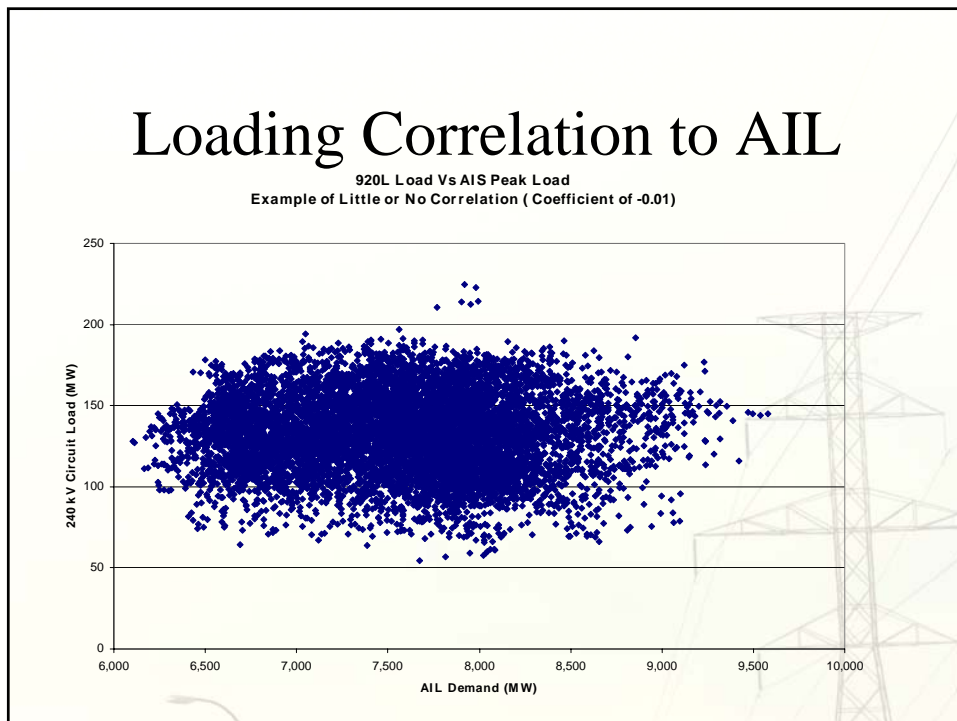
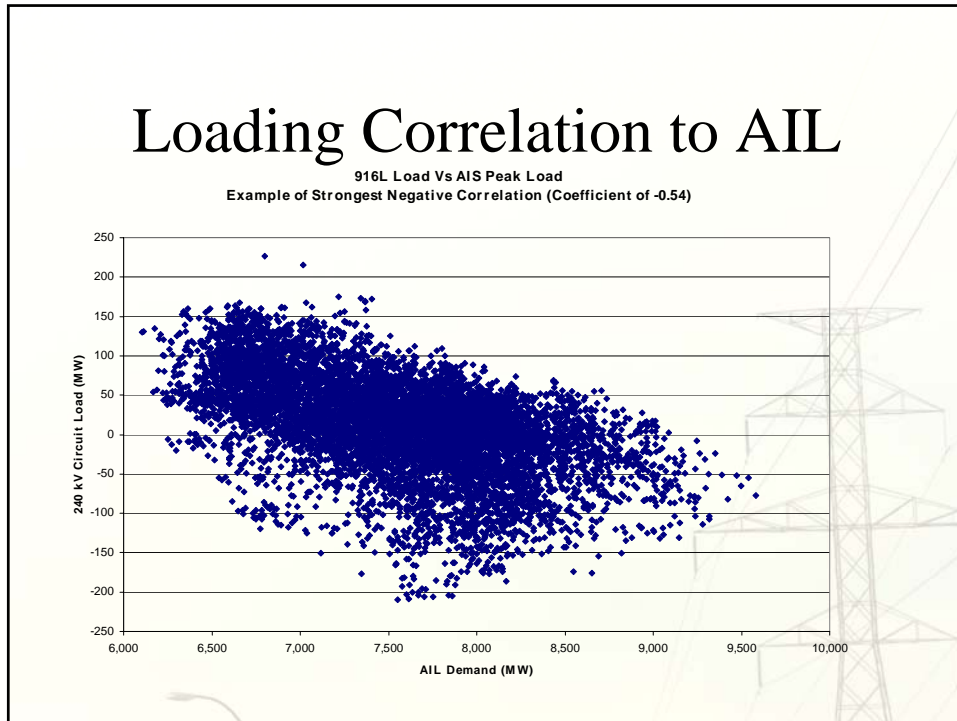
Classification of Bulk System

- Interview with transmission planners
 - Southern expansions driven largely by addition of wind generation,
 - Southern load peaks in the summer, when thermal capacity is most constrained
 - Central Alberta expansions driven by combination of factors including high load with no import, light load with export
 - North west driven by high load (coincident to AIL)
 - North east driven by Fort McMurray generation

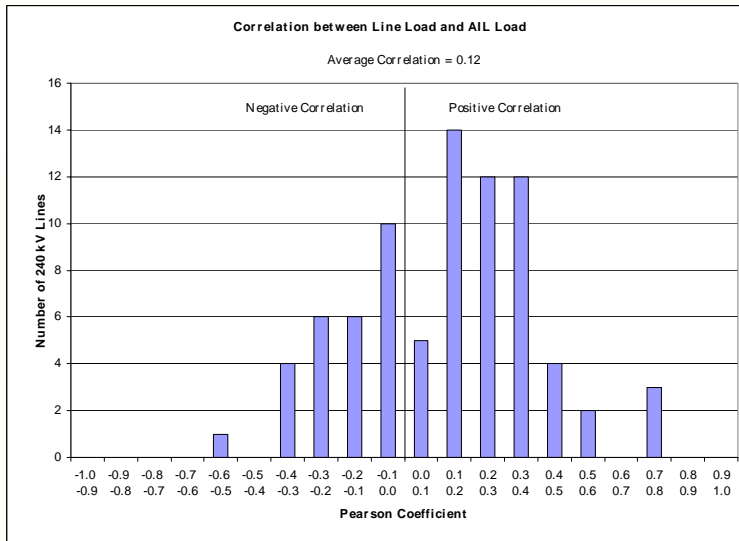
Loading Correlation to AIL

917L Load Vs AIS Peak Load
 Example of Strongest Positive Correlation (Coefficient of 0.70)

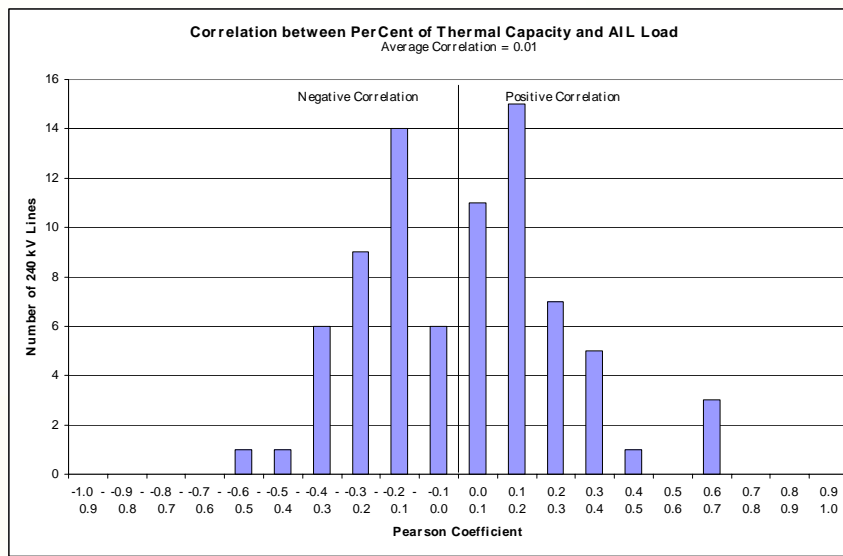




Loading Correlation to AIL



Thermal Correlation to AIL

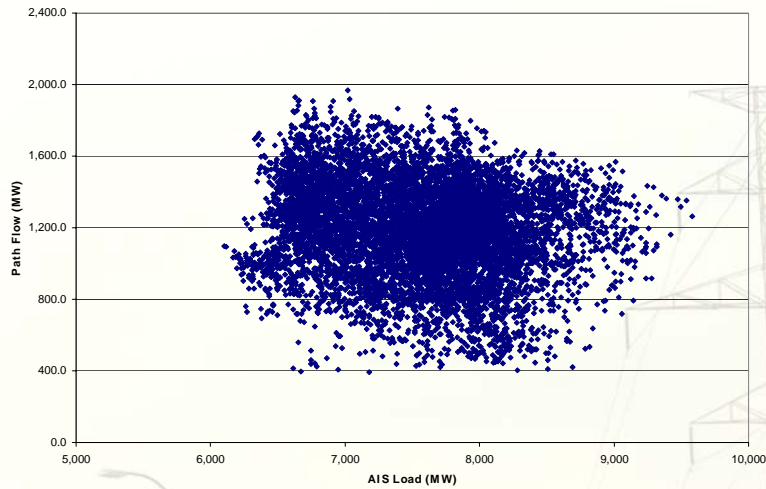


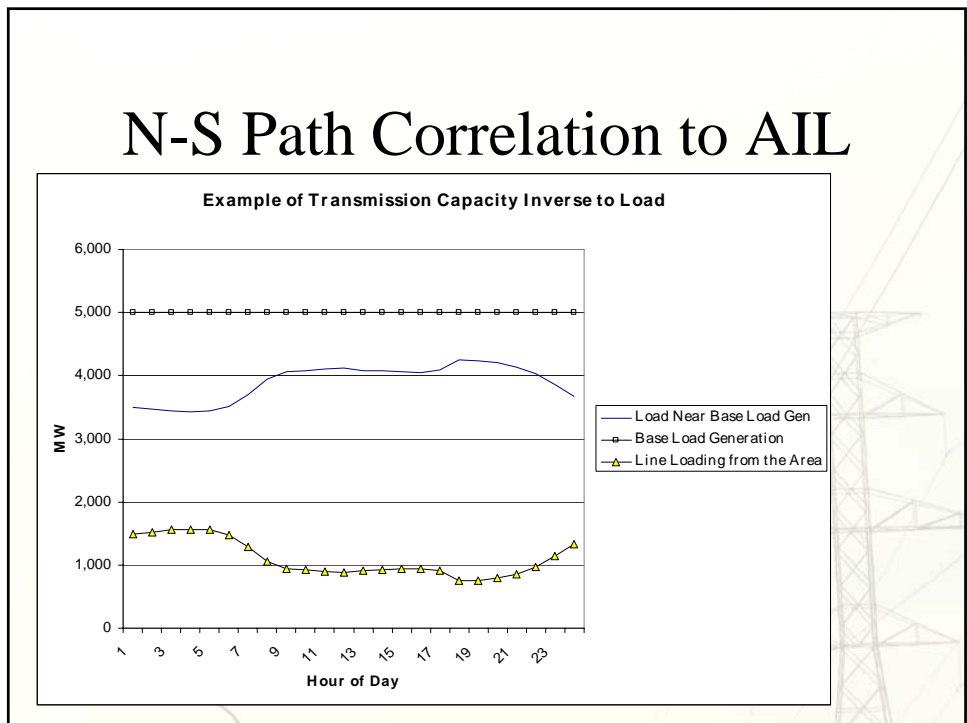
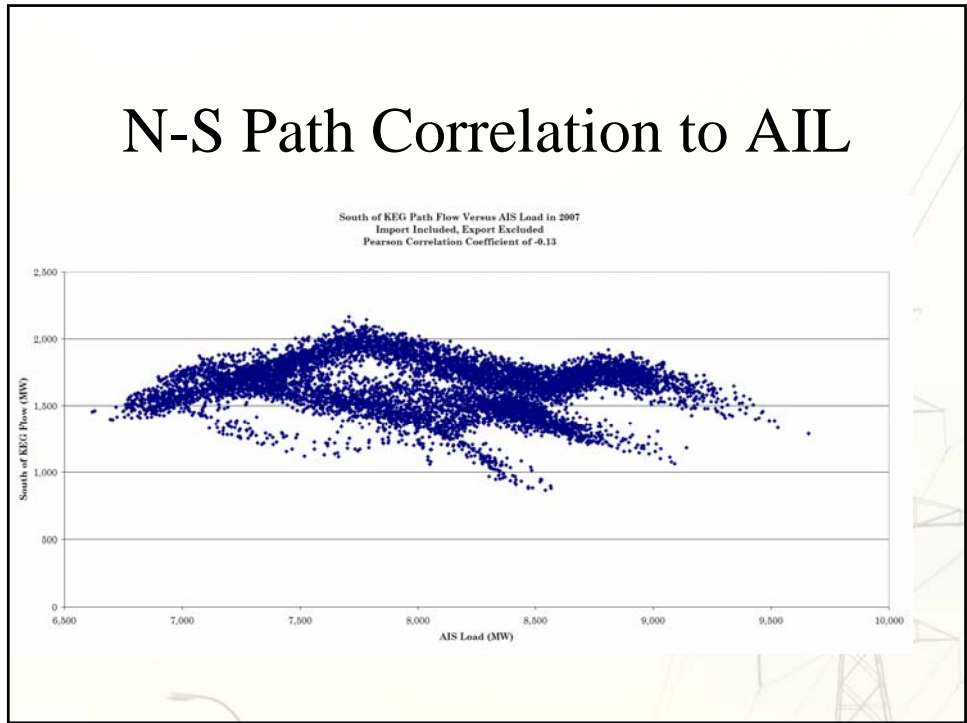
Overall Correlation to AIL

Description	Line Loading Coefficient	Thermal Capacity Coefficient
Weighted by Number of Lines	0.12	0.01
Weighted by Line Length	0.09	-0.03
Weighted by Net Book Value	0.17	0.04

N-S Path Correlation to AIL

6 Circuit 240 kV Line Flow N-S, 2005 Meter Data
 Pearson Coefficient -0.15





Cost Causation

- Transmission expansions are based on coincident load to maximum stress (CLMS)
- At a POD, $CLMS = CP(POD) = \text{Max Demand}$
- As you move from POD to Local to Bulk, CLMS is not equal to $CP(POD)$, $CP(AIL)$ or Max Demand

Cost Causation

- $CP(AIL)$ is not the same as CLMS because max stress occurs at different times at different locations
 - South in the summer
 - N-S corridor under scenarios not proportion to load
- In Alberta system, Max Demand is more stable predictor of stress than CP

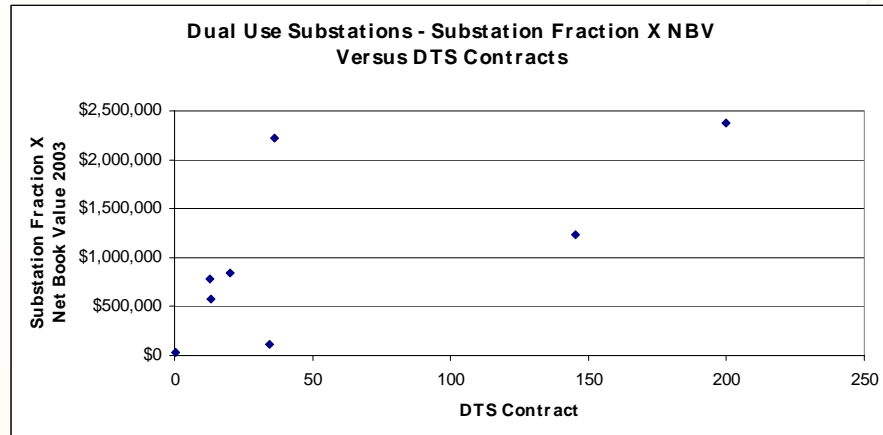
Interprovincial Ties

NBV of Four largest TFO's (2002/2003)	1,455,675
TCCS Results (% of Total that is Bulk)	46.1%
TCCS Results - NBV of Bulk System	671,789
NBV of Interprovincial Facilities	115,104
Percent of Bulk System - Interprov Ties	17.1%
Values - \$ X 1,000	

Compensation for CIAC

TCCS Functionalization of Alberta's Transmission System			
Based on % NBV Property	Bulk System	Local System	POD
Functionalization	45.7%	15.7%	38.6%
Translation into 2002/03 NBV			
Based on % NBV Property	Bulk System	Local System	POD
Functionalization	677,560	232,841	571,508
Offset of CIAC for AltaLink Facilities			
Based on % NBV Property	Bulk System	Local System	POD
Functionalization	5,771	0	20,463
NBV with compensation for AltaLink CIAC			
Based on % NBV Property	Bulk System	Local System	POD
Functionalization	671,789	232,841	551,046
Updated Functionalization of Alberta's Transmission System - 2002			
Based on % NBV Property	Bulk System	Local System	POD
Functionalization	46.1%	16.0%	37.9%

Dual Use Substations



OM&A

- Insufficient data from 2003 to analyze
- OM&A is approximately ¼ of Rev Req
- Substation and line property relatively evenly split
- Vintage of substation and line equipment similar
- Acquire proper data before embarking on study.

	2003 PPE	2003 Acc Dep	Acc Dep % of PPE
Substations	659.7	343.5	52.1%
Lines	657.3	388.4	59.1%