



**British Columbia Transmission  
CORPORATION™**

**System Impact Study for  
Columbia Power Corporation's  
Twenty-Year Transfer Applications on  
the  
BCHA × BPAT Path**

**Report No: SPA2003-10  
6 February 2004**

**System Performance Assessment Department**

## Executive Summary

Columbia Power Corporation (CPC) submitted the following Completed Applications for Long Term Firm Point-to-Point (LTFPtP) transmission service on the BCHA x BPAT Path:

OASIS #	Time Stamp	Amount	Term (revised on 26 November 2003)
620107	12 Mar 02	75 MW	20 year (1 Aug 2006 – 1 Aug 2026)
620109	13 Mar 02	50 MW	20 year (1 Aug 2006 – 1 Aug 2026)
620115	14 Mar 02	25 MW	20 year (1 Aug 2006 – 1 Aug 2026)

British Columbia Transmission Corporation (BCTC) prepared this System Impact Study (SIS) in response to the above applications. It only addresses the capability of the BC Hydro transmission grid and does not consider capabilities of adjacent systems. The conclusions of the SIS are based on the BC Hydro's existing system operating orders and "Facilities Study for Alberta to US Available Transfer Capability, Report No. NPP2002-05, 03 June 2002"

[http://www2.bctransco.com/system/studies/facilities/2002/fs\\_for\\_ab\\_to\\_us\\_atc.pdf](http://www2.bctransco.com/system/studies/facilities/2002/fs_for_ab_to_us_atc.pdf).

The starting conditions for this SIS are BC Hydro's native load requirements, existing "General Wheeling Agreement" (GWA) transfer rights, and prior LTFPtP commitments on the BCHA x BPAT Path. In the Facilities Study, power flow and voltage stability analyses were conducted to ensure that the Available Transfer Capability (ATC) would be accomplished in compliance with the BC Hydro, Western Electricity Co-ordinating Council (WECC), and North American Electric Reliability Council (NERC) reliability standards.

In this SIS, it is concluded that:

1. The existing long-term firm Available Transfer Capability (ATC) on the BCHA x BPAT Path is 0 MW.
2. OASIS # 620107, 620109, and 620119 can be accommodated by upgrading BC Hydro's transmission network.
3. These Network Upgrades will be necessary whether one or all of the above OASIS applications are approved:

ATC	Incremental Reinforcements
<p style="text-align: center;">&gt; 0 MW ≤ 170 MW</p>	<ul style="list-style-type: none"> <li>• Series capacitor bank on 5L82 upgraded for 3.3 kA operation</li> <li>• Series capacitor bank on 5L41 &amp; 5L42 upgraded for 3 kA operation</li> <li>• Summer ratings of 5L42 upgraded to 3 kA</li> <li>• Summer rating of 2L1 upgraded to 0.98 kA</li> <li>• Replace 5L44 2.0 kA circuit breaker (5CB11 at Ingledow Station) with a 3.0 kA circuit breaker</li> <li>• Addition of 1 × 250 MVAR and 1 × 250 MVAR mechanically switched shunt capacitors at Ingledow 500 kV Station and Meridian 500 kV Station</li> <li>• Replace two 672 MVA 230/500 kV transformers at Selkirk Station with two 1200 MVA 230/500 kV transformers (T3 earliest in-service date, T2 needed in 2014)</li> <li>• 50% series compensation of 5L91 for 3.0 kA operation (needed in 2010 for up to 28 MW ATC, in 2009 for up to 50 MW ATC, and earliest in-service date for more than 50 MW ATC)</li> <li>• 50% series compensation of 5L98 for 3.0 kA operation (needed in 2010 for up to 28 MW ATC, in 2009 for up to 50 MW ATC, and earliest in-service date for more than 50 MW ATC)</li> </ul>

4. Various Remedial Action Schemes (RAS) are required for Undervoltage-Load-Shedding, Direct Load Shedding, and Transfer Trip for multi-contingency events.

Assuming that a Transmission Service Agreement is signed by 1 April 2004, the transmission service is estimated to be provided by October 2007.

There are no Direct Assignment Facilities associated with these OASIS applications, as the SIS does not include an Interconnection Study. A Facilities Study is required to determine cost, CPC's share of the costs, and confirm schedule and capability of the Network Upgrades.

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## 1. Introduction

In March 2002, CPC submitted three Wholesale Transmission Service Applications (WTSA) for LTFPtP Transmission Service on the BCHA × BPAT Path between 1 August 2006 and 1 August 2026. In response to these applications, BCTC reviewed BC Hydro’s existing system operating orders and “Facilities Study for Alberta to US Available Transfer Capability, Report No. NPP2002-05, 03 June 2002” in conjunction with Aquila Networks Canada (ANC) transmission rights on BC Hydro transmission grid.

BCTC determined that the conclusions of NPP2002-05 for the Interior to Lower Mainland transfer capability are still applicable. It further determined the required transmission upgrades for providing additional ATC between Selkirk and Nicola substations.

## 2. Terms of Reference

This SIS is based on the following documents:

- BC Hydro’s “Facilities Study for Alberta to US Available Transfer Capability, Report No. NPP2002-05, 03 June 2002”
- BC Hydro’s existing system operating orders 7T-33 and 7T-34

## 3. System Study Conditions

The base conditions for OASIS requests # 620107, 620109, and 620115 include:

- The BC Hydro native load requirements as per Network Integration Transmission Service Agreements OASIS No.’s 39073, 39077, and 72625.
- The existing GWA transfer rights.
- Prior LTFPtP commitments on the BCHA x BPAT Path including OASIS No.’s 72623 (230 MW) and 254221 (500 MW).
- Teck Cominco Scheduling rights.
- BC Hydro’s Probable Peak Load Forecast including Power Smart dated 17 November 2003.
- Transmission Reliability Margin (TRM) of 50 MW on the BC-US intertie.
- TRM of 65 MW on the BC-Alberta intertie

## 4. Resources for Transmission Request

The Point-of-Receipt (POR) will be BCHA network inter-ties to the ANC, CPC, and Teck Cominco system at Selkirk 230 kV, Nelway 230 kV, and Kootenay Canal 230 kV buses. The bulk of power delivery will be through CPC’s direct connection to the Selkirk 230 kV bus. Review of power transfer from CPC’s generation resources to

Kootenay Interconnection to Selkirk 230 kV bus is not included in this study. Loop flow at the Kootenay Interconnection is not addressed in this System Impact Study. Since there is no ATC on the Eastern BC-US tie, power delivery will be through the Westside BC – US 500 kV interconnections (5L51 and 5L52). Point-of-Delivery (POD) will be at the BC – US border. CPC generation resources are the resources for this request.

## 5. Project and Transmission Service Risks

Content of this document contains some uncertainty in the plan, reinforcement, costs, and in-service dates. A Facilities Study is required to confirm the cost, CPS’s share of the costs, schedule and capability of the Network Upgrades.

## 6. Conclusions

The study concluded that:

1. The existing long-term firm ATC on the BCHA x BPAT Path is 0 MW.
2. OASIS # 620107, 620109, and 620115 can be accommodated with upgrading BC Hydro’s transmission network.
3. These Network Upgrades will be applicable whether one or all of the above OASIS applications are approved:

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There are no Direct Assignment Facilities associated with these OASIS applications, as the SIS does not include an Interconnection Study. A Facilities Study is required to determine the cost, CPC's share of the costs, and confirm the schedule and capability of the Network Upgrades.