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May 6, 2005

Mr. Robert J. Pellatt
Commission Secretary
British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Box 250
Vancouver, BC V6Z 2N3

Dear Mr. Pellatt:

Re: British Columbia Transmission Corporation ("BCTC")
Transmission System Capital Plan
F2006 to F2015 Application

As referenced in Section 1.2.1 of the Transmission System Capital Plan F2006 to F2015, BCTC files with the Commission the State of the Transmission System Report and the Asset Baseline Study.

Yours truly,

Original signed by
Marcel Reghelini

Marcel Reghelini
Director, Regulatory Affairs

cc: Registered Intervenors

Enclosures

State of the Transmission System Report

1.0 INTRODUCTION

The State of the Transmission System Report provides an overview of the transmission system managed by BCTC, its current capacity and condition, and identifies future requirements. The report highlights potential issues or capacity constraints and identifies potential solutions. These solutions range from the replacement of ageing or poorly performing equipment to the modification and expansion of the transmission system to improve reliability or meet growing customer demand. A comprehensive summary of the proposed initiatives and projects is in the Transmission System Capital Plan F2006 to F2015 (Capital Plan), filed with the Commission on March 23, 2005, and updated with two additional projects on May 5, 2005. Specific issues identified in the State of the Transmission Report are referenced to the related programs and projects in the Capital Plan by page number.

For reference, a list of definitions is provided in Appendix 1, and a list of Station Acronyms is provided in Appendix 2. Maps showing major growth capital projects are provided in Appendix 3.

2.0 THE TRANSMISSION SYSTEM

The Transmission System is made up of the bulk transmission system, four main regional transmission systems, transmission interties that connect BC to Alberta and Washington State and a comprehensive communication, protection and control system.

The bulk transmission system, often referred to as the backbone of the system, is comprised of high-voltage transmission lines that interconnect the large remote generating stations (in the Peace and Columbia), with the major load centres in the Lower Mainland and on Vancouver Island. The bulk system is comprised of the 500 kV transmission system, parts of the 230 kV system, interconnections with other utilities and the transmission connections to Vancouver Island.

The regional transmission systems move electricity within specific geographic areas, such as the Lower Mainland or Vancouver Island. The regional systems are made of the 230 kV, 138 kV and 60 kV transmission networks that connect local generation and deliver power to distribution utilities or transmission customers located within the region.

In addition, the Transmission System is interconnected to neighbouring transmission systems through a series of interties. These interties are high-voltage transmission lines that connect the Transmission network with transmission networks in Alberta and Washington State as well as other utilities in BC (e.g., Alcan and FortisBC). These interties provide access to other sources of generation, the opportunity for trade, improve the overall reliability of the system by providing backup resources and improve control of frequency and power fluctuations.

The transmission lines, cables and substations that move energy across and around the province are monitored and controlled from five control centres and one telecommunications centre. While much of this activity is automated through computerized Energy Management Systems, highly trained operating staff at each of the control centres work around the clock to respond to varying external conditions or system disturbances and ensure high levels of safety and reliability.

The system is managed by BCTC's System Control Centre (SCC) located in the Lower Mainland and supported by four regional (or area) control centres. SCC operates the bulk system and the interties and balances supply and demand of electrical energy using advanced computer applications and control systems. The regional Control Centres are located in Vancouver, Duncan, Vernon and Prince George and focus on regional operations. Strong coordination between the System Control Centre and four regional centres ensures that the electric system can operate reliably while accommodating customer demands and managing maintenance requirements.

As described in more detail in Section 5.0 of this report, BCTC will be implementing the System Control Modernization Project to reconfigure and modernize the control of the system.

Figure 2.1 - The Bulk Transmission System

Snapshot:

- 18,000 km circuit transmission lines
- 287 switching, distribution and capacitor stations
- Control Centers
  - 1 System Control Center
  - 4 Area Control Centers
- 244 microwave and repeater sites
- Interconnections to Alberta and the Pacific Northwest

The bulk transmission system transmits large amounts of power across the province from interconnections and the major generation areas (Peace and Columbia) to other interconnections and major load centres in the Lower Mainland and on Vancouver Island.

For planning purposes, the bulk system is broken down by region:

- The Northern System transmits power from the Peace River generating plants (GM Shrum and Peace Canyon) through the north and central interior region to connect with the Interior to Lower Mainland System at Kelly Lake Substation (near Clinton).

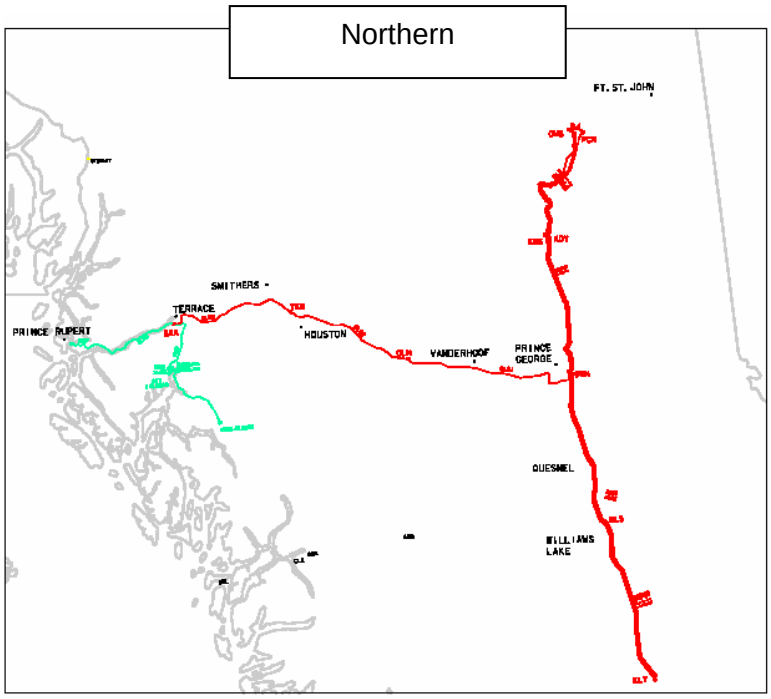
- The Southern Interior System (SI) transmits power from the Columbia and Kootenay Generators through the Columbia and Central Okanagan to connect with the Interior-Lower Mainland System at Nicola Substation (near Merritt). A transmission line between the Nicola and Kelly Lake Substations connects these two systems.

- The Interior to Lower Mainland System (ILM) moves power from Kelly Lake and Nicola Substations in the interior to substations in the Lower Mainland over four 500 kV transmission lines

- The Lower Mainland to Vancouver Island System (LM-VI) transfers power from the Lower Mainland to Vancouver Island over two 500 kV circuits and a 260/280 kV high voltage direct current system (HVDC). In addition, two 138 kV circuits transmit power to the Gulf Islands.

System reinforcements on the Northern and Southern Interior bulk transmission systems are generally driven by the addition of new generation resources in the region. In the Lower Mainland, reinforcements tend to be driven by load growth and the addition of new generation resources in remote regions.

Figure 2.2 - The Northern Region



Power from GM Shrum (GMS) is transmitted south along a series of 500 kV transmission lines. Three parallel 500 kV transmission lines (with five segments - 5L1, 5L2, 5L3, 5L4, 5L7) deliver power from the Peace River generating plants (GMS and Peace Canyon) to the Williston Substation (WSN) near Prince George. From there, three 500 kV transmission lines (5L11, 5L12, 5L13) move power from Williston south down to Kelly Lake Substation where it connects to the Interior to Lower Mainland System. One of these lines (5L4) connects GMS to Peace Canyon.

There is a single radial transmission line system comprised of three 500 kV transmission lines (5L61, 5L62 and 5L63) which connect Williston Substation to the North Coast. These lines connect Williston to Skeena Substation via Glenannan and Telkwa Substations. The flow on these lines can be in either direction, and is dependent on the actual load and generation levels in the North Coast at the time.

System Capacity and Performance

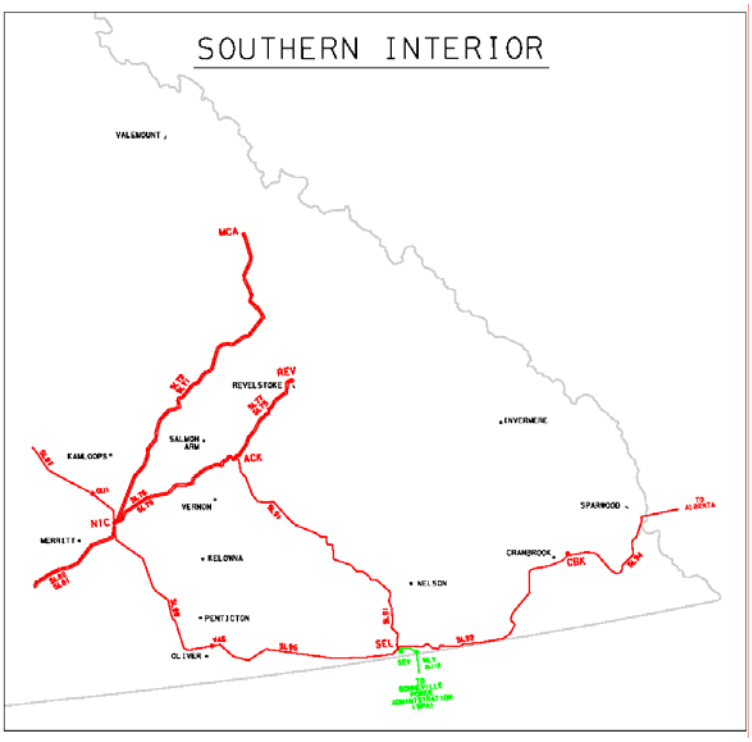
The Northern bulk system can be divided into two main components – the 500 kV lines that move power from Peace River Generation (GMS and Peace Canyon) to Kelly Lake Substation and the lines that connect Williston Substation to the North Coast.

Peace – Kelly Lake: The north-south 500 kV transmission system from GMS/Peace Canyon to Williston reaches up to 80% - 90% of capacity. From Williston to Kelly Lake, the flow can reach about 80% of capacity. Committed use for the Northern region is calculated based on maximum northern generation and the committed transfer from Alcan minus local load. The existing capacity will be sufficient unless significant new generation resources are added in the region.

Supply to the North Coast: The 500 kV line from Williston west to Skeena is a single radial line that serves local area load with support from local generation. While there is some increased risk as a result of the radial service, this risk is mitigated by the support provided by local generation and the use of single pole clearing. The North Coast has some local generation that can be called upon to support local load in the event of an outage (based on generator availability). Single pole clearing is a transmission circuit protection system which opens only the faulted phase of a circuit for single phase faults and reclosing after the fault has been cleared, thus avoiding an entire line outage should the fault have been temporary. Since most faults are single phase, outages to the North Coast are lower than they would be without single pole clearing.

While the bulk system on the North Coast can accommodate the current committed forecast requirements over the next ten years, the addition of any major new loads or large generation facilities may require system upgrades and reinforcement.

Figure 2.3 - The Southern Interior Region



A network of 500 kV transmission lines deliver power from the Columbia and Kootenay area generating stations across the southern interior, west to the central interior and east to Alberta, as well as providing power to serve load in the Southern Interior and transfer power to FortisBC.

Columbia West

Two transmission lines (5L71 and 5L72) connect Mica generation to Nicola Substation near Merritt, while power from Revelstoke travels along 5L75 and 5L77 from Revelstoke to Ashton Creek Substation (near Salmon Arm) then onto Nicola via 5L76 and 5L79.

Power from Kootenay Canal and Seven Mile generation plants is connected to Selkirk Substation through two 230 kV lines from each plant (2L221 and 2L222 from Seven Mile and 2L295 and 2L299 from Kootenay Canal). Four 500 kV lines carry power from the Selkirk Substation to Nicola Substation, one directly (5L98) and three via Ashton Creek (5L91 from Selkirk to Ashton Creek, 5L76 and 5L79 from Ashton Creek to Nicola).

Columbia East

Two 500 kV lines (5L92 and 5L94) and three 230 kV lines (2L293, 2L294, and 2L113) move power from Selkirk Substation east. Circuits 5L92, 2L293 and 2L294 move power from Selkirk Substation to Cranbrook Substation. From there, power is transferred to the border on 5L94 and to Natal Substation near Sparwood via 2L113 and then over two 138 kV lines to the Alberta border.

System Capacity and Performance

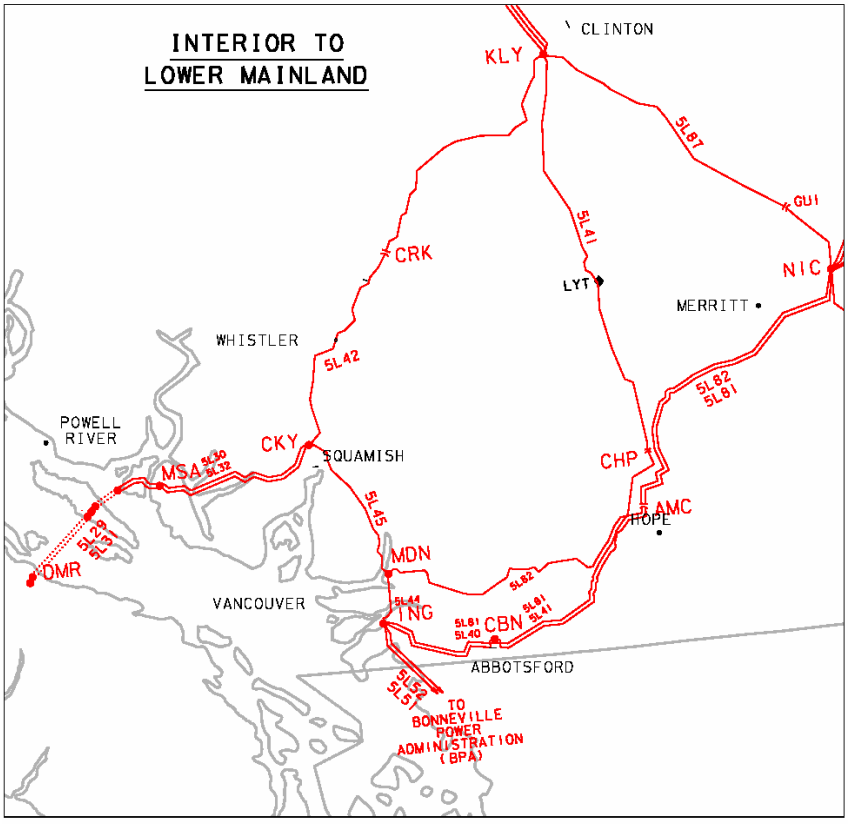
The 500 kV transmissions lines from Revelstoke and Mica were built to the capacity required for these generating stations. Future additions at Revelstoke and Mica will require an increase in capacity. To accommodate a possible increase at Mica, BCTC has proposed definition work for a new series capacitor station on circuits 5L71 and 5L72. (Capital Plan p 57)

The Transmission System from Selkirk to Nicola is currently limited to approximately 1700 MW. The existing surplus generation capacity in the Selkirk area plus imports from the US or Alberta can at times exceed this level. To meet increased transfer requirements, BCTC has applied for approval of several projects in the Capital Plan, including:

- Additional capacitor banks at Ashton Creek to provide voltage support in the area and increase transfer capacity (Capital Plan p 58);
- Definition phase work for the installation of series compensation and circuit breakers on circuits 5L91, 5L96 and 5L98 (Capital Plan p 54);
- A new 230/500 kV transformer at Selkirk (Capital Plan p 56); and
- Nicola -- Station Reconfiguration (Definition Phase) (Capital Plan p 51).

These projects are expected to increase the capacity from Selkirk to Nicola Substation to approximately 2300MW.

Figure 2.4 - The Interior to Lower Mainland System



The Interior to Lower Mainland system delivers power from the generating plants in the North and Southern Interior and power imported from Alberta to the major load centres in the Lower Mainland and to the BC-US intertie for export. This system is the heart of the bulk system, providing electricity to the major load centres in the Lower Mainland and on Vancouver Island (demand in these areas represent approximately 75% of firm load requirements).

One 500 kV transmission line (5L42) moves power from Kelly Lake Substation to Cheekye Substation in Squamish. From Cheekye, power is transmitted south to Meridian Substation in Coquitlam via 5L45. Another 500 kV line (5L41) moves power from Kelly Lake Substation to Clayburn Substation in Abbotsford, and then continues on to Ingledow Substation in Surrey via 5L44.

From Nicola Substation, power travels along two parallel transmission lines (5L81 and 5L82) to Ingledow Substation in Surrey and Meridian Substation in Coquitlam. A 500 kV line from Kelly Lake to Nicola (5L87) connects the Peace and Columbia systems together and provides the flexibility to transfer power flows to the remaining lines during single contingency outages. During an outage on 5L81 or 5L82 increased power flows over the remaining Interior to Lower Mainland lines and causes them to approach their rated capacities.

Four series capacitor stations – Creekside (Pemberton), Guichon (97 km Northwest of Nicola), Chapmans (Spuzzum) and American Creek (Hope) – provide voltage support to the Interior to Lower Mainland transmission system and improve transient stability. The completion of Guichon Capacitor station in 2004 provided an additional 500 MW of transfer capability from the Interior to Lower Mainland.

System Capacity and Performance

The load carrying capability of the Interior to Lower Mainland system is variable depending on a variety of factors, including the amount of Lower Mainland and Vancouver Island generation.

During the winter, the total transfer capacity of the Lower Mainland network is approximately 6300 MW. The winter peak load in the Lower Mainland for 2005/2006 is forecast to be 6900 MW. With export commitments (230 MW), line losses (220 MW) and the transmission reliability margin on the intertie (50 MW), the total load requirement in the Lower Mainland is expected to be approximately 7400 MW. The difference between the Interior to Lower Mainland transfer capability[1] and the transfer requirement is met using 1100 MW of BC Hydro's reliability must run generation (RMR)[2]. Until transmission system reinforcements (such as 5L83, the proposed new transmission line from Nicola to Meridian Substation) can be made, increases in coastal load will have to be met with corresponding increases in coastal generation or additional imports from the United States.

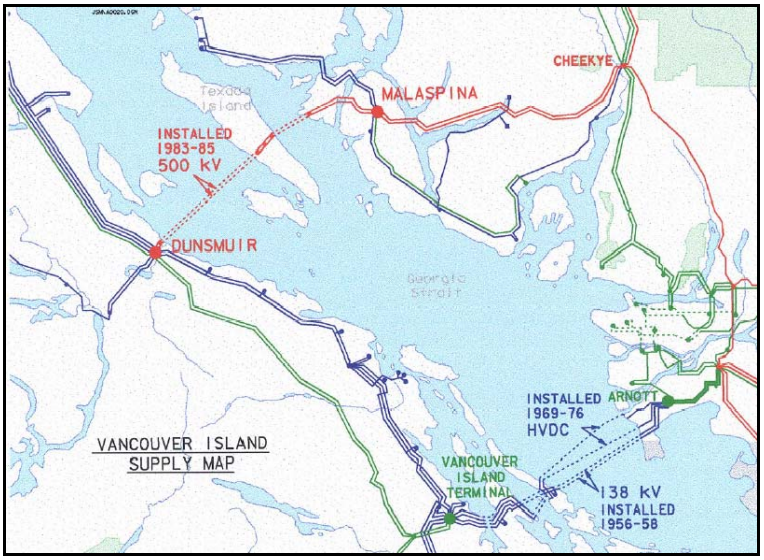
The Interior to Lower Mainland (ILM) transmission network is voltage stability and thermally limited during winter peak power transfer periods. It is also congested at other times depending on the Lower Mainland load, export levels, generation dispatch, equipment out of service and transmission maintenance requirements. The thermal limitation is the principal driver for reinforcement on this system at the present time and the potential solutions (e.g., new transmission lines) tend to require long lead times.

The existing Interior-Lower Mainland system will require additional transfer capacity as new generation resources are developed in the Peace and Columbia regions to serve the increasing

[1] the local generation required to meet the difference in load requirements and transfer capability is commonly referred to as Reliability Must Run generation (or RMR)
[2] BC Hydro Distribution NITS 2004 SIS Stage 1 Study

load in the Lower Mainland and on Vancouver Island. BCTC has initiated the definition phase to explore a new 500 kV line (5L83) from Nicola Substation to Meridian Substation that would provide about 2400 MW of additional transfer capability into the Lower Mainland. The Definition Phase was approved in the F2005 Capital Plan. Alternatively, new generation resources could be developed closer to the load centres which could defer the need for transmission upgrades. In addition, increased imports from Alberta could also trigger the need to increase transfer capacity into the Lower Mainland.

Figure 2.5 - Vancouver Island



Supply to Vancouver Island and the Gulf Islands is provided by a combination of transmission lines and submarine cables. Two 500 kV transmission lines from Cheekye Substation transfer power to Malaspina Substation on the Sunshine Coast (5L30, 5L32). From there two 500 kV submarine cables move power from Malaspina (near Pender Harbour) to Dunsmuir Substation (5L29, 5L31) near Parksville on Vancouver Island.

At the present time, two 138 kV submarine transmission lines (1L17, 1L18) from Arnott Substation in Delta supply power to the Gulf Islands. In addition, a series of high voltage direct current (HVDC) cables - three 260 kV 600 Amp and two 280 kV 900 Amp submarine DC transmission lines (DC1, DC2) - transmit power from Arnott Substation to Vancouver Island Terminal near Duncan.

System Capacity and Performance

The northern 500 kV circuits (5L29 and 5L31) are in good condition and provide a combined firm capacity of 1300 MW.

The two 138 kV circuits (1L17 and 1L18) that supply the Gulf Islands were originally built in the 1950s and have a design capacity of 150 MW each. Although they currently provide supply to the South Gulf Islands, due to their age they are considered to have zero dependable capacity for planning purposes. These will be kept in-service as long as they provide the required capacity and are economic to keep operational.

The HVDC system, including submarine cables and terminal converter station equipment, is also ageing and showing signs of deterioration. The dependable power transfer capacity of the HVDC system has been de-rated in steps over time from 800 MW to 240 MW as the reliability of this facility has degraded. The dependable capacity of the HVDC system will be de-rated to zero in fall 2007. However, the HVDC system will continue to be available for operation purposes as long as it is economic and capable of doing so. A more detailed analysis of the condition of the HVDC system can be found in BCTC's Asset Baseline Study filed concurrently with this report.

The October 2004 load forecast issued by BC Hydro indicates that Vancouver Island peak loads are about 100 MW higher than the previous year's forecast. Last winter, peak demand on Vancouver Island reached approximately 2300 MW. With the forecast load growth on Vancouver Island the existing firm supply could be capacity short by about 30 MW by the winter of 2006. BC Hydro has contracted with Duke Point Power near Nanaimo to purchase 252 MW of power to provide additional on-island capacity. Construction on this project is expected to begin this year and be completed by 2007. The addition of Duke Point combined with the reduction in dependable capacity of the HVDC from 240 MW to zero in 2007 will lead to another small capacity shortfall in the winter of 2007. BCTC will actively monitor and maintain the HVDC system to ensure its availability to meet any capacity short-falls during the 2006 and 2007 winters.

While the addition of 252 MW of on-island generation addresses most of the capacity shortfall over the 2007/2008 winter period, additional capacity is still required. BCTC is in the project definition phase to replace the existing 138 kV cables with a new 230 kV circuit (See Capital Plan p 52). This project would add 600 MW of dependable capacity to Vancouver Island and would resolve the forecast supply shortfall until approximately 2023. BCTC expects to file an application for a Certificate of Public Convenience and Necessity (CPCN) with the Commission by the summer of 2005.

The Interties

The transmission network is interconnected at the Bulk System level with Alcan in the North, FortisBC in the Southern Interior, Alberta to the East and Bonneville Power Administration (BPA) to the South.

Domestic Interties

Alcan Intertie

The Transmission System is connected to the Alcan transmission system on the north coast by a single 287 kV line from Minette Substation to Alcan's Kitimat Substation. This line has a transfer capacity of between 80-200 MW from BC to Alcan and approximately 150-400 MW from Alcan to BCTC.

FortisBC Interties

The Transmission System is connected to the FortisBC transmission system in the Okanagan and East Kootenays. Two 230 kV transmission lines (2L263 and 2L264) connect BC Hydro's Vernon Terminal Station in Vernon to FortisBC Substation in Kelowna. This intertie has the capacity to transfer about 200 MW of power from the Transmission System to FortisBC.

A new 500 kV loop on 5L98 (Selkirk to Nicola) is being constructed to connect the Transmission System with FortisBC new Vaseaux Lake Substation (near Oliver). This project increases the power transfer capability between the Transmission System and the FortisBC transmission system in the Okanagan by 272 MW. This project has an additional benefit of increasing the Selkirk to Nicola transfer capability by between 100-150 MW.

The BC Hydro and FortisBC transmission systems are also interconnected at Kootenay Canal at the 230 kV and 63 kV level. These connections are primarily used by BC Hydro, Tech Cominco, Columbia Power and FortisBC to exchange power between one another.

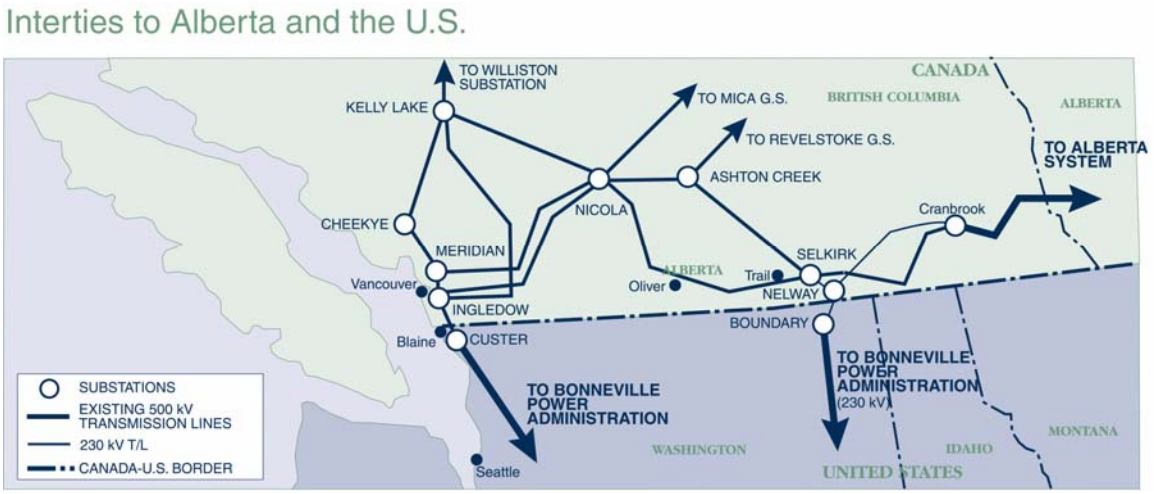
Cross Border Interties

The Transmission System is also interconnected with transmission systems in Alberta and Washington State. These interties provide access to sources of low cost generation, opportunities for trade and improve the overall reliability of the system by providing a connection to a strong system and backup resources. The transfer capability for each intertie is determined in two ways: a WECC Path Rating establishes the maximum permitted transfer capability and is set by WECC based on its criteria. BCTC also continually calculates the transfer capacity based on NERC/WECC criteria and uses this to set the hourly operational limit (which cannot exceed the WECC Path Rating). The firm transfer capability is the amount of power that can continue to be served immediately following a single outage (e.g., an N-1 event). Non-firm transfer capacity is transfer capacity that could be shed or curtailed following a contingency (e.g., N-1). The results of the calculation of Firm (and Non-Firm) total transfer capacity depends on the expected generation pattern, load demand, ambient conditions and system topology (equipment in or out of service).

Differences in the transfer capacity based on directional flows are due to the transmission system characteristics in each jurisdiction and the ability of their transmission system to withstand the loss of an intertie.

In addition to the firm transfer capacity, BCTC calculates available short-term capacity on an hourly basis. During periods of high market prices, demand for short-term capacity is high and, can, in some cases, be fully utilized.

Figure 2.6 – Interties to Alberta and the U.S.



BC – Alberta Intertie:

The Transmission System is connected with Alberta by one 500 kV line (5L94) from Cranbrook Substation in BC to Langdon Substation in Alberta and two 138 kV lines from Natal Substation near Sparwood to Altalink in Alberta (1L274 & 1L275).

Although the BC to Alberta intertie consists of one 500 kV transmission line and two 138 kV lines, transient stability limitations require that on a 5L94 contingency the two 138 kV ties be tripped, except during low transfer conditions. As a result, the intertie is effectively limited to the capacity of only the 500 kV line at most transfer levels.

The WECC approved Path Rating for the BC to Alberta path (i.e. west to east) is 1200 MW. However, this level of transfer would lead to excessive load shedding in Alberta (after loss of the intertie) and is rarely an acceptable operating condition for Alberta operators. The high levels of transfer to Alberta are only allowed under joint agreement between BC and Alberta system operators. Normally, the total transfer capacity for the BC to Alberta Intertie is 760 MW while the firm transfer limit is set at 545 MW. The firm transfer capacity from BC to Alberta is based on the expected transfer capability after the loss of the Ashton Creek to Selkirk Substation (5L91) or Nicola to Selkirk (5L98) transmission line.

The WECC approved Path Rating for the Alberta to BC intertie (i.e. west to east) is 1000 MW. However, most of the time there are limitations inside Alberta which prevent operation at this level. The BC limitation on the transfer from Alberta to BC is caused by the potential loss of the Nicola to Selkirk transmission line (5L98) and is currently 300 MW.

On the Alberta intertie, there is approximately 200 MW of firm capacity available in both directions. However, there are a number of customer requests pending and this capacity could be totally committed if these customers sign service agreements.

The BC – US Intertie

The BC to United States intertie consists of two sets of ties, one in the Lower Mainland (the west-side tie) and one in the Southern Interior (the east-side tie). The west-side tie consists of two 500 kV transmission lines (5L51 and 5L52) from Ingledow in Surrey to Custer (near Bellingham). The east-side tie consists of a 230 kV line (2L112) from Nelway near Trail to Boundary in Washington State and a 230 kV transmission line owned by Tech Cominco (L71) from Waneta (in Trail) to Boundary.

BC to United States: The WECC approved Path Rating is 3150 MW combined for the east and west-side ties. The firm transfer capacity from BC to US is currently 1800 MW and based on the expected transfer capacity available after the loss of 5L51.This rating depends on and assumes the availability of remedial action schemes, including an automatic generator shedding remedial action scheme. This transfer capacity is transient stability limited under low load conditions and the firm transfer capacity limit is lower during heavier load and outage periods.

United States to BC: The WECC approved Path Rating is 2000 MW. The firm transfer capacity from US to BC is currently 1800 MW and is also based on the expected transfer capacity available after the loss of 5L51. Firm capacity from the US to BC may also be affected by a constraint based on overall net imports to the province from all interties (e.g., Alcan, Alberta and US).

There is a small amount of firm capacity available on the US to BC intertie prior to 2009. However, there are pending customer requests for service that may contract for some of this capacity. For exports from BC to the US, there is approximately 1000 MW of firm capacity available if delivered from generation sources in the Lower Mainland or on Vancouver Island. There is no firm capacity available to export from the interior (see Lower Mainland to Interior section).

The Regional Systems

The Transmission System is divided into four regional systems:

- Northern
- Southern Interior
- Lower Mainland
- Vancouver Island

The regional transmission system consists of portions of 230 kV system and all of the 138 kV and 69 kV systems. In the larger regions where demand for electricity is concentrated (e.g. Lower Mainland), these regions are broken down into smaller areas for planning purposes.

The regional transmission networks are extensive. As a result, a written description of the facilities has not been provided. Instead, regional maps identifying the key substations and circuits in each area are provided in Appendix 4.

Numerous substations and hundreds of transmission circuits make up the regional transmission systems. BCTC has numerous programs to maintain these facilities and there are numerous small projects throughout the network at any given time to meet local load growth. This report focuses on the major issues and/or major new facilities that may be required in each region rather than a detailed summary of each initiative. Information on all of the projects and initiatives (e.g., local transformer upgrades, etc) is included in the Capital Plan.

Northern Region

Service to the North Coast area is provided by a single radial feed supported by local generation when available (see bulk system). To improve reliability, single pole clearing has been installed. While the existing infrastructure has the capacity to meet local load growth over the next ten years, the addition of any new major industrial loads or generation development will require system reinforcements of the regional and/or bulk system.

In the Northeast, load growth in the Fort St. John area is expected to exceed existing station capacity by 2007. In addition, a number of power quality concerns, such as low voltages, have been identified associated with the unusually long distribution feeders that have been extended out from the existing Ft. St. John Substation.

A new substation in the Fort St. John area would off-load the existing substation and shorten the distribution feeders, thus resolving both problems (Capital Plan p 64). The new substation will be able to reliably meet the projected load growth in the area stemming from anticipated oil and gas industry development north of Fort St. John. It will also alleviate many of the power quality issues on the local feeders by shortening the feeder lengths. Shorter feeder lengths will also reduce exposure to and impact from storm and motor vehicle related outages.

In addition, a number of smaller projects such as transformer additions or replacements have been identified in some areas to meet load growth as it occurs.

The Southern Interior

In general, the regional transmission system in the Southern Interior can accommodate growing regional demand and continues to meet the identified performance standards for the area. A number of smaller projects such as transformer additions or replacements have been identified in some areas to meet load growth as it occurs.

However, there are a number of local concerns regarding the reliability of supply provided by radial circuits. For example, load growth in the upper Columbia Valley has exceeded the capability of the Cranbrook-Invermere-Golden 69 kV system. During outages on 2L258 (Cranbrook to Invermere), the system load between Invermere and Golden must be shed to avoid a collapse of the underlying 69 kV system resulting in customer concerns regarding reliability. To address this situation, BCTC is investigating the feasibility of constructing a second 230 kV line from Cranbrook to Invermere by 2011. (Capital Plan P 76)

BCTC is also reviewing implications of local load growth and the performance of other long, radial feeders in the region.

The Lower Mainland Region

Two 230 kV transmission lines move power from Bridge River generation to Cheekye Substation (in Squamish) and over a 360 kV transmission line to Rosedale Substation east of Chilliwack.

Four 500 kV substations in the Lower Mainland (Cheekye, Meridian, Ingledow and Clayburn) form the main delivery points in the regional system. These stations provide bulk supply to the Lower Mainland and are linked by a series of 500 kV transmission lines (see Lower Mainland system map). An extensive network of 230 kV, 138 kV and 69 kV transmission lines deliver power to substations throughout the area.

As the primary load centre in the province, many of the issues in the region tend to be growth driven. However, due to its geographical location the region has significant seismic issues. Also, the age of some of the infrastructure (e.g., Murrin Substation in Vancouver was constructed in the mid-1940's), presents challenges related to ageing infrastructure.

Area Initiatives - Metro

Mt. Pleasant

Load growth in the south False Creek/Mount Pleasant area is relatively high, at 1.6% per year. Supply to this area is currently provided from Murrin, Mainwaring and Sperling Substations. The area load supplied from these substations is expected to increase from its current peak of 520 MVA[3] (2003) by 66 MVA to 585 MVA by 2007 and to 704 MVA by 2028. Each of these substations is nearing its existing capacity and new capacity must be added to meet the growing demand. In addition to a requirement to meet load growth, there are on-going seismic concerns

[3] To put this into perspective, residential customers in the BC Hydro system have an average coincidental peak of 2.86 kVA. 60 MVA (60,000 kVA) can serve approximately 21,500 customers(350 customers/ MVA)

with Murrin and its associated underground distribution facilities. Two main options have been identified to meet growth in this area: Expand the existing substations and construct new distribution duct banks or construct a new substation in the Mount Pleasant area.

A study is currently underway to determine the best option to address the load growth and seismic security issues identified.

2L43 (Capital Plan p 68)

Metro Vancouver is supplied by a network of 230 kV circuits. In the Burnaby and Vancouver area these circuits are predominantly constructed as underground cables. Many of these cables have been in service for more than 40 years and some of them are deteriorating. In addition to the risk due to ageing, all cables pass through areas of unstable ground in various locations and could be damaged in a moderate to major seismic event.

To address the issue of the ageing 230 kV cable circuits, BC Hydro embarked on a series of cable installation projects to address the ageing of 2L46 and 2L53 cables and address supply risks to downtown. The first phase of this project was construction of a new 230 kV circuit from Horne Payne Substation in Burnaby to Cathedral Square (2L33). The installation of this circuit provided a seismically secure supply to downtown and replaced the function of 2L46 (Newell-Mainwaring) which was retired. The second phase of this initiative is to construct a second new 230 kV cable from Sperling Substation (Vancouver Westside) to Cathedral Square (2L43). This project will provide support and a seismically secure connection between downtown Vancouver and the Westside and replace the function of the ageing 2L53 cable (Mainwaring – Murrin). A CPCN application will be submitted for this project.

Whistler (Capital Plan p 71)

Whistler is currently served from Rainbow Substation in the north. The two transformers at Rainbow Substation are forecast to reach their firm capacity of 117 MVA in the winter of 2006/2007 (and exceed the following winter). To provide reliable electrical service to Whistler and its surrounding area, more transformation capability must be added no later than November 2006.

Over the next ten years, the capacity shortfall in Whistler is projected to be approximately 31 MVA. This shortfall could increase to 60 MVA if the Municipality of Whistler relaxes it limits on bed unit growth and/or Terasen Gas does not expand the propane supply system. A new substation in the Function Junction area has been identified as the best option to meet load growth as it is the lowest cost option for reinforcing supply and ensuring an acceptable level of reliability for the 2010 Olympics.

Area Initiatives - Fraser Valley

Growth in the Fraser Valley has outpaced most other areas in the province. Load growth in Maple Ridge and Mission/Matsqui is expected to exceed existing supply in each those areas. New substations are proposed to meet this load growth.

Maple Ridge (Capital Plan p 67)

Maple Ridge is a high load-growth area with forecast growth of 4% over the next five years. The area load has a peak demand of approximately 143 MVA and this demand is forecast to increase to 246 MVA over the next 20 years. Major investments in transmission facilities are required to supply the forecast load growth. The existing capacity at both the Maple Ridge and

Whonnock Substations is fully utilised and an immediate increase is required. A short-term plan has been developed to ensure that the transmission system can operate within its firm capacity until reinforcements can be installed.

Mission & Matsqui (Capital Plan p 69)

The 69 kV transmission system in the Mission and Matsqui area is reaching its capacity on some supply circuits and substations. Specifically, the Maple Ridge circuits that supply the Mission area and Clayburn (CBN) and Sumas Way (SMW) Substations are near their capacity limits. Area capacity reinforcement is required by fall 2007 to meet planning criteria.

Mission Substation load has historically relied on power supplied from Ruskin (RUS) and Stave Falls (SFL) as well as support from Como Lake (COK) via 60L2/3/18 during low RUS/SFL generation levels. These Maple Ridge 69 kV circuits are now loaded to their full firm capacity and require additional area capacity support to avoid overloading during contingencies. The circuits supplying Mission (MIS) are also near their firm capacity levels and will be overloaded during contingencies.

The Matsqui area (Clayburn, Abbotsford, Sumas Way) loads are forecast to increase at greater than 3 percent annually (7-12 MVA/yr.) with station capacities reaching their firm limits by spring 2007. To meet forecast load growth, BCTC has proposed a new substation to be constructed east of Abbotsford. To address the firm capacity levels in the Mission and Matsqui areas, a new 230kV/69kV switchyard will be added to Clayburn Substation to supply the re-energization of an existing 69kV transmission line (60L14) between Clayburn and Mission.

Vancouver Island

The regional transmission system on Vancouver Island is comprised of a network of 230 kV, 138 kV and 60 kV systems. With additional supply to Vancouver Island provided by Duke Point and the proposed new 230 kV cable from Vancouver, the system is adequate to meet on-island load growth. Over time, minor modifications and transformer additions will be required to meet local area loads.

A new 132 kV transmission line will be constructed to connect Duke Point to Harewood Substation south of Nanaimo and the station will be expanded to receive the additional power by winter 2007.

The system on Vancouver Island has traditionally been load growth driven and designed to serve load. The potential for new generation opportunities on North Vancouver Island are transforming the area from one that is load driven to one that is driven by resource additions. As new generation resources are developed, system reinforcements will be required to move power out of the area to loads on south Vancouver Island or in the Lower Mainland.

3.0 Equipment Condition and Performance

BCTC has a number of Operations & Maintenance (OMA) as well as capital programs to ensure that the transmission system equipment and infrastructure provide reliable service and that equipment related outages are minimised.

The Transmission System is comprised of many different types of equipment, all performing specific and necessary functions. Each of these assets have a particular lifecycle, and eventually will have to be replaced or renewed in some fashion.

In 2004, BCTC commissioned the Asset Baseline Study (Baseline Study) to develop a baseline for BCTC's asset management programs. Acres International Ltd. was selected through a competitive process as the independent engineering firm to conduct this assessment, establish a baseline for asset health, and develop a framework of condition-based health indices for all assets managed by BCTC that can be repeated every three years.

The Baseline Study involved assessing the condition of thirty-three different classes of assets in the Transmission System including lines, cables, microwave, and transmission substation equipment. The Baseline Study relied on data supplied by BCTC for each asset class. While some field inspections took place, the Baseline Study did not involve monitoring or sampling or testing of any assets.

The Baseline Study used five standard categories of asset condition to report the results of a normalised health index. These designations provide directional guidance in the overall decision-making process:

Condition	Description	Requirements
Very Good	Some ageing or minor deterioration of a limited number of components	Normal Maintenance
Good	Significant deterioration of some components	Normal Maintenance
Fair	Widespread significant deterioration or serious deterioration of specific components.	Increase diagnostic testing, possible remedial work or replacement needed depending on criticality.
Poor	Widespread serious deterioration.	Start planning process to replace or rebuild considering risk and consequences of failure.
Very Poor	Extensive serious deterioration.	At end-of-life, immediately assess risk; replace or rebuild based on assessment.

Identified Issues

The condition of the Transmission System assets varies by asset class, but generally many assets are in good or very good condition. However, the Baseline Study did identify concerns with certain equipment. Below are the key findings from the study:

Assets in good or very good condition:

- **Gas Insulated Switchgear (GIS)** – 44.4% of GIS are in Good or Very Good condition.
- **High Pressure Air Systems (HPAS)** – 96.3% of HPAS are in Good or Very Good condition.
- **Batteries** – 94.4% of batteries are in Good or Very Good condition.
- **Conductor Systems** – 88% of conductor spans are in Good or Very Good condition.
- **Metal Support Structures** – 78.4% of the metal support structures are in Good or Very Good condition.

- **Underground and Submarine Cables** – Generally, these cables are in Good or Very Good condition.

Issues to Address

The Asset Baseline Study identified a number of areas of potential concern. BCTC is proposing projects in its Capital plan to address these issues. (Absence of page reference indicates non-capital program.)

- **Circuit Breakers (Capital Plan p 116)** – 14.8% of circuit breakers are in Poor or Very Poor condition. These include both Air Blast Circuit Breakers and SF_6 Circuit Breakers due to known design problems in certain models.
- **Shunt Capacitors (Capital Plan p 118)** – 4.5% are in Poor condition due to the presence of PCBs.
- **Protective Relays (Capital Plan p 108)** - 59% of protective measuring relays are considered to be in Poor condition and 29% in Fair condition due to age, obsolescence, and lack of spare parts.
- **Surge Arrestors (Capital Plan p 116)** – 58.7% are in Very Poor condition because they are technically inadequate to perform the duty required.
- **Station Grounding (Capital Plan p 118)** – There is currently not a program to measure station grounding levels, which may create unacceptable step and touch potentials during ground faults. This could present safety issues.
- **Fire Protection Systems (Capital Plan p 120)** – The available data show that 2.7% of the systems are in Very Poor condition since they are CO_2 based.
- **Microwave Equipment (Capital Plan p 126)** - 19% of equipment is in Fair condition due to decreasing reliability, lack of manufacturer support, and the need for bandwidth changes to conform to Industry Canada regulations.
- **Power Line Carrier Equipment (Capital Plan p 125)** - 60% of this equipment is in Fair condition based on BCTC's availability criteria.
- **Series Capacitors (Capital Plan p 118)** – 20.6% are in Fair condition and may need improvements, depending on the criticality of specific units.
- **HVDC Pole 1** – Overall, both HVDC Pole 1 Stations are in Poor condition. However, the mercury arc valves and their control equipment are kept in good working condition through an extraordinary operation and maintenance program that relies on the continued availability of spare parts, trained personnel, and special tools.
- **Vegetation/Rights-of-Way** – 48.9% of Vegetation/ROW circuit areas are reported in Fair, Poor or Very Poor condition.

4.0 Managing Risks

BCTC reviews the hazards and risks that could jeopardise the reliability of the transmission system. These risks include ice storms, fire, earthquakes and weather related events such as windstorms or lightning. Each of these risks is analysed based on the probability of the event and the expected impact. Risks are then prioritised based on magnitude of the consequences. For example, a risk that could potentially result in the large customer outage (such as substation) would be a higher priority than the loss of a single element whose impact could be contained. BCTC has ongoing risk management programs to address each of these hazards. Over the past year, new initiatives have been developed to address ice and seismic risk.

BCTC recently established a seismic task force to develop a seismic risk program specifically for the Transmission System. This program has identified appropriate seismic performance criteria for various system elements (lines, stations and communication sites) and will establish

priorities. Facilities in the Lower Mainland and Vancouver Island will be a high priority due to their geographic vulnerability and dense load centres. BCTC plans to have this program fully established by March 15 2006.

The Transmission System is also vulnerable to severe ice storms. Three locations have been identified as being particularly vulnerable – the Fraser Valley east of Langley, the Howe Sound/Pemberton corridor and the Skeena River area in the north.

The transmission systems in the Fraser Valley and Howe Sound/Pemberton areas are critical to the supply to Greater Vancouver during the winter period. To address this concern, BCTC has been studying a number of reinforcement options to ensure adequate supply is available. The need to reinforce portions of 230 kV and 500 kV lines in these two critical corridors was identified. These reinforcements have been identified as priorities based the probable magnitude of ice, the probability of structure failure, the consequence of failure, the cost to reinforce and the best benefit/cost ratios. BCTC is presently engaged in the definition stage of this work. It is expected that a capital program will result to structurally reinforce these critical paths over the next 3 to 4 years.

5.0 System Control and Communications Systems

BCTC's System Control Centres

BCTC has five control centres: one System Control Centre in Burnaby and four Area (regional) Control Centres -- one each in region (Duncan on Vancouver Island, Vernon, Prince George and Vancouver). These centres perform a combination of transmission, generation and distribution operations. In addition, there is a local control facility at GM Shrum near Hudson Hope and a Telecommunications Network Operations function at BC Hydro's offices in Burnaby.

The five centres are all using older versions of control systems (Energy Management (EMS) and Supervisory Control and Data Acquisition Systems (SCADA)) that are based on a mid-1980s computer technology platform. The EMS and SCADA systems are critical to maintaining system reliability.

In 2003, BCTC initiated an evaluation of the existing control centre technology and assessment of alternative solutions for upgrading and/or replacing current facilities. The recommended solutions provided for:

- The replacement of obsolete technology that was:-
    - no longer vendor supported;
    - costly to maintain;
    - experiencing data base errors causing customer outages;
    - unable to respond quickly to changes in market needs, and
    - unable to implement new stations and displays effectively;
- The upgrade of control centres to meet more stringent seismic criteria to be implemented in 2005;
- A geographically separate back up for the System Control Centre to ensure systems are available and minimize risk of disruption from a seismic or other event that prevents the System Control Centre from functioning;

- The reduction of costs and increase in efficiency from consolidating multiple control centres into a single control centre; and

- The relocation of the System Control Centre from the existing site, which had no space to allow for expansion or control centre consolidation and which was subject to a lease expiring in 2016 with no renewal option, to a site controlled by BCTC.

In 2004, BCTC applied to the Commission for a CPCN for the SCMP. The project will replace the existing outdated system operations technology, consolidate the current number of control centres, and replace the existing control centre buildings to meet applicable seismic standards. This project was approved on February 15, 2005 by Commission Order C-1-05 and is expected to be in-service by 2008. The existing control centres and equipment will continue to be maintained until the new facilities are in service.

Communication Systems

BCTC operates an extensive private telecommunications system to support power system protection, control and business requirements. A variety of telecommunications transport systems are used, depending on technical requirements, economics and WECC reliability requirements. These include microwave, power line carrier, fibre-optic cable, copper pairs and leased line. A point-to-point microwave communications system provides the majority of the communications needs of the bulk 500 kV transmission system. This high speed, high reliability system is an integral component of the protection relaying system, remedial action schemes, substation control, and generation dispatch systems. The microwave system is interconnected with similar systems on the BPA and Alberta systems. While its primary purpose is for power system protection and control, the telecommunications system also provides a low-cost alternative to the public network for internal voice and data traffic.

These telecommunications systems are used for:

- High speed protective relaying;
- Supervisory Control and Data Acquisition (SCADA);
- Remote monitoring;
- Automatic Generation Control;
- Remedial Action Schemes;
- Dispatch intercom;
- Wide Area Network for data traffic; and
- Inter-utility voice and data traffic.

Telecommunications (Capital Plan pages 126–128): A large portion of the telecommunications infrastructure requires systematic replacement to meet power system reliability and business requirements. This is primarily due to ageing equipment, which is experiencing failures, unavailability of spare parts, and lack of manufacturer support. Other drivers include increased need for rapid and interactive information exchange. Some of these requirements are addressed by moving from analog to digital communication services. Due to the importance of the telecommunications system to BCTC's system operations, standby generators provide back up power at critical locations. In the recent baseline audit, a number of standby generators were discovered to be in fair condition. Depending on the importance of the facility, a program to replace these standby generators may be considered.

The Microwave System (Capital Plan p 126): The microwave system consists of 240 microwave and repeater sites and associated equipment. Due to increasing unreliability, lack of manufacturer support, and the need for bandwidth changes to conform to Industry Canada regulations, BC Hydro initiated a program in the late 1900s to replace the analog microwave system with new digital equipment in four phases. Eight sites on northern Vancouver Island were completed in 1998/1999. The second phase, comprising 42 sites on the Mica-Kootenay system, was completed in 2001. The third phase, involving 30 sites in the Lower Mainland and southern Vancouver Island, was completed in 2003. The final stage, comprising 25 sites on the Peace and Skeena systems, is scheduled for completion in 2004/2005. As well, the MCC-Lookout site in the Sumas-Custer line will be replaced to improve communications with BPA.

The Power Line Carrier System (PLC) (Capital Plan p 125): Power Line Carrier systems are used extensively on 230 kV, 138 kV and 60 kV transmission lines to provide line protection, station supervision, telemetry and voice communications. A PLC system consists of PLC terminal, a line tuning unit, coupling capacitor and line trap. PLCs are used where a low channel requirement exists and economics do not warrant an alternative solution. The majority of PLC terminals over 30 years old are no longer supported by their manufacturers. Age, condition and traffic requirements are driving replacement of these units. A four-year replacement program has been developed to replace the PLC systems at transmission and generation sites. There are a total of 196 PLC terminals in service, of which 110 terminals require replacement. Phase 1 of the program completed replacement of 12 terminals in 2003. Phases 2, 3 and 4 will cover replacements of 30, 38 and 24 further terminals, respectively. In addition, some PLC and leased line circuits are being replaced with fibre optic systems due to increased traffic and bandwidth requirements.

BCTC's strategy for PLC equipment is to meet availability requirements at the lowest long-term cost. BCTC is currently in the process of upgrading the PLC equipment to improve its reliability. The older PLC equipment still in service is currently functional, but obsolete.

APPENDIX 1
DEFINITIONS

Abnormal operating conditions: The conditions that exist when transmission facilities are out of service, emergency conditions exist, construction or commissioning of transmission facilities occur or situations when transmission facility maintenance cannot be coordinated with generation outages.

Adequacy is the ability of the electric system to meet peak demand of customers at all times, taking into account any scheduled and reasonably expected unscheduled outages of system elements.

Alternating current: Electric current that reverses at regular intervals and has alternating negative and positive voltage.

Ampere: The basic unit of measurement for the strength of an electric current.

Ancillary services: Services required to support the safe, reliable and stable operation of the interconnected system and maintain reliability.

Apparent power: Voltage multiplied by current, normally measured as megavolt amperes (MVA).

Available Transfer Capability (ATC): Unit of measure for the transfer capability remaining in the physical transmission network for further commercial activity, over and above committed uses.

Base load: The minimum amount of electricity required over a period of time at a steady rate.

Blackout: Loss of all electrical load within a given area.

Brownout: The reduction of electrical voltages caused by customer demand being higher than anticipated or by the failure of the generation, transmission or distribution system. A brownout results in lights dimming and motor-driven devices slowing down.

Bulk electric system: The portion of the electric utility system, which encompasses the electrical generation resources, transmission lines, interconnections with neighboring systems, and associated equipment, generally operated at voltages of 69 kV or higher."

Bus: A group of conductors that serve as a common connection for two or more system elements.

Capacity: The amount of electricity that a transmission facility can transfer at any given time.

Capacitor bank: A set of electrical devices used to maintain or increase transmission voltage by providing reactive power.

Cascading: The uncontrolled and successive loss of system elements triggered by an incident at one location. Cascading results in widespread service interruption that cannot be restrained from spreading beyond an area.

Circuit: A conductor or a system of conductors through which electric current flows and can be automatically segregated by circuit breakers or fuses.

Circuit breaker: A protective switch which automatically interrupts the flow of an electric current in case of an overload, electrical fault, or short circuit.

Conductor: A substance or body, usually in the form of a wire, cable or busbar, that allows a current of electricity to pass continuously along it.

Congestion: Congestion occurs when the amount of transfer capacity requested by customers exceeds the existing capacity of the circuit or system.

Connection: The physical junction (e.g., transmission lines, transformers, switch gear, etc.) between two electric systems permitting the transfer of electric energy.

Constraint: A restriction on a transmission system or segment of a transmission system that limits the ability to transmit power between various locations. A path rating establishes the limits of power flow across defined paths often defined as the total transfer capability. The path rating is established taking into account physical limitations, such as the thermal limits of a transmission elements; local voltage and stability restrictions, or contingency limits that are established to assure secure operations in the event of an unexpected failure of a transmission elements or a generation facility.

Contingency: An event occurring on the transmission system that results in the loss of a system element.

> **"largest single generation contingency"** means the loss of an element that would result in the largest loss of generation measured in MW. This contingency includes more then one generator if a single elements outage could result in a prolonged outage of associated generators i.e., a combined cycle turbine outage may result in the outage of an associated steam generator or a interconnection transformer may result in the outage of more than one generator.
>
> **"single contingency"** - The loss of a single system element under any operating condition or anticipated mode of operation. Single contingency events include the outage of a generator, single transmission circuit or a transformer.
>
> **"multiple contingency"** - The loss of two or more system elements caused by unrelated events or by a single low probability event occurring within a time interval too short (less than ten minutes) to permit system adjustment in response to any of the losses.

Control area: An electric power system or combination of systems managed through a common control system.

Criteria: The standards on which a judgment or decision may be based.

Current: Flows of electricity passing through a conductor, measured in amperes. Current can either be alternating (AC) or direct (DC).

Cycle: The single complete series of changes in voltage and current direction of an alternating electric current. The standard used in North America is 60 cycles per second. One cycle is equal to 1/60th of a second or 17 milliseconds.

DC (direct current): Current that flows continuously in the same direction (as opposed to alternating current). The current supplied from a battery is direct current.

Demand: The rate at which electric power is delivered to or by a system; it is generally expressed in kilowatts (kW) or megawatts (MW).

Average demand: The electric energy delivered over any interval, when expressed in kilowatts or megawatts, it is determined by dividing the total energy by the units of time in the interval.

Coincident demand: The sum of two or more demands that occur in the same time interval (e.g., peak load hour)

Peak demand: The maximum instantaneous demand on a power system. Normally the hourly maximum demand.

Derating: Reducing the energy or capacity rating of a piece of equipment to reflect the fact that it can operate only below its original design rating because of site conditions, a deficiency or its physical condition. A derating can be temporary or permanent.

Dispatch: The monitoring and regulation of an electrical system to provide coordinated operation; the sequence in which generating resources are called upon to generate power to serve fluctuating loads.

Dispatchable: A supply or demand resource whose output can be adjusted for short-term variations in load or resource balance due to weather changes, unit outages, market price changes and non-power considerations.

Double Circuit: A transmission line having two separate circuits on a single structure.

Dynamic VAR control devices: A device that can rapidly vary its reactive power output in response to control signals.

Economic dispatch: A method of managing the operation of generation and transmission facilities to produce the most cost-effective result. Economic dispatch most commonly involves the selection of the lowest-cost available generating units.

Electro-mechanical Stability: The condition of operation of an AC electrical system based on all generators operating in synchronism; that is, at the same frequency and in-phase with each other and able to withstand normal disturbances that could otherwise cause instability. The instability can occur within a fraction of a second or minutes. It can result in the electrical breakup of the transmission system into several sections and a widespread interruption of the electrical load or blackouts. See also **Transient Stability.**

Element: Any electric device with terminals that may be connected to other electric devices, such as a generator, transformer, circuit breaker, bus section or transmission line. An element may be comprised of one or more components. A fault on an element usually results in the clearing of one protective zone by circuit breakers.

Emergency rating: The rating, as defined by the facility owner, that specifies the level of electrical loading (generally expressed in megawatts or other appropriate units) that a facility can support or withstand for short periods of time.

Fault: An event occurring on an electric system where abnormally high current flows resulting in the operation of a protection device or such as a short circuit, or a total interruption of an electrical circuit.

Firm Export: The assured sale of a contracted amount of energy and/or capacity to utilities or customers located outside the boundaries of BC.

Firm load: The load that BCTC will use reasonable best efforts to supply without interruption.

Firm Transmission: Transmission service that is reserved and/or scheduled with a priority that will not be interrupted for economic reasons.

Forced outage: An unplanned component failure (immediate, delayed, postponed, startup failure) or other condition that requires the unit be removed from service immediately or before the next weekend.

Frequency: The number of cycles through which an alternating current passes in a second. The North American standard is 60 cycles per second, known as 60 hertz.

Generation: The process of producing electric energy by transforming other forms of energy such as steam, heat or falling water. Also, the amount of electric energy produced, expressed in kilowatt-hours (kWh) or megawatt-hours (MWh).

Gigawatt: a thousand megawatts or one million kilowatts.

Gigawatt hour: One million kilowatt-hours—an amount of electric energy that will serve about 100 residential customers for one year.

Grid: The layout of an electrical transmission system.

Heavy Load Hours (HLH): Generally speaking, this refers to the time of day on a system that would be considered peak demand.

Impedance: The opposition in an electrical circuit to the flow of alternating current (AC). The ratio of electromotive force to the effective current.

Interchange: Electric power or energy that flows between British Columbia and other jurisdictions such as Alberta or Washington State.

Interconnected system: A system consisting of two or more individual electric systems that normally operates in synchronism and have connecting tie lines.

Intertie: A transmission line that interconnects the Transmission system with other utilities and jurisdictions outside of B.C. Used interchangeably with tie line.

Kilowatt: One thousand watts; the commercial unit of electric power. A kilowatt is the flow of electricity required to light ten 100-watt light bulbs.

Light Load Hours (LLH): Generally speaking, the term for the time of day on a system that could be considered off peak.

Limiting element: The device in a system that has the lowest energy rating, thereby setting the maximum amount of energy that can be transferred.

Load: The amount of electricity required by a customer or group of customers as measured by an electrical metre.

Load centre: The region where the majority of electricity customers are located.

Load forecast: The expected customer electricity requirements that will have to be met by the electrical system in future years.

Load shedding: Removal of pre-selected customer demand from a power system, as a result of the occurrence of an abnormal condition, in a effort to maintain the integrity of the system and minimise overall customer outages.

Mega VAr" or **"MVAr:** 1 million VArs or 1000 kiloVArs of reactive power.

Most critical generator: The generator outage that results in the worst system performance during subsequent outages and includes additional generators if a single element outage could result in a prolonged outage of associated generators i.e., a combined cycle turbine outage may result in the outage of an associated steam generator or an interconnection transformer may result in the outage of more than one generator.

Must Run Units: A specific generating unit that has been designated by the system operator to be on line or on the grid to insure the flow of electricity. This must run unit is outside of economic dispatch and may or may not be a system's most efficient unit. A unit may be designated as must run for operating reasons that may include system reliability, voltage control or system stability.

MVA: Mega Volt Amperes. See **Apparent Power**.

MW: Megawatt(s) or means 1 million watts or 1000 kilowatts of real electrical power.

MWh: Megawatt hour(s). A unit of energy.

MCR: (Maximum Continuous Rating): The maximum output a plant can sustain on a continuous basis and prescribed conditions.

N-1: A single system contingency event involving the loss of one component.

N-2: A double system contingency event involving the loss of two components.

NERC: The North American Electric Reliability Council.

Non-firm transmission service: Point-to-point transmission service that is scheduled and paid for on an as available basis and is subject to interruption.

Non-spinning reserve: Generating units that are not connected to the system but are capable of coming on line within a specified time, or interruptible load that can be removed from the system in a specified time.

Normal operating conditions: Conditions where all transmission facilities are available for service including generators.

Operating reserves: The generation capability above that required for system demand to provide for regulation, load forecasting errors, equipment forced and scheduled outages and local area protection.

Operator: The party in control of the physical operation and maintenance of a well or other facility.

Outage: Periods, both planned and unexpected, during which power system facilities (generating unit, transmission line or other facilities) cease to provide generation, transmission or the distribution of power.

Over frequency: The abnormal operating state or system condition that results in a system frequency above the normal 60-hertz.

Path: A transmission line or set of lines that carry energy from one region to another.

Path rating: The rating assigned to the transmission facility when it was placed in service and rated in accordance with reliability standards. Related to transfer capability.

PCR: (peak continuous rating) means the maximum rating a generator can produce for a prescribed period of time and conditions.

Peak demand: The maximum load during a specified period of time.

Phase-shifting transformer: Also called phase angle regulators, these devices are a special kind of transformers that induce a power flow into a circuit, in order to increase or decrease the power loading of that circuit by inserting a voltage phase angle difference.

Planned outage: The removal of a unit from service to perform work on specific components that is scheduled well in advance and has a predetermined duration (e.g., annual overhaul, inspections, testing).

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POD (Point Of Delivery): A conceptual point of delivery from the transmission system. A POD is the point at which energy is deemed to be delivered from the transmission system to the customer.

PTP (point-to-point): The transmission of power from one point to another point.

Post transient: The state of equilibrium of a power system after a transient event.

Power factor: The power factor is the ratio of active power (kW) to **apparent power** (kVA) in a circuit. It varies between 0 and 1, and is normally given in percent (0 to 100%).

Power Transfer Capability: The power that can be transferred over a particular section of a transmission system in a reliable manner.

Radial transmission: A transmission system that is not networked and does not provide multiple parallel flow paths.

Radial customer: A customer served from an electric system in which the electrical service is through a single transmission element.

Reactive power: Reactive power is the power required to maintain the flow of electrical energy and maintain voltages at acceptable levels.

Reinforcement: Improvements in the electrical system to maintain or increase reliability and security of supply, or increase power transfer capability.

Reliability: The degree of performance of the elements of the bulk electric system that results in electricity being delivered to customers within accepted standards and in the amount desired. Reliability may be measured by the frequency, duration, and magnitude of adverse effects on the electric supply. Electric system reliability can be addressed by considering two basic and functional aspects of the electric system adequacy and security.

> Adequacy: The ability of the electric system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements.
>
> Security: The ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system elements.

Reliability criteria: A set of standards and principles used to design, plan, operate, and assess the adequacy of an electric system and refers to the BCTC Reliability Criteria except where otherwise noted.

Reliability Must-Run Generation (RMR): Generation resources in a given area constrained to operate at a minimum specified MW output level in order to maintain system security. In BC, reliability must run generation resources are essentially located in the coastal generation region, which includes the Vancouver Island and Lower Mainland areas.

Remedial action scheme (**RAS**)**:** Protection schemes designed to perform pre-planned corrective measures following a system disturbance to ensure an acceptable level of performance or equipment protection. Most of these schemes provide high speed automatic system switching actions such as generation shedding, load shedding and switching station reactive power devices.

Rights-of-way: The land rights acquired by a utility to allow the construction and operation of electrical transmission or distribution facilities.

Safety net system: A control system that protects the system from widespread cascading outages and loss of load. Systems include under frequency load shedding, and under voltage load shedding.

Single pole trip and reclose (SPT&R): A transmission circuit protection system which is capable of opening only the faulted phase of a circuit for single phase faults and successfully reclosing after the fault has been cleared.

Spinning reserve: Unused capacity available from units connected to and synchronised with the grid available to respond instantly to system requirements.

Stability: The stability of a power system is its ability to develop restoring forces equal to or greater than the disturbing forces so as to maintain a state of equilibrium.

Stability limit: The maximum power flow possible through some particular point in the system while maintaining stability, during both normal and defined contingencies, in the entire system or the part of the system to which the stability limit refers.

Steady state: The operation of a power system with no disturbances or after regaining equilibrium after a disturbance.

Standard: Something established by authority, custom, or general consent as a model or example.

Substation: Facility equipment that switches, changes or regulates electric voltage. An electric power station which serves as a control and transfer point on an electrical transmission system. Substations route and control electrical power flow, transform voltage levels, and serve as delivery points to industrial customers.

Summer rating: The rating a piece of equipment is given when summer ambient weather conditions prevail.

Switching station: A facility for switching electrical elements.

Synchronism: The timing of alternating current generators so that their voltage waves go through their maximum and minimum values at exactly the same rate.

System: Integrated electrical facilities that may include generation, transmission, distribution, protection, control and communications facilities.

System Stability: The ability of all parts of an electrical system to remain synchronised following an electrical disturbance such as the interruption of a transmission line. See also **Transient Stability**

Terminal Station: The station at the end of a high voltage transmission line or cable circuit.

Thermal rating: The maximum amount of electrical current that a transmission line or electrical facility can conduct over a specified time period before it sustains permanent damage by overheating or before it violates public safety requirements.

Tie line: A circuit connecting two or more systems and used interchangeably with intertie.

Total Transfer Capacity (TTC): The total amount of power that can be transferred reliably over a transmission circuit or path.

Transfer capacity: The ability of interconnected electric systems to move or transfer power *in a reliable manner* from one area to another over all transmission lines (or paths) between those areas under specified system conditions. The units of transfer capability are in terms of electric power, generally expressed in megawatts (MW).

Transformer: An electrical device for changing electricity from one voltage to another.

Transient: The period when a power system is moving from one state of equilibrium to another (post transient) state.

Transient stability: A transient event can be a lightning strike, line fault, or equipment failure resulting in a short circuit. Transient instability occurs when, due to a short-circuit, some generators accelerate and others decelerate so that the usual stabilising forces cannot restore the generators to synchronous operation. The result of transient instability can be widespread blackouts. Transient phenomena can occur very quickly (typically in less than a second) due to a transient event.

Transmission: The network of high voltage lines, cables, transformers and switches used to move electrical power from generators to the distribution system. Also utilised to interconnect different utility systems and independent power producers together into a synchronised network. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Transmission circuit: A set of wires energized at transmission voltages extending beyond a substation which has its own protection zone and set of breakers for isolation.

Transmission line: A set of structures, wires and insulators that together make up one or more transmission circuits.

Transmission losses: The power lost in transmission between one point and another. It is measured as the difference between the net power passing the first (delivery) point and the net power passing the second (receiving) point.

Transmission reliability margin (TRM): The amount of transmission transfer capability set aside to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions.

Trip: The disconnection or breaking of a circuit, usually in context of an automatic interruption of the circuit such as the opening of a circuit breaker.

Underfrequency: The abnormal operating state or system condition that results in a system frequency below the normal system operating frequency of 60-hertz.

Vars: Volt-amp reactive, a measure of reactive power.

Voltage collapse: A catastrophic voltage drop in a region where the transmission and distribution system is incapable of supplying the load. A system enters a state of voltage collapse or instability when an increase in load, system disturbance or change causes voltage to drop quickly or drift downward, and automatic and manual system controls are unable to halt the decay. Voltage collapse may take anywhere from a few seconds to minutes.

Voltage control: The control of transmission voltage adjustments in generator reactive output and transformer taps, and by switching capacitors and inductors on the transmission and distribution systems.

Voltage instability: A system state in which an increase in load, disturbance, or system change causes voltage to decay quickly or drift downward, and automatic and manual system controls are unable to halt the decay. Voltage decay may take anywhere from a few seconds to tens of minutes. Unabated voltage decay can result in angular instability or voltage collapse.

Voltage limits:

> Normal Voltage Limits The operating voltage range on the interconnected systems that is acceptable on a sustained basis.
>
> Emergency Voltage Limits The operating voltage range on the interconnected systems that is acceptable for the time sufficient for system adjustments to be made following a facility outage or system disturbance.

Voltage recovery: The nature of voltage returning to an equilibrium state after a transient event.

Voltage stability: The ability of the electrical transmission system to withstand the failure of a system element such as a line or transformer without **voltage collapse** at the receiving (customer) end of the system.

Watt: The basic unit of electric power equal to one joule per second.

WECC: The Western Electricity Coordinating Council.

Wheeling: The movement of electricity from one system to another over transmission facilities of the intervening systems.

Winter rating: The rating a piece of equipment is given when winter ambient weather conditions prevail.

APPENDIX 2

STATION ACRONYMS

ABA	ALBREDA-TRANS MOUNTAINS
ABF	ABERFELDIE G.S.
ABP	ABBOTSFORD POWER SMART CENTER (closed)
ABT	ABBOTSFORD SUBSTATION
ABW	ALBRIGHT & WILSON AMERICAS (NOW SPC
ABY	ALERT BAY G.S.
ACK	ASHTON CREEK SUBSTATION
ACL	ACLAND ANPRODOME (VHF) REPEATER
ADC	ARNOTT DC TERMINAL
ADL	ADAMS LAKE SUBSTATION
AFP	APOLLO FOREST PRODUCTS
AFT	ASHCROFT SUBSTATION
AHM	ANAHIM LAKE D.G.S.
AIA	ABBOTSFORD INTERNATIONAL AIRPORT
AIR	AIYANSH REPEATER
AKO	ALKOKOLEX
ALC	ALICE LAKE REPEATER SITE
ALD	ALDERGROVE SUBSTATION
ALG	ALEX GRAHAM (VHF)
ALH	ARROW LAKES HYDRO G.S.
ALN	ALCAN
ALP	ALPINE SUBSTATION
ALR	MOUNT ALLARD
ALT	ALTA LAKE MICROWAVE REPEATER STN.
ALU	ALOUETTE GENERATING STATION
ALZ	ATCHELITZ SUBSTATION
AMC	AMERICAN CREEK CAPACITOR STN.
AMX	AMAX OF CANADA
AN2	ANNACIS ISLAND SUB #2
ANC	AQUILA NETWORKS
ANN	ANNACIS ISLAND SUBSTATION
ANP	ATSUKI NYLON PLANT
AON	AFTON-OPERATING CORP.
AOT	AHOUSAT DGS (DISMANTLED)
APP	PACIFICA PAPERS
APT	CANADIAN AUTOPARTS TOYOTA
ARD	ARROW DAM SUB. (DISMANTLED)
ARL	ARROW RESERVOIR (LOWER)
ARM	ARMSTRONG SUBSTATION
ARN	ARNOTT SUBSTATION
ARW	ARROW LAKE RESERVOIR (UPPER)
ASH	ASH RIVER G.S.(ELSIE LAKE)
ASK	AH-SIN-HEEK DGS
ATH	ATHALMER SUBSTATION
ATK	POINT ATKINSON
ATL	ATLIN D.G.S.
AVO	AVOLA SUBSTATION

AWH	ARROWSMITH REPEATER
AWL	AINSWORTH OSB SUBSTATION
AWT	ANNACIS ISLAND WASTEWATER TREATMENT PLANT
AXC	ALEXANDER CREEK SUBSTATION
AYH	AIYANSH SUBSTATION
BAB	BABINE LAKE SUBSTATION
BAD	BALD MOUNTAIN
BAL	BALFOUR SUBSTATION
BAM	BAMFIELD DGS #2 (DISMANTLED)
BAR	BARRIERE SUBSTATION
BBD	BOSTON BAR D.G.S.
BBE	BOUNDARY BAY ELECTRODE
BBH	BOSTON BAR HYDROELECTRIC GEN-IPP
BBN	BAMBERTON SUB. (DISMANTLED)
BBR	BOSTON BAR SUBSTATION
BBS	Big Bend Substation
BBY	BURNABY MOUNTAIN CONTROL CENTER
BCC	BC CHEMICALS
BCH	BC Hydro System
BCI	BUCKEYE CANADA INC.
BCK	BRITT CREEK SWITCHING STATION
BCL	B.C. COAL (renamed Elkview Coal EV1)
BCM	B.C.CHEMICAL CHLORATE #4
BCR	BC RAIL
BCS	BCH SECURITY
BCT	BC Timber (renamed Skeena Cellulose)
BDC	BOULDER CREEK
BDD	BOUNDARY PLANT/PROJECT
BDM	BRENDA MINES
BDR	BOULDER MICROWAVE STN.
BDW	BRANDYWINE IPP
BDY	BOUNDARY SUB
BEA	BEAR MOUNTAIN
BEC	BEAR CREEK (SEE JOR)
BEL	BELLA BELLA DGS
BGA	BRIDGE RIVER AREA
BGB	BIG BAR REPEATER STATION
BGC	BRIDGE RIVER CONTROL
BGR	BEAR RIDGE REPEATER
BGS	BURRARD GENERATING STATION
BGY	BINGLEY MOUNTAIN (VHF) REPEATER
BHQ	BOUNDARY HEADQUARTERS
BIG	BIG EDDY DYKES
BIS	BISSETT
BKL	BROCKLEHURST SUBSTATION
BKR	BAKER MICROWAVE REPEATER STN.
BKY	BUCKEYE CANADA INC.(RENAMED BCI)
BLA	BELLA COOLA DGS
BLD	BURNS LAKE POWER DISTRICT

BLH	BULLHEAD MICROWAVE STATION
BLK	BOUNDARY LAKE
BLM	BULLMOOSE MINE
BLR	BELL COPPER-MACLAREN FOREST PRODUCT
BLS	BROWN BEAR LAKE D.C.P.
BLU	BLUE RIVER SUBSTATION
BLW	BARLOW SUBSTATION
BLZ	BLIZZARD MICRO. REPEATER STATION
BMM	BULLMOOSE MOUNTAIN (VHF) REPEATER
BMN	BEAR MOUNTAIN (VHF) REPEATER
BMP	BINGHAM PUMPS (SULZER)
BMR	BOSTON BAR REPEATER
BND	BARNARD SUBSTATION
BNI	BOWEN ISLAND
BNT	BURNETT ROAD TERMINAL STATION
BOD	BODWELL SUB. (DISMANTLED)
BOM	BOARD MILL
BOR	BORDER
BOT	BOTANIE MOUNTAIN (VHF) REPEATER
BP1	Ballard Power Systems
BP2	BALLARD POWER PLANT
BPA	BONNEVILLE POWER
BQR	BOB QUINN REPEATER
BR1	BRIDGE RIVER G.S. #1 & TERZAGHI DAM
BR2	BRIDGE RIVER G.S. #2
BRA	BRALORNE SUBSTATION (DISMANTLED)
BRC	BYRON CREEK COAL-CORBIN CREEK RES.
BRD	BRILLIANT (WKP)COMINCO/BCH EXPAN.
BRG	BUTLER RIDGE (VHF) REPEATER
BRK	BEAR CREEK HYDRO
BRL	BROWN LAKE Hydro Electric Plant
BRM	BULL RIVER MINERAL
BRN	BURNS LAKE SUB.
BRP	BC RAIL POLE (SETON LAKE)
BRU	BRUCE PEAK MICROWAVE STATION
BRX	BRILLIANT EXPANSION
BSS	BOSS MOUNTAIN SUBSTATION
BTA	BRITANNIA SUBSTATION (DISMANTLED)
BTL	BUTTLE RESERVOIR
BTS	BRILLIANT TERMINAL STATION
BUL	BULKLEY AREA TRANS. SYSTEM
BUT	BURRARD THERMAL SUBSTATION (see BGS for Gen Stn)
BVC	BEAVER COVE SUBSTATION
BVY	BEAVERLEY SUBSTATION
BWD	BRENTWOOD SUBSTATION
BWN	BOWEN ISLAND MICROWAVE STATION
BXR	BAXTER (WAS KNOWN AS CK1)
BYD	BURRARD YARROW SHIPYARD

BZA	BONANZA MOUNTAIN REPEATER STATION
CAL	Callaghan Creek IPP
CAM	CAMBIE SUBSTATION
CAP	CAPILANO SUBSTATION
CAR	CAMBIE ROAD (RENAMED 'CAM')
CAT	MOUNT CARTIER SEISMOGRAPH (VHF) REP
CBC	CARBON CREEK (VHF) REPEATER
CBH	CAMPBELL HILL REPEATER STATION
CBK	CRANBROOK SUB
CBL	CAMPBELL RIVER SUB
CBN	CLAYBURN SUBSTATION
CBP	CARIBOO PULP & PAPER SUBSTATION
CBR	CAMPBELL RIVER SYSTEM
CBY	CRANBERRY LAKE RADIO REPEATER
CCB	CAPE COCKBURN CABLE TERMINAL
CCD	COMINCO COPPER DIVISION
CCG	CLYDE COATES CO-GENERATION IPP
CCP	CENTRAL COAST POWER CORPORATION
CCR	COQUITLAM CENTRE VAULT
CCW	CACHE CREEK WOODCHIPS.GEORGIA PAC.
CFE	CRESTBROOK FOREST INDUSTRIES (ELKO)
CFI	CROWN FOREST INDUSTRIES(FRASER ML)
CFM	CANADIAN FOREST PRODUCTS MDF PROJ.
CFT	CROFTON MILL SUBSTATION
CHA	CHASE (VHF) A.T.B. REPEATER
CHC	CHAPMAN CAMP (PREVIOUSLY KM2)
CHF	CHIEF LAKE SUBSTATION
CHG	CHINGEE (VHF)
CHI	CHINA CREEK
CHK	CHILLIWACK SUBSTATION
CHL	CHARLIE LAKE RADIO STATION
CHN	CHEMAINUS REPEATER
CHP	CHAPMANS CAPACITOR STN.
CHR	CHUWANTEN MTN REPEATER
CHS	CHASE SUBSTATION
CK5	CHEEKYE 500kV SUBSTATION YARD
CKB	CHECKERBOARD SLOPE
CKP	CRANBROOK POWER SMART CENTER - Closed
CKY	CHEEKYE SUBSTATION
CLA	CLAYTON FALLS GENERATING STATION
CLB	COLEBANK SUBSTATION
CLD	COLWOOD SUBSTATION
CLL	CONTINENTAL LIME (PAVILLION)
CLN	CLINTON SUBSTATION
CLT	COULTER MOUNTAIN REPEATER STATION
CLV	CLEVELAND DAM SUBSTATION
CLW	CLEARWATER SUBSTATION
CMB	COAST MOUNTAIN BUS CO. LTD.
CMC	COMOX DAM

CMH	CONUMA RIVER HATCHERY-FISHER.& OCNS
CML	CAMPBELL RIVER LODGE
CMM	Cummins BC (Cummins Western Canada)
CMN	CHEMAINUS SAWMILL (DISMANTLED)
CMO	COAL MOUNTAIN OPERATIONS
CMR	CAMERON LAKE REPEATER
CMS	CHEAKAMUS GENERATING STATION
CMT	CRAIGMONT SUBSTATION (DISMANTLED)
CMX	COMOX SUBSTATION
CNB	CN BOSTON BAR
CNG	CANADIAN NATIONAL GISCOME
CNH	CANADIAN MOUNTAIN HOLIDAYS
CNL	CANAL FLATS SUBSTATION
CNM	CANOE MOUNTAIN (VHF) REPEATER
CNP	CROWN PACKAGING LTD. (renamed NAC)
CNR	CANADIAN NATIONAL RAIL
CNT	CROWSNEST-ALBERTA NATURAL GAS
CNY	CANYON POWER IPP
COC	CANADIAN OXY CHEMICAL-HARMAC
COF	COFFEE CREEK SUBSTATION
COH	COMOX HARBOUR
COK	COMO LAKE SUBSTATION
COM	CLOWHOM GENERATING STATION
COP	CANADIAN OXY INDUSTR. CHEM.(SEE NXC
COR	CORRA LINN (WKP)
COS	CANADIAN OXY-SQH CHLORINE
COU	COURSIER DAM-WALTER HARDMAN STORAGE
COX	COMOX RIVER NR COURTENAY
CPC	COLUMBIA POWER CORPORATION
CPG	CPR GOLDEN
CPH	CROFTON PUMP HOUSE
CPM	COPPER MOUNTAIN MICRO REPEATER STN
CQD	COQUITLAM DAM
CQM	COQUITLAM SUBSTATION
CRB	COLUMBIA RIVER DEVELOPMENT
CRC	CRESTBROOK FOREST IND.(CANAL FLATS)
CRD	CANREED SUBSTATION
CRK	CREEKSIDE CAP.STN.
CRN	CARSON MICROWAVE STN.
CRO	CROWSNEST (TRANSALTA)
CRP	CARPENTER LAKE RESERVOIR
CRQ	CARQUILLE SUBSTATION
CRR	REVELSTOKE GS
CRS	CRESTBROOK FOREST IND. SKOOKUMCHUCK
CSN	CAMOSUN SUBSTATION
CSQ	CATHEDRAL SQUARE SUBSTATION
CST	COASTAL CS AREA
CTE	Coteay Creek
CTF	CATFACE REPEATER

CTL	COTTLE HILL MICROWAVE STN.
CTY	COURTENAY SUBSTATION (DISMANTLED)
CUS	CUSTER (BPA)
CVN	CHEVRON CANADA SUBSTATION
CVP	COLUMBIA VALLEY PULP SUBSTATION
CWD	CHETWYND SUBSTATION
CYP	CYPRESS SUBSTATION
DAN	MOUNT DAINARD SEISMOGRAPH (VHF) REP
DAW	DAWSON CREEK SUBSTATION
DBG	DOMINION BRIDGE
DBY	DUNCAN BAY SUBSTATION
DCK	DOG CREEK
DCN	DUNCAN
DCR	DUNCAN ANPRODOME (VHF) REP-DROP
DCS	DECOSMOS REPEATER
DCV	DEEP COVE SUBSTATION
DCY	D'ARCY MICROWAVE STN.
DDM	DUNCAN DAM
DEC	DECEPTION CONE (VHF) REPEATER
DEL	DELTA SUBSTATION
DFD	DARFIELD-TRANS.MOUNTAIN
DFN	DUFFERIN SUBSTATION
DGB	D.G. BELL (WKP)
DGN	DRAGON MICROWAVE STN.
DGR	DAL GRAUER SUBSTATION
DIL	DIANA LAKE SUBSTATION
DKY	DUNKLEY LUMBER
DLD	DONALD REPEATER
DLK	DEASE LAKE D.G.S.
DLS	DENNIS LAKE D.C.P.
DMI	DOMAN INDUSTRIES
DMR	DUNSMUIR SUBSTATION
DMU	DUNSMUIR RADIO REPEATER SITE
DND	DND ESQUIMALT
DOM	DOME MOUNTAIN (VHF) REPEATER
DOR	DORAN MOUNTAIN TOP REPEATER SITE
DOW	DOWNIE SLIDE
DPS	DOWNIE PEAK RIDGE SEISMOGRAPH
DPT	DELTAPORT CONTAINER TERMINAL
DRV	DUAL OR DOUBLE DUAL RADIAL VAULTS
DSR	DEASE LAKE REPEATER
DSY	DAISY LAKE (CHEAKAMUS) HEADWORKS
DTR	DORAN TAYLOR
DUG	DOUGLAS STREET SUBSTATION
DUK	DUKE POINT POWER IPP
DUN	DUNSMUIR OFFICE TELECONTROL EQUIPMENT
DUT	DUTCHMAN'S RIDGE
DVC	DEVILS CANYON REPEATER,TELECONTROL
DWN	DOWNTON RESERVOIR

EBT	ENGLISH BLUFF TERMINAL
EDO	ELDORADO MOUNTAIN (VHF) REPEATER
EDR	EDDONTENAJON REPEATER
EFD	ELKFORD SUBSTATION
EFM	ELK FALLS MILL-NORSKE SKOG
EFT	ELKFORD TAP STATION
EKA	EUREKA ANPRODOME (VHF) REPEATER
EKC	EAST KOOTENAY CONTROL CTR.
EKG	EAST KOOTENAY GENERATION
EKN	ERICKSON REPEATER
EKO	ENDAKO SUBSTATION
EKT	EAST KOOTENAY THERMAL
EKW	EKWAN CELL SITE
ELF	ELK FALLS REPEATER STATION
ELH	ELAHO RIVER
ELK	ELKO GENERATING STATION
ELL	ELLIOTT DAM (SEE JOR)
ELM	ELSIE LAKE MOUNTAIN TOP REPEATER
ELR	ELK RIVER HEADPOND
ELS	ELSIE LAKE INTAKE
EMC	ELCO MINING CO
EMW	ELECTRA MICROWAVE STATION
EN1	ENDERBY NO.1 OLD SUB (SEE END)
END	ENDERBY SUBSTATION
EPG	EDMONDS DIESEL PARALLEL GENERATOR
EPM	EPSOM
EPS	EAGLE PASS SEISMOGRAPH
EQU	EQUITY MINING
ERC	ERIC CREEK
ERS	MOUNT ERSKINE
ESC	ESCO FOUNDRY
ESM	EBURNE SAWMILLS-CAN.FOREST PROD.
ESQ	ESQUIMALT SUBSTATION
ESS	Emerald Switching Station (Teckcominco)
ETC	EAST TWIN HYDRO
EUR	EUROCAN SUBSTATION
EV1	ELKVIEW COAL (PREV. KAISER COAL)
EVP	EVANS PRODUCTS -name change to LPE
EWL	ELSWORTH LOGGING
EXR	EXETER SUBSTATION
FBC	FIBRECO
FCC	FLETCHER CHALLENGE CANADA,MACKENZIE
FCK	FOX CREEK SUBSTATION
FCL	FIBERGLASS CANADA LTD.SCOTT PAPER
FCN	FUNCTION JUNCTION SUBSTATION
FCO	FEDERATED CO-OPERATIVES (PREV. CNU)
FDC	FORDING COAL (RENAMED 'FRO')
FFI	FINLAY FOREST INDUSTRIES
FGS	FAUQUIER-ARROW LAKE GAUGE STATION

FHS	FOOTHILLS SUBSTATION
FIH	FAITH ANPRODOME (VHF) REPEATER
FIN	FINLAY RIVER ABOVE AKIE RIVER
FIR	FIR STREET RECTIFIER STATION
FJ2	FORT ST.JOHN #2 SUBSTATION
FJN	FORT ST JOHN SUBSTN.
FKR	FORREST KERR RUN OF RIVER
FLD	FIELD SUBSTATION
FLG	FRED LAING MICROWAVE (VHF) REPT.
FLR	EXSTALL REPEATER
FLS	FALLS RIVER GENERATING STATION
FM1	FORT ST JAMES NO.1 SUB.
FM2	FORT ST JAMES NO.2 SUBSTATION
FMC	FMC - PRINCE GEORGE
FMM	FOUR MILE MOUNTAIN REPEATER VHF/UHF
FMR	FIRE MOUNTAIN REPEATER
FMT	FAIRMONT SUBSTATION
FNE	FERNIE SUBSTATION
FNG	FORT NELSON GENERATING STATION
FNL	FORT NELSON (VHF) REPEATER
FNN	FORT NELSON DGS NO. 1
FRC	FURRY CREEK SUBSTATION
FRF	FRASER RIVER FIBREBOARD (see MDF)
FRH	FIRTH LAKE SUBSTATION
FRI	FURRY CREEK IPP
FRK	FREDERICK REPEATER
FRO	FORDING COAL-FORDING RIVER OPERATIO
FSR	FRASER LAKE SUB.
FSS	FRASER LAKE SAWMILLS-LEJAC
FST	FORT STEELE SUBSTATION
FTH	FIRTH MICROWAVE STATION
FVW	FOREST VIEW SUB/FVW AREA
GAR	GARRISON MOUNTAIN (VHF) REPEATER
GBR	GIBRALTER MINE-MARGUERITE
GBW	GIBRALTER WELLS
GCL	GREAT CENTRAL SUBSTATION
GDC	GALIANO DC STATION
GDF	GOLDSTREAM AERIAL FERRY (VHF) RPTR.
GDK	GEORGE DICKIE SUBSTATION
GDN	GOLDEN SUBSTATION
GDS	GOLDSTREAM MICROWAVE SITE
GDT	GOLDSTREAM TRAM
GHS	GORDON HEAD SUBSTATION
GIB	GIBSONS LANDING SUBSTATION
GIL	GULF ISLAND LOOP SCHEME
GLB	GILLIES BAY
GLD	GOLD RIVER SUB.
GLM	GILMORE ST. TELECONTROL
GLN	GLENANNAN SUBSTATION

GLO	GALIANO RIDGE
GLR	GLENMORE SUBSTATION
GLS	GALIANO SUBSTATION
GLT	GLOUCESTER SUBSTATION
GMC	G.M.S. CONTROL
GMR	GARDNER MICRO. REPEATER STN.
GMS	GORDON M. SHRUM G.S.(WAC BENNETT)
GMT	GORDON M. SHRUM TRAILER
GNO	GALIANO TERMINAL
GNR	GLENANNAN MICROWAVE REPEATER STN.
GOW	GOWARD SUBSTATION
GPT	GRIEF POINT SUBSTATION
GRC	GALIANO RECLOSER
GRD	GOLD RIVER G.S.
GRH	GREEN HILLS-FORDING COAL
GRP	GOLD RIVER PULPMILL (PREV. TAH)
GRR	GREEN RIVER SUBSTATION
GRS	GROUSE MICROWAVE REPEATER STN.
GRT	GOLD RIVER REPEATER SITE
GRV	GRAVEL PIT (RENAMED 'SSY')
GRY	MOUNT GREY REPEATER SITE
GSC	GENSTAR CEMENT LTD. (RENAMED TCL)
GSM	GOLDSTREAM MINE SUBSTATION
GSP	GVRD SAPPERTON PUMPS
GST	GOLDSTREAM TAP
GSY	GLOSSY MOUNTAIN (VHF) RPTR (SEE CBH
GTC	GUILDFORD TOWN CENTRE
GTP	GEORGE TRIPP SUBSTATION
GUI	GUICHON CAPACITOR STATION
GVH	GVRD IPP (renamed SEE - Seegen IPP)
GVL	GAVIN LAKE SUBSTATION
GVR	GREENVILLE RADIO REPEATER
HAL	HALPIN (PREVIOUSLY KM1)
HAM	HAMILTON MICROWAVE REPEATER STN.
HAR	HARRISON REPEATER STN (FORMERLY BEAR)
HAW	HAYWARD LAKE
HAY	HAYWARD LAKE RADIO REPEATER
HCK	HAT CREEK THERMAL DEVELOPMENT
HCL	HAT CREEK LIQUEFACTION PLANT
HCR	PRINCE GEORGE PULP #2 HCR
HCT	HILLCREST SUBSTATION
HDC	HEBER DIVISION
HDW	HOLDSWORTH REPEATER SITE
HEB	HEBER RIVER DIVERSION DAM
HEN	HENDRIX
HFP	HOUSTON FOREST PRODUCTS SUB.
HFY	HEFFLEY CREEK SUBSTATION
HGR	HELLS GATE MICROWAVE RPTR
HHP	HUDSON HOPE

HHT	HUDSON HOPE TRANSMISSION
HKS	HKUSAM (VHF)
HLD	HIGHLAND SUBSTATION
HLK	HUGH L. KEENLEYSIDE (ARROW DAM)
HLL	HALL LAKE SUBSTATION
HLN	HOLLYBURN SUB.
HLR	HALL LAKE MICROWAVE REPEATER STN
HLT	HILL AVENUE TERMINAL STATION
HMC	HARMAC-PACIFIC INC.
HMH	HUNDRED MILE HOUSE SUBSTATION
HML	HUCKLEBERRY MINE PROJECT
HMR	HOPE REPEATER
HNY	HANEY SUBSTATION
HOM	HOMATHKO RIVER DEVELOPMENT
HOP	HOPE SUBSTATION
HPA	HORNE PAYNE ANNEX
HPI	HARMAC PACIFIC INC. (See HMC)
HPL	HIGH POWER LAB
HPN	HORNE PAYNE SUBSTATION
HRD	HARVIE ROAD SUBSTATION
HRF	HAYWARD RECREATION FACILITY
HRG	HOWSER RIDGE REPEATER
HRN	MOUNT HORNE REPEATER STN
HRO	HARO STREET RECTIFIER STATION
HRS	HORSEY RADIO REPEATER SITE
HSB	HORSESHOE BAY SUBSTATION
HSK	HUSKY OIL
HSP	HOWE SOUND PULP AND PAPER
HSR	HOWSER RIDGE REPEATER STATION
HSS	HILL STREET SUBSTATION
HST	HASTINGS EAST RECTIFIER STATION
HSY	HORSEY SUBSTATION
HTN	HUNTINGDON RADIO STN (DISMANTLED)
HTR	HOTNARCO MOUNTAIN REPEATER VHF/UHF
HTV	HUNTINGDON VHF SITE
HUS	HOUSTON SUBSTATION
HVC	HIGHLAND VALLEY COPPER
HWD	HAREWOOD SUBSTATION
HXN	HIXON SUBSTATION
HYS	HAYES SUBSTATION
HZN	HAZELTON SUBSTATION
ICG	ISLAND COGENERATION PLANT
ICP	INTERCONTINENTAL PULP
IFM	INTERNATIONAL FOREST PRODUCTS
ILD	ILLECILLEWAET DYKES
ILL	ILLECILLEWAET SUB.
IMR	INSTRUMENT MODULE REPAIR SHOP
IND	INDUSTRIAL (WAS KNOWN AS CK2)
ING	INGLEDOW SUBSTATION

INV	INVERMERE
IOC	IOCO SUB-ESSO PETROLEUM
IPH	ISLAND PHOENIX
IPM	ISLAND PAPER MILL
IPR	ISLE PIERRE SUB.
IPS	INTERPROV. PIPE & STEEL CORP
IRD	INVESTMENT RECOVERY DEPT (DISPOSAL)
IRR	IRON RIVER REPEATER
ISK	ISKUT RIVER DEVELOPMENT
ITO	INTALCO ALUMINUM COMPANY
IVR	INVERMERE REPEATER STATION
JAR	JARVIS MICROWAVE REPEATER STATION
JCL	Jones Creek below Laidlaw Bridge
JHC	JOHN HART CONTROL.
JHM	JOHN HART (SURGE TANK)
JHN	JOHN HART GS
JHS	JOHN HART SUBSTATION
JHT	JOHN HART GEN. STN.
JLK	WAHLEACH POWER TUNNEL - JONES LAKE
JLN	JOHN LAWSON SUBSTATION
JOD	JORDAN DIVERSION DAM
JOE	JOSEPH CREEK SUBSTATION
JOR	JORDAN RIVER G.S.
JPT	JINGLE POT SUBSTATION
JRI	JAMES RICHARDSON INTERNATIONAL LTD.
JUL	JEUNE LANDING SUB.
KAB	KABAU ANPRODOME (VHF) REPEATER
KAL	KALUM SUBSTATION
KAS	KASLO SUBSTATION
KBL	KINBASKET LAKE
KBY	KIMBERLEY SUBSTATION
KC1	ELKVIEW COAL (OBSOLETE USE EV1)
KCD	KOOTENAY DIVERSION
KCL	KOOTENAY CANAL DEVELOPMENT
KCS	KITIMAT COPPER SMELTER
KDS	KENNEDY SUBSTATION
KDY	KENNEDY CAPACITOR STN.
KEN	KENT SUBSTATION
KGG	KINGSGATE SUB.
KGH	KEOGH SUBSTATION
KGP	KWOEN 230KV SUBSTATION
KGT	KEOGH GAS TURBINE
KI1	KIDD NO.1 SUBSTATION
KI2	KIDD NO.2 SUBSTATION
KIR	KING ISLAND REPEATER
KIT	KITIMAT TRANS. SYSTEM
KKT	KITKATLA DIESEL GENERATING STATION.
KLO	KASLO MOUNTAIN TOP REPEATER
KLS	KEENLEYSIDE POWERPLANT PROJECT

KLW	KELOWNA (WKP)
KLY	KELLY LAKE SUBSTATION
KMI	KEMESS SOUTH MINE PROJECT
KMO	KEMANO (ALCAN)
KNS	KAINS LAKE
KNT	KNIGHTON (PREVIOUSLY KM5)
KOK	KOKISH RIVER DEVELOPMENT
KPD	KIMBERLEY POWER DISTRICT
KRD	KINGS ROAD SUBSTATION
KRH	KAISER HOSMER
KSA	KASLO REPEATER STATION
KSD	STILES SUBSTATION (previously Kimberly Stiles)
KSH	KOKSILAH SUBSTATION
KSP	KINGS PEAK (VHF)
KST	KITSAULT SUB.
KSY	KAMLOOPS STORAGE YARD.
KTC	KANELK TRANS COMPANY
KTG	KEATING SUBSTATION
KTR	KITIMAT RADIO REPEATER
KVS	KINGSVALE SUBSTATION
KWD	KAMWOOD SUBSTATION
KWY	KINGSWAY RECTIFIER STATION
LAC	LAC DES ROCHE
LAJ	LAJOIE GENERATING STATION
LAP	LOUISIANA PACIFIC
LB1	LAKE BUNTZEN G.S. #1 (Dam)
LB2	LAKE BUNTZEN G.S. #2 (POWER INTAKE)
LBD	LAKE BUNTZEN DAM
LBH	LONG BEACH SUBSTATION
LBO	LOWER BONNINGTON (WKP)
LBP	LAKE BUNTZEN PUMPHOUSE & REC. AREA
LBR	LIBBY RESERVOIR (LAKE KOOCANUSA)
LBY	LIONS BAY SUBSTATION
LCC	LINE CREEK COAL
LCD	LOWER COLUMBIA DEVELOPMENT
LCL	LOWER CAMPBELL RESERVOIR
LCN	LAKE COWICHAN REPEATER (VHF)
LCR	LIONS CREEK
LCW	LAKE COWICHAN SUBSTATION
LDR	LADORE FALLS G.S.
LDY	LADYSMITH SUBSTATION
LEE	F.A. LEE SUBSTN (WKP)
LF1	LAFARGE CEMENT NO.1
LF2	LAFARGE CEMENT NO.2
LGL	LOGAN LAKE SUBSTATION
LGM	LIGNUM SAWMILL
LGN	LANGDON SUBSTATION (TAU)
LGP	LAVINGTON GLASS PLANT
LGS	LADORE FALLS (RENAMED 'LDR')

LGW	LIGNUM AT WILLIAMS LAKE
LHS	LARCH HILL REPEATER STATION
LIB	LIBBY DEVELOPMENT (U.S.)
LIK	LIKELY REPEATER STATION
LKL	LAKELSE SUBSTATION
LLD	LORNEX LOW LEVEL DAM
LLH	LAC LA HACHE SUB (DISMANTLED)
LLK	LOGAN LAKE RADIO REPEATER SITE
LLT	LILLOOET SUBSTATION
LMA	LOWER MAINLAND TRANSMISSION SYSTEM
LMC	LOWER MAINLAND CONTROL CENTER
LMM	LIME MOUNTAIN (VHF) REPEATER
LMT	LOWER MAINLAND TRANSMISSION
LNG	TILSBURY ISLE.LNG.PLANT
LNL	LONG LAKE IPP
LOH	LOUGHEED SUBSTATION
LRA	LANGLEY PRODUCTION
LRD	LIARD RIVER DEVELOPMENT
LRP	LANTIC REAL PROPERTY LTD.PARTNERSHP
LSD	LOVELAND SADDLE DAM
LTN	LYTTON DIESEL GENERATION STATION
LTZ	LANTZVILLE SUBSTATION
LU1	LUMBY NO.1 SUBSTN (DISMANTLED)
LU2	LUMBY NO.2 SUBSTATION
LWT	LONGWORTH (VHF)
LYN	LYNN VALLEY SUBSTATION
LYT	LYTTON SUB
LYW	LYTTON WOODWASTE IPP
MAB	MA-BUTTE MICROWAVE STATION
MAC	MACDONALD MOUNTAIN REPEATER STN.
MAD	MAD CREEK
MAM	MAMQUAM G.S.
MAN	MAINWARING SUBSTATION
MAR	MASSET REPEATER
MAS	MASSET DIESEL G.S.
MAT	MATHESON MOUNTAIN REPEATER STN.
MBC	MOUNT BECHER
MBD	MCBRIDE POWER DISTRICT
MBH	MOUNT BLENHEIM RPTR
MBL	MCMILLAN BLOEDEL-CAN.WHITE PINE
MBO	MARACAIBO TERMINAL
MBR	MCBRIDE HILL REPEATER
MCA	MICA CREEK DEVELOPMENT
MCC	MICROWAVE CONTROL CENTRE
MCF	MITSUBISHI CHOPSTICK FACTORY
MCG	MCGREGOR RIVER DIVERSION
MCH	MCNAIR CREEK IPP
MCK	MCCULLOCH CREEK
MCL	MICHEL SUBSTATION

MCM	MCMAHON COGENERATION PLANT
MCO	CARIBOU MOUNTAIN REPEATER VHF/UHF
MCP	MILLER CREEK POWER
MCR	MISERY CREEK GENERATING STATION
MDF	MEDIUM DENSITY FIBRE PLANT
MDH	MACDONALD RANCH
MDN	MERIDIAN SUBSTATION
MDR	MICA DUTCHMAN RIDGE (VHF) REPEATER
MDS	MOLYBDENUM SUBSTATION
MER	MEZIADIN REPEATER
MEZ	MEZIADIN SUBSTATION
MFE	MORFEE SUB (ALEXANDRA)
MGT	MARGUERITE SUBSTATION
MHA	MOUNT HALL (ADAS) REPEATER
MHX	METHANEX CORPORATION
MID	MAYNE ISLAND DEPOT
MIN	MINETTE SUBSTATION
MIS	MISSION SUBSTATION
MKS	MICA/KOOTENAY COMMUNICATION SYSTEM
MLC	MICA LITTLE CHIEF SLIDE (VHF) REPT.
MLN	MCLELLAN SUBSTATION
MLR	MICA LITTLE CHIEF RIDGE (VHF) REPT.
MLS	MCLEESE CAPACITOR STN.
MML	MOUNT MILLIGAN MINE PROJECT
MMR	MOUNT MORSE REPEATER
MMS	MCLEESE MICROWAVE STATION
MNC	Mount Cook
MNM	MAYNARD MOUNTAIN (VHF)
MNR	MONROE (BPA)
MNX	METHANEX CORPORATION - See MHX
MO1	MOBILE SUB NO.1
MO2	MOBILE SUB NO.2
MO3	MOBILE SUB NO.3
MO4	MOBILE SUB NO.4
MOM	MONKMAN
MON	MONASHEE SUBSTATION
MOR	MORRISSEY MTN. ANPRODOME (VHF) RPTR
MOS	METRO STATION
MPH	MCPHEE
MPN	MCPHERSON ANPRODOME (VHF) REPEATER
MPY	MURPHY CREEK DEVELOPMENT
MRE	MORFEE MOUNTAIN MICROWAVE STN.
MRF	RENAMED 'BKY' BUCKEYE CANADA INC.
MRG	MAPLE RIDGE SUBSTATION
MRR	MORRISSEY RIDGE MICROWAVE STATION
MRT	MERRITT SUBSTATION
MS2	MISSION 2
MSA	MALASPINA SUBSTATION
MSF	MILE 64 (VHF) REPEATER

MSN	MISSION MOUNTAIN MICROWAVE STATION
MSV	MOUNT SAVONA MICRO. REPEATER
MSZ	MISSEZULA MOUNTAIN (VHF) REPEATER
MTB	MOBILE TRANSFER BUS
MTD	MOUNT DOUGLAS
MTE	MONTE LAKE SUBSTATION
MTG	MONTAGUE TERMINAL
MTH	MOUNT HALOWELL
MTL	METALINE - BONNEVILLE
MTM	MOUNT MURRAY (VHF) REPEATER
MTN	MILLIGAN MOUNTAIN SUBSTATION
MTO	MINTO MICROWAVE REPEATER STN.
MTP	MOUNT POLLEY
MUA	MURRIN #2 SUBSTATION (SWITCHYARD)
MUR	MURRIN #1 SUBSTATION
MVL	MARYSVILLE SUBSTATION
MVR	MOREHEAD VALLEY RANCH HYDRO INC.
MWA	MOUNT WARBURTON PIKE
MWG	MERRILL WAGNER (WILLIAMS LK)
MWN	MCEWAN SUBSTATION
MYE	MOYIE SUBSTATION
MYI	MOYIE (VHF) REPEATER
MYR	MURRAY RIDGE (VHF)
NAE	NORTH AMERICAN ENERGY SYSTEMS CORP.
NAK	NAKUSP SUBSTATION
NAS	NASS REPEATER
NAZ	NAZCO REPEATER
NBF	NABOB FOODS
NCA	NORTH COAST PRODUCTION AREA
NCC	NORTHERN CONTROL CENTER
NCK	NECHAKO SUBSTATIOIN
NCR	NORTH COAST REGION
NCS	NORTHERN CUSTOMER SERVICE
NCT	NILE CREEK TERMINAL
NDA	NEW DENVER REPEATER STATION
NDN	NADEN (HMCS) SUBSTATION
NDR	NEW DENVER SUBSTATION
NDV	NEW DENVER MOUNTAIN TOP REPEATER
NEL	NEWELL SUBSTATION
NEX	NEXEN CHEMICALS CANADA LTD.(NANAIMO
NFD	NORTHFIELD SUBSTATION
NGL	SOLEX GAS LIQUIDS LTD. (WAS NGL)
NGS	NAKUSP - ARROW LAKE GAUGE STATION
NGT	NEWGATE SUBSTATION
NHS	NORTHWOOD HOUSTON SAWMILL
NIC	NICOLA SUBSTATION
NID	NORTH VI DISTRIBUTION
NIP	NORTH ISLAND POWER CORPORATION
NIR	NICOMEN REPEATER

NKA	NAKUSP REPEATER STATION
NKL	NICOMEKL SUBSTATION
NKM	NAKUSP MARINA SUBSTATION
NLN	NELSON TOWER
NLV	NECHAKO LUMBER VANDERHOOF
NLY	NELWAY SUBSTATION
NMN	NORTH MAYNE ISLAND RECLOSER
NMR	NINE MILE REPEATER
NMT	NEWMONT (RENAMED 'SCO' SIMILCO)
NNO	NANAIMO STORAGE YARD
NOR	NORGATE SUBSTATION
NOS	NETHERLANDS OVERSEAS SAWMILL
NRG	NEWSTECH RECYCLING COQUITLAM
NRS	NORTHERN REGION SUBSTATION
NSS	NANAIMO SAFETY SHOP
NTC	NEWSTECH RECYCLING COQUIT (SEE NRG)
NTL	NATAL SUBSTATION
NUR	NEWCASTLE RIDGE REPEATER SITE
NVR	NORTH VANCOUVER SUBSTATION
NWP	NORTHWOOD PULP AND PAPER
NWR	NEW WESTMINSTER SUB.
NXC	NEXEN CHEMICALS LTD. PARTNERSHIP
OCT	OCELOT - METHANEX (RENAMED MNX)
OFD	OLDFIELD SUBSTATION
OKR	OAKRIDGE RECTIFIER STATION
ORD	ORENDA
OSA	OOTSA LAKE (VHF)
OSP	OSPIKA
OVR	OLIVER
OXY	CANADIAN OXY
OYR	OYSTER RIVER SUBSTATION
PAC	PORT ALBERNI COGENERATION PROJECT
PAL	PORT ALBERNI SUBSTATION
PAM	PORT ALICE MILL
PAR	PARMIGAN CREEK
PAV	PAVILION SUBSTATION
PC1	PACIFIC CENTRE NORTH
PC2	PACIFIC CENTRE SOUTH
PCA	PATRICIA SUBSTATION
PCC	P&C NORTH (CONWAY)
PCH	POCAHONTAS (VHF)MICROWAVE STATION
PCI	PACIFIC CASCADE HYDRO INC.
PCN	PEACE CANYON G.S. (SITE #1)
PCP	PETRO-CANADA PRODUCTS.
PCT	PORT CLEMENTS SUBSTATION
PDR	PENDER ISLAND RECLOSER
PED	PORT EDWARD SUBSTATION
PEL	PEMBERTON LINE ROOM
PEM	PEMBERTON SUBSTATION

PEN	PENNASK ANPRODOME (VHF) REPEATER
PEX	PETRO CANADA TAYLOR (RENAMED 'MGP')
PFD	PANEL AND FIBRE DIVISION (CFP)
PGG	PRINCE GEORGE SUB
PGP	PRINCE GEORGE PULP & PAPER
PGS	PORT ALBERNI GENERATION PROJECT (renamed VIG)
PGT	PIONEER GRAIN TERMINAL(RENAMED JRI)
PHD	PACIFIC VENEER
PHI	PHILLIPS CANYON DEVELOPMENT
PHM	PORT HARDY MOUNTAIN.(VHF)
PHR	PENDER HARBOUR SUBSTATION
PHY	PORT HARDY SUB
PIK	PIKE LAKE SUBSTATION
PIN	PINGSTON GS (IPP)
PKL	PORT KELLS SUBSTATION
PKR	PARKER ISLAND TERMINAL
PLP	PRINCETON LIGHT & POWER SUBSTATION
PLT	PLATEAU MILLS
PMD	PORTAGE MOUNTAIN DEVELOP. (SEE GMS)
PML	PORT MCNEILL SUBSTATION
PMM	PTARMIGAN MOUNTAIN (VHF) REPEATER
PMS	PITT MEADOWS
PMT	PEMBERTON MOUNTAIN REPEATER
PND	PEND D'OREILLE RESERVOIR
PNE	PACIFIC NATIONAL EXHIBITION
PNP	POINT NO POINT REPEATER STN.
PNS	PINE STREET SUBSTATION
PNT	PATTERSON TOWER
POC	POCATERRA GENERATING STATION
POW	POWELL RIVER SUBSTATION
PPR	PACIFIC PRESS (renamed PNG)
PPS	PORTAGE PASS SUBSTATION
PRA	PUNTLEDGE RV. GAUGE 6
PRB	PUNTLEDGE RV. GAUGE 8
PRC	PARK ROYAL SHOPPING CENTRE
PRD	PRINCE RUPERT DISTRICT
PRF	PORTABLE RECTIFIER
PRG	PRINCE RUPERT GRAIN
PRI	PRINCETON SUBSTATION
PRK	PARKLAND (WAS KNOWN AS CK3)
PRN	PORT RENFREW
PRO	PROMONTORY MOUNTAIN (VHF) REPEATER
PRR	PROPHET RIVER VHF
PRS	PARSNIP (FINLEY FOREST IND)
PRT	PRINCE RUPERT THERMAL G.S.(SEE RPG)
PRW	PORT RENFREW REPEATER STN (VHF)
PSN	PARSON SUBSTATION
PSS	PRODUCTION SYSTEM STORE(STORE 4049)
PTC	PORT CLEMENTS SWITCHING STN.

PTH	PORT HARDY DIESEL G.S.
PTL	POWERTECH LABS (PREVIOUSLY RDL)
PTN	PTARMIGAN MOUNTAIN (VHF REPEATER)
PTO	PORTEAU SUBSTATION
PTR	POINT ROBERTS SUBSTATION
PTS	PINETTE & THERRIEN SAWMILLS
PUD	PUNTLEDGE INTAKE DIVERSION DAM
PUN	PUNTLEDGE G.S.(COMOX DAM)
PUR	PURCELL POWER PROJECT
PVG	PRINCE GEORGE VEHICLE GARAGE
PVL	PARKSVILLE SUBSTATION
PVN	PEAVINE (VHF)
PVO	PREVOST SUBSTATION
PVW	PINEVIEW SUBSTATION
PWP	PEACE WOOD PRODUCTS
QCC	QUEEN CHARLOTTE CITY
QCH	QUEEN CHARLOTTE ISLAND DIESEL GEN.
QCI	QUEEN CHARLOTTE ISLAND REGION
QCP	QUEEN CHARLOTTE POWER CORPORATION
QIN	QUINSAM RIVER AT ARGONAULT BRIDGE
QLB	QUALICUM BEACH TERM. (RENAMED NCT)
QLC	QUALICUM BEACH SUBSTATION
QNL	QUESNEL SUBSTATION
QNR	QUINSAM RIVER FISH FLOW
QNT	QUINTETTE
QRP	QUESNEL RIVER PULP
QSM	QUINSAM MINES
QUD	QUINSAM DIVERSION DAM
QUI	QUINSAM RIVER DIVERSION
RBF	RED BLUFF SUBSTATION
RBK	ROBERTS BANK PORT DEVELOPMENT
RBL	RAINBOW LAKE
RBV	ROBSON VALLEY POWER
RBW	RAINBOW SUBSTATION
RCK	ROCK CREEK ANPRODOME (VHF) REPEATER
RDL	RESEARCH & DEVELOPMENT LAB (SEE PTL)
RDM	RADIUM SUBSTATION
REE	REES CREEK
REP	REVELSTOKE PASSIVE
REV	REVELSTOKE G.S. (aka - Columbia River Revelstoke)
RIM	RICHMOND SUBSTATION
RLD	RUTLAND (WKP)
RMB	RUMBLE BEACH IPP
RMH	RICHMOND HOSPITAL
RO2	ROYAL NO.2 SUBSTATION
RON	RONAYNE REPEATER
ROS	ROSEDALE SUBSTATION
ROY	ROYAL OAK
RPG	PRINCE RUPERT G.S.

RPT	ROCKY POINT
RRK	RED ROCK MICROWAVE STN.
RSC	RIVERSIDE,SODA CREEK MILL
RSR	RICHMOND STEEL RECYCLING
RSW	RIVERSIDE AT WILLIAMS LAKE
RTI	RIDLEY TERMINALS INCORPORATED
RUP	RUPERT SUBSTATION
RUS	RUSKIN GENERATING STATION
RUT	RUTHERFORD CREEK IPP
RVS	RIVERSIDE FOREST PRODUCTS
RVW	RIVERVIEW SUBSTATION
RY1	RAYONIER #1
RY2	ROYAL SUBSTATION NO. 2 (SEE RO2)
RYC	RUBY CREEK SUBSTATION
S12	STORE 12
S2S	SOOKE NO.2 SUBSTATION
SAI	SALMON INLET I.P.P. (RENAMED SCG)
SAL	SALTSPRING SUBSTATION
SAM	SALMON ARM SUBSTATION
SAN	SAN JUAN REPEATER
SAR	SALMON RIVER DIVERSION DAM
SAT	SAHTLAM SUBSTATION
SBH	SHUTTY BENCH
SBR	SPENCES BRIDGE SUBSTATION
SC2	SCOTT PAPER MISSION
SCA	STRATHCONA G.S.
SCC	SYSTEM CONTROL CENTRE
SCG	SECHELT CREEK GENERATING STATION
SCI	SCAIA MICROWAVE REPEATER STN.
SCK	SODA CREEK SUBSTATION
SCM	SICAMOUS SUBSTATION
SCN	SURREY CONSTRUCTION
SCO	SIMILCO SUBSTATION (PREV. 'NMT')
SCP	SCOTT PAPER
SCS	SURREY SERVICE CENTRE SITE SERVICES
SCT	SCOTT SUBSTATION
SCZ	SCUZZY CREEK G.S.
SDM	SHOULDER MOUNTAIN (VHF)
SDS	SARDIS
SEA	SEA ISLAND SUBSTATION
SEC	SECHELT SUBSTATION
SEE	SEEGEN IPP
SEL	SELKIRK SUBSTATION
SEV	SEVEN MILE DEV. (PEND D OREILLE)
SEY	SEYMOUR ARM ANPRODOME (VHF)REPEATER
SFI	STAVE FALLS INTAKE GATE
SFL	STAVE FALLS GENERATING STATION
SFN	STAVE FALLS NEW GENERATING STATION
SFY	STAVE FALLS SWITCHYARD (see SFN)

SGD	GENERATION MTCE-SURREY
SGR	SUGAR LAKE (SHUSWAP FALLS G.S.)
SHA	SHAWNIGAN LAKE SUB.
SHD	SHEPPARD
SHE	SHELPAC (ELCO)
SHL	SHELLBURN SUBSTATION
SHN	SHELPAC (NATAL)
SHO	SHADOW RESERVOIR
SHP	SHEPHERD REPEATER
SHR	SHERATON MICROWAVE REPEATER STN.
SHU	SHUSWAP FALLS G.S.(WILSEY,SUGAR LKE
SIC	SOUTHERN INTERIOR CONTROL
SIG	SOUTH ISLAND GENERATION
SIL	SILVERDAISY
SIP	SALMON INLET POWER CORPORATION.
SIR	SALMON INLET MICROWAVE RPTR STN.
SIS	3 SISTERS REPEATER,TELECONTROL
SIT	SITE 1, (RENAMED 'PCN')
SKA	SKEENA SUBSTATION
SKC	SKEENA CRAFT
SKL	SKEENA CELLULOSE SUBSTATION
SKM	SKAGIT MTN REPEATER-DROPPED FROM PLAN
SKR	SKEENA RIVER REPEATER
SKT	SINKUT MICRO REPEATER STN.
SKU	SKOOKUMCHUCK SUBSTATION
SLC	SOUTH SLOCAN (WKP)
SLE	SALE MICROWAVE REPEATER STN.
SLK	STAVE LAKE CORRECTION CAMP
SLM	SALMON RIVER DIVERSION
SLN	SALMON RIVER DIV. NR CAMPBELL RIVER
SLR	SANDSPIT REPEATER
SLS	SUNDANCE LAKES
SMC	SEVEN MILE CONSTRUCTION (DISMANTLED
SMH	SEVENTY MILE HOUSE SUBSTATION
SMO	SALMO REPEATER,TELECONTROL
SMR	SOUTH MAYNE ISLAND RECLOSER
SMS	SUMAS MOUNTAIN MICROWAVE STATION
SMW	SUMAS WAY SUBSTATION
SNE	SANSUM NARROWS ELECTRODE
SNK	SUKUNKA SWITCHING STATION
SNP	STIKINE NATION POWER CORPORATION
SNY	SIDNEY SUBSTATION
SOK	SOUTH OKANAGAN SUB. (renamed VAS)
SON	SETON GENERATING STATION
SOO	SOOKE SUBSTATION
SOR	SOO RIVER I.P.P.
SPA	SPERLING ANNEX RECTIFIER STATION
SPC	STERLING PULP CHEMICALS (renamed ERW)
SPD	SPARWOOD SUBSTATION

SPG	SPERLING SUBSTATION
SPH	SPANISH MOUNTAIN (VHF)
SPL	STEEPLES SUBSTATION
SPN	SPILLIMACHEEN G.S.
SPR	SPROAT ANPRODOME (VHF) REPEATER
SPT	SANDSPIT D.G.S.
SQA	SQUAMISH CHLOR ALKALI
SQH	SQUAMISH SUBSTATION
SRF	SETON RECREATION FACILITY
SRG	SLOCAN RIDGE MICROWAVE REPEATER STN
SRR	SALOOMPT MOUNTAIN REPEATER VHF/UHF
SRS	SMITHERS SUBSTATION
SRY	SURREY SUBSTATION
SSA	SILVER STAR ANPRODOME (VHF) REPEATER
SSM	SEVENTY-SIX MILE HOUSE
SSR	SILVER STAR MICROWAVE REPEATER STN.
SSS	SYSTEM SPARE STORAGE FACILITY
SSY	SOUTH SURREY REPEATER SITE
STA	SATURNA RECLOSER
STC	SITE C DEVELOPMENT (PEACE RIVER)
STG	STEWART (DGS) ... PLEASE SEE 'STW'
STH	SPLINTER HILL REPEATER
STI	STIKINE RIVER DEVELOPMENT
STK	STIKINE DISTRICT
STL	SPATSUM-LORNEX
STN	STRATHCONA REPEATER STN.
STO	SORRENTO SUB.
STP	STEEL BROTHERS (PAVILLION)
STR	STAVE FALLS RECREATION FACILITY
STS	STAVE LAKE SUBSTATION
STV	STEVESTON SUBSTATION
STW	STEWART SUBSTATION
SUA	SUGAR LAKE (VHF) REPEATER
SUT	SUTTON REPEATER
SVA	SAVONA SUB (230 KV T/S)
SVG	SURREY VEHICLE GARAGE
SVH	SEVEN HILLS REPEATER STATION
SVS	SILVERSMITH P&L
SVY	SALMON VALLEY SUBSTATION
SWL	SWAN LAKE (VHF) REPEATER
SWP	SASKATCHEWAN WHEAT POOL
SYH	STRAWBERRY HILL SUB.
SYP	SURREY PLACE SHOPPING CENTRE
SZM	SPUZZUM SUBSTATION
TAC	TACHICK SUBSTATION
TAH	TAHSIS PULP MILL (RENAMED GRP)
TAK	TAKAMA FOREST PRODUCTS
TAU	TRANS ALBERTA UTILITIES
TAY	TAYLOR SUBSTATION

TBI	TILBURY ISLAND
TBN	TIMBERNORTH (MACKENZIE)
TBR	TABOR MICROWAVE STN.
TBT	TSAWWASSEN BEACH TERMINAL
TBW	TIMBERWEST (MACKENZIE)
TBY	TAYLOR BAY TERMINAL
TCK	TELEGRAPH CREEK D.G.S.
TCL	TILBURY CEMENT LTD.
TCR	TELEGRAPH CREEK REPEATER
TEL	KITCHENER TELECONTROL
TER	TERRACE SUBSTATION
TFM	TELECOM FACILITIES MANAGEMENT
TFP	TAKLA FOREST PRODUCTS,FORT ST.JAMES
TFS	TOFINO SUBSTATION
TGD	TERRACE GENERATION DIESEL.
THC	THORNHILL CREEK GENERATING STATION
THR	THUNDER MOUNTAIN REPEATER SITE
THY	THYESTES REPEATER
TII	TREE ISLAND INDUSTRIES
TIL	TOLKO INDUSTRIES LTD. - LAVINGTON
TIM	TIMOTHY MICROWAVE STATION
TIR	TEXADA ISLAND REACTOR
TIS	TISDALL SUB STORAGE YARD
TKA	TAKLA LAKE (VHF)
TKC	TELKWA COAL
TKL	TAKLA LANDING
TKP	TELKWA PASS TELEMETRY
TKR	TELKWA REPEATER
TKW	TELKWA SUBSTATION
TLR	TUMBLER SUBSTATION
TMM	TRANS MOUNTAIN OIL MCMURPHY
TMO	TRANS MOUNTAIN OIL VEDDER
TMT	TRANS MOUNTAIN OIL KAMLOOPS
TMW	TRANS MOUNTAIN OIL WAHLEACH
TNO	TELECOM NETWORK OPERATIONS
TOK	TOLKO INDUSTRIES - HEFFLEY Creek Div.
TOM	MOUNT THOMPSON SEISMOGRAPH (VHF)REP
TPH	TELKWA PASS D.C.P.
TPL	TRAPLINE MICROWAVE REPEATER STN.
TPY	TOPLEY SWITCHING STN.
TRH	THORNHILL SUBSTATION
TRI	TRIUMPH (RENAMED 'UNS')
TRN	TRINCOMALI TERMINAL
TRR	TAYLOR RIVER REST AREA
TRZ	TERZAGHI DAM-IN BRIDGE RIVER COMPLX
TSC	TERRACE SKEENA CELLULOSE
TSK	BLACK TUSK MICROWAVE STATION
TSL	TSABLE REPEATER
TSM	TAHSIS SAWMILL

TSO	TSOLUM RIVER NR COURTENAY
TSS	TADANAC (WKP)
TSV	TAHSIS VILLAGE SUBSTATION
TSW	TSAWWASSEN SUBSTATION
TTC	TERRACE TELECONTROL
TUK	TUKTAKAMIN MICRO REPEATER STN.
TWN	TOWNSITE-CBK(CRANBROOK) (PREV. KM4)
TXB	TEXACO (BOUNDARY LAKE)
TXE	TEXADA ISLAND EAST CABLE TERMINAL
TXL	TYAX LAKE SUBSTATION
TXW	TEXADA ISLAND WEST CABLE TERMINAL
TYN	THYNNE MICROWAVE REPEATER STN.
UCL	UPPER CAMPBELL RESERVOIR
UCO	UCONA RIVER
UCV	UPPER COLUMBIA VALLEY
UFR	UPPER FRASER SUB.
UMH	UPPER MAMQUAM IPP
UNS	SOUTH CAMPUS (TRIUMPH)
UTA	UTAH MINE
VAC	VERNON ARMY CAMP REPEATER STATION
VAL	VALEMOUNT DIESEL (DISMANTLED)
VAS	VASEUX LAKE TERMINAL STATION
VBM	VAVENBY MOUNTAIN (VHF) REPEATER
VBY	VAVENBY SUBSTATION
VCC	VERNON CONTROL CENTRE
VCR	VICTORIA REPEATER
VCT	VANCOUVER ISLAND TERMINAL REPEATER
VDC	VANCOUVER ISLAND DC TERMINAL
VDF	VANDERHOOF SUBSTATION
VDK	VANCOUVER DRY DOCK COMPANY LTD.
VES	VANCOUVER ENERGY SYSTEMS.
VGP	VICTORIA GAS PLANT
VIC	VANCOUVER ISLAND CONTROL
VIT	VANCOUVER ISLAND TERMINAL
VLM	VALEMOUNT 138 KV
VNA	VANANDA
VNT	VERNON TERMINAL
VPD	VICTORIA POWER DISTRICT
VPE	VANCOUVER POLICE DEPT/BCH EMERGENCY
VVW	VALLEYVIEW SUBSTATION
WAB	WABI MOUNTAIN (VHF) REPEATER
WAH	WAHLEACH GENERATING STATION
WAN	WANETA GENERATING STATION
WAX	WANETA EXPANSION
WBK	WESTBANK SUBSTATION
WCE	WESTCOAST ENERGY (RENAMED WEI)
WCF	WESTCOAST CELLUFIBRE INDUSTRIES
WCS	WESTERN CANADA STEEL
WCT	WEST COAST TAYLOR (RENAMED 'NGL')

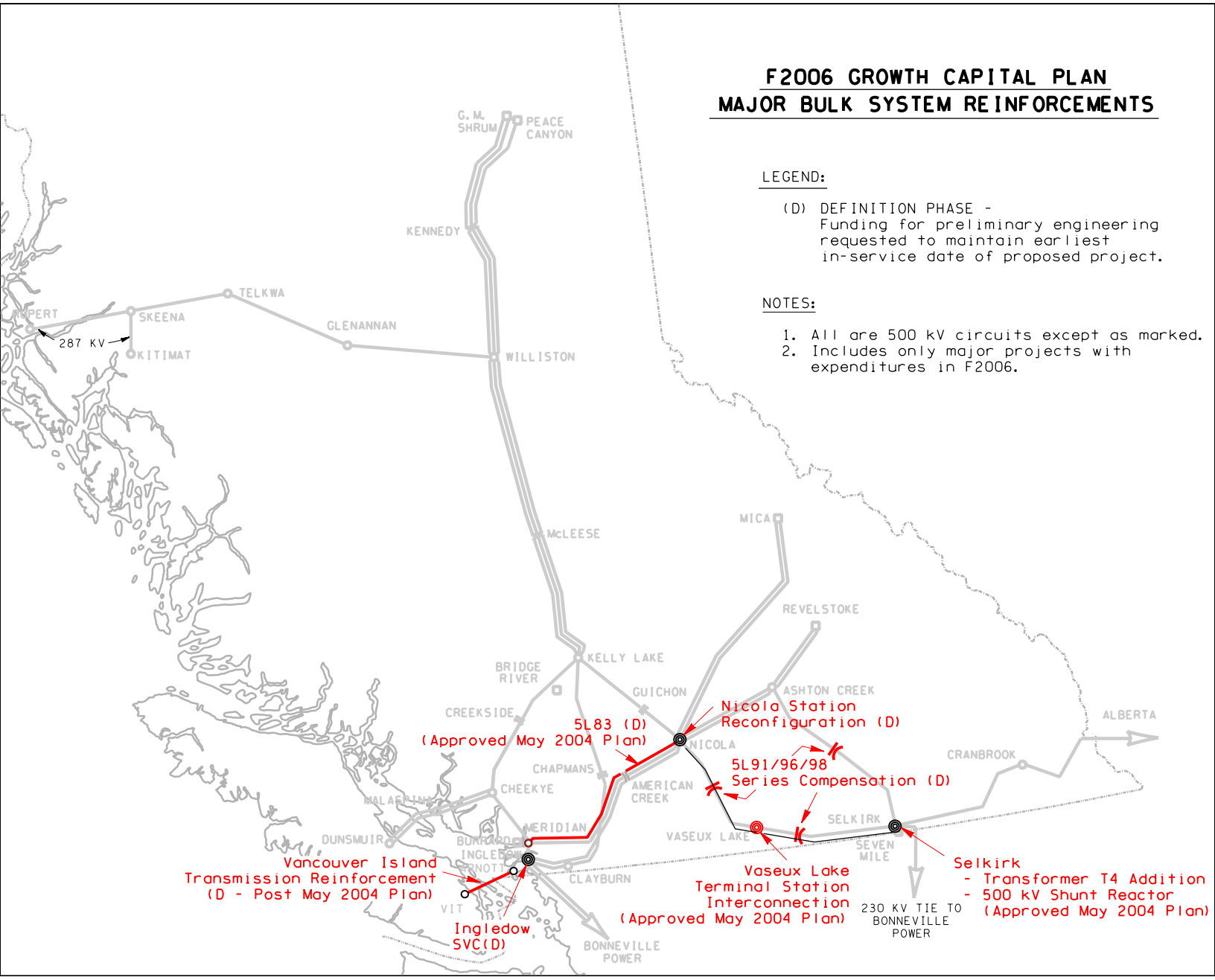
WCV	WINTER COVE
WDN	WALDEN NORTH
WDS	WOODS LAKE SUBSTATION
WDW	WELDWOOD (METRO)
WEI	WESTCOAST ENERGY
WEL	WELLS REPEATER STATION
WES	WESTAR MINING LIMITED (RENAMED KC1)
WEY	WEYERHAEUSER PULP MILL STATION
WFN	WEST COAST TRANSMISSION
WFQ	WEST FRASER SAWMILL
WFR	WOODFIBRE - WESTERN PULP LTD.
WGS	WHATSHAN G.S.
WHL	WHATSHAN LAKE
WHN	WALTER HARDMAN G.S.
WHY	WHALLEY SUBSTATION
WI1	WESTERN INTEGRATED #1
WIG	WAHLEACH JONES LAKE-INTAKE GATE
WIL	WILSEY DAM
WIN	WINSOR SUBSTATION
WIT	WESTERN INTEGRATED TECHNOLOGY
WL2	WILLIAMS LAKE NO.2
WLB	WILLIAMS LAKE BASE STATION
WLF	WOLFENDEN MTN. REPEATER SITE
WLM	WILLIAMS LAKE SUBSTATION
WLT	WALTERS SUBSTATION
WMR	WAHLEACH REPEATER SITE
WMS	WESMAN STEWART
WNK	WHONNOCK SUBSTATION
WNR	WESTMIN RESOURCES
WOK	WOKAS LAKE PEAK REPEATER
WOL	WOLF RIVER
WOS	WOSS SUBSTATION
WP1	WESTPORT INNOVATIONS 1
WP2	WESTPORT INNOVATIONS 2
WPM	WEST PINE MED.DENSITY FIBRE
WPN	WEST PINE MDF PLANT
WPS	G.V. WATER DIST. CAPE HORN PUMP STN
WQL	WELDWOOD (QUESNEL)
WRK	WHITE ROCK SUBSTATION
WSE	WESTERN STATE ELECTRIC DISCONNECT
WSM	WOSS MOUNTAIN (VHF)
WSN	WILLISTON SUBSTATION
WSP	WESCUP SUBSTATION
WSR	WOSS
WSS	WARFIELD (WKP)
WST	WEST STODDART PLANT
WTB	WARTENBE (VHF) REPEATER (SEE WAB)
WTL	WESTSHORE TERMINALS LTD.
WVN	WOLVERINE (VHF)

WWD	WESTWOLD SUBSTATION
WWI	WESTAR WATSON ISLAND (RENAMED SKL)
WWL	WELDWOOD (WILLIAMS LAKE)
WWQ	WELDWOOD (QUESNEL) #2
YAL	YALE MICROWAVE REPEATER STN.
YAR	YARROWS
YHD	YELLOWHEAD SUBSTATION
YRK	YORK SUBSTATION
YVR	VANCOUVER INTERNATIONAL AIRPORT
ZZC	ZZ CREEK (renamed to MEA - Mears Creek)

1

APPENDIX 3
GROWTH CAPITAL PROJECT MAPS

F2006 GROWTH CAPITAL PLAN
MAJOR BULK SYSTEM REINFORCEMENTS

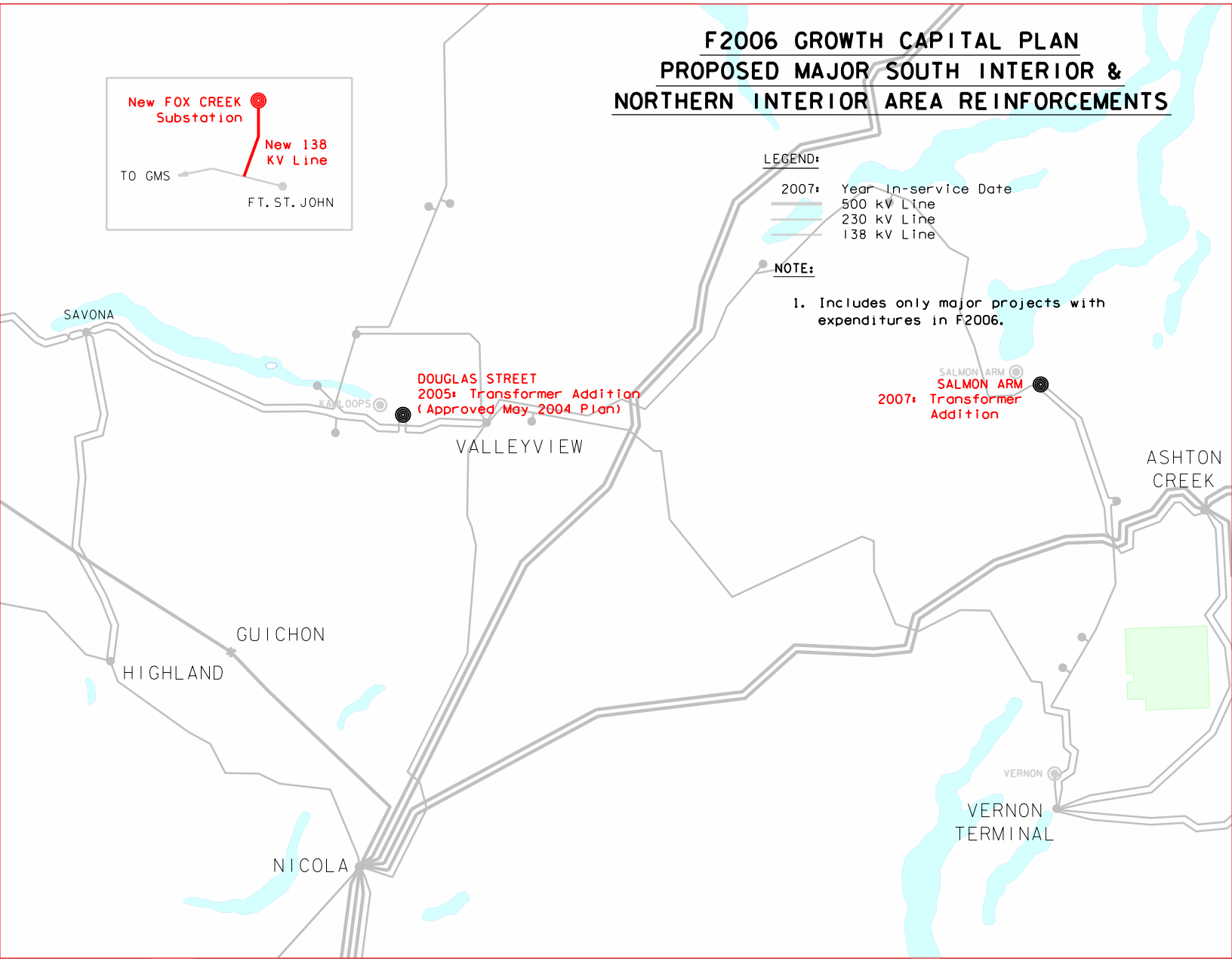


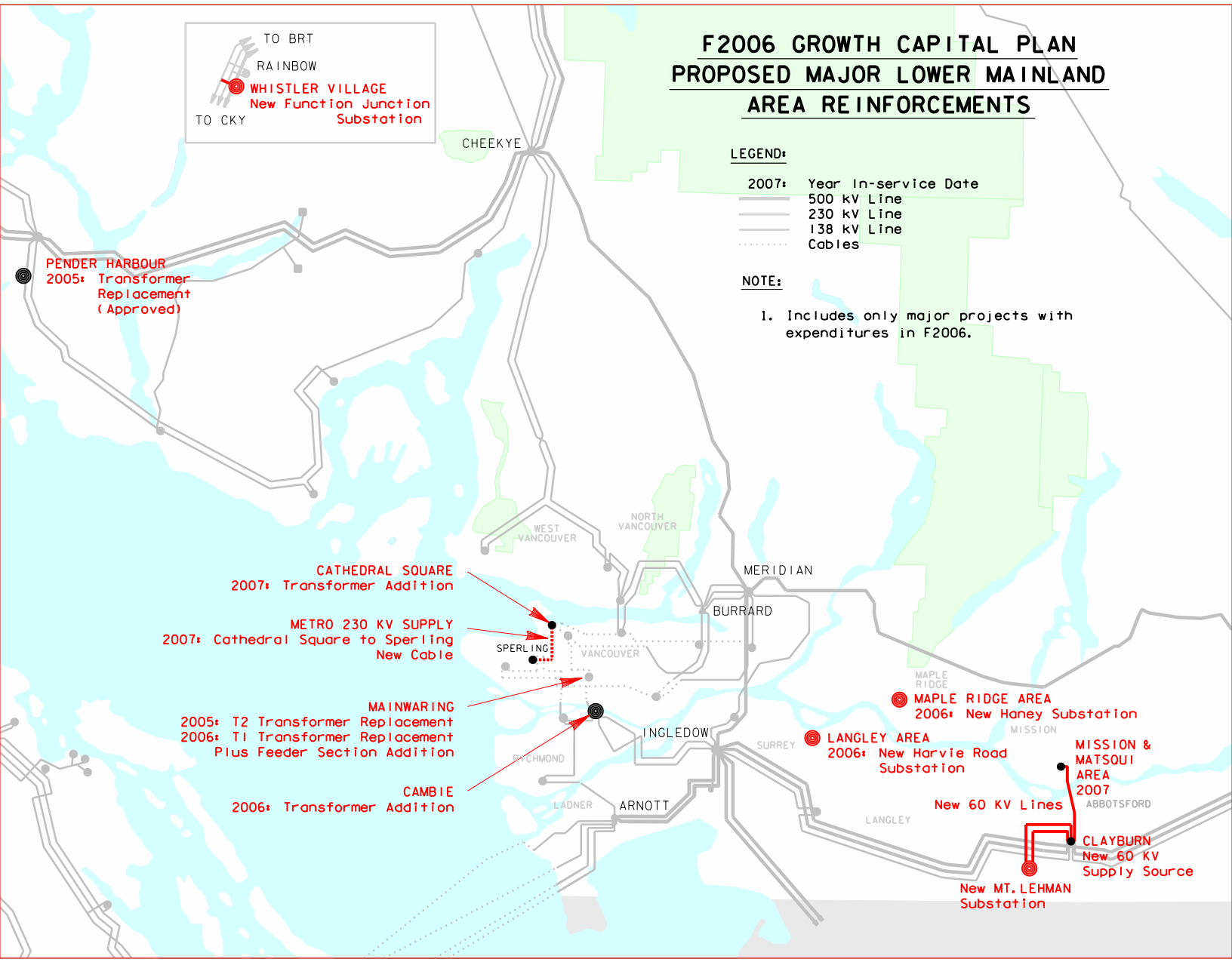
LEGEND:

(D) DEFINITION PHASE -
Funding for preliminary engineering requested to maintain earliest in-service date of proposed project.

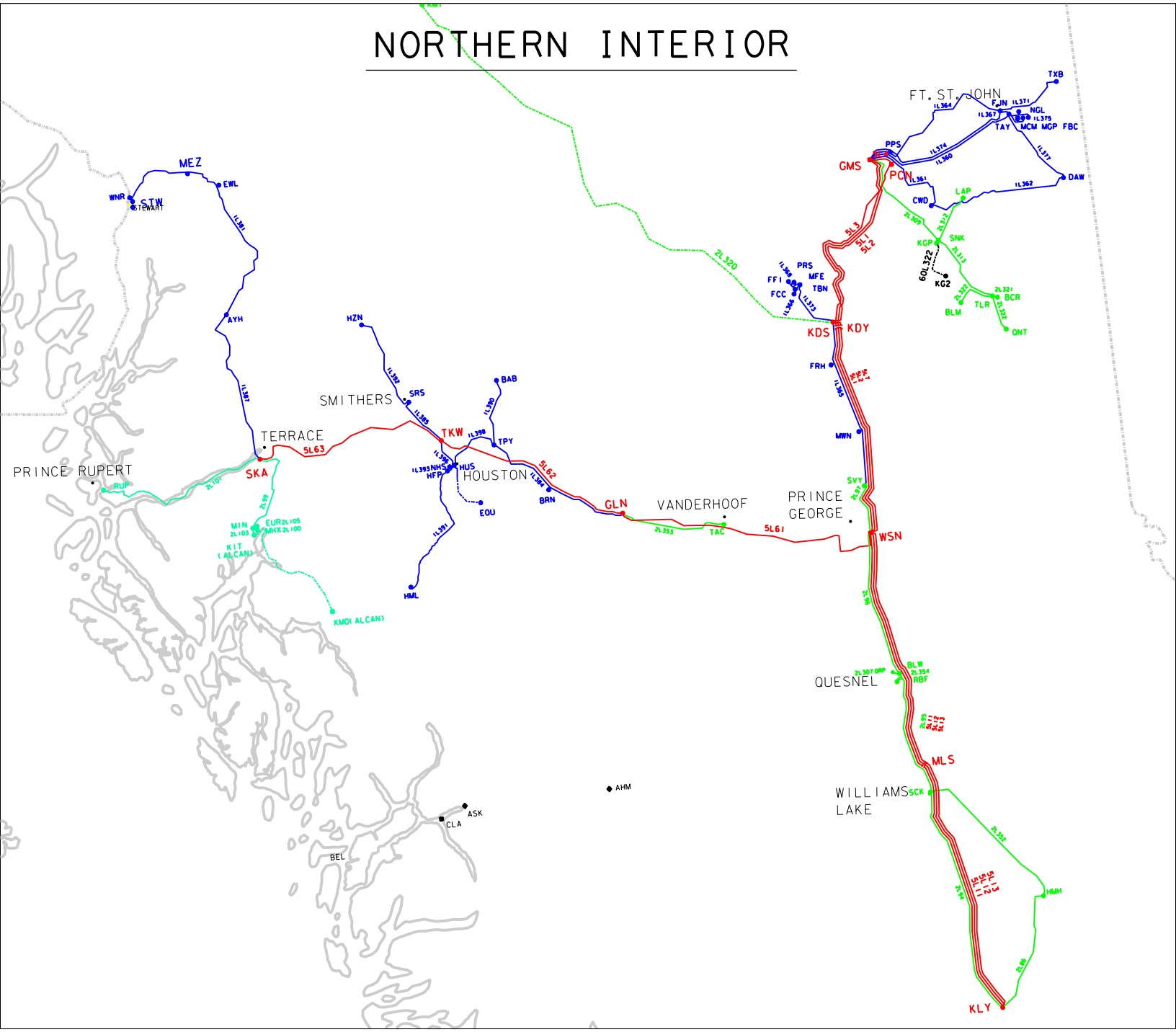
NOTES:

1. All are 500 kV circuits except as marked.
2. Includes only major projects with expenditures in F2006.

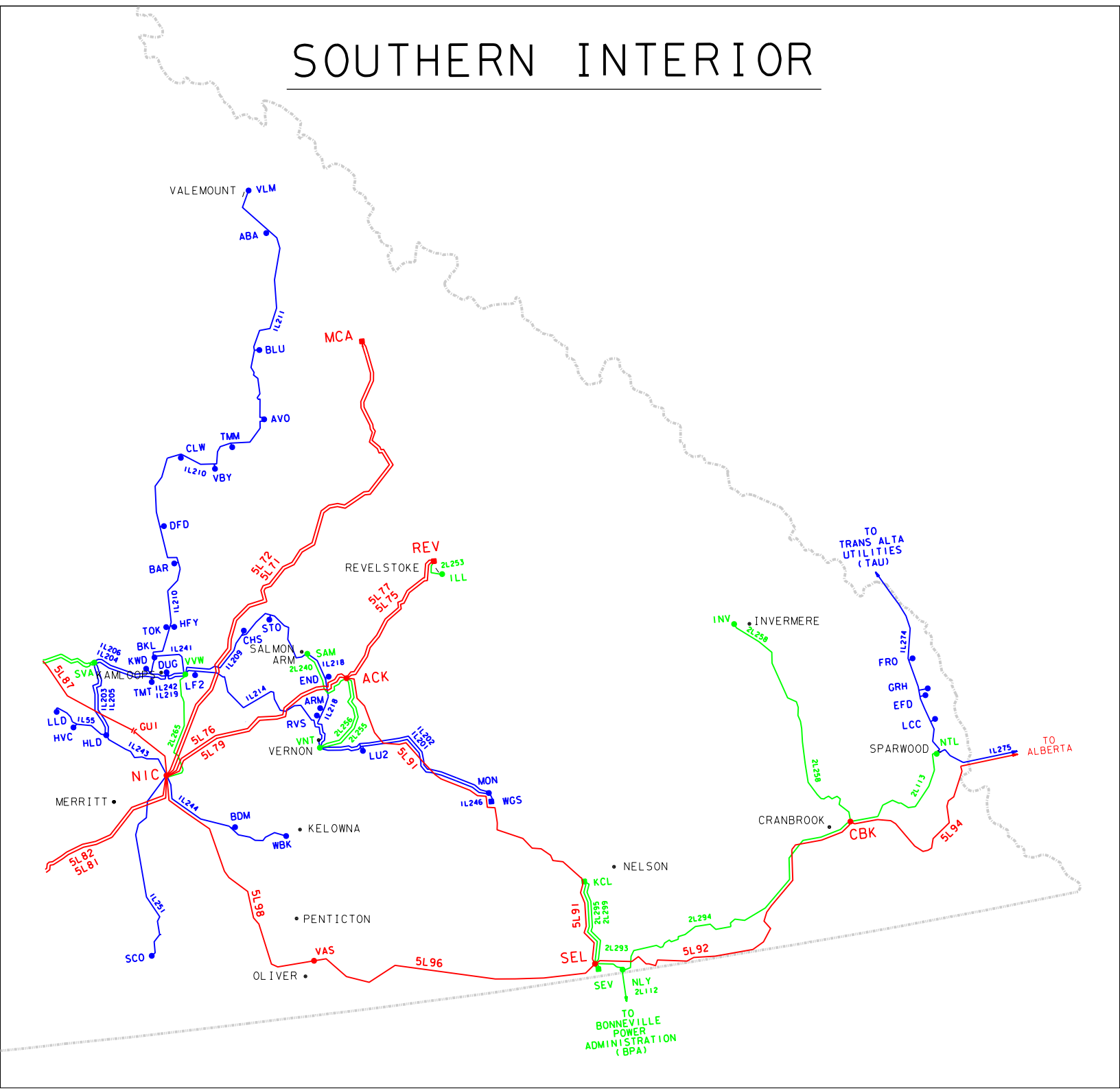

F2006 GROWTH CAPITAL PLAN
PROPOSED MAJOR SOUTH INTERIOR &
NORTHERN INTERIOR AREA REINFORCEMENTS
New FOX CREEK Substation
New 138 KV Line
TO GMS
FT. ST. JOHN
LEGEND:
2007: Year In-service Date
500 kV Line
230 kV Line
138 kV Line
NOTE:
1. Includes only major projects with expenditures in F2006.
SAVONA
KAMLOOPS
DOUGLAS STREET
2005: Transformer Addition
(Approved May 2004 Plan)
VALLEYVIEW
SALMON ARM
SALMON ARM
2007: Transformer Addition
ASHTON CREEK
GUICHON
HIGHLAND
NICOLA
VERNON
VERNON TERMINAL

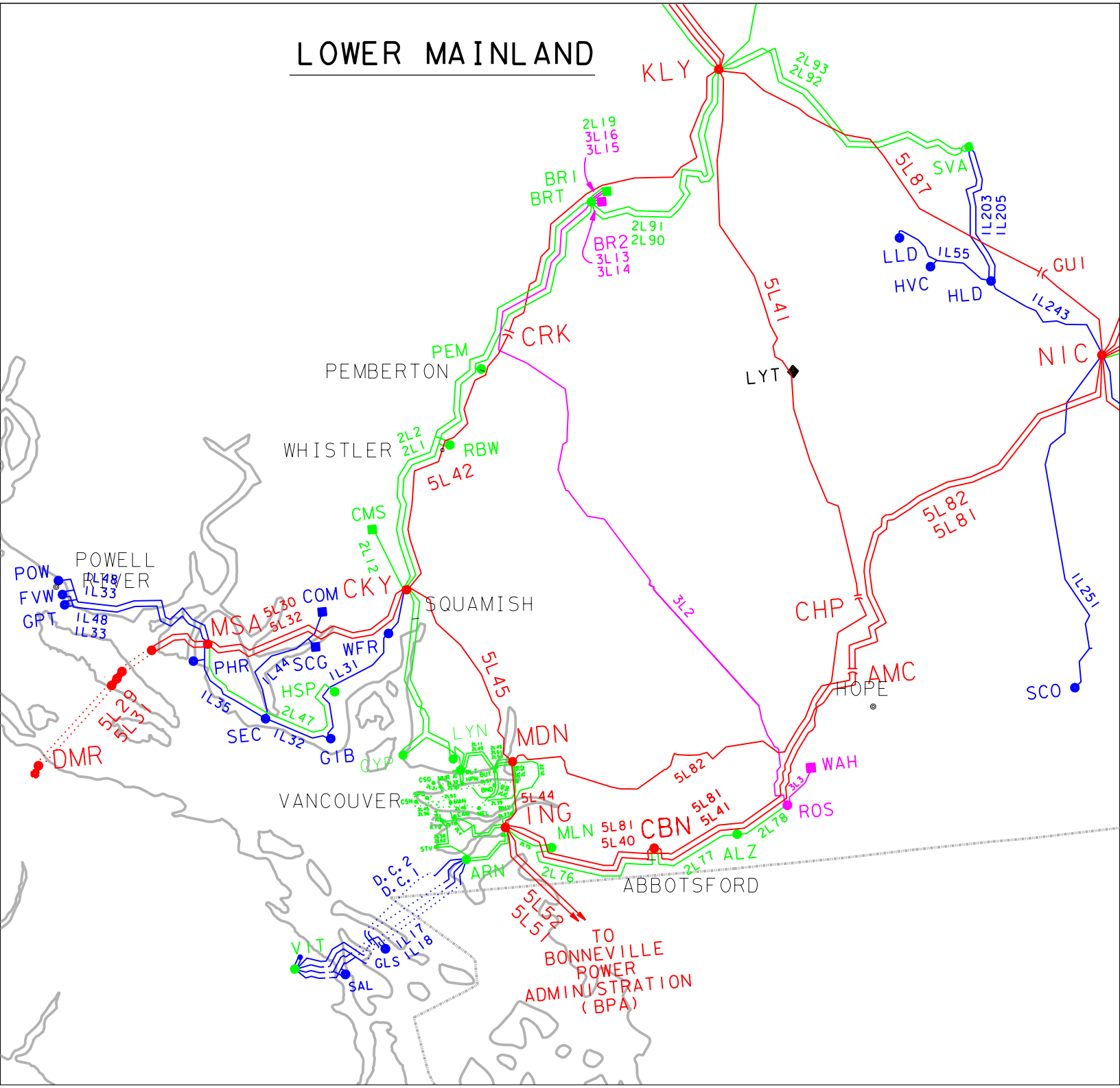

F2006 GROWTH CAPITAL PLAN
PROPOSED MAJOR LOWER MAINLAND
AREA REINFORCEMENTS
LEGEND:
2007: Year In-service Date
500 kV Line
230 kV Line
138 kV Line
Cables
NOTE:
1. Includes only major projects with expenditures in F2006.
TO BRT
RAINBOW
WHISTLER VILLAGE
New Function Junction
Substation
TO CKY
CHEEKYE
PENDER HARBOUR
2005: Transformer
Replacement
(Approved)
CATHEDRAL SQUARE
2007: Transformer Addition
METRO 230 KV SUPPLY
2007: Cathedral Square to Sperling
New Cable
MAINWARING
2005: T2 Transformer Replacement
2006: T1 Transformer Replacement
Plus Feeder Section Addition
CAMBIE
2006: Transformer Addition
SPERLING
WEST VANCOUVER
NORTH VANCOUVER
VANCOUVER
MERIDIAN
BURRARD
INGLEDOW
RICHMOND
LADNER
ARNOTT
SURREY
MAPLE RIDGE
MAPLE RIDGE AREA
2006: New Haney Substation
MISSION
LANGLEY AREA
2006: New Harvie Road
Substation
MISSION &
MATSQUI
AREA
2007
New 60 KV Lines
ABBOTSFORD
LANGLEY
CLAYBURN
New 60 KV
Supply Source
New MT. LEHMAN
Substation

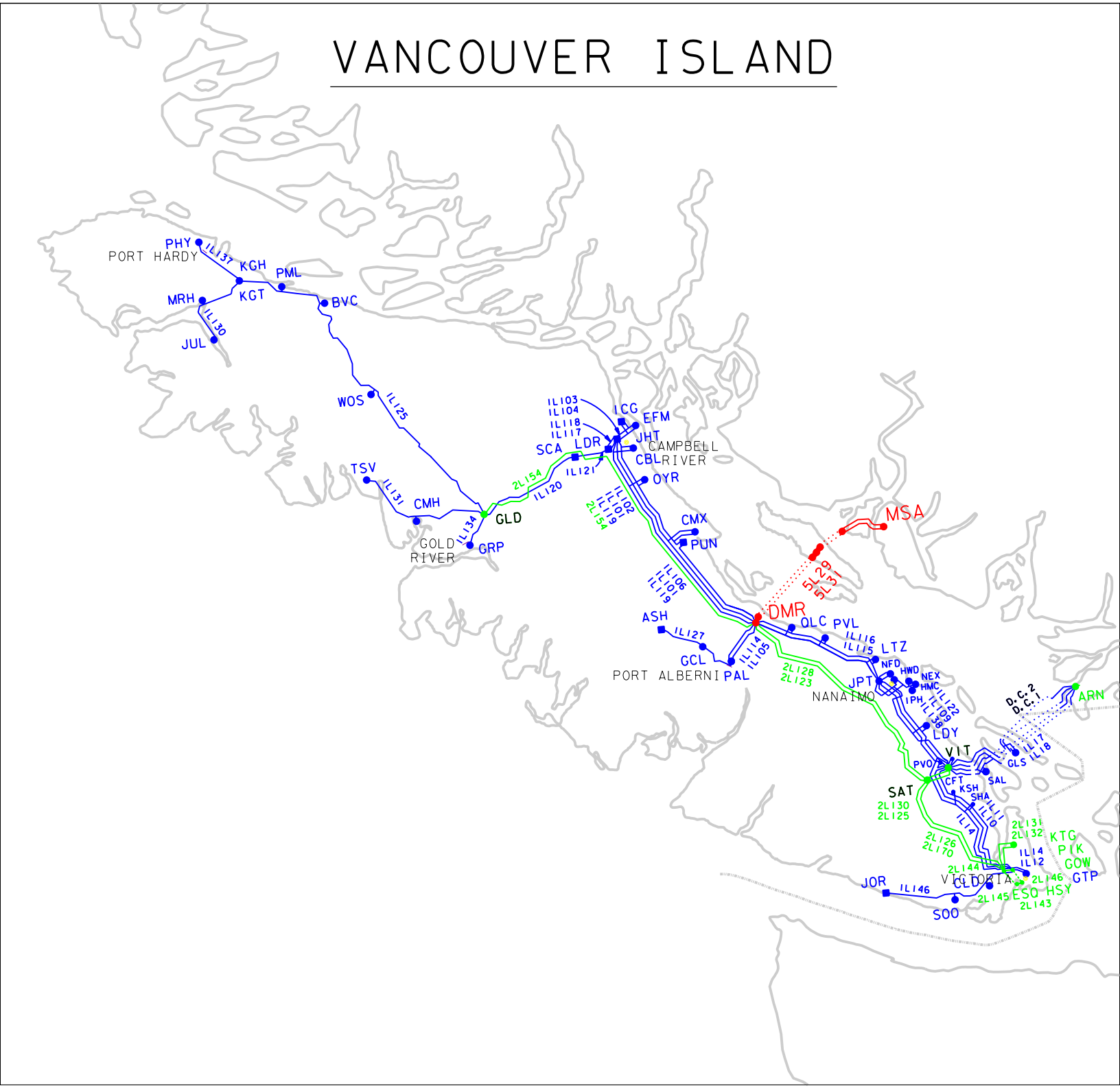
APPENDIX 4
REGIONAL MAPS


NORTHERN INTERIOR
FT. ST. JOHN
TXB
FJN
NGL
TAY
MCM MGP FBC
PPS
GMS
PCN
DAW
CWD
LAP
KGP
SNK
BCR
TLR
BLM
ONT
KG2
PRS
MFE
TBN
FFI
FCC
KDS
KDY
FRH
MWN
SVY
WSN
PRINCE GEORGE
VANDERHOOF
GLN
TAC
BRN
HUS
HOUSTON
TKW
TPY
BAB
SRS
SMITHERS
HZN
HML
EOU
NHS
HFP
TERRACE
SKA
PRINCE RUPERT
RUP
MIN
EUR
KIT
(ALCAN)
KMO(ALCAN)
MEZ
EWL
WNR
STW
STEWART
AYH
QUESNEL
BLW
RBF
MLS
WILLIAMS LAKE
SCK
HMH
KLY
AHM
ASK
CLA
BEL

SOUTHERN INTERIOR




LOWER MAINLAND
KLY
2L93
2L92
2L19
3L16
3L15
BR1
BRT
BR2
3L13
3L14
2L91
2L90
SVA
5L87
IL203
IL205
LLD
IL55
HVC
HLD
GUI
IL243
NIC
5L41
LYT
CRK
PEM
PEMBERTON
WHISTLER
2L2
2L1
RBW
5L42
CMS
2L12
POWELL
RIVER
POW
FVW
GPT
IL48
IL33
MSA
5L30
5L32
COM
CKY
SQUAMISH
PHR
IL44
SCG
WFR
IL31
HSP
2L47
IL35
SEC
IL32
GTB
QYP
DMR
5L29
5L31
LYN
MDN
5L45
3L2
CHP
5L82
5L81
IL251
SCO
AMC
HOPE
WAH
3L3
ROS
5L82
5L81
5L41
2L78
ALZ
2L77
CBN
5L81
5L40
MLN
ING
5L44
VANCOUVER
ARN
2L76
ABBOTSFORD
D.C.2
D.C.1
5L52
5L51
TO
BONNEVILLE
POWER
ADMINISTRATION
(BPA)
VIT
IL17
IL18
GLS
SAL


VANCOUVER ISLAND
PHY
PORT HARDY
IL137
KGH
PML
MRH
KGT
BVC
IL130
JUL
WOS
IL125
TSV
IL131
CMH
GOLD RIVER
IL134
GRP
GLD
2L154
IL120
SCA
LDR
IL121
IL103
IL104
IL118
IL117
ICG
EFM
JHT
CAMPBELL RIVER
CBL
OYR
CMX
PUN
IL106
IL107
IL109
ASH
IL127
GCL
PORT ALBERNI
PAL
IL114
IL105
DMR
MSA
5L29
5L31
QLC
PVL
IL116
IL115
LTZ
NFD
HWD
NEX
HMC
IPH
IL122
IL136
IL139
LDY
JPT
NANAIMO
2L128
2L123
VIT
PVO
CFT
KSH
SHA
SAL
GLS
IL17
IL18
D.C.2
D.C.1
ARN
SAT
2L130
2L125
IL11
IL10
IL1A
2L131
2L132
KTG
PIK
GOW
2L126
2L170
IL14
IL12
2L144
VICTORIA
2L146
GTP
JOR
IL146
CLD
2L145
ESO
HSY
2L143
SOO