



- Supply and install a new 500/230 kV, 600 MVA transformer with associated disconnect switches, voltage transformers and surge arresters
- Install a 230 kV line terminal, including a 230 kV capacitor voltage transformer, motor operated disconnect switch, surge arrester and associated bus work
- Terminate 500/230 kV transformer and the customer's 230 kV transmission line at the respective terminals
- Supply one 1-phase 500/230 kV, 200 MVA transformer to be held as a spare
- Expand and upgrade the station ground grid
- Upgrade the required substation facilities, infrastructures, and bus work to support new station equipment
- Supply and install required Protection, Control and Telecommunications equipment

**Exclusions:**

- GST
- Permits
- Right-of-Way & property costs

**Key Assumptions:**

- Construction by contractor
- 24 months of construction is considered
- No construction during winter season
- Execution of early Engineering and Procurement Agreement
- No expansion of control buildings or other substations to accommodate new equipment
- Impact Benefit Agreements with First Nations are not considered

**Key Risks:**

- Expansion of the existing control building and/or other substations may be required leading to increased costs and/or a longer project schedule
- Major equipment delivery presents potential project cost and schedule risks, based on variance in equipment lead times
- No defined supply chain strategy; construction costs may increase depending on delivery method
- Project schedule may be longer than expected, leading to increased overhead costs
- Ground improvements may be required leading to increased construction costs
- Contaminated soil may be encountered leading to increased construction costs
- Cost of materials and major equipment may be affected by market conditions and escalation

**Study Limitations and Exclusions*****Protection, Control, and Telecommunications***

The Interconnection Feasibility Study does not include a detailed review of the protection, control, and telecommunications system requirements specific to your Interconnection Request. Based on a high-level review, we have identified proxy costs for protection, control, and telecom Network Upgrades drawn from comparable interconnection projects with similar scope and complexity; these proxy costs have been included solely for indicative budgeting purposes. The relative interconnection cost determined by the

Interconnection Feasibility Study includes a telecommunications component based on an assumed solution to deliver teleprotection and telecontrol circuit requirements necessary for the Interconnection Request. Protection, control, and telecommunications system requirements will be reviewed in detail in the System Impact Study if you are a successful participant of the CEAP and meet applicable requirements.

For Interconnection Feasibility Study purposes, it is assumed that any applicant-proposed works that could obstruct or impair the performance of existing BC Hydro microwave systems or new links from the proposed Interconnection Customer Interconnection Facilities (ICIF) to the BC Hydro microwave system would be identified and either relocated or repositioned as determined in a System Impact Study if you are a successful participant of the CEAP and meet applicable requirements. Such works may include, but are not limited to, towers, turbines, dams, support structures, panels, surface materials deposited or redistributed, water surface changes, or vegetation.

### ***Generation Shedding/Curtailment Scheme and Electromagnetic Transient (EMT) Studies***

The generation shedding/curtailment scheme reviews (e.g., Remedial Action Scheme (RAS), and a direct transfer trip for anti-islanding scheme) and EMT studies are completed in a System Impact Study. The outcomes of these studies may result in additional requirements, which could include Network Upgrades or ICIF. Any costs associated with completion of these studies, and resulting requirements, are not included in the Interconnection Feasibility Study cost estimate.

### ***Revenue Metering***

Please note that revenue metering requirements have not been determined with the Interconnection Feasibility Study. As such, any costs associated with revenue metering and other interconnection components are not included in the cost estimate provided above. Once these requirements are defined, costs that are attributable to the Interconnection Customer are to be paid in cash. For more details on revenue metering requirements and responsibilities, please refer to:

<https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/distribution/standards/ds-rmr-complex-revenue-metering.pdf>.

### **Schedule**

Based on the Interconnection Feasibility Study, the non-binding good faith estimated in-service date for your Interconnection Request's Network Upgrades is Quarter 3 2032 (calendar year). To achieve this timeline, we may need to expedite certain activities, including engineering design and procurement of long-lead equipment.

Timely actions required from you to minimize risks to the schedule:

- Submission of additional technical data required for the System Impact Study and Facilities Study
- Submission of any required information or document such as demonstration of Site Control
- Execution of Combined Study Agreement and Standard Generator Interconnection Agreement
- Financial commitments and securities

Please note that changes to your Interconnection Request or delays in data submission or financial commitments may also impact the target in-service date.

If you have any questions, please contact the BC Hydro CEAP team at [ceap2025@bchydro.com](mailto:ceap2025@bchydro.com).

Sincerely,

[Redacted signature]

[Redacted name]

Manager, Customer Interconnections

BC Hydro

Encl.: CEAP\_2025\_IR103\_[Redacted]\_Feasibility\_Study.pdf



# Interconnection Feasibility Study

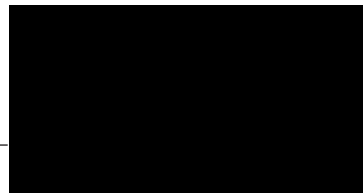
**BC Hydro EGBC Permit to Practice No: 1002449**

**2025 CEAP IR # 103**

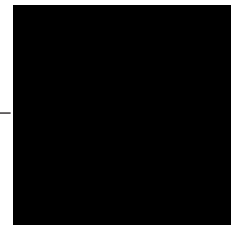
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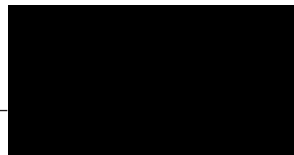
Prepared by:



Sr. Engineer, Transmission Planning

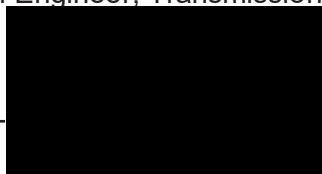


Reviewed by:



Principal Engineer, Transmission Planning

Accepted by:



Manager, Transmission Planning

## Report Metadata

Header: 2025 CEAP IR # 103  
Subheader: Interconnection Feasibility Study  
Title: [REDACTED]  
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Report Number: 431-APR-00014  
Revision: 0  
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Prepared by: [REDACTED]  
Title: Sr. Engineer, Transmission Planning  
Checked by: [REDACTED]  
Title: Consultant, Transmission Planning  
Reviewed by: [REDACTED]  
Title: Principal Engineer, Transmission Planning

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Additional Metadata: Transmission Planning 2025-116  
Filing Subcode 1350

## Revisions

Revision	Date	Description
0	2025 Nov	Initial release

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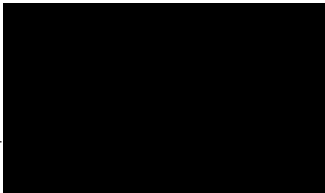
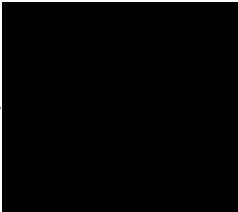
**Section:**

Entire report  
except listed  
below

**Discipline:**

Transmission Planning

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**Section:**

5.2, 5.3

**Discipline:**

Stations Planning

Contributed by:

   
\_\_\_\_\_  
Sr. Engineer, Station Planning

## Executive Summary

██████████ the interconnection customer (IC), requests to interconnect its ██████████ project (2025 CEAP IR # 103) to the BC Hydro (BCH) system. ██████████ project has 4 hydro generators with total installed capacity of 500 MW. The IC's proposed commercial operation date (COD) is July 7, 2030.

To interconnect the ██████████ project and its facilities to the BCH Transmission System, this Feasibility Study has made the recommendations and conclusions as follow:

1. The IC initially proposed the Point of Interconnection (POI) at the 230 kV bus of BC Hydro's Cheekye Substation (CKY). Following a collaborative decision by the BC Hydro study team, the POI will be a 230 kV bus to be constructed in BC Hydro's Cheekye 500 kV Substation (CK5) to facilitate IC's project interconnection to the BC Hydro system. Cheekye 500 kV Substation is co-located with CKY, with the two substations situated approximately 200 metres apart.

The IC proposed to construct a 230 kV transmission line approximately 50 km from the project site to the designated POI.

2. To facilitate the interconnection of IC Project, a new 500/230 kV transformer with a rating of 600 MVA will be installed at Cheekye 500 kV Substation.
3. Based on the projected base cases, the connection of ██████████ project does not cause any performance violation (i.e. thermal overload, voltage performance violation or voltage stability concern) under system normal conditions.
4. Under 2030 heavy summer conditions, the outages of 5L45 and circuit breaker fault at Cheekye 500 kV Substation are expected to cause the 2L9 to exceed its continuous rating, reaching approximately 108% loading. The ██████████ project may need a generation runback or shedding remedial action scheme (RAS) to secure the system. The RAS function scope will be specified in the System Impact Study (SIS) if required.

The above conclusions are made based on the IC's input data and study assumptions listed in Section 4, which represent the best available information on October 14, 2025.

A non-binding good faith cost for required network upgrades and estimated schedule for construction are included in a separate letter to the IC.

Please note that, this Feasibility Study report does not include the descriptions of Protection, Control, and Telecommunications requirements and the associated upgrade scopes; however, as discussed in Section 2 "Purpose and Scopes of Study", the associated cost implications are captured and delivered in the cover letter to the IC".

# Contents

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## Appendices

Appendix A	Schematic Diagram of the IC's Project
Appendix B	Power Flow Study Results
Appendix C	One-Line Sketch for Cheekye 500 kV Substation

## Acronyms

The following are acronyms used in this report.

BCH	BC Hydro
CEAP	Competitive Electricity Acquisition Process
COD	Commercial Operation Date
DTT	Direct Transfer Trip
ERIS	Energy Resource Interconnection Service
FeS	Feasibility Study
IBR	Inverter-Based Resources
IC	Interconnection Customer
IR	Interconnection Request
LAPS	Local Area Protection Schemes
MPO	Maximum Power Output
NERC	North American Electric Reliability Corporation
NRIS	Network Resource Interconnection Service
OATT	Open Access Transmission Tariff
POI	Point of Interconnection
RAS	Remedial Action Scheme
TIR	BC Hydro “60 KV to 500 kV Technical Interconnection Requirements for Power Generators”
WECC	Western Electricity Coordinating Council
WTG	Wind Turbine Generator

# 1 Introduction

Table 1-1 below summarizes the project reviewed in this Feasibility Study.

Table 1-1 Summary of Project Information

Project Name	[REDACTED]	
Name of Interconnection Customer (IC)	[REDACTED]	
Point of Interconnection (POI)	230 kV bus at Cheekye 500 kV Substation	
IC's Proposed COD	7th July 2030	
Type of Interconnection Service	NRIS <input checked="" type="checkbox"/>	ERIS <input type="checkbox"/>
Maximum Power Injection (MW)	488 MW (Summer)	488 MW (Winter)
Number of Generators	4 x 125 MW	
Plant Fuel	Hydro	

[REDACTED] the interconnection customer (IC), requests to interconnect its [REDACTED] Project (2025 CEAP IR # 103) to the BC Hydro (BCH) system. [REDACTED] project has 4 hydro generators with total installed capacity of 500 MW. The IC's proposed commercial operation date (COD) is July 7, 2030.

The IC initially proposed POI at the 230 kV bus of BC Hydro's Cheekye Substation (CKY). Following a collaborative decision by the BC Hydro study team, the POI will be a 230 kV bus to be constructed in BC Hydro's Cheekye 500 kV Substation (CK5). Cheekye 500 kV Substation is co-located with CKY, with the two substations situated approximately 200 metres apart.

To facilitate the interconnection, the IC proposed to construct a 230 kV transmission line approximately 50 km from the project site to the designated POI. Additionally, a new 500/230 kV transformer rated at 600 MVA will be installed at Cheekye 500 kV Substation.

Figure 1-1 presents the North Shore and Sunshine Coast (NS-SC) area transmission system diagram, including the existing system, and the proposed [REDACTED] project.



transmission line 2L90. The planned in-service date for this upgrade is February 2030.

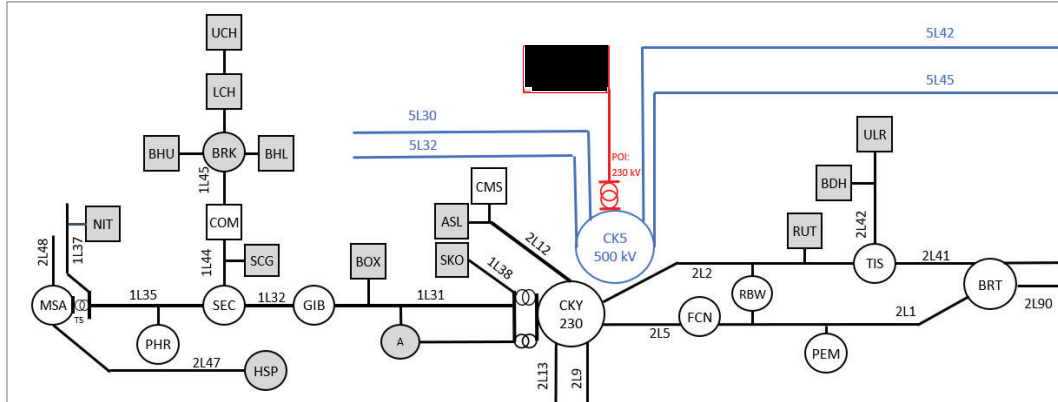


Figure 1-2: 2030 Project Interconnection Configuration (132 kV and up)

## 2 Purpose and Scopes of Study

This Feasibility Study is a preliminary evaluation of the system impact of interconnecting the proposed project to the BC Hydro system based on power flow and short circuit analysis in accordance with BCH's Open Access Transmission Tariff (OATT) and produces the estimated cost of required Network Upgrades and the implementation schedule.

Per OATT, the Feasibility Study is performed individually for each of the participating projects in the CEAP process and focuses specifically on the BC Hydro regional transmission system where the proposed generating project is connected and affects.

This is a "limited scope" study which is restricted to power flow studies of P0, P1 and P2 planning events as defined in TPL-001-4 and short circuit analysis. The study does not address other technical aspects such as transient stability and switching transients and impact of multiple contingencies. These subjects will be addressed in subsequent System Impact Study if the project proceeds further. In addition, any potential impacts to the adjacent external systems to BC Hydro would be addressed in subsequent detailed and coordinated studies with the relevant adjacent entities if the proposed generator project proceeds further.

Please note that, due to the compressed study timeline for CEAP 2025 Feasibility Study, this report does not include the descriptions of the Protection, Control, and Telecommunication requirements and the associated upgrade scopes. Instead, the network upgrades associated with Protections, Controls and Telecommunications are incorporated with cost estimates in a separate cover letter to the IC.

### 3 Standard and Criteria

The Feasibility Study is performed in compliance with the North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability standards, and the BCH interconnection requirements in the TIR, and upon the ratings of the existing BCH transmission facilities described in Operating Orders, specifically:

- NERC standards: TPL-001-4 and FAC-002-3 relevant to the scope of this Feasibility Study.
- WECC criteria TPL-001-WECC-CRT-4 Transmission System Planning Performance, July 1, 2023.
- BC Hydro's 60 kV to 500 kV Technical Interconnection Requirements for Power Generators, Rev 2.1.1, Effective: Sept 22, 2025.
- BC Hydro Operating Order 5T-10, Ratings for All Transmission Circuits 60 kV or Higher, Sept 17, 2025.
- BC Hydro Operating Order 5T-14, Ratings for All Transmission and Distribution Transformer, Sept 22, 2025.
- BC Hydro System Operating Order 7T-22 System Voltage Control, Sept 19, 2023.

## 4 Assumptions and Conditions

This Feasibility Study is performed based on the IC's submitted data and information available to BC Hydro on Oct 14, 2025, for the study purpose. Assumptions are made wherever the IC's input is unavailable. Appendix A shows the schematic diagram of the IC's Project used in the study model.

The power flow study cases used in this Feasibility Study are established based upon the BC Hydro's base resource plan and load forecasts available at the time of performing the study, which includes existing and future generators, transmission facilities, and loads in addition to the subject interconnection project in this study. Applicable seasonal conditions and the appropriate study years for the study planning horizon are also incorporated. Additional assumptions are listed as follows.

- 1) The generation in the study area are dispatched to the patterns that stress the transmission system in the study area. In these patterns, the associated generators are typically set to their Maximum Power Outputs (MPO) unless otherwise specified.
- 2) For performing the study, the CKY 230/132 kV T3 capacity upgrade project and the associated new 132 kV transmission line from CKY to a higher queue Customer A and the Bridge River area 2L90 upgrade project are included.

## 5 System Studies and Results

Based upon the IC's submitted information and the area system conditions, the project POI is recommended to be a 230 kV bus at Cheekye 500 kV Substation. To facilitate the interconnection, the IC proposed to construct a 230 kV transmission line approximately 50 km from the project site to POI. Additionally, a new 500/230 kV transformer rated at 600 MVA will be installed at Cheekye 500 kV Substation.

### 5.1 Power Flow Study Results

Power flow studies were performed to evaluate whether the IC's generating project would cause any unacceptable system performance (e.g. equipment overloads, steady-state voltage violation and voltage instability) and to determine the system reinforcement requirement based on steady state performance analysis.

The study focuses on the base scenario — 30HS/30LS/30HW system conditions. These base cases were prepared based on factors such as load conditions, seasonal variation in ambient temperatures, and generation patterns that stress the transmission system.

The studies are performed for system normal conditions and under critical system contingencies specified in the P1 and P2 events by NERC TPL-001-4. Study results are summarized below.

#### 5.1.1 Thermal Overload Analysis

Table B-1 in Appendix B summarizes the thermal overload concerns identified in the study.

Based on the projected base cases, the connection of [REDACTED] does not cause any performance violation (i.e. thermal overload, voltage performance violation or voltage stability concern) under system normal conditions.

For critical single contingency (N-1) conditions, the study observed under 2030 heavy summer conditions, the outages of 5L45 and circuit breaker fault at Cheekye 500 kV Substation are expected to cause the 2L9 to exceed its continuous rating, reaching approximately 108% loading. The [REDACTED] project may need

a generation runback or shedding remedial action scheme (RAS) to secure the system. The RAS function scope will be specified in the System Impact Study (SIS) if required.

### **5.1.2 Steady-State Voltage Analysis**

With the connection of the IC's project, the steady-state voltage performance under system normal and single contingency conditions is acceptable for all the three load conditions (30LS, 30HS, 30HW). Table B-2 in Appendix B shows the details in the steady-state voltage study results.

## **5.2 Fault Analysis**

The short circuit analysis in the FeS is based upon the latest BC Hydro system model, which includes the generating facility information and associated impedance data provided by the IC. A more detailed study will be performed at the System Impact Study stage if needed.

## **5.3 Stations Requirements**

### **Assumptions:**

- There is no space available in the existing CKY 500kV switchyard. It is assumed that the expansion of CKY 500 kV switchyard toward north to accommodate proposed station equipment is feasible.
- It is assumed that protection and control equipment can be installed in the existing control building.

### **Scope of work at CKY 500 kV switchyard:**

CKY 500 kV substation will be expanded and upgraded to install a new 500/230 kV, 600 MVA transformer, terminate IC's 230 kV transmission line and install associated equipment. Refer to the one-line diagram in Appendix C for details.

- Expand the existing CKY 500 kV switchyard toward north with sufficient space to install a new 500/230 kV, 600 MVA transformer, terminate IC's 230 kV transmission line and install other associated equipment/structures.
- Add one 500 kV circuit breaker (5CB11) and associated 500 kV equipment in the existing bus to create a 500 kV termination (5B1) for the transformer.

- Install a new 500/230 kV, 600 MVA (3 × 1-phase 200 MVA) transformer with associated disconnect switches, voltage transformers and surge arresters.
- Buy one 1-phase 500/230 kV, 200 MVA transformer and keep it as a spare unit at the site.
- Install a 230 kV line terminal, including a 230 kV CVT, motor operated disconnect switch, surge arrester and associated bus work.
- Terminate 500/230 kV transformer and the [REDACTED] 230 kV transmission line (2LXX) at the respective terminals.
- Expand and upgrade the station ground grid.
- Install associated protection, control, station service, and other associated equipment in the existing control building.
- All electrical, mechanical, civil, structural and foundation work.
- The location of metering kits will be determined in next stage.

## 6 Cost Estimate and Schedule

The non-binding good faith estimated cost and time to construct the Network Upgrades required to interconnect the proposed project will be provided in a separate letter to the IC.

## 7 Conclusions

To interconnect the [REDACTED] and its facilities to the BCH Transmission System at the POI, this Feasibility Study has identified the following conclusions and requirements:

1. The IC initially proposed the Point of Interconnection (POI) at the 230 kV bus of BC Hydro's Cheekye Substation (CKY). Following a collaborative decision by the BC Hydro study team, the POI will be a 230 kV bus to be constructed in BC Hydro's Cheekye 500 kV Substation (CK5) to facilitate IC's project interconnection to the BC Hydro system. Cheekye 500 kV Substation is co-located with CKY, with the two substations situated approximately 200 metres apart.

The IC proposed to construct a 230 kV transmission line approximately 50 km from the project site to the designated POI.

2. To facilitate the interconnection of IC Project, a new 500/230 kV transformer with a rating of 600 MVA will be installed at Cheekye 500 kV Substation.
3. Based on the projected base cases, the connection of [REDACTED] does not cause any performance violation (i.e. thermal overload, voltage performance violation or voltage stability concern) under system normal conditions.
4. Under 2030 heavy summer conditions, the outages of 5L45 and circuit breaker fault at Cheekye 500 kV Substation are expected to cause the 2L9 to exceed its continuous rating, reaching approximately 108% loading. The [REDACTED] project may need a generation runback or shedding remedial action scheme (RAS) to secure the system. The RAS function scope will be specified in the System Impact Study (SIS) if required.

## Appendix A

### Schematic Diagram of the IC's Project

Figure A-1 shows the schematic diagram for the [REDACTED] project. Note that the proposed plant configuration includes four generator units, each rated at 125 MW, and four corresponding step-up transformers.

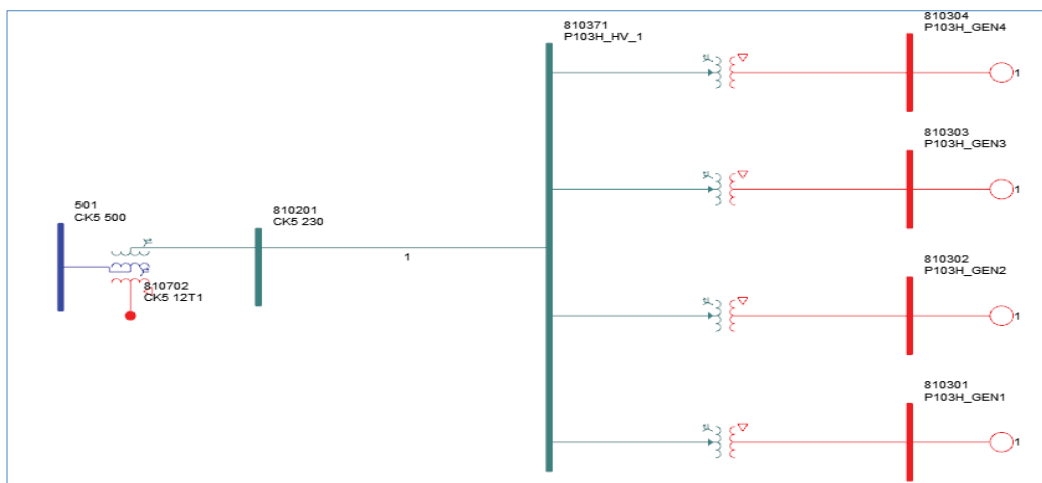


Figure A-1: [REDACTED] Project Plant Schematic Diagram

## Appendix B

### Power Flow Study Results

#### Base Scenario (30HS/30LS/30HW)

**Table B-1: Thermal Overload Study Results**

Case	IC's Plant Output	Contingency		Branch Loading (% of its seasonal normal rating)		
				2L13	2L9	ROS T1
		Cat.	Description	CKY-CYP	CKY-LYN	
Summer Rating (MVA)				373.3	347	450
30HS	Max	P0	System Normal	83%	101%	101%
	Max	P1	5L30	83%	101%	101%
	Max	P1	5L42	84%	103%	101%
	Max	P1	5L45	88%	108%	103%
	Max	P2	5CB13 at CK5	88%	108%	103%
30LS	Max	P0	System Normal	75%	93%	95%
	Max	P1	5L30	75%	93%	95%
	Max	P1	5L42	75%	93%	95%
	Max	P1	5L45	79%	98%	97%
	Max	P2	5CB13 at CK5	79%	97%	97%
Winter Rating (MVA)				502.7	487.2	534
30HW	Max	P0	System Normal	59%	68%	82%
	Max	P1	5L30	59%	67%	82%
	Max	P1	5L42	61%	69%	84%
	Max	P1	5L45	63%	72%	84%
	Max	P2	5CB13 at CK5	62%	71%	84%

**Table B-2: Steady-State Voltage Study Results**

Case	IC's Plant Output	Contingency		Bus Voltages (pu)	
		Cat.	Description	CK5 230 kV	CK5 500 kV
30HS	Max	P0	System Normal	1.04	1.06
	Max	P1	5L30	1.04	1.06
	Max	P1	5L42	1.04	1.06
	Max	P1	5L45	1.04	1.06
	Max	P2	5CB13 at CK5	1.04	1.06
30LS	Max	P0	System Normal	1.05	1.07
	Max	P1	5L30	1.05	1.07
	Max	P1	5L42	1.04	1.06
	Max	P1	5L45	1.04	1.06
	Max	P2	5CB13 at CK5	1.05	1.07
30HW	Max	P0	System Normal	1.05	1.07
	Max	P1	5L30	1.05	1.07
	Max	P1	5L42	1.05	1.07
	Max	P1	5L45	1.05	1.07
	Max	P2	5CB13 at CK5	1.04	1.06

## Appendix C

### One-Line Sketch for Cheekye 500 kV Substation

Figure C-1 shows the Stations Planning One-Line Sketch for Cheekye 500 kV Substation.

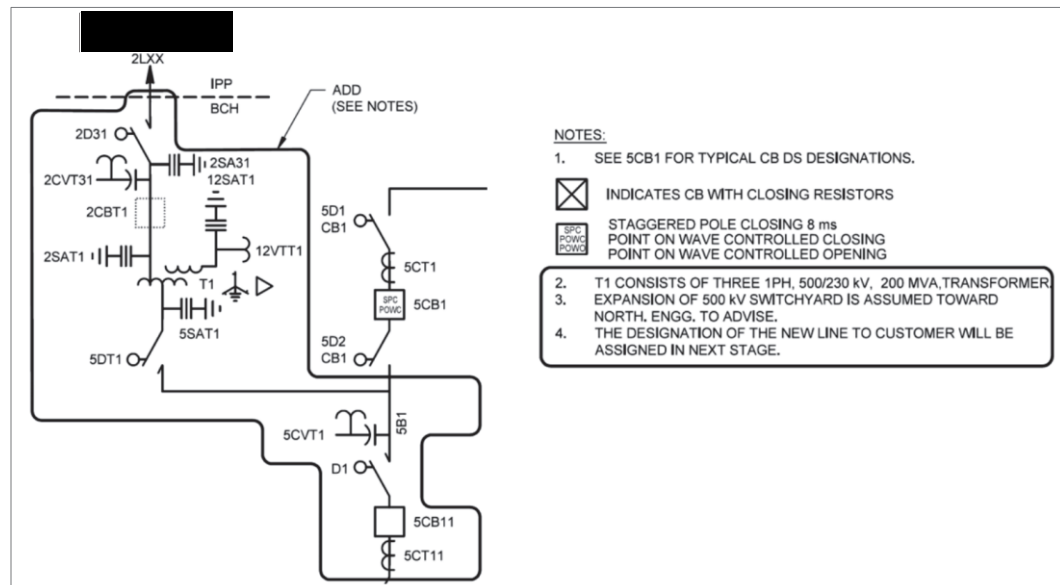


Figure C-1: Station Planning One-Line Sketch for Cheekye 500 kV Substation