Customer Information Session on Transmission Load Interconnection Process, Timelines and Requirements

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Housekeeping and Agenda

Moderator: Frank Lin

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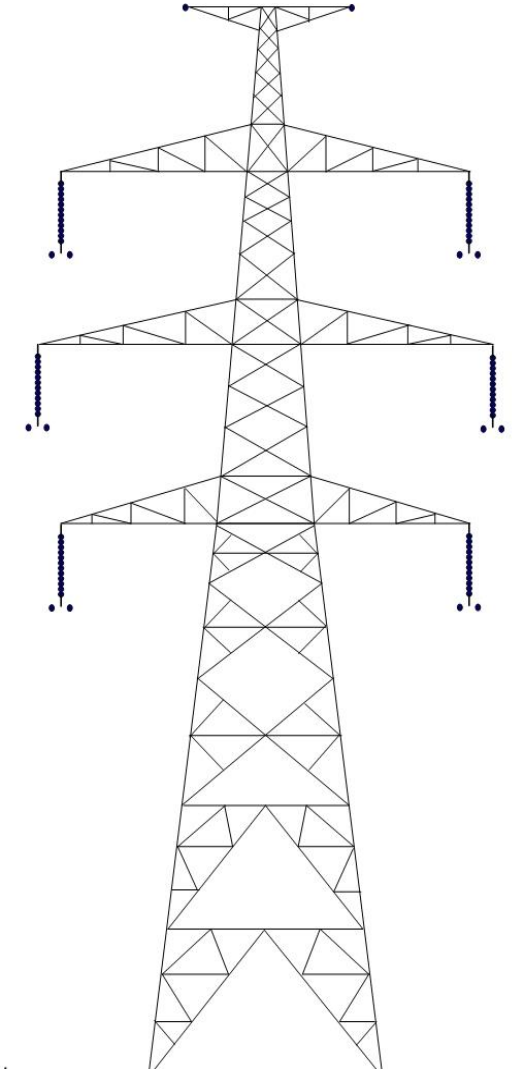
AGENDA

1. Context
2. Interconnection Process
3. System Impact Study
4. Facilities Study
5. Implementation
6. RDA Timeframe & Next Steps
7. Questions & Comments



Context and Scope

Presenter: Sam Jones

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CONTEXT

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BCUC: DCAT CPCN Decision – October 2012

- "… this Panel recommends that the Commission should consider a review of TS 6 and invite all interested parties to participate in the review as this is a significant and urgent issue." (Decision Page 128)

Industrial Electricity Policy Review (IEPR) Final Report – Oct 2013

- Taskforce Recommendations
- Government Response

2015 Rate Design Application (RDA)

2015 RDA SCOPE

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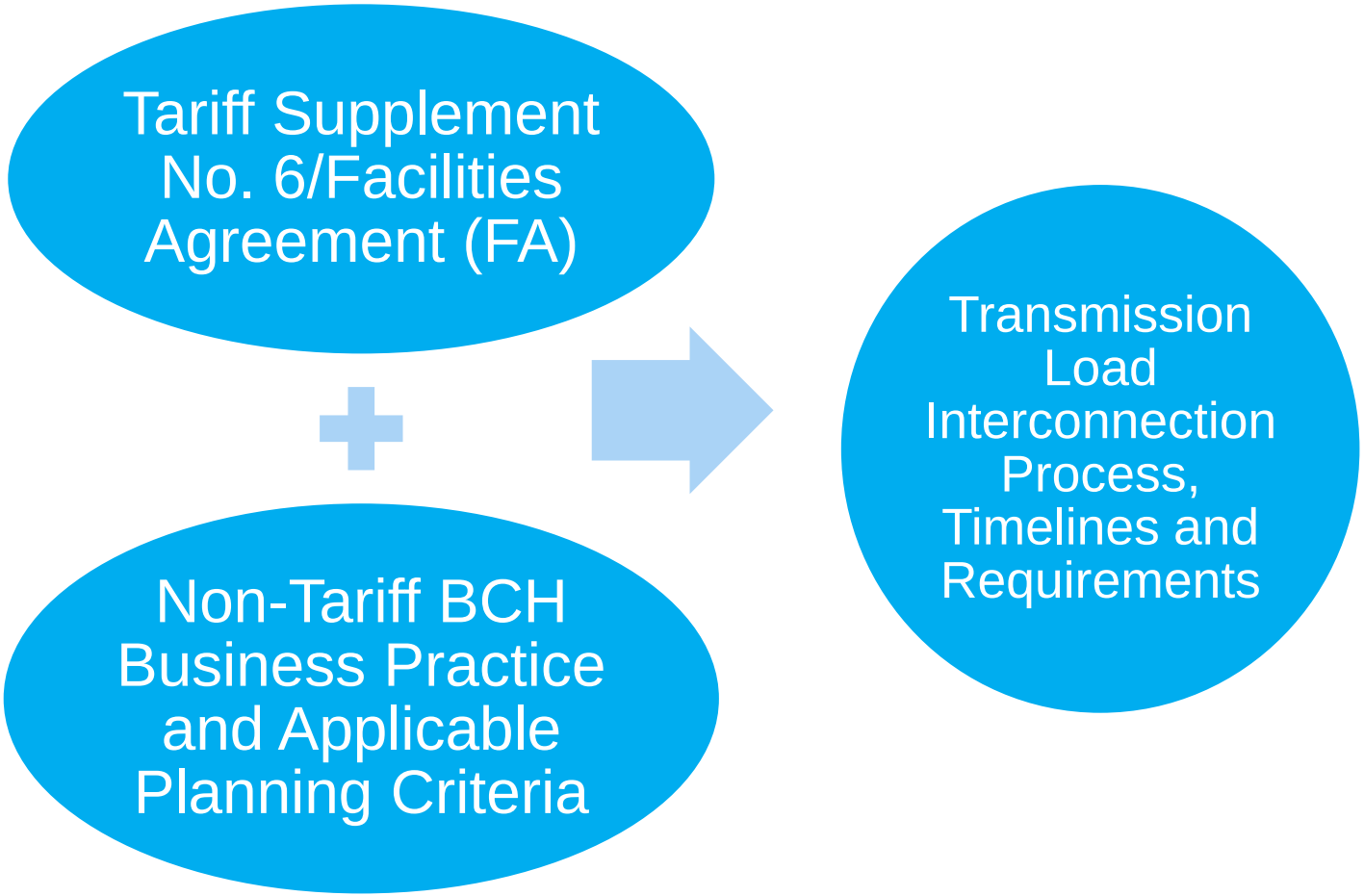
- All 7 customer classes: Residential, Small General Service, Medium General Service, Large General Service, Irrigation, Street Lighting and Transmission
- Cost of Service (COS), and Rebalancing within confines of section 58.1 of the *Utilities Commission Act* (*UCA*)
- Rate structure design, including all conservation rate structures and relevant IEPR recommendations such as Recommendation #13 to take advantage of industrial power consumption flexibility such as Time of Use (TOU) and Interruptible rates
- Transmission and Distribution extension policies, informed by DCAT CPCN proceeding and IEPR submissions for Transmission, and 2007 RDA and customer issues for Distribution
- Electric Tariff terms and conditions

CONTEXT


Tariff Supplement No. 6/Facilities Agreement (FA)
Non-Tariff BCH Business Practice and Applicable Planning Criteria
Transmission Load Interconnection Process, Timelines and Requirements

Interconnection Process

Presenter: Herman Kwan

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INTERCONNECTION PROCESS

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Customer at Early Stage (No Queue Position)

Accepted Request with Minimal Load and Equipment Information

Conceptual Review

Feasibility Study

Customer Ready to Commit to formal process (Assigned Queue Position) – First Come First Served Principle

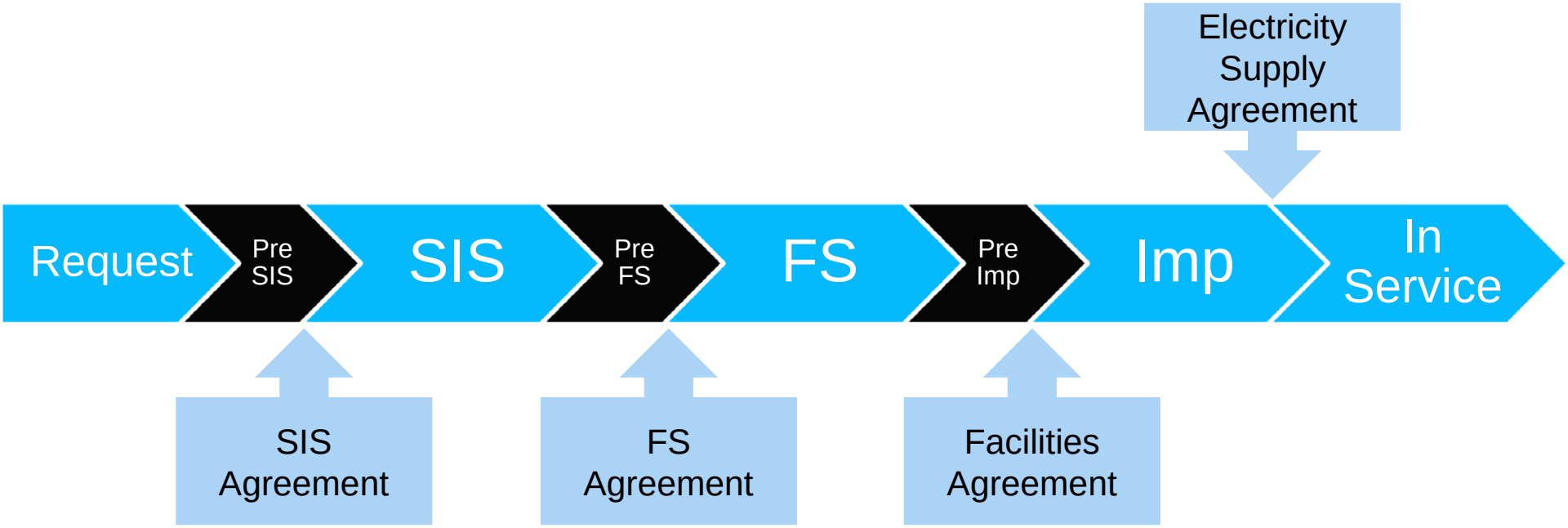
Accepted Request with Detailed Load and Equipment Information

System Impact Study

Facilities Study

Implementation

MANDATORY STEPS AND AGREEMENTS



SIS: System Impact Study

FS: Facilities Study

Imp: Implementation

STUDY TASKS

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	Conceptual Review	Feasibility Study	System Impact Study	Facilities Study	Implementation
Commentary on Interconnection Proposal	✓				
Preliminary Impact Study		✓			
Order of Magnitude Cost Estimate		✓			
Impact to BC Hydro System			✓		
Interconnection Method			✓		
System Reinforcements Required			✓		
High-level Cost Estimate			✓		
In Service Date Feasibility		✓	✓		
Scope of Work			✓		
Implementation Level Cost Estimate				✓	
High Level Schedule				✓	
Project Plan				✓	
Permitting					✓
Construction					✓
Commissioning					✓

INTERCONNECTION PROCESS

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Study Considerations - Risks and Impacts

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-study scope
-planning criteria
-data assumptions

Risks and Impact on Customer
- Plant construction cost and schedule
- Financial decision
- Equipment selection
- First Nation, environmental, etc.

Impact on Delivered Product
- Quality
- Speed
- Cost

Risks and Impact on BC Hydro/Rate Payers
- System capacity
- System reliability
- System upgrade cost and schedule
- First Nation, environmental, etc.

Customer
-data provided
-operation reliability
-study output

INTERCONNECTION PROCESS

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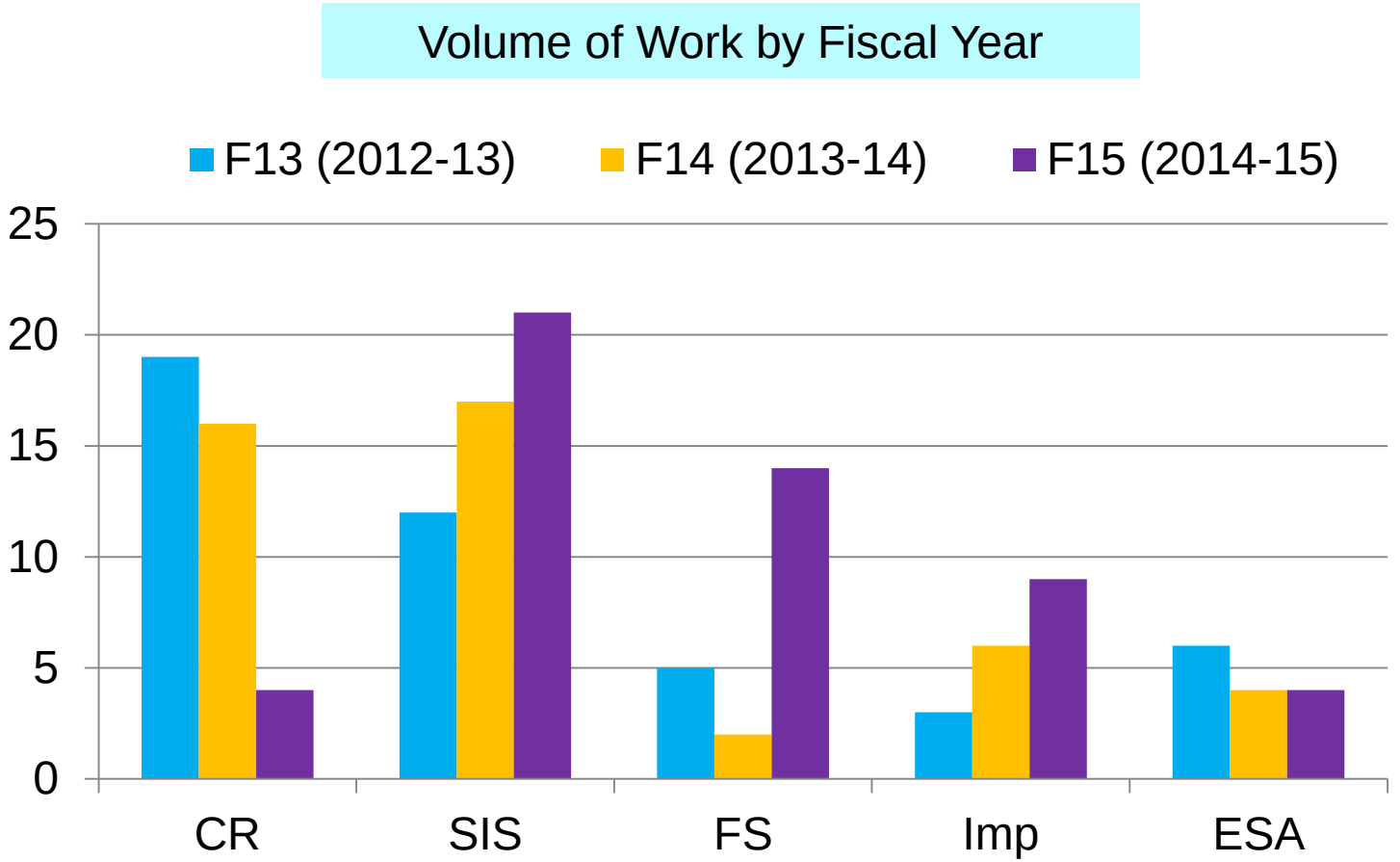
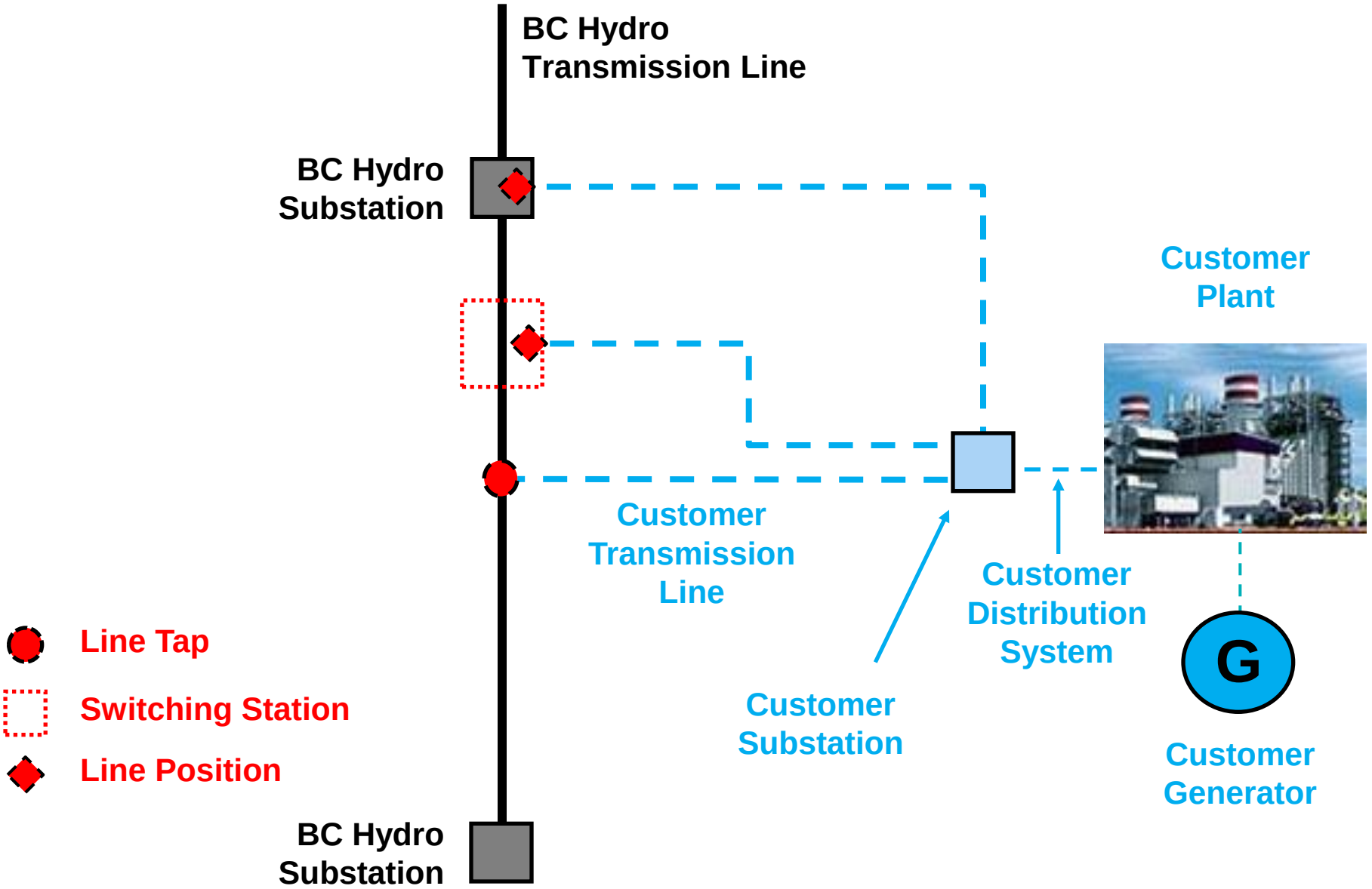


CR:	Conceptual Reviews	SIS:	System Impact Study
FS:	Facilities Study	Imp:	Implementation
ESA:	Signed Electricity Supply Agreement		

INTERCONNECTION PROCESS



System Impact Study

Presenter: Wah Shum

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PURPOSE

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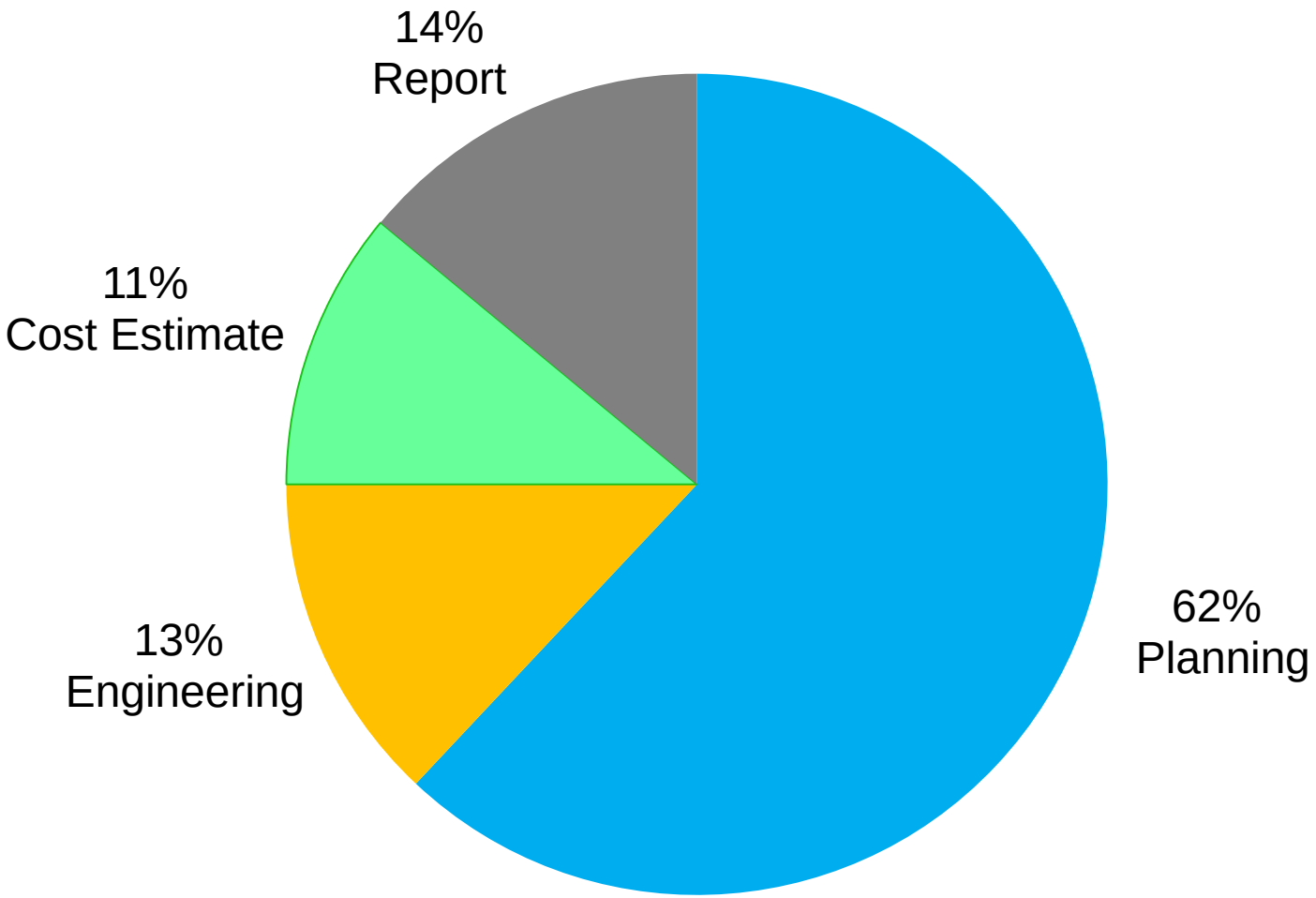
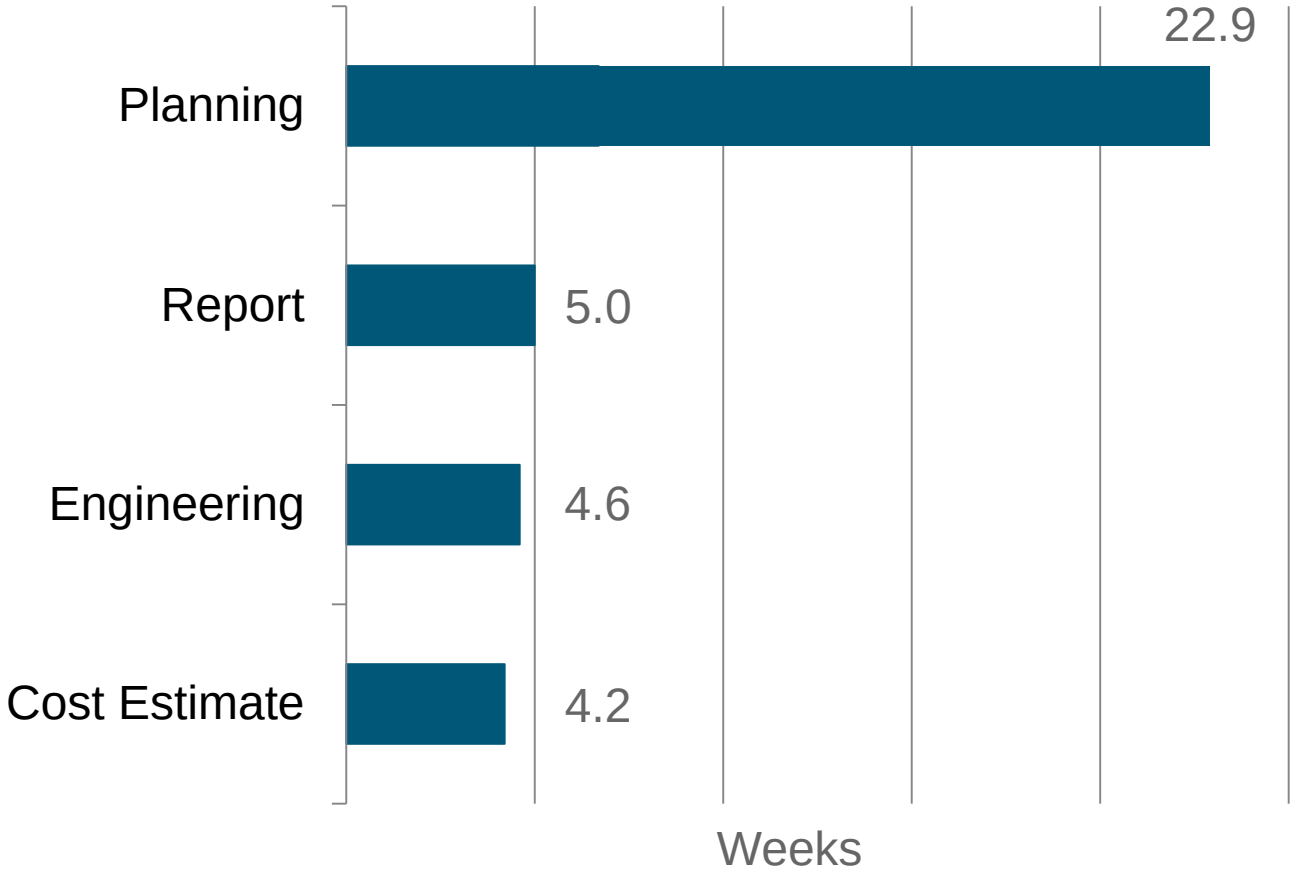
Study impact of the interconnection.

[for both normal and contingency conditions]

EFFORT



TIME ALLOTMENTS (36.7 WEEKS)



Average Study Time: 31.7 weeks

[does not include data collection]

CUSTOMER ENGAGEMENT

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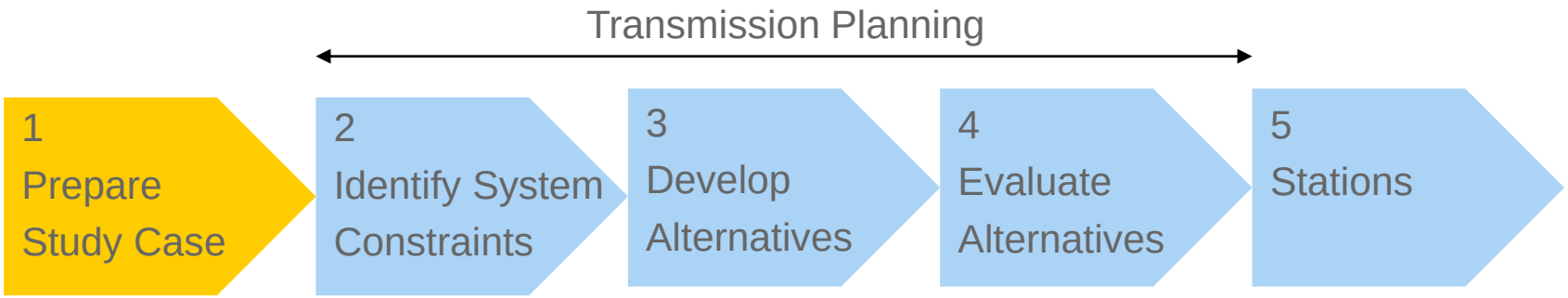
- Clarify Scope
- Clarify Customer Reliability and Performance Needs
- Optimize Solutions (customer installed facilities can avoid system facilities)
- Update Meetings (progress and feedback)

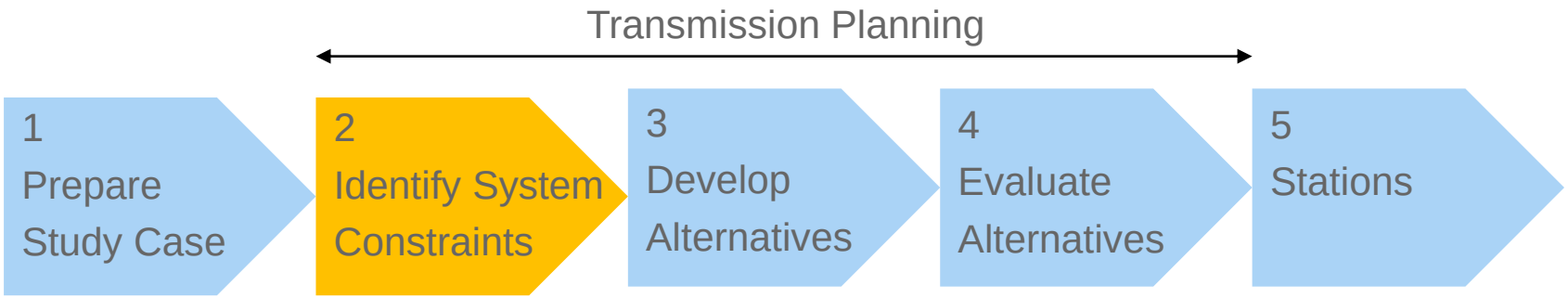
SCOPE



1. Study Case

- review customer request and data
- prepare computer models incorporating customer facilities [base cases]

SCOPE



2. System Constraints

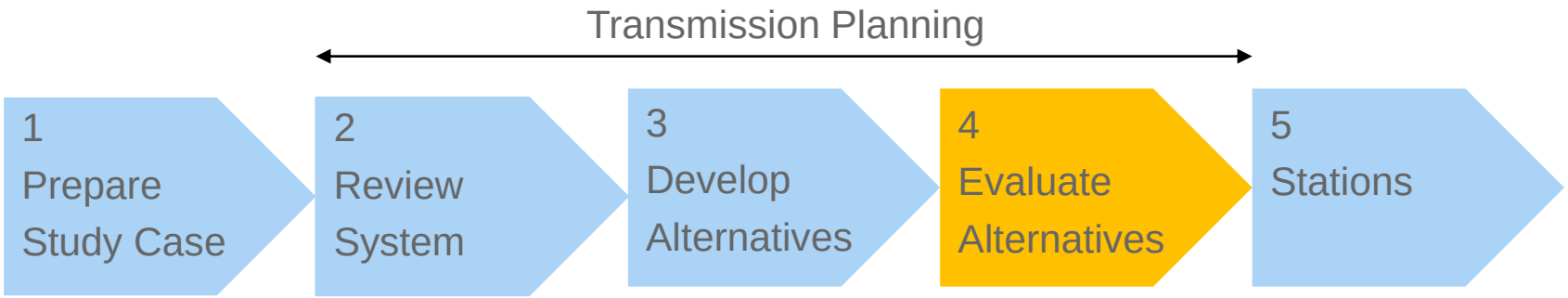
- review new system
- apply system contingencies
- Identify reliability violations (NERC, WECC,...)

SCOPE

3. Determine System Reinforcements

- Ability to supply demand needs
- Ability to withstand disturbances
- Ability to provide reliable service from a long term perspective
- Feasibility screening

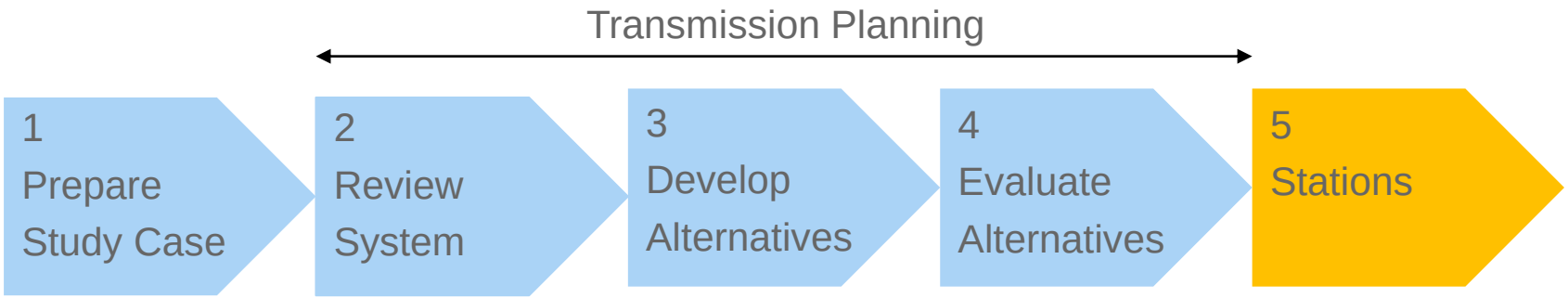
SCOPE



4. Select Alternatives for Downstream Work

- Technical Feasibility, Order-of-Magnitude Cost
- Losses
- Reliability
- Preliminary assessment of routing, First Nations, environment
- Implementation timelines; * Risks

SCOPE



5. Determine Substation Equipment

- Assess stations constraints and expansion feasibility
- Develop alternatives (upgrade existing station or new station)
- Technical evaluation of alternatives

SCOPE

6. Assess impact of proposed interconnection on BC Hydro's system and existing customers from system performance and equipment perspectives

- Prepare electromagnetic transient model to conduct studies
- Develop mitigation solutions

SCOPE

7. Preliminary transmission engineering

- Conducted* in parallel with tasks 5, 6, or 8
- Upgrade existing lines or construct new lines
- Preliminary routing for new lines

SCOPE

8. Specifies Protection and Control systems to protect system integrity

- Specifies telecom requirements
- May require system changes for the protection system to operate securely

Scope

9. Specifies Telecom Facilities
   - For Protection and Control

Scope

10.

- +100/-35% accuracy

Scope

11
Report

11.

- P. Eng. Sealing starting 2014

Outcome

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- Technical Feasibility
- Method of Interconnection
- Facility Upgrades
- Costs
- Customer Requirements
- Schedule Feasibility
- Risks

Discussion

Facilities Study

Presenter: Navreet Kooner

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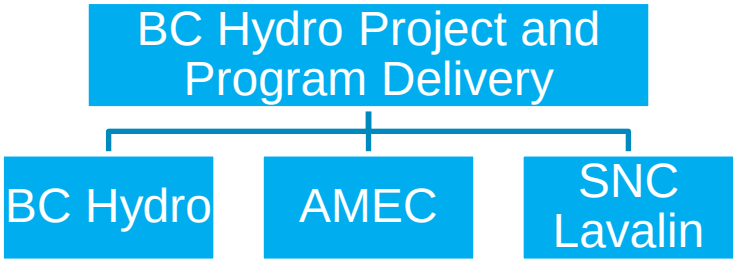
FACILITIES STUDY

1) Project Scope of Work
   - Refinement of SIS scope

2) Project Implementation Schedule



3) Project Implementation Cost Estimate
   - +20%/-10% estimate variability
   - Split of Basic Transmission Extension and System Reinforcement cost estimate

FACILITIES STUDY - PROJECT SCOPE

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- Electrical
- Civil/Structural
- Metering
- Telecommunications
- Protection and Control
- Automation SCADA

FACILITIES STUDY

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1) Project Scope of Work

- Refinement and finalization of project scope

- Preliminary Engineering
  - Site visits

- Assessments
  - First Nations
  - Community Relations and Stakeholder Engagement
  - Regulatory, permits and tenures
  - Property issues, acquisitions, etc.
  - Environmental issues
  - Risks/Hazards
  - Outage Planning

FACILITIES STUDY

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2) Project Implementation Schedule

3) Project Implementation Cost Estimate

- +20/-10% estimate variability
- Split of Basic Transmission Extension and System Reinforcement costs

FACILITIES STUDY

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- Risk Management
  - Key risks to project delivery
  - Enter into Early Engineering and Procurement Agreement
    - Advance engineering and critical procurement

Implementation

Presenter: Navreet Kooner

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IMPLEMENTATION

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- Project Management
  - Cost control and schedule management
- Engineering
  - Detailed Engineering
  - BC Hydro Transmission Engineering – Owner's Engineer role
- Procurement
  - Materials
    - Blanket contract orders or BCH inventory
    - Tender on BC Bid for unique equipment (i.e. capacitor banks, control buildings etc.)

IMPLEMENTATION

- Construction
  - Internal resources or external contractors
  - Competitive procurement via tenders on BC bid

- Commissioning
  - Operating Order 1T35 - Commissioning Procedure For Generators, Station and Transmission Projects
  - http://transmission.bchydro.com/transmission_system/system_operating_orders/

IMPLEMENTATION

- Risk Management
  - Scope, schedule and cost impacts
  - Examples
    - Outages unavailable
    - Increase in time needed for receipt of permits, applications, etc.
    - Environmental issues encountered
- Customer Engagement
  - Visibility of risks and issues
  - Impact assessment
  - Coordination
    - Construction and commissioning milestones

RDA Timeframe and Next Steps

Presenter: Sam Jones

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NEXT STEPS

- Post presentation
- Collect and analysis feedback from this session
- Continue to engage and collect feedback from industry groups over the next several months as options on TS #6 and interconnection process are developed
- Post a draft of the revised Guide and Requirements for comments

RDA ENGAGEMENT

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Workstream	Date
Cost of Service	concluded
Transmission Service Rates - workshop #1	Oct 22, 2014
Transmission Extension Policy – workshop #1	Nov 18, 2014
Distribution Extension Policy – workshop #1	Dec 4, 2014
Large General Service, (LGS), Medium General Service (MGS) Small General Service (SGS) – workshop #1	mid Jan 2015
Large General Service, (LGS), Medium General Service (MGS) Small General Service (SGS) – workshop #2	early Apr 2015
Residential Rates - workshop	mid Feb 2015
Transmission Extension Policy – workshop #2	Feb/Mar 2015
Distribution Extension Policy – workshop #2	Feb/Mar 2015
Transmission Service Rates – workshop #2	early Mar 2015

CONTACTS

If there are any questions on this presentation or the interconnection process please contact:

- Email: Herman.Kwan@bchydro.com

For all general 2015 RDA feedback, questions or if you are interested in participating in other Rate Design engagement activities, please contact us by:

- Mail: BC Hydro, BC Hydro Regulatory Group – “Attention 2015 RDA”, 16th Floor, 333 Dunsmuir St., Vancouver, B.C. V6B-5R3
- Fax: 604-623-4407, “Attention 2015 RDA”
- Email: bchydroregulatorygroup@bchydro.com
- Web: www.bchydro.com/about/planning_regulatory/2015-rate-design.html

QUESTIONS / COMMENTS / FEEDBACK

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