From: JasonKean@lowerchurchillproject.ca [mailto:JasonKean@lowerchurchillproject.ca]
Sent: Tuesday, October 29, 2013 6:00 AM
To: Ducey, BJ <BDucey@QuantaServices.com>
Cc: LanceClarke@lowerchurchillproject.ca
Subject: Estimate Framework

BJ,
Attached are a copy of the estimating framework used today.

I will take a closer look at it over the next day or two to ensure it adequately captures all elements.

Regards,

Jason

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You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

Open Book Estimate Development Model

28-October-2013

Boundless Energy

nalcor energy

Confidential and Commercially Sensitive

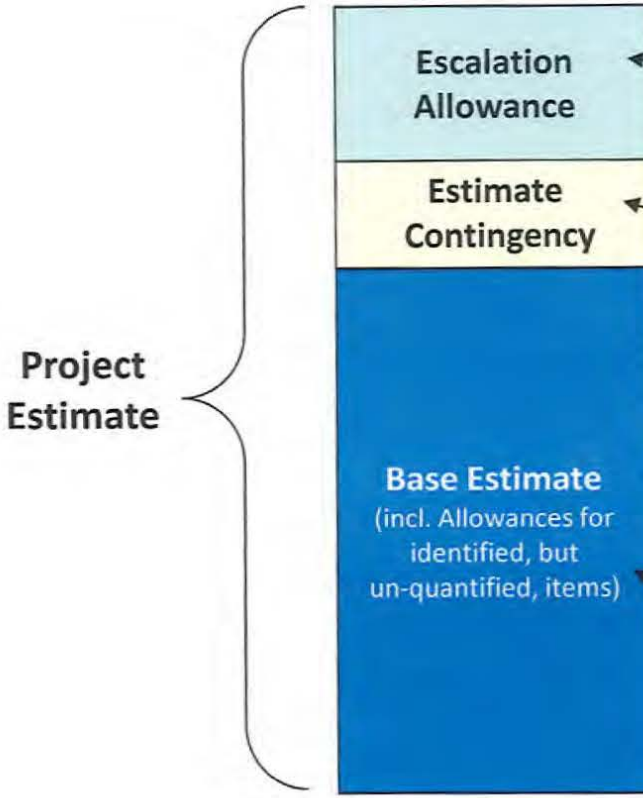
Purpose

- Leverage Nalcor's estimating framework as a collaboration model to develop an open book estimate for the HVdc TL.

Nalcor's Estimating Approach

- Adopt industry recommended practice
  - Association for Advancement of Cost Engineering (AACE) International
- Focus on key cost drivers
- Fully engage project team
- Understand and apply lessons learnt from other projects
- Gather external and independent input

Cost Estimate Components



Escalation Allowance
Provision for changes in price levels driven by economic conditions. Includes inflation. Estimated using economic indices weighted against base estimate components.

Estimate Contingency
Provision made for variations to the basis of an estimate of time or cost that are likely to occur, that cannot be specifically identified at the time the estimate is prepared but, experience shows, will likely occur. It is not meant to cover scope changes outside the Project's parameters, events such as strikes or natural disasters, escalation or foreign currency impact, or changes that alter the basis upon which the control point for management of change as been established as captured in key project documents (e.g. basis of design, project execution plan).

Base Estimate
Reflects most likely costs for known and defined scope associated with project's specifications and execution plan as produced by the estimator.

The Estimators Consider 4 Elements

Each Element has Extensive Information Set

Definition Factors (Scope) + **Construction Methodology & Timeline Factors** + **Price Factors** + **Performance Factors** = **Base Estimate**

- ❑ Design Criteria & Specifications
- ❑ General Arrangements & Layouts
- ❑ Design Drawings for major components – towers and hardware
- ❑ MF rock and concrete quantities from 3D CAD
- ❑ Master Equipment List
- ❑ Cable List
- ❑ Material Take-offs for Construction Bulks
- ❑ Equipment Specifications
- ❑ Geotech surveys
- ❑ WBS & Cost Codes

- ❑ Construction Philosophies
- ❑ Construction Execution Plan
- ❑ Constructability Reviews
- ❑ Construction Schedule
- ❑ Logistics and Access, incl. freight forwarding & marshaling yards
- ❑ Contract Package Dictionary
- ❑ Org. Design and Staff Plans
- ❑ Construction Equip. Types
- ❑ Labor Demand
- ❑ Labor Demarcation
- ❑ In-directs Strategies
- ❑ Site Services
- ❑ Pre-Fabrication Plans
- ❑ Crane & Access Studies
- ❑ Support Facilities
- ❑ Material Sourcing Strategies
- ❑ Seasonality Constraints
- ❑ Permit Register

- ❑ Labor Agreement
- ❑ Construction Equip. Rates
- ❑ Bid Analysis – T/G, SOBI Cable, Tower Steel, Accommodations, Road
- ❑ Budgetary Quotes – various equipment
- ❑ Site Services Costs – catering, air transport
- ❑ Construction Bulks Prices – Rebar, Cement, Diesel, etc.
- ❑ Helicopters and Aircrane
- ❑ Contracting Market Intelligence – overhead and profit
- ❑ Foreign Exchange Rates

- ❑ Crew Make-up and Assignments
- ❑ Task durations
- ❑ Workface Restrictions
- ❑ Labor Productivity & Benchmarks
- ❑ Mobilization Constraints
- ❑ Work Front Stacking
- ❑ Seasonality Impacts
- ❑ Equipment Productivity
- ❑ In-Directs Usage
- ❑ Offsite Fabrication

- ❑ Estimate organized by Project, Physical Component and by Contract Package
- ❑ Documented Basis of Estimate
- ❑ Foreign Currency Demand
- ❑ Person hours
- ❑ Trade demands
- ❑ Cash flows