

Boundless Energy



Award Recommendation

CH0032 – Supply and Install Powerhouse
Hydro/Mechanical Equipment



SNC • LAVALIN EPCM consultant for Nalcor



Lower Churchill Project
RECOMMENDATION FOR AWARD
SUMMARY REPORT

**CH0032: Supply/Install Powerhouse
 Hydro/Mechanical Equipment**

	NAME	TITLE	SIGNATURE	DATE
PREPARED BY:	Robert Anderson	Contract Administrator		25 Oct 2013
REVIEWED BY:	Bruce Drover	Package Leader		25 OCT 2013
REVIEWED BY:	Ed Over	Sr. Advisor –Commercial Strategies		25 Oct 2013
REVIEWED BY:	Frank Gillespie	Area Manager		25 Oct 2013
REVIEWED BY:	Ed. Bush	Project Cost Controls Manager		25 OCT 2013
REVIEWED BY:	Scott O'Brien	Project Manager – C1		25-OCT-2013
REVIEWED BY:	Jason Kean	Deputy Project General Manager		31-OCT-2013
APPROVED BY:	Pat Hussey	Supply Chain Manager		29 Oct 13
APPROVED BY:	Ron Power	General Project Manager		31 OCT - 2013



1 INTRODUCTION

1.1 PACKAGE NO.:

CH0032

1.2 PACKAGE TITLE:

SUPPLY/INSTALL POWERHOUSE HYDRO/MECHANICAL EQUIPMENT

1.3 PACKAGE SCOPE OF WORK BRIEF DESCRIPTION:

- Design, supply and installation of the spillway hydro-mechanical equipment;
- Supply and installation of mechanical and electrical auxiliaries, and architectural interior works for the spillway;
- Design, supply and installation of powerhouse intake hydro-mechanical equipment;
- Design, supply and installation of powerhouse draft tube hydro-mechanical equipment and handling equipment;
- Design, supply and installation of the trash cleaning system.

1.4 ESTIMATE:

CAD\$ 180 Million.

(D63 BUDGET) JPK.

1.5 CONTRACTING PARTIES:

Nalcor Energy and Andritz Hydro Canada Inc. (Contractor)

1.6 AGREEMENT TYPE:

Supply & Install

1.7 APPROVED BIDDERS LIST:

- ALSTOM Power & Transport Canada Inc.
- ANDRITZ Hydro Canada Inc.
- BLACK & MCDONALD/AFI/HATCH
- GANOTEC Inc./CANMEC Industriel Inc.
- KOREA Hydro & Nuclear Power Co. Inc./DAEWOO International Inc.
- HMI Construction/LAR/SUNNY CORNER



1.8 RFP KEY DATES AND VALIDITY:

- Issue RFP: 07 December 2012
- Proposal Closing Date: 19 February 2013
- Revised Proposal Closing Date 16 April 2013
- RFP validity 120 DAYS (Extended to Oct. 31, 2013)

1.9 RFP ADDENDUMS AND BIDDER CLARIFICATIONS

During the RFP period all Bidders received a total of Qty 14 separate RFP Addendums and SLI / Nalcor responses to 185 Bidder's Technical and Commercial Clarifications.

2 EVALUATION OF PROPOSALS

2.1 EVALUATION LEADS

Following the receipt, opening and distribution of Proposals the SLI / Nalcor Integrated Evaluation Team commenced a detailed analysis of the Proposals in accordance with the Package approved Bid Evaluation Plan. Proposals were received from 4 of the 6 Proponents. Black & McDonald/AFI/Hatch and HMI Construction/LAR/Sunny Corner declined to submit a proposal.

The Technical Evaluation including an analysis of the Technical Scope of Work, Schedule, Execution Plan, QA-QC, Environment, Health and Safety was led by Bruce Drover with support from project discipline representatives from both the local project office and Montreal.

The Commercial Evaluation including Risk Assessment and Newfoundland & Labrador Benefits was led by Ed Over with support from Aidan Meade, (McInnis Cooper, Lawyers / Avocats), Robert Anderson (Contract Administrator), Maria Moran (Industrial Benefits Lead), J.D. Tremblay (Risk Manager) and Andrew Sinnott (Assistant Treasurer).

To maintain security of information during the evaluation process, all members of the evaluation team signed a Confidentiality Agreement and the four Bidders were assigned code names as follows:

Alstom – Habs

Andritz – Sens

Ganotec/Canmec – Leafs

KHNP/Daewoo - Jets

2.2 BIDDER CLARIFICATION MEETINGS

The KOREA Hydro & Nuclear Power Co. Inc./DAEWOO International Inc. proposal was evaluated and determined to be technically unacceptable. Efforts to obtain further information via clarifications were unsuccessful.



ALSTOM Power & Transport Canada Inc. proposed two separate contracts; one for the supply of equipment and a separate contract for the installation with their proposed installer. The combined value of the contracts was significantly higher (over \$300M) than the other bids and was not evaluated further.

Off Site Technical and Commercial Clarification Meetings were arranged with two Bidders, Andritz Hydro Ltd. and Ganotec Inc./Canmec Ind. Inc. as these companies submitted the two lowest cost proposals that met the technical and commercial evaluation criteria. During these meetings Senior Representatives were invited to deliver Technical and Commercial Presentations to support their respective Proposals:

- ANDRITZ Hydro : 29 May 2013
- GANOTEC Inc./CANMEC Industriel Inc. 31 May 2013

2.3 PREFERRED BIDDER STATUS

Following the Bidder Clarification Meetings, the evaluation was focused on one Bidder, Andritz Hydro Ltd. The remaining three Bidders were notified that a “Preferred Bidder” had been selected however their Proposals would remain open for acceptance if negotiations with above failed to materialise into a formal contract award.

2.4 PERFORMANCE SECURITY

Performance Bond for 50% of the contract price.

The RFP requested a cost for a 10% Letter of Credit until a Final Completion Certificate was issued and a 5% Letter of Credit during the Warranty Period.

After financial evaluation it was determined that a Letter of Credit for 10% of the contract price, up to Final Completion would be required. This resulted in a cost saving of \$174,830.

2.5 EVALUATION REPORTS

A complete set of Evaluation Reports are attached, please refer to Appendices for details.

In summary:

	Andritz		Ganotec/ Canmec	
	Points	%	Points	%
Commercial (60% Weighting)	5.67	95%	1.82	30%
Technical (27.5% Weighting)	2.48	90%	2.61	95%
Schedule Execution Plan (10% Weighting)	0.93	93%	0.93	93%
NL Benefits (2.5% Weighting)	0.12	5%	0.17	7%
Overall Result		92%		55%
Risk Management		Pass		Pass
Health & Safety		Pass		Pass
Quality Assurance		Pass		Fail
Environmental		Pass		Pass



3 SUMMARY OF FINAL BIDDER PRICES

	ANDRITZ HYDRO	GANOTEC/ CANMEC
Total Base Proposal Price Converted to CAD\$	\$226,292,168.00	\$283,892,126.00
Estimate for Trades Labour Travel & Costs	\$5,081,252.00 (incl in proposal cost)	\$7,724,000.00 (not incl. in proposal cost)
Total Base Proposal Price Converted to CAD\$	\$226,292,168.00	\$291,616,126
Less credits offered through negotiation	-\$25,906,154	-\$44,690,803
Additional Cost re Technical & Commercial Clarifications	\$ 4,222,593	
Total Cost CAD\$	\$204,608,607	\$246,925,323

4 RECOMMENDATION FOR AWARD

In consideration of the Evaluation Reports detailed in Section 5.0 including the summary of final proposal prices detailed in Section 3 above, the Evaluation Team recommend awarding a Supply & Install Contract to:

ANDRITZ Hydro Canada Inc. for the following fixed contract prices:

- CAD\$ 122,378,792
- Euros 61,046,633

All prices detailed above exclude HST

The Evaluation Team is recommending award of an interim Limited Notice to Proceed (LNTP) Agreement for a maximum three months period to enable commencement of engineering deliverables required to maintain project schedule. The total value of the LNTP will not exceed CAD \$2,000,000.00 and Euros 2,000,000. The identified costs for work completed under the LNTP will be applied to specific milestone payments and not paid as a single lump sum line item.



5 APPENDICES:

- Commercial Evaluation Reports
- Technical Evaluation Reports
- QA Evaluation Reports
- Health & Safety Evaluation Reports
- Environmental Evaluation Reports
- Schedule & Execution Plan Evaluation Reports
- Newfoundland & Labrador Benefits Evaluation Reports
- Risk Management Evaluation Reports
- Overall Evaluation Scoring Matrix Report

CH0032 - S/I Powerhouse Hydro-mechanical equipment

Estimated Contract Value and Comparison to Budget

24-Oct-13

The Lump Sum final value for this award is indicated in Table 1-Contract Value and Comparison to Budget

1 EUR=1.3475 CAD

Table 1-Contract Value and Comparison to Budget

Description (all amount in CAD)		Amount
Contract Value (CAD section)	a1	\$ 122,378,792
Contract Value (EUR section)	a2	\$ 61,046,633
Total Contract Value (CAD)	a	\$ 204,639,130
Escalation (Note 1)	b	\$ -
Forecast Specific Growth Allowance (Note 2)	c	\$ 25,900,000
Forecast Non-specific Growth Allowance (Note 3)	d	\$ 19,584,000
Forecast Total Contract Value	e=a+b+c+d	\$ 250,123,130
Original Control Budget	f	\$ 101,525,168
Budget transfers and scope changes (Note 4)	g	\$ 73,633,628
DG3 Escalation allowance	h	\$ 2,716,907
Current Control Budget	i=f+g+h	\$ 177,875,703
Variance (Note 5)	j=e-i	\$ 72,247,427

Note 1: Escalation

- Contract value includes all escalation

N/A

Sub Total Escalation

\$ -

Note 2: Specific growth (i.e. Part of the scope not included in the contract value but to be awarded later)

For details refer to attached sheet

- Support during operation of the Spillway through diversion
- Provision for Second stage concrete
- Intake gate hoist elevation
- Bonus

\$ 400,000
\$ 20,000,000
\$ 500,000
\$ 5,000,000

Sub Total Specific

\$ 25,900,000

Note 3: Non-Specific growth (i.e. Additional scope that may or may not be added to the contract at a later stage)

For details refer to attached sheet

- Provision for Site coordination and interface
- Provision for Site conditions
- Provision for ECN's and Interference

\$ 7,344,000
\$ 2,010,000
\$ 10,230,000

Sub Total Non-Specific

\$ 19,584,000

Note 4: Budget revisions

- Transfer of CH0046 scope to CH0032 : 52,899,185 (MNCP 0001)
- Transfer of the Spillway electrical fro CH0031 : 3,163,963 (MNCP 0001)
- Spillway LLO gates optimization : 8,500,000 PCN# 0055
- Transfer of Spillway and Intake secondary concrete from CH0007: 9,831,272 (CH0007 addendas)
- Transfer a portion of the air transportation to SM0709: (760,792)

Note 5: Variance

- Growth : 45.5 M
- Fabrication: (27.4) M
- Air Travel : 5 M
- Installation: 49.4 M (Andritz has a higher rate for his Manpower : there is a 92 \$/Hr difference between our budget and his price representing 75% over-run for 550,000 Hrs)

Conclusion:

The Forecasted Total Contract VValue of \$ 250,123,130 inclusive of escalation, specified and un-specified growth, represents an over-run of \$ 72,247,427 compared to the Current Control Budget and should be retained as Authorised Fund Amount.

Note: Per discussions with Paul Harrington on 31-OCT-2013, the requisition for CH0032 to exclude Non-Specific Growth (\$19.5M); further provision of second stage concrete will likely fall within target value of CH0007.
JK-K
31-OCT-2013

CH0032 - S/I Powerhouse Hydro-mechanical equipment		
Basis of calculation		
		Revised 24 Oct. 2013
Note 1: <u>Escalation</u>		\$ -
1.1 included in contract price	N/A	
Note 2: <u>Specified Growth</u>		\$ 25,900,000
2.1 Support during operation of the Spillway through diversion (estimated 2000 Hrs)	\$ 400,000	
2.2 Second stage concrete (as per bid)	\$ 20,000,000	
2.3 Intake gate hoist elevation (estimated)	\$ 500,000	
2.4 Bonus (as per contract)	\$ 5,000,000	
Note 3: <u>Non-specified Growth</u>		\$ 19,584,000
3.1 Provision for site coordination and interface to prioritise day to day work execution in case of HSE, schedule and other constraints based on 6% of the CAD portion of the contract (Installation) of 122.4 M\$	\$ 7,344,000	
3.2 Provision for site conditions related to the owner's commitments towards the contractor such as camp availability, yards, construction power and others based on 1% of the contract value of 201 M\$	\$ 2,010,000	
3.3 Provision for ECN's during fabrication and interference on site during installation based on 5% of the contract value of 204.6 M\$	\$ 10,230,000	

Appendix 4 - Commercial Evaluation Report

Nalcor Energy-Lower Churchill Project

"AS BID and FINAL COST" DETAIL OPTION A&B - Spillway, Intake & Draft Tube

Package No./ Description: 505573-CH0032 SUPPLY/INSTALL POWERHOUSE HYDRO/MECHANICAL EQUIPMENT										
Item	Quantity	Description	Jets Total	SensTotal -Bid	SensTotal - Final	Leafs Total	Habs (Supply) Total	Habs (Install) Total	Habs Total	Notes
			(KHNP/Daewoo)	(Andritz)	(Andritz)	(Ganotec/Canmec)	(Alstom)	(Alstom)	(Alstom)	
AB-1	1	Mobilization	\$ 18,004,317.00	\$ 1,098,245.00	\$ 1,098,245.00	\$ 4,621,759.00	\$ 26,405.00	\$ 2,052,736.51	\$ 2,079,141.51	
AB-2	1	Management	\$ 21,124,564.00	\$ 10,164,447.00	\$ 10,164,447.00	\$ 27,717,128.00	\$ 26,514,202.00	\$ 21,355,771.44	\$ 47,869,973.44	
AB-3	1	Employee Training	\$ 224,076.00	\$ 97,912.00	\$ 97,912.00	\$ 221,920.00	\$ 21,330.00	\$ 593,617.12	\$ 614,947.12	
AB-4	1	Health & Safety Requirements	\$ 3,513,522.00	\$ 13,457.00	\$ 13,457.00	\$ 969,077.00	AB-2	\$ 5,439,061.98	\$ 5,439,061.98	
AB-5	1	Environmental Requirements	\$ 1,926,572.00	\$ 5,046.00	\$ 5,046.00	\$ -	AB-2	\$ 1,772,818.84	\$ 1,772,818.84	
AB-6	1	Quality Assurance/Quality Control	\$ 3,513,522.00	\$ 1,601,026.00	\$ 1,601,026.00	\$ 1,827,725.00	\$ 4,903,494.00	\$ 3,856,004.44	\$ 8,759,498.44	
AB-7	1	Letter of Credit (per Article 7 of Agreement)	\$ 414,000.00	\$ 906,154.00	\$ -	\$ -	\$ -	\$ -	\$ -	Jets - If require LC from Cdn bank then the cost is \$1,553,000
		Revised Letter of Credit			\$ 731,324.00					
AB-8	1	Parental Guarantee (per Article 7 of Agreement)	\$ -	\$ -	\$ -	\$ -	\$ 609,510.00	incl	\$ 609,510.00	
AB-9	1	Performance Bond (per Article 7 of Agreement)	\$ 2,070,000.00	\$ 3,825,976.00	\$ 3,825,976.00	\$ 2,059,430.00	\$ 2,437,274.00	\$ 2,085,000.00	\$ 4,522,274.00	
AB-10	1	Insurance (per Article 18 of Agreement)	\$ 4,959,470.00	\$ 2,592,720.00	\$ 2,592,720.00	\$ 101,452.00	\$ 1,980,440.00	\$ 2,186,381.03	\$ 4,166,821.03	Sens - Cost fo Insurance is for info only as this value has been distributed over various cost items in the bid.
AB-11	1	Warranty (per Article 17 of Agreement)	\$ 283,500.00	\$ -	\$ -	\$ 990,744.00	\$ 2,444,888.00	incl	\$ 2,444,888.00	
AB-12	1	Demobilization	\$ 292,794.00	\$ 408,404.00	\$ 408,404.00	\$ 1,522,013.00	\$ 26,405.00	\$ 116,248.73	\$ 142,653.73	
3.1	1	Phase A - Intake & Draft Tube Engineering	\$ 871,781.00	\$ 1,275,037.00	\$ 1,275,037.00	\$ 2,668,951.00	\$ 3,680,853.00	\$ -	\$ 3,680,853.00	
3.2	1	Phase B - Intake & Draft Tube Fabrication & Supply	\$ 39,045,573.00	\$ 42,023,212.00	\$ 42,023,212.00	\$ 60,704,258.00	\$ 85,870,032.00	\$ -	\$ 85,870,032.00	
		Add Hairpin Type Primary Anchors (Clarification #15)			\$ 435,515.00					
		Add Intake Gate Hoist Wire Rope (Clarification #31)			\$ 1,752,062.00					
		Add Intake Gate MCC NEMA Enclosures (Clarification #68)			\$ 75,624.00					
		Add Intake Gate Slot Covers (Clarification #152)			\$ 127,451.00					
3.3	1	Phase C - Intake & Draft Tube Installation	\$ 42,461,743.00	\$ 67,085,602.00	\$ 67,085,602.00	\$ 76,518,351.00	\$ -	\$ 66,422,266.86	\$ 66,422,266.86	
		Delete Cost of Second Stage Concrete (option to be put back prior to Feb 2014)			-\$ 14,000,000.00	-\$ 25,310,325.00				
3.4	1	Phase D - Intake & Draft Tube Commissioning	\$ 2,294,545.00	\$ 3,269,479.00	\$ 3,269,479.00	\$ 1,740,969.00	\$ 269,293.00	\$ 4,620.00	\$ 273,913.00	
4.1	1	Phase A - Spillway Hydro/Mechanical Engineering	\$ 897,170.00	\$ 2,230,017.00	\$ 2,230,017.00	\$ 4,219,755.00	\$ 3,027,945.00	\$ 759,000.00	\$ 3,786,945.00	
4.2	1	Phase B - Spillway Hydro/Mechanical Fabrication & Supply	\$ 34,840,954.00	\$ 40,729,516.00	\$ 40,729,516.00	\$ 50,087,082.00	\$ 56,380,049.00	\$ -	\$ 56,380,049.00	
		Add Hairpin Type Primary Anchors (Clarification #15)			\$ 186,649.00					
		Add Spillway Gate Hoist Wire Rope (Clarification #20)			\$ 838,343.00					
		Add Spillway Gate MCC NEMA Enclosures (Clarification #54)			\$ 75,624.00					
4.3	1	Phase C - Spillway Hydro/Mechanical Installation	\$ 28,646,001.00	\$ 49,285,150.00	\$ 49,285,150.00	\$ 44,569,121.00	\$ -	\$ 50,512,617.46	\$ 50,512,617.46	
		Delete Cost of Second Stage Concrete (option to be put back prior to Feb 2014)			-\$ 6,000,000.00	-\$ 10,847,282.00				
4.4	1	Phase D - Spillway Hydro/Mechanical Commissioning	\$ 2,492,034.00	\$ 2,273,408.00	\$ 2,273,408.00	\$ 3,352,391.00	\$ 317,536.00	\$ 264,359.31	\$ 581,895.31	
		Negotiated Global Discount (\$ to be allocated to items later)			-\$ 5,000,000.00	-\$ 8,533,196.00				
		Reimburseable Travel Costs (est)	\$ 4,745,659.00	\$ 5,081,252.00	\$ 5,081,252.00	\$ 7,724,000.00		\$ 8,256,993.53	\$ 8,256,993.53	Travel in cost - Sens; Travel not in cost - Leafs/Habs/Jets
		Total Cost	\$ 212,621,833.00	\$226,292,168.00	\$204,608,607.00	\$246,925,323.00	\$188,509,656.00	\$165,677,497.25	\$354,187,153.25	
5.0	2	Spillway Hydro/Mechanical Alternate Supply				\$ 7,399,178.00	\$ 6,957,275.00	\$ 157,131.35	\$ 7,114,406.35	

Appendix 4 - Commercial Evaluation Report

Nalcor Energy-Lower Churchill Project

"AS BID" DETAIL OPTION A - Intake & Draft Tube (not evaluated further)

Package No./ Description: 505573-CH0032 SUPPLY/INSTALL POWERHOUSE HYDRO/MECHANICAL EQUIPMENT									
Item	Quantity	Description	Jets Total	Sens Total	Leafs Total	Habs (Supply) Total	Habs (Install)Total	Habs Total	Notes
			(KHNP/Daewoo)	(Andritz)	(Ganotec/Canmec)	(Alstom)	(Alstom)	(Alstom)	
A-1	1	Mobilization	\$ -	\$ 885,223.00	\$ 3,128,886.26	\$ 13,351.00	\$ 1,817,024.04	\$ 1,830,375.04	
A-2	1	Management	\$ -	\$ 9,045,039.00	\$ 17,775,869.35	\$ 17,881,300.00	\$ 15,313,843.92	\$ 33,195,143.92	
A-3	1	Employee Training	\$ -	\$ 44,085.00	\$ 214,066.53	\$ 21,318.00	\$ 551,201.77	\$ 572,519.77	
A-4	1	Health & Safety Requirements	\$ -	\$ -	\$ 602,487.95	incl in A-2	\$ 5,011,745.38	\$ 5,011,745.38	
A-5	1	Environmental Requirements	\$ -	\$ -	\$ -	incl in A-2	incl A-4	\$ -	
A-6	1	Quality Assurance/Quality Control	\$ -	\$ 797,149.00	\$ 1,229,347.94	\$ 3,610,854.00	\$ 2,125,025.84	\$ 5,735,879.84	
A-7	1	Letter of Credit (per Article 7 of Agreement)	\$ -	\$ 453,077.00	\$ -	\$ -	not proposed	\$ -	
A-8	1	Parental Guarantee (per Article 7 of Agreement)	\$ -	\$ -	\$ -	\$ 365,824.00	included	\$ 365,824.00	
A-9	1	Performance Bond (per Article 7 of Agreement)	\$ -	\$ 1,912,988.00	\$ 1,128,953.56	\$ 1,462,807.00	\$ 1,271,850.00	\$ 2,734,657.00	
A-10	1	Insurance (per Article 18 of Agreement)	\$ -	\$ -	\$ 72,964.44	\$ 1,188,630.00	\$ 1,406,381.03	\$ 2,595,011.03	
A-11	1	Warranty (per Article 17 of Agreement)	\$ -	\$ -	\$ 582,163.13	\$ 1,335,129.00	included	\$ 1,335,129.00	
A-12	1	Demobilization	\$ -	\$ 205,960.00	\$ 1,077,529.24	\$ 13,351.00	\$ 116,248.73	\$ 129,599.73	
3.1	1	Phase A - Intake & Draft Tube Engineering	\$ -	\$ 1,275,037.00	\$ 2,072,521.80	\$ 3,758,950.00	\$ -	\$ 3,758,950.00	
3.2	1	Phase B - Intake & Draft Tube Fabrication & Supply	\$ -	\$ 42,023,212.00	\$ 51,435,624.47	\$ 87,515,640.00	\$ -	\$ 87,515,640.00	
3.3	1	Phase C - Intake & Draft Tube Installation	\$ -	\$ 67,085,602.00	\$ 78,077,510.57	\$ -	\$ 67,714,234.17	\$ 67,714,234.17	
3.4	1	Phase D - Intake & Draft Tube Commissioning	\$ -	\$ 3,269,479.00	\$ 1,523,445.55	\$ 269,293.00	\$ 4,620.00	\$ 273,913.00	
		Total Cost		\$ 126,996,851.00	\$ 158,921,370.79	\$ 117,436,447.00	\$ 95,332,174.88	\$ 212,768,621.88	

Appendix 4 - Commercial Evaluation Report

Nalcor Energy-Lower Churchill Project

"AS BID" DETAIL OPTION B - Spillway (not evaluated further)

Package No./ Description: 505573-CH0032 SUPPLY/INSTALL POWERHOUSE HYDRO/MECHANICAL EQUIPMENT									
Item	Quantity	Description	Jets Total	Sens Total	Leafs Total	Habs (Supply)Total	Habs (Install)Total	HabsTotal	Notes
			(KHNP/Daewoo)	(Andritz)	(Ganotec/Canmec)	(Alstom)	(Alstom)	(Alstom)	
A-1	1	Mobilization	\$ -	\$ 213,022.00	\$ 3,589,707.71	\$ 13,054.00	\$ 1,607,762.72	\$ 1,620,816.72	
A-2	1	Management	\$ -	\$ 7,473,249.00	\$ 15,804,380.86	\$ 14,545,360.00	\$ 10,591,682.53	\$ 25,137,042.53	
A-3	1	Employee Training	\$ -	\$ 53,827.00	\$ 236,329.81	\$ 22,346.00	\$ 579,303.47	\$ 601,649.47	
A-4	1	Health & Safety Requirements	\$ -	\$ 13,457.00	\$ 563,896.35	Incl in B-2	\$ 3,529,410.02	\$ 3,529,410.02	
A-5	1	Environmental Requirements	\$ -	\$ 5,046.00		Incl in B-2	incl in B-4	Incl in B-2	
A-6	1	Quality Assurance/Quality Control	\$ -	\$ 803,877.00	\$ 817,174.68	\$ 3,386,518.00	\$ 2,254,765.16	\$ 5,641,283.16	
A-7	1	Letter of Credit (per Article 7 of Agreement)	\$ -	\$ 453,077.00	\$ -	not proposed	not proposed	not proposed	
A-8	1	Parental Guarantee (per Article 7 of Agreement)	\$ -		\$ -	\$ 310,430.00	included	\$ 310,430.00	
A-9	1	Performance Bond (per Article 7 of Agreement)	\$ -	\$ 1,912,988.00	\$ 985,258.44	\$ 1,241,444.00	\$ 771,450.00	\$ 2,012,894.00	
A-10	1	Insurance (per Article 18 of Agreement)	\$ -		\$ 59,107.78	\$ 1,008,729.00	\$ 926,381.03	\$ 1,935,110.03	
A-11	1	Warranty (per Article 17 of Agreement)	\$ -		\$ 410,470.63	\$ 1,423,073.00	included	\$ 1,423,073.00	
A-12	1	Demobilization	\$ -	\$ 202,524.00	\$ 1,087,113.12	\$ 13,054.00	\$ 103,896.00	\$ 116,950.00	
4.1	1	Phase A - Spillway Hydro/Mechanical Engineering	\$ -	\$ 2,231,016.00	\$ 4,001,737.46	\$ 3,110,190.00	\$ 759,000.00	\$ 3,869,190.00	
4.2	1	Phase B - Spillway Hydro/Mechanical Fabrication & Supply	\$ -	\$ 40,729,516.00	\$ 50,415,081.74	\$ 62,619,437.00	\$ -	\$ 62,619,437.00	
4.3	1	Phase C - Spillway Hydro/Mechanical Installation	\$ -	\$ 49,285,150.00	\$ 52,978,229.07	\$ -	\$ 51,219,692.80	\$ 51,219,692.80	
4.4	1	Phase D - Spillway Hydro/Mechanical Commissioning	\$ -	\$ 2,273,407.00	\$ 3,377,121.37	\$ 317,536.00	\$ 266,686.37	\$ 584,222.37	
		Total Cost		\$ 105,650,156.00	\$ 134,325,609.02	\$ 88,011,171.00	\$ 72,610,030.10	\$ 160,621,201.10	
5.0	2	Spillway Hydro/Mechanical Alternate Supply	\$ -	\$ -	\$ -	\$ 6,957,275.00	\$ 157,131.35	\$ 7,114,406.35	

CH0032

Hydro Mechanical Bid Evaluation

T&C Scoring

		BIDDER Habs	BIDDER Sens	BIDDER Leafs	BIDDER Jets
Article 1	Interpretation	Not evaluated for commercial reasons- two contracts and cost	¼	½	
Article 2	Contractor's Status		-	-	
Article 3	Contractor Obligations		¼	-	
Article 4	Contractor's Design Obligations		-	-	
Article 5	Contractor's Personnel		¼	¼	
Article 6	Subcontracts		¼	-	
Article 7	Performance Security		¼	½	
Article 8	Policy on Ethics/Conflicts of Interest		-	-	
Article 9	Compliance with Laws		¼	-	
Article 10	Company's Obligations		-	¼	
Article 11	Role & Responsibilities of Engineer		¼	-	
Article 12	Compensation & Terms of Payment		¼	¼	
Article 13	Taxes		-	-	
Article 14	Audit and Records		-	-	
Article 15	Health, Safety & Environmental Protection		¼	-	
Article 16	Access and Quality		-	-	
Article 17	Warranty		½	½	
Article 18	Contractor Insurance		¼	¼	
Article 19	Workers Compensation		-	-	
Article 20	Project Insurance		¼	½	

		BIDDER Habs	BIDDER Sens	BIDDER Leafs	BIDDER Jets
Article 21	Indemnification		1/2	1/2	
Article 22	Site & Transport Route Conditions		-	-	
Article 23	Title and Risk		1/4	1/4	
Article 24	Completion and Delivery		1/4	1/4	
Article 25	Substantial & Final Completion		-	1/4	
Article 26	Changes in the Work		1/4	-	
Article 27	Public Communications		-	-	
Article 28	Confidentiality		1/4	-	
Article 29	Patents, Trademarks, Copyrights		1/4	-	
Article 30	Assignment		-	-	
Article 31	Force Majeure		1/4	1/4	
Article 32	Default and Termination		1/4	1/4	
Article 33	Bankruptcy, Insolvency, and Receivership		-	-	
Article 34	Suspension		1/4	1/4	
Article 35	Labour Relations		1/4	-	
Article 36	Liquidated Damages		1/4	1/4	
Article 37	Contractor's Representations, Warranties and Covenants		-	1/4	
Article 38	Entirety of Agreement, Non Waiver		-	1/4	
Article 39	Dispute Resolution		-	-	
Article 40	Notices		-	-	
Articles 41	Notices		-	-	
Article 42	Enurement, Time, Survival of Provisions		1/4	- (rounded scores)	
Articles 43	Counterparts		-	-	
			1/4		

1. I have assumed that the marking is out of "1" for each article.
2. I have deducted $\frac{1}{4}$ mark for each significant deviation from the wording proposed by the Company in the RFP form of Contract.

TK-2435 (14729497.1)



CONFIDENTIAL MEMO

Via Email

TO: ED OVER, SNC-LAVALIN; ROBERT ANDERSON, SNC-LAVALIN
FROM: ANDREW SINNOTT, ASSISTANT TREASURER
SUBJECT: CREDITWORTHINESS ASSESSMENT OF CH0032 BIDDERS
DATE: MAY 24, 2013
CC: SCOTT PELLEY, CORPORATE TREASURER; PAT HUSSEY, SUPPLY CHAIN COORDINATOR

Background:

- At the request of the Nalcor Energy – Lower Churchill Project (“LCP”), Treasury and Risk Management (“TRM”) conducted a financial analysis and credit worthiness verification of the following entities (the “Bidding Entities”):
 - Alstom Power and Transport Canada Inc. (“Alstom Canada”) and Vytrell Engineering Limited (“Vytrell”), a Consortium
 - Andritz Hydro Canada Inc. (“Andritz Canada”)
 - Ganotec Inc. and Canmech Industrial Inc., a partnership (“Ganotec-Canmech”)
 - Korea Hydro & Nuclear Power Co. and Daewoo International Corporation, a partnership (“KNHP-Daewoo”)
- The above-noted entities were all bidders on the recent RFP for CH0032 – Powerhouse and Spillway Hydromechanical Equipment
- Our analysis was required by and conducted in accordance with the *Guidelines for Credit Worthiness Verification* (LCP-PT-MD-0000-FI-PR-0003-01 Rev B.2)

Contract Details:

- For the purpose of our analysis, and to calculate turnover score, we used an approximate contract value of \$200M CAD¹

¹ Based on discussions with Ed Over on May 23, 2013. While actual bids are above \$200M, using actuals would not change outcome of conclusions regarding turnover.

- The package is broken down into two major deliverables: (a) supply and install of the Spillway equipment, and (b) the supply and install of the power house equipment.
- Bidders were asked to submit separate prices for the two components of the package
- The contract will be approximately 50% materials cost and 50% on-site work, and involves a significant steel component. The equipment will be built at the contractor's manufacturing facility, shipped to the site, and assembled and installed on-site. There will be ability for Nalcor to do inspections and testing throughout the process.²

Performance Security General:

- Where the financial assessment and rating is based on the parent company, a guarantee from the parent company will be required.
- The financial security recommended is for:
 - Standby letter of credit, equal to 10% of the contract price, to remain in effect until end of the warranty period.³ The letter of credit security must be issued from a Schedule 1 Canadian Bank⁴.
 - Bonding, by way of a performance bond, with Nalcor Rider, in the amount of 50% of the contract price. The bond shall be issued by a surety which has a minimum credit rating of A- by Standard & Poor's, or equivalent rating by another rating agency approved by Company
 - We can consider waiving the 50% payment bond for a 10% holdback or 10% retention bond, if this strategy is sufficient to mitigate the risk of exposure to subcontractors.
- The performance security recommendation would have to be revisited if, during the course of negotiating with the successful bidder, the commercial team is considering agreeing to significant up-front and/or milestone payments.

Results – General

- The results of the creditworthiness assessment are outlined in Appendix 1 of this memo.
- The reader is cautioned that the conclusions outlined in Appendix 1 are based on the effective date of the financial information used in the analysis, and our conclusions are subject to change based on any new information published after that date.

Alstom Power and Transport Canada Inc. (Consortium with Tyrell Engineering Limited)

- Alstom Power and Transport Canada Inc. ("Alstom Canada") is incorporated under the CBCA and headquartered in Quebec.
- Alstom Canada is 100% owned by Alstom SA (France), a leading global manufacturer of transport and energy infrastructure.

² As per discussion with Ed Over on May 16, 2013

³ The 10% amount equals the liquidated damages cap, as per discussion with Ed Over on May 23, 2013

⁴ Royal Bank of Canada, Canadian Imperial Bank of Commerce, Bank of Montreal, TD Bank or Bank of Nova Scotia

- Alstom SA is publicly traded in France with a market capitalization of €8.9 billion (\$11.8 billion CAD). For the year ended March 31, 2013, Alstom had global sales of €20.3 billion (\$27.0 billion CAD) and net income of €802 million (\$1.07 billion CAD)⁵.
- Alstom SA is rated by S&P as BBB (Negative), and Baa2 (Negative) by Moody's, which are investment grade ratings, albeit with negative outlooks.
- Based on the parent company turnover ratio and 3rd party information, Alstom was given a preliminary rating of MEDIUM. A rating of HIGH would have been given with a better public rating and/or outlook from Moody's and S&P.
- In terms of the financial statement and ratio analysis, Alstom Canada did not provide any financial information, and opted to include financial statements for the parent company for the years ended March 31, 2010, 2011 and 2012. March 31, 2013 financial statements were obtained from Credit Risk Monitor. The weighted credit score for the parent, Alstom SA, is 68%.
- We have not been provided with any financial information on Tyrell Engineering Limited and thus cannot assess the creditworthiness of that company. Also, the consortium submitted two separate bids, and would not submit a joint bid when requested to do so.
- Therefore, while we would rank Alstom as MEDIUM/HIGH (based on the parent guarantee), we are unable to do a complete assessment on the Consortium, thus a final ranking of LOW.
- **Consequently, the Alstom/Tyrell consortium is not considered creditworthy.**

Andritz Hydro Canada Inc.

- Andritz Hydro Canada Inc. ("Andritz Canada") is a Canadian corporation headquartered in Peterborough, Ontario.
- Andritz Canada is 100% owned by Andritz AG (Austria), a global company that develops production systems and industrial process solutions, including turnkey electromechanical equipment and services for hydro power plants.
- Andritz AG is publicly traded in Austria with a market capitalization of €4.5 billion (\$6.05 billion CAD). For the year ended December 31, 2012, Andritz AG had sales of €5.2 billion (\$6.9 billion CAD) and net income of €243 million (\$323 million CAD)⁶.
- We have been provided with audited financial statements for Andritz Canada for the year ended December 31, 2012. The turnover ratio is 1.4 based on revenues of \$284 million CAD. And with no public ratings available, the preliminary rating would be LOW.
- A review of financial ratios results in a ratio score of 84%, as Andritz Canada shows good profitability, cash flow and a strong balance sheet. Overall, the final rating would be MEDIUM/HIGH.
- **While the parent guarantee would be available if needed, security in form of a 10% letter of credit, 50% performance bond with Nalcor rider, and 10% holdback or retention bond would be sufficient to mitigate any risks. This would also avoid issues around enforceability of a guarantee from another jurisdiction.**

⁵ Based on Bank of Canada noon rate of 1.3293 CAD per Euro, as at May 22, 2013

⁶ Based on Bank of Canada noon rate of 1.3293 CAD per Euro, as at May 22, 2013

Ganotec Inc. and Canmech Industrial Inc., a partnership (“Ganotec-Canmech”)

- Ganotec Inc. is a Canadian company, owned by Peter Kiewit Infrastructure Co.
- Canmech Industrial Inc. is also a Canadian company, owned by Group Canmech Inc.
- Ganotec has a 75% share in the partnership, while Canmech has 25%. We have assigned the turnover and financial ratio scores based on this percentage.
- Audited financial statements for Peter Kiewit Infrastructure Co. have been received for the year-ended December 31, 2011; and internal September 30, 2012 have been reviewed. The turnover ratio is 9.7.
- Audited Financial statements for Group Canmech Inc. have been received for the year-ended December 31, 2011, and show a turnover ratio of 0.4. We will require December 31, 2012 year-end financial statements for Group Canmech Inc. prior to the award of any contract.
- The combined turnover score is 7.4, and based on lack of any 3rd party information the preliminary rating is MEDIUM.
- The financial ratio score is 100% for each entity, as both companies demonstrate strong cash flow and low debt levels. Overall, the final rating for the partnership is MEDIUM/HIGH.
- **We will require parent guarantees from Peter Kiewit Infrastructure Co. and Group Canmech Inc., as well as confirmation that Ganotec and Canmech are jointly and severally liable.**
- **Recommended security is a 10% letter of credit, 50% performance bond with Nalcor rider, and 10% holdback or retention bond.**

Korea Hydro & Nuclear Power Co. and Daewoo International Corporation, a partnership (“KHNP-Daewoo”)

- This partnership is between two South Korean companies. KHNP is a subsidiary of Korea Electric Power Corporation (“KEPCO”), a government owned corporation. Daewoo is a majority owned by POSCO, one of the world’s largest steel-making companies.
- KHNP is not publicly traded, but it is rated by S&P (A+ / Stable) and Moody’s (A1 / Stable). They are covered by Credit Risk Monitor with a FRISK score of 7 (probability of bankruptcy 0.38-0.54%), and a Z-Score of 2.31 (Neutral risk).
- KEPCO is publicly rated by S&P (A+ / Stable) and Moody’s (A1 / Stable).
- Daewoo is publicly traded in Korea with a market capitalization of 4.3 trillion Korean Won (\$4.0 billion CAD)⁷. Daewoo is not publicly rated but is covered by Credit Risk Monitor with a FRISK score of 7 (probability of bankruptcy 0.38-0.54%), and a Z-Score of 1.48 (Neutral risk).
- POSCO is publicly traded in Korea, with a market capitalization of 28 trillion Korean Won (\$26.0 billion CAD)⁵. The company is rated by S&P (BBB+ / Stable) and Moody’s (Baa1 / Negative).
- We have been provided with financial statements for both of the bidding entities and turnover and ratio scores are pro-rated based on the 50/50 share in the partnership between KHNP and Daewoo. We have not assessed the parent companies.
- KHNP has a turnover ratio of 31.2, and Daewoo’s ratio is 81.5 resulting in a combined turnover ratio is 56.4. Based on this score and the 3rd party information, the preliminary rating is HIGH.

⁷ Based on Bank of Canada noon rate of 1077.6 Korean Won per CAD, as at May 22, 2013

- KHNP has provided historical Audited financial statements for the last 3 years, and internal December 31, 2012 statements. The financial ratio score is 80%.
- Daewoo has provided historical Audited financial statements for the last 3 years. Financial statements for the year-ended December 31, 2012 are available on Credit Risk Monitor. The financial ratio score is 56%.
- The combined financial ratio score is 68%, which results in a final rating of MEDIUM/HIGH.
- **Recommended security is a 10% letter of credit, 50% performance bond with Nalcor rider, and 10% holdback or retention bond. We would not recommend any parent guarantees.**
- **Also, while the partnership agreement states each party is jointly and severally liable, this must be confirmed prior to the final award of any contract.**

Recommendations

- Alstom Canada
 - As outlined above, we are unable to do a complete assessment on the consortium, therefore have assessed a final rating of LOW, and would recommend excluding this bidder based on lack of creditworthiness.
- Andritz Canada
 - Based on the final rating of MEDIUM/HIGH, Andritz Canada is creditworthy
 - Financial security as outlined on page 2
 - The Commercial Questionnaire states that bonding is available via Chubb Insurance. The parent is rated A+ (Stable) by S&P, and all Chubb subsidiaries are rated AA (Stable) which would be acceptable to Nalcor.
- Ganotec-Canmech partnership
 - Based on the final rating of MEDIUM/HIGH, the partnership is creditworthy
 - The partnership agreement appears to indicate that the two partners are not joint and severally liable, which will be required prior to final award of any contract.
 - We require receipt of December 31, 2012 financial statements for Group Canmech Inc.
 - Guarantees from Peter Kiewit Infrastructure Inc. and Group Canmech Inc.
 - Financial security as outlined on page 2
 - The Commercial Questionnaire states that bonding is available via Travelers Insurance Company of Canada, rated AA- (Stable) by S&P, which is acceptable to Nalcor.
- KNHP-Daewoo JV
 - Based on the final rating of MEDIUM/HIGH, the joint venture is creditworthy
 - The liability of each partner must be joint and several, which is to be confirmed prior to final award of any contract.
 - Financial security as outlined on page 2
 - The Commercial Questionnaire states that bonding is available via four Korean companies all rated by S&P; Woori Bank (A- / Stable), Shinhan Bank (A / Stable), Korea Exchange Bank (A- / Stable) and Hana Bank (A / Stable). These would all be acceptable to Nalcor.

Appendix 1 – Summary of Credit Worthiness Assessment

Nalcor Energy - Lower Churchill Project Credit Worthiness Assessment Summary CH0032 - Supply and Install of Powerhouse and Spillway Hydromechanical Equipment May 24, 2013							
	Turnover Score ⁽¹⁾	3rd Party Credit Rating and Outlook ⁽²⁾	Preliminary Nalcor Rating ⁽³⁾	Post-Balance Sheet and Ratio Analysis ⁽⁴⁾		Final Nalcor Rating ⁽⁵⁾	Conclusion ⁽⁵⁾
				Ratio Score	Comments		
Alstom Power and Transport Canada and Tyrell Engineering Limited, a Consortium ⁽⁶⁾	124.59x	No ratings available for Alstom Canada; Parent (Alstom SA) has very high turnover, and is rated BBB/Negative (S&P) and Baa2/Negative (Moody's). No financial information or ratings for Tyrell Engineering.	MEDIUM	68%	No historical financial information was provided for the Canadian subsidiary, however, risks mitigated given guarantee from the parent company (Alstom SA), who show ratio score of 68%. The bid was submitted as a consortium, with Tyrell Engineering Limited. Tyrell were unwilling to provide financial information and the consortium were unwilling to provide one joint bid. Therefore we cannot assess any further, and while Alstom would rank a MEDIUM/HIGH on their own, we are assessing LOW, in the absence of complete information for all bidders.	LOW	Not Creditworthy
Andritz Hydro Canada Inc.	1.42x	No ratings available.	LOW	84%	Strong weighted credit score with financially strong parent company. Tests 3 and 4 indicate <u>no concern</u> .	MEDIUM/HIGH	Partially creditworthy - Letter of credit (10%), performance bond with Nalcor rider (50%) and holdback or retention bond (10%)
Ganotech-Canmech, partnership ⁽⁷⁾	7.36x	No rating available.	MEDIUM	100%	Weighted credit score of 100%, or HIGH. Tests 3 and 4 indicate <u>no concern</u> . Final rating is MEDIUM/HIGH. This is assuming Joint and Several liability and guarantees from Peter Kiewit Infrastructure Co. and Group Canmech Inc.	MEDIUM/HIGH	Partially creditworthy - Letter of credit (10%), performance bond with Nalcor rider (50%) and holdback or retention bond (10%). Parent guarantees from Peter Kiewit Infrastructure Co. and Group Canmech Inc.
KHNP-Daewoo, partnership ⁽⁸⁾	56.35x	Daewoo not rated, but publicly traded; KNHP is not publicly traded, however is rated, A+ Stable (S&P) and A1 Stable (Moody's)	HIGH	68%	Good weighted credit score, at the high end of MEDIUM/HIGH. Sovereign backing, Tests 3 and 4 indicate <u>no concern</u> . Overall, MEDIUM/HIGH rating	MEDIUM/HIGH	Partially creditworthy - Letter of credit (10%), performance bond with Nalcor rider (50%) and holdback or retention bond (10%)

(1) The minimum threshold for scoring above LOW on the turnover test is annual sales of at least 3.0x contract value. (See Test 1 - Guidelines for Credit Worthiness Verification)

(2) Reference to 3rd party ratings here means publically available credit rating reports from Standard and Poors, Moody's, Fitch, DBRS or Dunn & Bradstreet (See Test 2 -Guidelines for Credit Worthiness Verification), if available and/or applicable (i.e. if company is rated)

(3) Companies failing the turnover test receive a preliminary rating of LOW. For companies that pass the test, the preliminary rating is based on the magnitude of the turnover score and an assessment of any 3rd party credit information, if available. For a company that passes the turnover test, the lack of third party information for a Company, or 3rd party information that causes concern, results in a preliminary preliminary rating of MEDIUM

(4) As outlined in the Guidelines for Creditworthiness Verification, a post-balance sheet review (Test 3) and a ratio analysis (Test 4) are used to refine the preliminary rating. The ratio analysis results in a weighted average credit score for the company, which serves as a measure of financial capacity

(5) The final rating is determined after the Ratio Analysis and Post-Balance Sheet review. Ratings are as per Evaluation Matrix in Guidelines for Credit Worthiness Verification - Page 14

(6) Alstom Canada provided financial information Alstom SA, the global holding company in France. Alstom is a investment grade company with significant financial capacity. The turnover and ratio score presented here are for Alstom. We do not have any financial information on Tyrell.

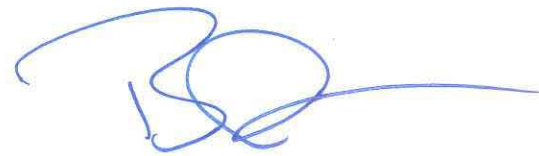
(7) Financial analysis of Ganotech performed on Peter Kiewit Infrastructure Co., the parent company. Financial analysis of Canmech performed on Group Canmech Inc., the parent company. Turnover and Ratio scores represent a weighted average of the individual scores for each company; 75% for Ganotech and 25% for Canmech; Therefore, the weighted average presented represents the financial capacity of the group as a whole, assuming joint and several liability

(8) Turnover and Ratio scores represent a 50:50 weighted average of the individual scores for each company. Therefore, the weighted average presented represents the financial capacity of the group as a whole, assuming joint and several liability

Appendix 14A - Technical Backup to Weighted Evaluation Criteria						
RFP CH0032		RFP Name: S/I Powerhouse Hydro-Mechanical Equipment				
		Habs	Sens	Leafs	Jets	Bidder 5
Evaluation Plan Appendix 14a	Max Score	Score	Score	Score	Score	Score
A. Spillway Hydro-Mechanical						
1. Experience with design type & capacity	6.00	6	6	6	4	
2. Selection of material and components	8.00	7	5	8	6	
3. Proven design and reliability	8.00	7	8	8	6	
4. Maintainability	2.00	2	2	2	1	
5. Spare parts availability	1.00	1	1	1	0.5	
Score	25.00	23	22	25	17.5	0
6. Compliance with Specifications (Pass/Fail Multiplier)	(1 or 0)	1	1	1	0	
Total Evaluated Score (Score x Multiplier)		23	22	25	0	-
B. Spillway Electrical Building						
1. Experience with design type & capacity	5.00		5	4		
2. Selection of material and components	6.00		5	5		
3. Proven design and reliability	6.00		6	4		
4. Maintainability	2.00		2	2		
5. Spare parts availability	1.00		1	1		
Score	20.00	0	19	16	0	0
6. Compliance with Specifications (Pass/Fail Multiplier)	(1 or 0)	0	1	1	1	
Total Evaluated Score (Score x Multiplier)		0	19	16	0	-
C. Intake Hydro-Mechanical						
1. Experience with design type & capacity	6.00	5	6	6	4	
2. Selection of material and components	8.00	7	5	8	6	
3. Proven design and reliability	8.00	7	8	8	6	
4. Maintainability	2.00	2	2	2	1	
5. Spare parts availability	1.00	1	1	1	0.5	
Score	25.00	22	22	25	17.5	0
6. Compliance with Specifications (Pass/Fail Multiplier)	(1 or 0)	1	1	1	0	
Total Evaluated Score (Score x Multiplier)		22	22	25	0	-


14-06-2013

Appendix 14A - Technical Backup to Weighted Evaluation Criteria						
RFP CH0032	RFP Name: S/I Powerhouse Hydro-Mechanical Equipment					
		Habs	Sens	Leafs	Jets	Bidder 5
Evaluation Plan Appendix 14a	Max Score	Score	Score	Score	Score	Score
D. Draft Tube Hydro-Mechanical						
1. Experience with design type & capacity	4.00	4	4	4	3	
2. Selection of material and components	4.00	4	2	4	3	
3. Proven design and reliability	4.00	4	4	4	3	
4. Maintainability	2.00	2	2	2	2	
5. Spare parts availability	1.00	1	1	1	0.5	
Score	15.00	15	13	15	11.5	0
6. Compliance with Specifications (Pass/Fail Multiplier)	(1 or 0)	1	1	1	0	
Total Evaluated Score (Score x Multiplier)		15	13	15	0	-
E. Trash Cleaner						
1. Experience with design type & capacity	4.00	4	4	4	4	
2. Selection of material and components	3.00	3	3	3	3	
3. Proven design and reliability	3.00	2	2	2	2	
4. Maintainability	4.00	4	4	4	4	
5. Spare parts availability	1.00	1	1	1	1	
Score	15.00	14	14	14	14	0
6. Compliance with Specifications (Pass/Fail Multiplier)	(1 or 0)	1	1	1	1	
Total Evaluated Score (Score x Multiplier)		14	14	14	14	-
Score-Based Conclusion	100.00	N/C	90	95	N/C	???


 14-06-2013

Technical Bid Evaluation			Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment				Revision No.: 01				
			Package No.: CH0032	Project Title: LCP-MUSKRAT FALLS		Rev. Date.: 2013-06-13					
			Tag No.:	Client: NALCOR		Project No.: 505573					
Bidder:			HABS	SENS	LEAFS	Jets					
Item Number	Description	Specified Value or Reference	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant			
1	GENERAL TECHNICAL REQUIREMENTS										
	The bidder must acknowledge that there are no exceptions to the technical specifications (TS).	ACCEPT		K		K		N			
	The bidder must acknowledge that there are no exceptions to the scope of works (SOW).	ACCEPT	4 of 8 S2 Stoplogs 8 of 16 S3 Stoplogs 5 of 10 S4 Stoplogs 4 of 8 DFT Stoplogs	N	5 of 10 S4 Stoplogs	N	5 of 10 S4 Stoplogs 4 of 8 DFT Stoplogs	N	Missing Sections ?		
	The technical requirements of the bid and subsequent execution of the SOW are summarized in the Supplier Document Requirements List (SDRL).	ACCEPT	Bidder agrees in principle with this requirement. In general, further discussion shall take place in order to negotiate a timetable that would be mutually beneficial to all parties involved.	N	Bidder acknowledges the content of Exhibit 4 and is prepared during contract execution to supply all the documentation as listed in this Exhibit. Bidder is not in a position within the RFP time frame to supply the complete and detailed MDL. The actual MDL – Master Document List will be generated based on the requirements of Exhibit 4 at the time of the project execution after Contract Award within the first few weeks. Bidder has demonstrated as part of the execution of the other packages, its understanding of SLI/Nalcor Energy requirements and has shown its adherence to	N	Marked up SDRL provided. No statement made about bidders acceptance of SDRL. Agreement with items not marked up to be clarified.	N	"We reviewed the Supplier Document Requirement in Exhibit 4. As a result of our review, We have no comments on the Supplier Document Requirements "		
	The bidder shall make all necessary arrangements to undertake the SOW within the overall project milestone as illustrated in the Milestone Schedule (MS) – Exhibit 9.	ACCEPT									
2	GENERAL TECHNICAL QUESTIONNAIRE										
	The bidder shall provide the information listed below to the extent that it describes the systems being provided. Information not provided shall be provided after Award as listed in the SDRL.	ACCEPT									
3	SPILLWAY STOPLOGS										
3.1	SPILLWAY UPSTREAM STOPLOGS (TEMPORARY) - EMBEDDED PARTS										
3.1.1	Weight of embedded parts (without anchors)	129 000 kg ea.	33039 kg	Y	17,640_kg	Y	217 475 kg	Y	53,600 kg	Y	Per Bay?
3.1.2	Loaded support bumper path profile/depth/moment of inertia	mm4	Proposed Section Carbon steel, rectangular 125mm x 170mm / Stainless steel, rectangular 100mm x 200 mm / 11300mm / 28017mm4 / 410094mm4 SECTION Carbon steel, rectangular 12.5mm x 170mm / Stainless steel, rectangular 100mm x 200 mm / 6000mm / 17473mm4 / HIGHER: SECTION Carbon steel, rectangular 12.5mm x 100mm / Stainless steel, rectangular 100mm x 200 mm / 26300mm / 165748mm4	K	1/150mm/2E+07mm ⁴	Y	WT / 233 mm/29.4X10 ⁶ mm4	Y	200/300mm/1.28x10 ⁶ mm4	K	
3.1.3	Guide support bumper path profile/depth/moment of inertia	VTS	See 3.1.5	VTS	Rect./10_mm/31233mm ⁴	VTS	N/A / N/A mm/ N/A mm4	VTS	200/90mm/2.77x10 ⁶ 6mm4	VTS	
3.1.4	Back guide/roller paths profile/depth/moment of inertia	VTS	Carbon steel: rectangular (12,5 mm x 150 mm) Stainless steel: rectangular (12,5 mm x 100 mm) / 40700 mm / 157878 mm4	VTS	T/150_mm/1.6E+07mm ⁴	VTS	L / 200 mm/ 15.6X10 ⁶ mm4	VTS	200/200mm/4.6x10 ⁶ 7 mm4	VTS	
3.1.5	Side guides profile/depth/moment of inertia	VTS	Carbon steel: I-beam made of plates (19 mm x 150 mm, 150 mm x 19 mm, 16 mm x 150 mm) Stainless steel: rectangular (10.0 mm x 150 mm) / 40700 mm / 42150094 mm4	VTS	T/55_mm/1E+06mm ⁴	VTS	FB / 250 mm/115.6X10 ⁶ mm4	VTS	200/90mm/2.77x10 ⁶ 6mm4	VTS	
3.1.6	Sill beam profile/depth/moment of inertia	mm4	Carbon steel: I-beam (12x5-1/4) Stainless steel: rectangular (10 mm x 95 mm) / 13200 mm / 113300000 mm4	Y	1/150_mm/1.9E+07mm ⁴	Y	S / 250 mm/ 51.4X10 ⁶ mm	Y	200/300mm/1.28x10 ⁶ 8mm4	Y	
3.1.7	Lintel beam profile	N/A	Not applicable	N/A	there is no lintel beam	N/A	N/A	N/A	N/A	N/A	
3.1.8	Loaded support bumper path anchors/vertical spacing	450 mm A-307	22 mm Ø / 600mm	K	25 mm Ø / 600 mm	K	32 mm □ / 300 mm	Y	22 mm □ / 600 mm	Y	600
3.1.9	Guide support bumper path anchors/vertical spacing	600 mm A-307	See 3.1.11	Y	25 mm Ø / 600 mm	Y	N/A mm □ / N/A mm	Y	22 mm □ / 600 mm	Y	600
3.1.10	Back roller/guide paths anchors/vertical spacing	600 mm A-307	22 mm Ø / 600mm	Y	25 mm Ø / 600 mm	Y	25 mm L / 600 mm	Y	22 mm □ / 600 mm	Y	600
3.1.11	Side guides anchors/vertical spacing	600 mm A-307	22 mm Ø / 600mm	Y	25 mm Ø / 600 mm	Y	22 mm □ / 600 mm	Y	22 mm □ / 600 mm	Y	600
3.1.12	Sill beam anchors/ horizontal spacing	450 mm A-307	22 mm Ø / 600mm	Y	25 mm Ø / 600 mm	Y	22 mm □ / 600 mm	Y	22 mm □ / 600 mm	Y	600
3.1.13	Lintel beam anchors/ horizontal spacing	N/A	NA	N/A	20 mm Ø / 600 mm	N/A	mm □ / mm	N/A	N/A mm / N/A mm	N/A	
3.1.14	Material specification of sealing faces	A-240 SS-304	ASTM A276 type 304	Y	A276-304 or 00Cr19Ni or equiv.	Y	A276, 304 L	Y	ASTM A276 Type 304	Y	
3.1.15	Thickness of sealing faces	10 mm	Back roller faces: 12,5 mm, Other faces: 10 mm	Y	16 mm	N	10 mm	Y	16mm	Y	
3.1.16	Material specification of bumper tracks	300/350W	CSA G40.21-04 300 WT	Y	A529Gr50 or Q345 or equivalent	N	CSA G40.21 – 300W	Y	ASTM A240 Type 304	Y	
3.1.17	Thickness of bumper tracks	12 mm	12mm	K	10+10 mm	Y	10 mm	K	16mm	Y	
3.1.18	Hardness of bumper tracks	92-107 BHN	145 HB	Y	BHN170	Y	100 – 140 BHN	Y	187	Y	
3.1.19	Material specification of backing members	VTS	Not applicable	VTS	A529Gr50 or Q345 or equivalent.	VTS	CSA G40.21 – 300&350W	VTS	ASTM A36	VTS	
3.1.20	Second stage concrete volumes	570 m3	122 m ³	Y	209 95_m ³ /bay; or 1045 [AH-Q6] [high?]	Y	680-m ³ - Q5 clarification answer 132 m3 per temporary stoplog slot	Y	150m ³	Y	Per Bay?
3.1a	SPILLWAY STOPLOGS (PERMANENT) - EMBEDDED PARTS										
3.1a.1	Weight of embedded parts (without anchors)	30 500 kg ea.	24,881 kg	Y	27,760_kg	Y	158 350 kg	Y	30,700 kg	Y	Per Bay? YES.

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			Tag No.:	Client: NALCOR		Project No.: 505573					
Item Number	Description	Specified Value or Reference	Bidder: HABS		SENS		LEAFS		Jets		
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	
3.1a.2	Loaded support bumper path profile/depth/moment of inertia	mm4	DEEPEST SECTION: Carbon steel: rectangular (12mm x 170mm)Stainless steel: rectangular (12mm x 200 mm)/ 5520mm / 260079mm4 MIDDLE SECTION: Carbon steel: rectangular (12,5mm x 160mm)Stainless steel: rectangular (10mm x 200 mm)/ 5520mm / 172062mm4 MIDDLE SECTION: Carbon steel: rectangular (12,5mm x 255mm)Stainless steel: rectangular (10mm x 200 mm)/ 107100mm / 106448mm4	K	1/150mm/2E+07mm ⁴	Y	WT / 204 mm/82 X10 ⁶ mm4	Y	250/150mm/9,18x10 ⁶ mm4	K	
3.1a.3	Guide support bumper path profile/depth/moment of inertia	VTS	See 3.1a.5	VTS	Rect./10_mm/31233mm ⁴	VTS	N/A / N/A mm/ N/A mm4	VTS	200/90mm/2.77x10 ⁶ 6mm4	VTS	
3.1a.4	Back guide/roller paths profile/depth/moment of inertia	VTS	Carbon steel: rectangular (12,5 mm x 150 mm)Stainless steel: rectangular (12,5 mm x 100 mm)/ 27800 mm / 157878 mm4	VTS	T/150_mm/1.6E+07mm ⁴	VTS	L / 200 mm/ 16 X10 ⁶ mm4	VTS	200/200mm/4.6x10 ⁶ 7 mm4	VTS	
3.1a.5	Side guides profile/depth/moment of inertia	VTS	Carbon steel: I-beam made of plates (19 mm x 150 mm, 150 mm x 19 mm, 16 mm x 150 mm)Stainless steel: rectangular (10,0 mm x 150 mm)/ 27800 mm / 42150094 mm4	VTS	T/55_mm/1E+06mm ⁴	VTS	FB / 250 mm/116 X10 ⁶ mm4	VTS	200/90mm/2.77x10 ⁶ 6mm4	VTS	
3.1a.6	Sill beam profile/depth/moment of inertia	mm4	Carbon steel: I-beam (12x5-1/4)Stainless steel: rectangular (10 mm x 95 mm)/ 13600 mm / 113300000 mm4	Y	1/150_mm/1.9E+07mm ⁴	Y	S / 250 mm/ 51 X10 ⁶ mm4	Y	200/300mm/1.28x10 ⁶ 8mm4	Y	
3.1a.7	Lintel beam profile	N/A	NA	N/A	there is no lintel beam	N/A	N/A	N/A	N/A	N/A	
3.1a.8	Loaded support bumper path anchors/vertical spacing	450 mm A-307	22 mm Ø / 600mm	K	25_mm Ø/600mm	Y	32 mm □ / 600 mm	Y	22 mm □ / 600mm	K	
3.1a.9	Guide support bumper path anchors/vertical spacing	600 mm A-307	See 3.1a.11	Y	25_mm Ø/600mm	Y	N/A mm □ / N/A mm	Y	22 mm □ / 600mm	K	
3.1a.10	Back roller/guide paths anchors/vertical spacing	600 mm A-307	22 mm Ø / 600mm	Y	25_mm Ø/600mm	Y	22 mm □ / 600 mm	Y	22 mm □ / 600mm	K	
3.1a.11	Side guides anchors/vertical spacing	600 mm A-307	22 mm Ø / 600mm	Y	25_mm Ø/600mm	Y	22 mm □ / 600 mm	Y	22 mm □ / 600mm	K	
3.1a.12	Sill beam anchors/ horizontal spacing	450 mm A-307	22 mm Ø / 600mm	Y	25_mm Ø/600mm	Y	22 mm □ / 600 mm	Y	22 mm □ / 600mm	K	
3.1a.13	Lintel beam anchors/ horizontal spacing	N/A	NA	N/A	20_mm Ø/600mm	N/A	mm □ / mm	N/A	N/A mm /N/A mm	N/A	
3.1a.14	Material specification of sealing faces	A-240 SS-304	ASTM A276 type 304	Y	A276-304 or 00Cr19Ni or equiv.	Y	A276, gr 304 L	Y	ASTM A276 Type 304	Y	
3.1a.15	Thickness of sealing faces	10 mm	Back roller faces: 12,5 mm, Other faces: 10 mm	Y	10/8_mm	N	10 mm	Y	16mm	Y	
3.1a.16	Material specification of bumper tracks	300/350W	CSA G40.21-04 300 WT	Y	A276-304 or 00Cr19Ni or equiv.	N	CSA G40.21 – 300W / 350W	Y	ASTM A240 Type 304	Y	
3.1a.17	Thickness of bumper tracks	12 mm	16mm	K	10+10_mm	Y	10 mm	N	16mm	Y	
3.1a.18	Hardness of bumper tracks	92-107 BHN	145 HB	Y	BHN170	Y	100 – 140 BHN	Y	187	Y	
3.1a.19	Material specification of backing members	300W	NA	N	A276-304 or 00Cr19Ni or equiv.	N	CSA G40.21 – 300 / 350W	Y	ASTM A36	Y	
3.1a.20	Second stage concrete volumes	378 m3	91m ³	Y	95 209 m ³ /bay; or 475 [AH-Q5]	Y	435 m ³ - C6 clarifications answer 94 m3 per permanent stoplog slot	Y	87m ³	Y	Per Bay?
3.2	SPILLWAY UPSTREAM STOPLOGS – TYPE S1 (THEN PERMANENT)										
3.2.1	Number of stoplog sections – S1	10	10 (ten)	Y	10	Y	10	Y	10	Y	
3.2.2	Material specification	300WT	CSA G40.21-04 350 WT	Y	A276-304 or 00Cr19Ni or equiv.	N	CSA G40.21 – 300 / 350W	Y	CSA G40	K	
3.2.3	Thickness of skin plate	25 mm	22,4mm	Y	15_mm	Y	29 mm	Y	22mm	Y	
3.2.4	Minimum thickness of structural parts	10 mm	12,5mm	Y	10_mm	Y	10 mm	Y	12mm	Y	
3.2.5	Height of Stoplog sections (seals compressed)	2 330 mm	2330m	Y	2.330_m	Y	2.3 m	Y	2.33m	Y	
3.2.6	Weight of each Stoplog section	13 700 kg	15795kg	Y	16.300/16.600_kg	Y	16 050 kg	Y	16600kg	Y	
3.2.7	Material and type of seals	Elastomer Solid J	SBR/ Elastomeric bulb	N	SBR/Double-J	Y	RUBBER /DOUBLE SOLID BULB J SEAL	Y	C.R./J, "I"	N	
3.2.8	Side seal distance between seal centres	10 900 mm	10800mm	Y	10.70_m	Y	10.7 m	Y	10.815m	Y	
3.2.9	Lintel seal Elevation – bottom seals compressed	N/A	Not applicable	N/A	no lintel seal	N/A	N/A	N/A	N/A m	N/A	
3.2.10	Overall width of Stoplogs	11 200 mm	11396mm	Y	11.10_m	Y	11.3 m	Y	11.18m	Y	
3.2.11	Overall depth of Stoplogs (seal face to back of stoplog)	1 000 mm	1710mm	Y	1,640_mm	Y	1 463 mm	Y	1408mm	Y	
3.2.12	Load bearing guides centre distance	11 200 mm	11,2m	Y	10.90_m	Y	11.1 m	Y	11.08m	Y	
3.2.13	Load bearing guides loading – normal operating conditions	VTS	205MPa	VTS	74 N/mm ²	VTS	502 MPa (HERTZ CONTACT STRESS)	VTS	29MPa	VTS	
3.2.14	Load bearing guides loading – unusual operation conditions	VTS	217MPa	VTS	51 N/mm ²	VTS	537 MPa (HERTZ CONTACT STRESS) BRONZE	VTS	33MPa	VTS	
3.2.15	Material specification of bumpers	VTS	ASTM B584-C92300	VTS	A276-304 or 00Cr19Ni or equiv.	VTS	ASTM B21	VTS	ASTM B21	VTS	
3.2.16	Bumper loading – normal operating conditions	VTS	183MPa	VTS	2 N/mm ²	VTS	N/A	VTS	0.4MPa	VTS	
3.2.17	Bumper loading – unusual operation conditions	VTS	Not applicable	VTS	19N/mm ²	VTS	N/A	VTS	5.5MPa	VTS	
3.2.18	Description of spring-loaded rollers	VTS	Not applicable	VTS	Rubber spring	N	N/A	VTS	N/A	VTS	
3.2.19	Material specification of Filling Valve	N/A	Not applicable	N/A	304 (cast steel) A283C or equiv.	N	N/A	N/A	N/A	N/A	
3.2.20	Material specification of Filling Valve seat	N/A	Not applicable	N/A	A283C or equivalent	N	N/A	N/A	N/A	N/A	
3.2.21	Hoist load required to lift Stoplog:										
3.2.21.1	At balanced pressure	19 000 kg	27000	Y	17,700_kg	N	20 000 kg	Y	26200kg	Y	
3.2.21.2	At 2.0 m differential pressure	29 000 kg	33000	Y	36,700_kg	Y	N/A	Y	58800kg	Y	
3.3	SPILLWAY UPSTREAM STOPLOGS – TYPE S2										
3.3.1	Number of stoplog sections – S2	8	4 (four)	N	8	Y	8	Y	8	Y	Per Bay? YES, 2 bays = 8 sections.
3.3.2	Material specification	300WT	CAS G40.21-04 350 WT	Y	A276-304 or 00Cr19Ni or equiv.	N	CSA G40.21 – 300 / 350W	Y	CSA G40	K	
3.3.3	Thickness of skin plate	19 mm	16mm	Y	12_mm	Y	22 mm	Y	20mm	Y	
3.3.4	Minimum thickness of structural parts	10 mm	12,5mm	Y	10_mm	Y	10 mm	Y	12mm	Y	
3.3.5	Height of Stoplog sections (seals compressed)	2 900 mm	2900m	Y	2.90_m	Y	2.9 m	Y	2.9m	Y	
3.3.6	Weight of each Stoplog section	13 700 kg	11403kg	Y	12,450_kg	Y	14 635 kg	Y	12700kg	Y	
3.3.7	Material and type of seals	Elastomer Solid J	SBR/ Elastomeric bulb J-seals	Y	SBR/J-type	Y	RUBBER /SOLID BULB J SEAL	Y	C.R./J, "I"	Y	
3.3.8	Side seal distance between seal centres	10 900 mm	10800mm	Y	10.70_m	Y	10.7 m	Y	10.815m	Y	
3.3.9	Lintel seal Elevation – bottom seals compressed	N/A	Not applicable	N/A	no lintel seal	N/A	N/A	N/A	N/A m	N/A	
3.3.10	Overall width of Stoplogs	11 200 mm	11396mm	Y	11.10_m	Y	11.3 m	Y	11.108m	Y	
3.3.11	Overall depth of Stoplogs (seal face to back of stoplog)	800 mm	1300mm	Y	1,521_mm	Y	1 145 mm	Y	1008mm	Y	
3.3.12	Load bearing guides centre distance	11 200 mm	11,2m	Y	10.90_m	Y	11.1 m	Y	11.08m	Y	
3.3.13	Load bearing guides loading – normal operating conditions	VTS	129MPa	VTS	30 N/mm ²	VTS	320 MPa (HERTZ CONTACT STRESS)	VTS	11.5MPa	VTS	
3.3.14	Load bearing guides loading – unusual operation conditions	VTS	140MPa	VTS	25 N/mm ²	VTS	346 MPa (HERTZ CONTACT STRESS) BRONZE	VTS	15.5MPa	VTS	
3.3.15	Material specification of bumpers	VTS	ASTM B584-C92300	VTS	A276-304 or 00Cr19Ni or equiv.	VTS	ASTM B21	VTS	ASTM B21	VTS	
3.3.16	Bumper loading – normal operating conditions	VTS	158MPa	VTS	2 N/mm ²	VTS	N/A	VTS	0.3MPa	VTS	
3.3.17	Bumper loading – unusual operation conditions	VTS	Not applicable *	VTS	19N/mm ²	VTS	N/A	VTS	0.65MPa	N/A	
3.3.18	Description of spring-loaded rollers	VTS	Not applicable	VTS	Rubber spring	VTS	N/A	N/A	N/A	N/A	
3.3.19	Material specification of Filling Valve	N/A	Not applicable	N/A	304 (cast steel) A283C or equiv.	N/A	N/A	N/A	N/A	N/A	
3.3.20	Material specification of Filling Valve seat	N/A	Not applicable	N/A	A283C or equiv.	N/A	N/A	N/A	N/A	N/A	

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			CH0032	LCP-MUSKRAT FALLS		Project No.: 505573							
			Tag No.:	Client:		NALCOR							
Item Number	Description	Specified Value or Reference	HABS		SENS		LEAFS		Jets		Proposed	Compliant	
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant			
3.3.21	Hoist load required to lift Stoplog:												
3.3.21.1	At balanced pressure	19 000 kg	21500	Y	17.600_kg	Y	18 200 kg	Y	22300kg	Y			
3.3.21.2	At 2.0 m differential pressure	36 000 kg	27500	Y	37.800_kg	Y	N/A	Y	66600kg	Y	Missing/High ? N/A because not specified to be removed under 2m WC pressure.		
3.4	SPILLWAY UPSTREAM STOPLOGS – TYPE S3												
3.4.1	Number of stoplog sections – S3	18	8 (optm)	N	16	Y	16	Y	18	Y			
3.4.2	Material specification	300WT	CSA G40.21-04 350 WT	Y	A276-304 or 00Cr19Ni or equiv.	N	CSA G40.21 – 300 / 350W	Y	CSA 340	K			
3.4.3	Thickness of skin plate	29 mm	25mm	Y	1600-mm 16_mm ??	K	25 mm	Y	20mm	Y			
3.4.4	Minimum thickness of structural parts	10 mm	12.5mm	Y	10_mm	Y	10 mm	Y	12mm	Y			
3.4.5	Height of Stoplog sections (seals compressed)	1 422 mm	1600mm	Y	12.80_m	Y	1.6 m	Y	1.442m	Y			
3.4.6	Weight of each Stoplog section	13 700 kg	13530kg	Y	13,930_kg	Y	11 885 kg	Y	10800kg	Y			
3.4.7	Material and type of seals	Elastomer Solid J	_SBR/_ Elastomeric bulb J-seals	Y	SBR/J-Type	Y	RUBBER /SOLID BULB J SEAL	Y	C.R/J", "I"	Y			
3.4.8	Side seal distance between seal centres	10 900 mm	10.8m	Y	10.70_m	Y	10.7 m	Y	10.815m	Y			
3.4.9	Lintel seal Elevation – bottom seals compressed	N/A	Not applicable	N/A	no lintel seal	N/A	N/A	N/A	N/A m	N/A			
3.4.10	Overall width of Stoplogs	11 200 mm	11.396m	Y	11.10_m	Y	11.3 m	Y	11.18m	Y			
3.4.11	Overall depth of Stoplogs (seal face to back of stoplog)	1 400 mm	1910mm	Y	1,836_mm	Y	1478 mm	Y	1408mm	Y			
3.4.12	Load bearing guides centre distance	11 200 mm	11.2m	Y	10.90_m	Y	11.1 m	Y	11.08m	Y			
3.4.13	Load bearing guides loading – normal operating conditions	VTS	262MPa	VTS	104 N/mm²	VTS	636 MPa (HERTZ CONTACT STRESS)	VTS	49MPa	VTS			
3.4.14	Load bearing guides loading – unusual operation conditions	VTS	275MPa	VTS	75 N/mm²	VTS	680 MPa (HERTZ CONTACT STRESS) BRONZE	VTS	53MPa	VTS			
3.4.15	Material specification of bumpers	VTS	ASTM B584-C92300	VTS	A276-304 or 00Cr19Ni or equiv.	VTS	N/A	VTS	ASTM B21	VTS			
3.4.16	Bumper loading – normal operating conditions	VTS	170MPa	VTS	2 N/mm²	VTS	N/A	VTS	0.6MPa	VTS			
3.4.17	Bumper loading – unusual operation conditions	VTS	Not applicable *	VTS	19N/mm²	VTS	N/A	VTS	0.8MPa	VTS			
3.4.18	Description of spring-loaded rollers	VTS	Not applicable	VTS	Rubber Spring	VTS	N/A	VTS	N/A	VTS			
3.4.19	Material specification of Filling Valve	N/A	Not applicable	N/A	Hook (steel) A276-304	N/A	N/A	N/A	N/A	N/A			
3.4.20	Material specification of Filling Valve seat	N/A	Not applicable	N/A	A276-304 or equivalent	N/A	N/A	N/A	N/A	N/A			
3.4.21	Hoist load required to lift Stoplog												
3.4.22	At balanced pressure	19 000 kg	23516kg	Y	15,500_kg (Low Limit)	K	14 800 kg	Y	line item missing	Y			
3.4.23	At 2.0 m differential pressure	24 000 kg	line item missing	N/A	line item missing	N/A	line item missing	N/A	line item missing	N/A			
3.5	SPILLWAY LIFT BEAM FOR S1, S2 & S3 STOPLOGS												
3.5.1	Height of Lift Beam	1000 mm	2781mm	Y	1.80_m	Y	2 080mm OVERALL	Y	1.2m	Y			
3.5.2	Weight of Lift Beam	5 000 kg	6037kg	Y	2,200_kg	Y	3 070 kg	Y	8500kg	Y	Heavy ? YES.		
3.5.3	Latching mechanism description		Lifting Spec (from HNA)	VTS	Hook, engaged mechanically	VTS	TWO HOOKS PERMANENTLY LINKED BY CONNECTING RODS TO A RELEASE LEVER, ACTIVATED BY THE LATCHING MECHANISM LOCATED ON THE TRASH RACK SYSTEM HOIST.	VTS	Balance Weight	VTS			
3.6	SPILLWAY DOWNSTREAM STOPLOGS - EMBEDDED PARTS												
3.6.1	Weight of embedded parts (without anchors)	21 000 kg ea.	17015kg	Y	10,800_kg	Y	5 339 kg	Y	17700kg	Y	Low? YES. To be vtrified in detail design.		
3.6.2	Loaded support bumper path profile/depth/moment of inertia	mm4	Carbon steel: rectangular (12.5 mm x 160 mm) stainless steel: rectangular (10 mm x 350 mm) / 16000 mm / 177381 mm4	K	1/150mm/1.5E+07mm ⁴	Y	L / 203 mm/18 X106 mm4	Y	200/250mm/4.6x10 ⁶ mm4	K			
3.6.3	Guide support bumper path profile/depth/moment of inertia	VTS	_See 3.6.5	VTS	Rect./10_mm/31233mm ⁴	VTS	N/A / N/A mm/ N/A mm4	VTS	200/90mm/2.77x10 ⁶ 6mm4	VTS			
3.6.4	Back guide/roller paths profile/depth/moment of inertia	VTS	Carbon steel: rectangular (12,5 mm x 350 mm) Stainless steel: rectangular (10 mm x 110 mm) / 16000 mm / 177381 mm4	VTS	T/150_mm/1.6E+07mm ⁴	VTS	L / 203 mm/18 X10*6 mm4	VTS	200/200mm/4.6x10 ⁶ 7 mm4	VTS			
3.6.5	Side guides profile/depth/moment of inertia	VTS	Carbon steel: I-beam made of plates (16 mm x 150 mm, 100 mm x 16 mm, 12.5 mm x 150 mm) Stainless steel: rectangular (10,0 mm x 150 mm) / 16000 mm / 42150094 mm4	VTS	T/55_mm/1E+06mm ⁴	VTS	FB / 101 mm/ 3 X10*6mm4	VTS	200/90mm/2.77x10 ⁶ 6mm4	VTS			
3.6.6	Sill beam profile/depth/moment of inertia	mm4	Carbon steel: I-beam (12x5-1/4) Stainless steel: rectangular (10 mm x 95 mm) / 14800 mm / 113300000 mm4	VTS	1/150_mm/1.9E+07mm ⁴	VTS	S / 250 mm/ 51 X10*6 mm4	VTS	200/300mm/1.28x10 ⁶ 8mm4	VTS			
3.6.7	Lintel beam profile	N/A	Not applicable	N/A	no lintel beam	N/A	N/A	N/A	N/A	N/A			
3.6.8	Loaded support bumper path anchors/vertical spacing	450 mm A-307	22 mm Ø/ 600mm	Y	25_mm Ø/600_mm	Y	32 mm □/ 600 mm	Y	22 mm Ø/ 600mm	K			
3.6.9	Guide support bumper path anchors/vertical spacing	600 mm A-307	See 3.6.11	Y	25_mm Ø/600_mm	Y	mm □/ mm	Y	22 mm Ø/ 600mm	K			
3.6.10	Back roller/guide paths anchors/vertical spacing	600 mm A-307	22 mm Ø/ 600mm	Y	25_mm Ø/600_mm	Y	22 mm □/ 600 mm	Y	22 mm Ø/ 600mm	K			
3.6.11	Side guides anchors/vertical spacing	600 mm A-307	22 mm Ø/ 600mm	Y	25_mm Ø/600_mm	Y	mm □/ mm	Y	22 mm Ø/ 600mm	K			
3.6.12	Sill beam anchors/ horizontal spacing	450 mm A-307	22 mm Ø/ 600mm	Y	25_mm Ø/600_mm	Y	22 mm □/600 mm	Y	22 mm Ø/ 600mm	K			
3.6.13	Lintel beam anchors/ horizontal spacing	N/A	Not applicable	N/A	25_mm Ø/600_mm	N/A	mm □/ mm	Y	N/Amm / N/Amm	Y			
3.6.14	Material specification of sealing faces	A-240 SS-304	ASTM A 276 type 304	Y	A276-304 or 00Cr19Ni or equiv.	Y	A276, gr 304 L	Y	ASTM A276 Type 304	Y			
3.6.15	Thickness of sealing faces	10 mm	10mm	Y	8 mm	N	10 mm	Y	16mm	Y			
3.6.16	Material specification of bumper tracks	300/350W	CSA G40.21-04 350 WT	Y	A276-304 or 00Cr19Ni or equiv.	Y	CSA G40.21, 350W / 300W	Y	ASTM A276 Type 304	Y			
3.6.17	Thickness of bumper tracks	12 mm	128.5mm	Y	55 mm	Y	10 mm	N	16mm	Y			
3.6.18	Hardness of bumper tracks	92-107 BHN	145 HB	Y	BHN170	Y	128 BRINELL	Y	187	Y			
3.6.19	Material specification of backing members	300W	Not applicable	N	A276-304 or 00Cr19Ni or equiv.	N	CSA G40.21, 350W / 300W	Y	ASTM A36	Y			
3.6.20	Second stage concrete volumes	102 m3	30	Y	33_m³; 165 m3 total (AH Q8)	Y	121m³ - Q8 clarification answer - 23m3 per downstream stoplog slot	Y	28 m³	Y	Per Bay? YES.		
3.7	SPILLWAY DOWNSTREAM STOPLOGS – TYPE S4												
3.7.1	Number of stoplog sections – S4	10	5 (five)	N	5/bay; 10 total (AH-Q19)	Y	10 Total: 1 Perma set of 5 + 1 Tempo set of 5 (Q20 Clarification)	Y	10	Y			
3.7.2	Material specification	300WT	CSA G40.21 -04 350 WT	Y	A276-304 or 00Cr19Ni or equiv.	N	CSA G40.21 – 300 / 350W	Y	CSA 340	K			
3.7.3	Thickness of skin plate	19 mm	12.5mm	Y	12 mm	Y	22 mm	Y	22mm	Y			
3.7.4	Minimum thickness of structural parts	10 mm	12.5mm	Y	10 mm	Y	10 mm	Y	12mm	Y			
3.7.5	Height of Stoplog sections (seals compressed)	2 180 mm	2180mm	Y	2.18_m	Y	2.2 m	Y	2.18m	Y			
3.7.6	Weight of each Stoplog section	6 400 kg ??	8406kg	Y	13,400_kg	Y	12 800 kg	Y	16200kg	Y			
3.7.7	Material and type of seals	Elastomer Solid J	_SBR/_ Elastomeric bulb J-seals	Y	SBR/J-Type	Y	RUBBER /SOLID BULB J SEAL	Y	C.R/J", "I"	Y			
3.7.8	Side seal distance between seal centres	12 500 mm	12500mm	Y	12.4_m	Y	12.3 m	Y	12.3m	Y			
3.7.9	Lintel seal Elevation – bottom seals compressed	N/A	Not applicable	N/A	no lintel seal	N/A	11.1 m	N/A	N/A m	N/A			
3.7.10	Overall width of Stoplogs	12 800 mm	12996mm	Y	12.6_m	Y	12.8 m	Y	12.74m	Y			
3.7.11	Overall depth of Stoplogs (seal face to back of stoplog)	1000 mm	950mm	Y	2,248 mm. The stoplog S4 will be supplied with a depth of 1,030 mm.	Y	1 454 mm. To be optimized during detail design.	K	958mm	Y			
3.7.12	Load bearing guides centre distance	12 800 mm	12.8m	Y	12.5_m	Y	12.6 m	Y	12.6m	Y			

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Technical Bid Evaluation			Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment								Revision No.: 01	
			Package No.: CH0032				Project Title: LCP-MUSKRAT FALLS				Rev. Date.: 2013-06-13	
			Tag No.:				Client: NALCOR				Project No.: 505573	
Item Number	Description	Specified Value or Reference	Bidder: HABS		SENS		LEAFS		Jets		Proposed	Compliant
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant		
3.7.13	Load bearing guides loading – normal operating conditions	VTS	66MPa	VTS	30 N/mm ²	VTS	313 MPa (HERTZ CONTACT STRESS)	VTS	11MPa	VTS		
3.7.14	Load bearing guides loading – unusual operation conditions	VTS	75MPa	VTS	20 N/mm ²	VTS	N/A MPa (HERTZ CONTACT STRESS)	VTS	15MPa	VTS		
3.7.15	Material specification of bumpers	VTS	ASTM B584-C92300	VTS	A276-304 or 00Cr19Ni or equiv.	VTS	BRONZE	VTS	ASTM B21	VTS		
3.7.16	Bumper loading – normal operating conditions	VTS	136MPa	VTS	2 N/mm ²	VTS	2.6 MPa	VTS	0.4MPa	VTS		
3.7.17	Bumper loading – unusual operation conditions	VTS	Not applicable * contact pressures need not to be verified under exceptional conditions	VTS	19 N/mm ²	VTS	3.4 MPa	VTS	0.6MPa	VTS		
3.7.18	Description of spring-loaded rollers	VTS	Not applicable	VTS	Rubber Spring	VTS	N/A	VTS	N/A	VTS		
3.7.19	Material specification of Filling Valve	N/A	Not applicable	N/A	CS6 (cast steel) A387 or equiv.	N/A	N/A	N/A	N/A	N/A		
3.7.20	Material specification of Filling Valve seat	N/A	Not applicable	N/A	A387 or equiv.	N/A	N/A	N/A	N/A	N/A		
3.7.21	Hoist load required to lift Stoplog:											
3.7.21.1	At balanced pressure	11 000 kg	13000kg	Y	14,700 kg (To be optimized during detail design)	K	20 800 kg (MOBILE CRANE)	Y	27000kg	Y		
3.7.21.2	At 2.0 m differential pressure	22 000 kg	19500kg	N/A	33,100 kg	N/A	N/A	N/A	61000kg	N/A	Missing / High ? N/A because not specified to be removed under 2m WC pressure.	
3.8	SPILLWAY LIFT BEAM FOR TYPE S4 STOPLOGS											
3.8.1	Height of Lift Beam	500 mm	3154mm	Y	2.20_m	Y	2.2 m	Y	1.2m	Y		
3.8.2	Weight of Lift Beam	5 000 kg	2078kg	Y	2,500 kg	Y	3200 kg	Y	9300kg	Y	Heavy ?	
3.8.3	Latching mechanism description		Lifting Spec (from HNA)	Y	Hook, engaged mechanically	Y	COUNTER-WEIGHT MECHANISM TO ENGAGE HOOKS A NYLON ROPE TO DISENGAGE MANUALLY	Y	Balance Weight	Y		
4	SPILLWAY GATES											
4.1	SPILLWAY GATE											
4.1.1	Material specification	300W	CSA G40.21-04 350 WT	Y	A575-50 or CS60 or equiv.	N	CSA G40.21 – 300 / 350W	Y	CSA G40	K		
4.1.2	Thickness of skin plate	29-25 mm	25mm	Y	24/16/12 mm	Y	22 mm	Y	30mm	Y		
4.1.3	Minimum thickness of structural parts	10 mm	12.5mm	Y	10 mm	Y	10 mm	Y	12mm	K		
4.1.4	Height of Spillway Gate (seals compressed)	23 000 m	23000mm	Y	23,010 mm	Y	23 000 mm	Y	23000mm	Y		
4.1.5	Number of gate sections	5 - 6	7 (seven)	Y	6	Y	5	Y	5	Y		
4.1.6	Lintel seal Elevation	N/A	Not applicable	N/A	no lintel seal	N/A	N/A	N/A	N/A m	N/A		
4.1.7	Overall width of gate	11 500 mm	11952mm	Y	11,300 mm	Y	11 670 mm	Y	11550mm	Y		
4.1.8	Overall depth of gate (seal face to back of gate)	1 500 mm	1573mm	Y	1,650 mm	Y	1570 mm	Y	1496mm	Y		
4.1.9	Side seal distance between seal centres	10 800 mm	10750mm	Y	10,600 mm (limit)	K	10 720 mm	Y	10610mm	N		
4.1.10	Material specification of wheel and BHN	ASTM A504-C 321/363 BHN	ASTM A504 Classe C, 321 363 HB	Y	ASTM A-504 Class C_321 BHN	Y	ASTM A504, CLASS C, 321 TO 363 BHN	Y	ASTM A504,Class C and 363	Y		
4.1.11	Wheel path centre distance	11 000 mm	11120mm	Y	11,050 mm	Y	11 120 mm	Y	11100mm	Y		
4.1.12	Number of wheels each gate section	2 to 6	4 (7x4 total)	Y	4 (6x4 total)	Y	#1:4/ #2:4/ #3:4/ #4:2/ #5:0 (14 TOTAL)	Y	22	Y		
4.1.13	Wheel diameter	650 mm	750mm	Y	600 mm (flat top Wheel not acceptable)	N	813 mm	Y	762mm	Y		
4.1.14	Wheel shaft diameter	240 mm	280mm	Y	280 mm	Y	260 mm	K	260mm			
4.1.15	Wheel bearing make/model number	TIMKEN/SKF	_SKF 32056 X/_DF	Y	SKF for equiv 2311-B CC-3033 (Copper roller Bearing not acceptable)	N	SKF /32052	K	FAG / 23152-MB			
4.1.16	Wheel loading – normal operating conditions	125 000 kg	127650kg	N	215 000 kg (Wheel need to be equally shared)	N	195 275 kg	Y	160000kg	N		
4.1.17	Wheel loading – unusual operation conditions	130 000 kg	180278kg	Y	275,400 kg	Y	236 415 kg	Y	208000kg	Y		
4.1.18	Material specification of bumpers	VTS	ASTM A514 Gr. F	VTS	ASTM A473 Type 420 or equiv.	VTS	BRONZE	VTS	ASTM B21	VTS		
4.1.19	Bumper loading – normal operating conditions	VTS	277 MPa	VTS	30kN	VTS	N/A	VTS	8MPa	VTS		
4.1.20	Bumper loading – unusual operation conditions	VTS	Not applicable **contact pressures need not to be verified under exceptional conditions	VTS	795kN	VTS	N/A	VTS	11MPa	VTS		
4.1.21	Static weight of gate with seals	178 000 kg	172614kg	Y	169,800 kg	Y	153 000 kg	Y	227000kg	Y		
4.1.22	Maximum hoist load required to open gate	300 000 kg	275000kg	Y	245 000 kg (low, to be revised during detail design)	K	214 500 kg (low, to be revised during detail design)	K	320000kg	Y		
4.1.23	Maximum exceptional hoist load (with gate jammed)	VTS	605000kg	Y	670 000 kg (low, to be revised during detail design)	K	637 525 kg	Y	960000kg	Y		
4.1.24	Maximum load applied to hoist during emergency closure	VTS	396800kg	N	335 000 kg	K	153 000 kg	Y	240000kg	K		
4.1.25	Minimum residual closing force during emergency closure	VTS	157700kg	N	133 250 kg	K	110 900 kg	K	138000kg	Y		
4.1.26	Lift pin diameter	VTS	200mm	VTS	160 mm	VTS	300 mm	VTS	260mm	VTS		
4.1.27	Material and type of seals	Elastomer PTFE	Sides:SBR 60-70 Shore A/ Elastomeric bulb J seals with PTFEBottom (between sections):SBR 60-70 Shore A/ Elastomeric bulb J seals Bottom (sill):SBR 50 Shore A/ Elastomeric flat sel	Y	SBR+PTFE J-Type	Y	SINGLE STEM, SOLID BULB, PTFE COATED	Y	C.R and J	N		
4.1.28	Maximum hydrostatic load on gate	3 000 000 kg	271	VTS	33,000kN	VTS	230.5 kPa	VTS	266kPa	VTS		
4.1.29	Force required to start gate	270 000 kg	275000kg	Y	235,000 kg	Y	214 500 kg	Y	880000kg	N		
4.2	SPILLWAY GATE - EMBEDDED PARTS											
4.2.1	Weight of primary embedded anchors and template steel/gate	VTS	13471 kg	Y	65 000 kg (W/Padding pad type anchors not acceptable)	N	7000 kg	Y	3300 and 3,900kg	N		
4.2.2	Number of embedded anchors per lower lined side guide	VTS	1200	N	300	Y	4760 kg	Y	1049	Y		
4.2.3	Number of embedded anchors per upper side guide	VTS	1288	N	211	Y	N/A	Y	220	Y		
4.2.4	Number of embedded anchors per sill beam	VTS	102	Y	60	Y	1080 kg	Y	108	Y		
4.2.5	Number of embedded anchors per lintel beam	N/A	Not applicable	Y	80	N/A	N/A	Y	N/A	Y		
4.2.6	Weight of embedded parts (without anchors) per gate	71 500 kg	92773 kg	Y	50,000 kg	Y	83 900 kg	Y	78500kg	Y		
4.2.7	Loaded roller paths profile/depth/moment of inertia	mm4	Carbon steel: I-beam made of plates (57mm x 250mm, 300mm x 25mm, 31,5mm x 260mm) / 40500mm / 692835850mm4	Y	1/300mm/2.6E+08mm ⁴	Y	WT / 528 mm/ 2214X10 ⁶ mm4	Y	2208860mm2 363 x 919mm4	K		
4.2.8	Guide roller paths profile/depth/moment of inertia	VTS	_See 4.2.10	VTS	1/150mm/1.7E+07mm ⁴	VTS	N/A / N/A mm/ N/A mm4	VTS	200/90mm/2.77x10 ⁴ 6mm4	VTS		
4.2.9	Back guide paths profile/depth/moment of inertia	VTS	Carbon steel: rectangular (25mm x 150mm) Stainless steel: rectangular (10mm x 200mm) / 46000mm / 611436mm4	VTS	-	VTS	L / 203 mm/18 X 10 ⁶ mm4	VTS	200/300mm/1.2x10 ⁴ 8 mm4	VTS		

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			Package No.: CH0032		Project Title: LCP-MUSKRAT FALLS		Rev. Date.: 2013-06-13						
			Tag No.:		Client: NALCOR		Project No.: 505573						
Item Number	Description	Specified Value or Reference	Bidder: HABS		SENS		LEAFS		Jets				
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant			
4.2.10	Side guides profile/depth/moment of inertia	VTS	LOWER SECTION Carbon steel: I-beam made of plates(31,5mm x 220mm, 140mm x 25mm, 19mm x 220mm)Stainless steel: rectangular (10mm x 200mm)/ 40500mm / 49094623mm4HIGHER SECTIONCarbon steel: rectangular (9,5mm X 220mm)Stainless steel: rectangular (10mm x 200mm)/ 11500mm / 129540mm4	VTS	Y	1/100_mm/4.5E+06mm ⁴	VTS	WT / 345 mm/170 X 10*6 mm4	VTS	200/90mm/2.77x10 ⁴ 6mm4	VTS		
4.2.11	Sill beam profile/depth/moment of inertia	mm4	Carbon steel: I-beam (10x4-5/8) Stainless steel: rectangular (10mm x 148,8mm) / 13120mm / 51400000mm4	Y	Y	1/150_mm/1.7E+07mm ⁴	Y	S / 250 mm/51 X 10*6 mm4	Y	200/300mm/1.28x1 0*8mm4	Y		
4.2.12	Lintel beam profile	N/A	Not applicable	Y	Y	Top/Flange (bonded plate)	N/A	N/A	Y	N/A	Y		
4.2.13	Loaded roller path anchors/vertical spacing	450 mm A-325	22 mm □ / 300mm	K	K	30 mm □/300 mm (Anchor type not acceptable, to be revised)	N	38 mm □ / 300 mm	Y	22 mm □ / 300mm	K		
4.2.14	Guide roller path anchors/vertical spacing	600 mm A-307	22 mm □ / 300mm	K	K	30 mm □/500 mm	K	mm □/mm	Y	22 mm □ / 300mm	K		
4.2.15	Back guide path anchors/vertical spacing	600 mm A-307	22 mm □ / 300mm	K	K	30 mm □/600 mm	K	25 mm □ / 600 mm	Y	22 mm □ / 300mm	K		
4.2.16	Side guides anchors/vertical spacing	600 mm A-307	22 mm □ / 300mm	K	K	30 mm □/500 mm	K	25 mm □ / 600 mm	Y	22 mm □ / 300mm	K		
4.2.17	Sill beam anchors/horizontal spacing	450 mm A-307	22 mm □ / 300mm	K	K	30 mm □/600 mm	K	22 mm □ / 600 mm	Y	22 mm □ / 300mm	K		
4.2.18	Lintel beam anchors/ horizontal spacing	N/A	Not applicable	Y	Y	30 mm □/600 mm	K	25 mm □ / 600 mm	Y	N/A mm / N/A mm	Y		
4.2.19	Material specification of sealing faces	A-240 SS-304	ASTM A276 type 304	Y	Y	A276-304 or 00Cr19Ni or equiv.	Y	A276, gr 304 L	Y	ASTM A276 Type 304	Y		
4.2.20	Thickness of sealing faces	A-240 SS-304	10mm	Y	Y	10 mm	Y	10 mm	Y	13mm	Y		
4.2.21	Material specification of wheel tracks	ASTM A514-F/Q	ASTM A514-F/Q	N	N	ASTM A240 UNS S41500 or-eqv. Track material will be A514 grade F as specified.	Y	A514, gr. Q	Y	ASTM A504, Grade F or Q	Y		
4.2.22	Width of wheel tracks	VTS	230	Y	Y	220 mm	Y	145 mm	Y	250mm	Y		
4.2.23	Thickness of wheel tracks	VTS	38.1mm	Y	Y	15 mm	N	80 mm	Y	35mm	Y		
4.2.24	Hardness of wheel tracks	235 - 270 BHN	360-450 HB	N	N	BHN275	Y	271 TO 315	Y	300	N		
4.2.25	Material specification of backing members	300W	Not applicable	N	N	A529Gr50 or Q345 or equiv.	N	CSA G40.21 - 300 / 350W	Y	ASTM A36	Y		
4.2.26	Second stage concrete volumes	1 148 m3	210 m ³	Y	Y	275_m ³ /bay; 1275 m ³ total (AH-Q7)	Y	2-956-m ³ - Q7 clarification answer - 240 m3 per spillway gate slot	Y	112m ³	Y	Per Bay? YES.	
4.3	SPILLWAY GATE – HOISTS												
4.3.1	Overall height	VTS	2335mm	VTS	Y	~2.50_m	VTS	2.1 m	VTS	3m	VTS		
4.3.2	Overall length	VTS	13146mm	VTS	Y	~14.00_m	VTS	12.5 m	VTS	13.5m	VTS		
4.3.3	Overall width	VTS	3818mm	VTS	Y	~4.00_m	VTS	3.1 m	VTS	3m	VTS		
4.3.4	Total weight of hoist (inc. ropes and sheave blocks)	27 500 kg ea.	114885kg	Y	Y	30,000_kg 48600 kg (Q2 Clarification)	Y	76800 kg (Q1 Clarification confirmed weight)	Y	90000kg	Y	Different... Need details	
4.3.5	Rated capacity	300 000 kg	246000kg	N	Y	~275000_kg (Q20 Clarification - Rated Cap (incl. Kh) = 260 MT	Y	225,000-kg (Q21 Clarification - Rated Cap 2 445 kN or 249 000 kg)	Y	320000kg	Y	Spillway gate hoist increased from 30 T to 48.6 T. Hoist Drum and Gear: 37,8 T Motor and Control: 1,2 T Sheaves: 6.5 T Base: 4.1 T	
4.3.6	Rope Drums												
4.3.6.1	Material	300W	CSA G40.21 Gr. 300W	Y	Y	Steel	K	50W	Y	CSA G40	K		
4.3.6.2	Number of ropes per rope drum	2	2	Y	Y	2	Y	4 (2X2)	Y	8 +8	Y		
4.3.6.3	Diameter to bottom of grooves	30 x Rope diam.	2092mm	Y	Y	1404 mm	Y	1492 mm	Y	1583mm	Y		
4.3.6.4	Rope drum length	VTS	3848mm	VTS	Y	4039 mm	VTS	9690 mm	VTS	5000mm	VTS		
4.3.6.5	Grooved length (Left hand & right hand)	VTS	1734mm	VTS	Y	1992 mm	VTS	3807/3807 mm	VTS	4,884(2,442+2,442) mm	VTS		
4.3.6.6	Type of bearings	VTS	23068 CC/W33	VTS	Y	Zollern ZHP4.34	VTS	Sperical Roller	VTS	Oilless Metal	VTS		
4.3.6.7	Bearing capacity	VTS	4550 kN	VTS	Y	Load plus safety	VTS	1.780 kn (Static)	VTS	24000	VTS		
4.3.7	Wire Ropes	CSA G4-M											
4.3.7.1	Type of material	IPS Galv. w/SFC	IPS galv. fiber core	Y	Y	steel 1960N/mm ² zinc coated	Y	Galvanized Steel	Y	CSA G4	K		
4.3.7.2	Country of manufacture	CANADA / US / EUR	Canada	Y	Y	EU	Y	England		KOREA	Y		
4.3.7.3	Factor of safety	5/0.5 to Design Load	6,2	Y	Y	~3.7	N	8:1 on nominal CAP	Y	5.53	Y	Shall be 5	
4.3.7.4	Construction	6 x 19 - 6 x 37	6 x 19	Y	Y	6x19FC	Y	6 X 19 Fibre Core	Y	6 x 19	K		
4.3.7.5	Rope diameter	VTS	41mm (1.5/8")	VTS	Y	26 mm (Q20 Clarification - Rope Diameter: 32 mm)	Y	32 mm	Y	33 mm	N	Rope diam revised.	
4.3.7.6	Breaking load	VTS	97100kg	Y	Y	44,546_kg (Q20 - Revised Rope to 32 mm)	Y	70000 kg	Y	65700kg	N		
4.3.7.7	Number of falls	VTS	2 x 2 x 6	VTS	Y	8	VTS	4 X 8	VTS	16 + 16	VTS		
4.3.7.8	Wire Rope Dead Ends	4	Open spelter socket	VTS	Y	Op. spelter socket WLL12.000kg	VTS	line item missing	VTS	Line item missing	VTS		
4.3.9	Hoist drive												
4.3.9.1	Motor rating	60 kW @ 0.9 m/min	55,9 kW	Y	Y	55 kW	Y	44,75 kW	Y	110kW	N		
4.3.9.2	Motor rated full load speed	1200 rpm	880rpm	Y	Y	~1180_rpm	Y	1170 rpm	Y	1185rpm	Y		
4.3.9.3	Motor rated emergency lower speed	2400 rpm	1760rpm	Y	Y	~2400_rpm	N	3510 rpm	Y	N/A rpm	N	Shall be 3510 rpm	
4.3.9.4	Rated voltage/# phase/frequency	575/3P/60Hz	557 V / 3Ph / 60 Hz	Y	Y	575/3/60_V/Ph/Hz	Y	600/3/60 V/Ph/Hz	Y	600 / 3 / 60V/Ph/Hz	Y		
4.3.9.5	Starting current	VTS	± 500 A	VTS	Y	- A	VTS	TBC A	VTS	980.3A	VTS		
4.3.9.6	Rated full load current	VTS	100 A	VTS	Y	68.6 A	VTS	TBC A	VTS	130.7A	VTS		
4.3.9.7	Motor manufacturer	VTS	Reuland / US Motor	VTS	Y	WEG	VTS	Reuland	VTS	HYOSUNG	VTS		
4.3.9.8	Motor Class	VTS	Squirrel cage	Y	Y	IE2/EPACT	VTS	CMAA"B"Service(Stalltor que 180%-210%)	VTS	IP44	VTS		
4.3.9.9	Locked-rotor current	VTS	200 ± 10%	Y	Y	419A	VTS	TBC	VTS	979.8	VTS	200 ± 10% specified	
4.3.9.10	Code letter	G	G	Y	Y	V	VTS	TBC	VTS	H	VTS		
4.3.9.11	Design letter	Design B	C modified	Y	Y	B C	Y	TBC C Modified	Y	B	N		
4.3.9.12	Rated temperature rise	Class B	70°C	Y	Y	80°C	Y	B	Y	80	Y		
4.3.9.13	Insulation system class	Class: F	F	Y	Y	F	Y	F	Y	F	Y		
4.3.9.14	Rated ambient temperature	40 Degree C	-40°C / 40°C	Y	Y	-20°C - +40°C -20°C - +40°C	Y	+40 deg. C -20 C - +40 C	Y	40	N		
4.3.9.15	Time rating	Continuous	continuous	Y	Y	60 min/hr Continuous	Y	Continous	Y	100%ED	Y		
4.3.9.16	Secondary volts/# phase/full load current (for wound-rotor induction motor)	VTS	N/A	N/A	Y	575/3_V/Ph/A	VTS	TBC V/Ph/A	VTS	335 / 3 / 202.7V/Ph/A	N/A		
4.3.9.17	Motor Thermally protected (Yes or no)	VTS	Yes	Y	Y	Yes	Y	YES	Y	Yes	Y		
4.3.9.18	Motor Space Heater- rated voltage/#phase/watts	120V/1P/VTS	120 V / 1 Ph / 150 W	Y	Y	No Yes	Y	240/1/125 V/Ph/W 120V/150W	Y	220 / 1 / 300V/Ph/W	K		
4.3.9.19	Gear Box Space Heater- rated voltage/#phase/watts	120V/1P/VTS	120 V / 1 Ph / 500 W	Y	Y	No	K	240/1/50 V/Ph/W	K	N/A V/Ph/W	N		
4.3.9.20	Motor full load efficiency	Premium high efficiency	± 94 %	Y	Y	93.60%	Y	TBC	K	92%	Y		
4.3.9.21	Power factor	VTS	N/A	N/A	Y	0.86	VTS	TBC	VTS	0.88	N/A		
4.3.9.22	Service factor	VTS	1.15	Y	Y	1.125	Y	1.15	Y	1.00	N		
4.3.9.23	Enclosure type	TEFC	TEFC	Y	Y	TEFC	Y	TEFC	Y	Totally Enclosed	Y		
4.3.9.24	NEMA Frame type	NEMA MG-1	444T	N/A	Y	404/ST	VTS	405T 365T	VTS	58XX	N/A		
4.3.9.25	NEMA Design	VTS	C	Y	Y	B/C	Y	C Modified	Y	B	N		
4.3.9.26	Inverter Duty (yes/no)	VTS	Yes	N/A	Y	Yes	N/A	No	N/A	N/A	N/A		
4.3.10	Gearbox												

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			Tag No.:	Client: NALCOR			Project No.: 505573					
Item Number	Description	Specified Value or Reference	Bidder: HABS		SENS		LEAFS		JETS		Proposed	Compliant
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant		
4.3.10.1	Gearbox manufacturer	SEW EUR (Equiv.)	SEW	Y	Zollern	Y	COH	K	WOORIM	Y	COH Gearbox	
4.3.10.2	Gearbox drive ratio	Fully enclosed	965:01:00	Y	i=738	Y	778.6	Y	1 : 720	Y		
4.3.11	Brakes											
4.3.11.1	Holding brake manufacturer	ELEVANJA	Johnson Elevania	Y	SHB	Y	Mondel	Y	CHANGWON	Y		
4.3.11.2	Holding brake type	Magnetic Drum	Spring set DC magnet released drum brake	Y	drum brake	Y	Shoe Type	Y	Drum Type	Y		
4.3.11.3	Holding brake rated torque	VTS	1,487 kN-m	VTS	0.2-1.6_kN-m	VTS	0.542 kN-m	VTS	1.37kN-m	VTS		
4.3.11.4	Fan Brake	Power absorption		VTS	See below	VTS		VTS		VTS		
4.3.11.5	Fan brake manufacturer	SHELDONS	Sheldon Engineering	Y	Sheldors Engineering	Y	Sheldon	Y	LATER	N		
4.3.11.6	Fan brake rated torque	VTS	0,29kN-m	VTS	0,32_kN-m	VTS	__162@2340RPM	VTS	LATER kN-m	N		
4.3.11.7	Fan brake speed during emergency lower	2 400 rpm	1760rpm	VTS	2400_rpm	VTS	2340 rpm	VTS	LATER rpm	N		
4.3.11.8	Fan brake maximum rated speed	3 600 rpm	2600rpm	VTS	>2400_rpm	VTS	3510 rpm	VTS	LATER rpm	N		
4.3.12	Controls											
4.3.12.1	PLC (Programmable Logic Controller) (Make)	Schneider	Refer to Vytrell Proposal (*not in Vytrell Proposal)	N	Green Schneider Electric	Y	SCHNEIDER ELECTRIC	Y	SIEMENS	K		
4.3.12.2	PLC (Programmable Logic Controller) (Model)	Modicon Quantum	Refer to Vytrell Proposal (*not in Vytrell Proposal)	N	CJ2M-CPU33 Quantum	Y	QUANTUM 140CPU65150	Y	S7-300 SIPNUS	K		
4.3.12.3	HMI (Human Machine Interface) display (Make)	Nematron	Refer to Vytrell Proposal (*not in Vytrell Proposal)	N	OMRON Nematron	Y	SCHNEIDER ELECTRIC	Y	SIEMENS	K		
4.3.12.4	HMI (Human Machine Interface) display (Model)	VTS	Refer to Vytrell Proposal (*not in Vytrell Proposal)	N	N510	K	HMIPCCP172CB46T14 N	Y	MP377 PRO 15"	K		
4.3.12.5	Rotary limit switch manufacturer and model	VTS	Gemco #1980-1208	N/A	Stromag GETS Series	VTS	Stromag RLS51-75-SP	VTS	schneider/XCM D2145L	N/A		
4.3.12.6	Control cabinet manufacturer	VTS	TBA	N/A	Gantner	VTS	Hoffman-Junction	VTS	PROTECH	N/A		
4.3.12.7	Control power	dual 125 Vdc pwr supplies	120 / 1 / 60	N	24V-DC Dual 125 V dc	Y	110V/120V/125V/130V/140V/150V/160V/170V/180V/190V/200V/220V/240V/250V/260V/280V/300V/320V/340V/360V/380V/400V/420V/440V/460V/480V/500V/520V/540V/560V/580V/600V/620V/640V/660V/680V/700V/720V/740V/760V/780V/800V/820V/840V/860V/880V/900V/920V/940V/960V/980V/1000V	Y	110 / 1 / 60 V/Ph/Hz	N		
4.3.12.8	General Arrangement drawing of the hoist assembly.	VTS	TBA	N/A	See drawings	VTS	See attached	VTS	DWG : B-M-07	N/A		
4.3.12.9	Details of fan brake	VTS	TBA	N/A	-	VTS	See attached	VTS	LATER	N/A		
4.3.12.10	Details of motor	VTS	TBA	N/A	-	VTS	Custom Motor details only after PO placed	VTS	DWG : B-M-07	N/A		
4.3.12.11	Details of holding brake operation	VTS	TBA	N/A	-	VTS	Mondel Std. catalog for MBE Brake	VTS	DWG : B-M-07	N/A		
4.3.12.12	Extreme upper limit switch make and model	VTS	Telemecanique	N/A	Stromag GETS	VTS	Square-D 9007CLS1	VTS	schneider/XCM D2145L	N/A		
4.3.12.13	Details of drum dogging device limit switch	VTS	XF9 F1152	N/A	-	VTS	Turk Induction Type Limit Switch	VTS	schneider/XCM D2145L	N/A		
4.3.12.14	Continuous position indicator make and model	VTS	Rittmeyer MGIM	N/A	Stromag GETS / Kübler	VTS	Posital OCD S10G1212T120PRL	VTS	WONILLEVEL/WTG 200	N/A		
4.3.12.15	Maintenance upper limit switch make and model	VTS	Allen Bradley 802T	N/A	Stromag GETS	VTS	Use of Rotary Limit Switch above	VTS	schneider/XCM D2145L	N/A		
4.3.12.16	Hoist load cell make and model	VTS	PIAB LKUE 16	N/A	W&H SB Series	VTS	Strainert SPA-75	VTS	BONGSHIN and CDDM-50T	N/A		
4.3.12.17	Slack rope detection make and model	VTS	Allen Bradley 802T	N/A	Bernstein GC-SU1Z	VTS	Will use the hoist cel	VTS	schneider/XCM D2145L	N/A		
4.3.12.18	Unbalance wire rope load detector make and model	VTS	Allen Bradley 802T	N/A	W&H SB Series	VTS	Can use the load to determine unbalanced load if required	VTS	KUMSUNG and KLD 33.5	N/A		
4.3.12.19	Horn make and model	VTS	TBA	N/A	WERMA 64580075	VTS	Edward 870 P	VTS	KUMSUNG and KH 33.5	N/A		
4.4	SPILLWAY GATE HEATING CONTROL											
4.4.1	Heating control panel manufacturer	VTS	Bucan Electric Heating Devices Inc. -model BCP-XXX (Final part number issued with the order)	VTS	Siemens	VTS	HAMMOND	VTS	PROTECH	VTS		
4.4.2	Temperature controller make and model	VTS	RKC Instruments model MA series, OMRON or others CSA-US Approved	VTS	Siemens 7PX	VTS	WATLOW, PM6C1FA	VTS	AUTONICS and TK4M-B4CC	VTS		
4.4.3	TRIAC make and model	VTS	Cristal Controls CCS Series	VTS	Siemens	VTS	WATLOW, DC21	VTS	WISE and WM2-XR	VTS		
4.4.4	Make and model of temperature sensor located inside the gate	VTS	Bucan Model RTD, J Type or K Type Temperature Sensor	VTS	Siemens QAA2071	VTS	HONEYWELL, T678A1163	VTS	KONICS and SL4	VTS		
4.4.5	Make and model of temperature sensor for embedded part	VTS	Bucan or other CSA-US Approved	VTS	Siemens QAP2012.150	VTS	HONEYWELL, T678A1163	VTS	KONICS and SL4	VTS		
4.4.6	Make and model of temperature sensor for heating element	thermocouple	Bucan Model RTD, J Type or K Type Temperature Sensor	K	Siemens QAM2171.040	K	WIKA, TR10/TW15	K	AUTONICS and TK4M-B4CC	K		
4.4.7	Blower/heater type/description	VTS	Gate Body Heater model 8GB XXXX (final part number issued with the order)	VTS	Ziehl-Abegg FV/Carlo-Loysch	VTS	CALORITECH, MXG	VTS	LATER	VTS		
4.4.8	Heater Rating (each)	VTS	60,5 kW, 2 per gate	VTS	40_kW	VTS	61 kW	VTS	LATER kW	VTS		
4.4.9	Blower air flow rate (each)	VTS	~ 2500 CFM	VTS	1,12_L/s	VTS	TBC L/s	VTS	LATER L/s	VTS		
4.4.10	Number of Blower/heaters	minimum two (2)	1	N	4/gate	Y	2 / Gate	Y	2/6 Unit	Y		
4.5	SPILLWAY HOIST HOUSE -- OVERHEAD CRANE											
4.5.1	Rated capacity	1 000 kg min.	3000kg	Y	3000_kg	Y	10000 kg 3000 kg	Y	5000 kg	Y		
4.5.2	Description	Electric Overhead - Double Brake	Underhung ceiling mounted single girder bridge crane	Y	Winch type, local control	Y	SGUR	Y	WIRE WINDING TYPE	Y		
4.6	SPILLWAY GATE MOTOR CONTROL CENTRES											
4.6.1	Manufacturer	VTS	Eaton	Y	Eaton	Y	ABB Inc.	Y	PROTECH	Y		
4.6.2	Model No.	VTS	Freedom	Y	Freedom MCC2100	Y	MNS-MCC	Y	N/A	N/A		
4.6.3	Rated Voltage	600 V/3P/60Hz	600V	Y	600 V	Y	600 V	Y	600V	Y		
4.6.4	Rated Bus Current	800 A minimum	800	Y	800 A	Y	800 A	Y	180A	N		
4.6.5	Enclosure Type	Indoor CSA 1 Gasketed Enclosure, Class 1 Type B (Suitable for installed environment)	NEMA 1A	K	NEMA 1A	N	NEMA 1A	N	UNIVERSAL ENCLOSURE	K		
4.6.6	Bus Bracing	42kA	65kA	Y	42 kA	Y	42kA	Y	8kA	N		
4.6.7	Disconnecting Means (Fused Switch or Circuit Breaker)	Feeder-MCCB, MCP	Circuit Breaker	Y	Circuit Breaker	Y	Circuit Breakers	Y	MCCB	K		
4.6.8	Overload relay Type	VTS	Solid State	Y	Later-Electronic	Y	Electronic	Y	EOCR	Y		
4.7	SPILLWAY GATE - DOGGING DEVICES											
4.7.1	Dogging devise weight - each	VTS	808kg	Y	450_kg	Y	200 kg	Y	3000kg	Y	How is it operated?	
4.7.2	Dogging devise guide Weight - each	VTS	Not applicable	VTS	200_kg	VTS	N/A	VTS	1500kg	VTS		
4.7.3	Dogging beam profile/depth/moment of inertia	VTS	I-beam made of plates (19mm x 250mm, 1300mm x 12,5mm, 19mm x 250mm) / 2891mm / 6420759833mm4	VTS	I/Later mm/Later mm ⁴	VTS	W/ 310mm/128 X 106 mm4	VTS	300/400mm/1.33x1 0'8mm4	VTS		
4.7.4	Block-out profile	VTS	Not applicable	N/A	No block out, HILTI	N/A	N/A	N/A	N/A	N/A		
4.7.5	Locking mechanism	VTS	Mechanical	Y	Mechanically, by pin by cranking system	Y	MANUALLY PINNED	Y	Manual	Y		
4.7.6	Operation description	VTS	Manual	Y		Y	THE DOGGING BEAM IS ROTATING AROUND A SHAFT	Y	MANUAL(HINGE)	Y		
4.8	SPILLWAY HOIST HOUSE ELECTRICAL DISTRIBUTION											
4.8.1	Motor Control Center	VTS							SQUARE-D	N/A		
4.8.1.1	Manufacturer	VTS	Eaton	N/A	Eaton	VTS	ABB Inc.	VTS	LATER	N/A		
4.8.1.2	Model No.	VTS	Freedom	N/A	Freedom MCC 2100	VTS	MNS-MCC	VTS	Later	N/A		
4.8.1.3	Rated Voltage	600 V	600V	N/A	600 V	Y	600 V	Y	600V	N/A		
4.8.1.4	Rated Bus Current	800 A	800A	N/A	800 A	Y	1600 A	Y	400 A	N/A		
4.8.1.5	Enclosure Type	VTS	NEMA 1A	N/A	Nema 1A	Y	NEMA 1A	Y	NEMA 1	N/A		
4.8.1.6	Bus Bracing	42 kA	65kA	N/A	42 kA	Y	42	Y	42 kA	N/A		
4.8.1.7	Disconnecting Means (Fused Switch or Circuit Breaker)	CB	Circuit Breaker	N/A	Circuit Breaker	Y	Circuit Breakers	Y	CIRCUIT BREAKER	N/A		
4.8.1.8	Overload Relay Type	VTS	Solid State	N/A	Later	VTS	ELECTRONIC	VTS	Later	N/A		
4.8.2	Dry Type Distribution Transformer		*Note: Two (2) 600-600/347V Transformers will be provided for lighting loads									
4.8.2.1	Manufacturer	VTS	Rex	Y	Rex	VTS	ABB	VTS	WESTINGHOUSE	Y		
4.8.2.2	Model No.	VTS	BJ Series	Y	various	VTS	See attached	VTS	Later			
4.8.2.3	Number per Hoist House	7	1 (5 total)	Y	2	VTS	See attached	VTS	HOIST 1 - 5	Y		

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Technical Bid Evaluation			Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment				Revision No.: 01			
			Package No.: CH0032	Project Title: LCP-MUSKRAT FALLS			Rev. Date.: 2013-06-13			
			Tag No.:	Client: NALCOR			Project No.: 505573			
Bidder:			HABS	SENS	LEAFS	Jets				
Item Number	Description	Specified Value or Reference	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant
4.8.2.4	Enclosure Type	CSA C 22.2, No. 94, Type 2.	NEMA 4	Y	Nema 1	K	See attached	VTS	NEMA 1	K
4.8.2.5	Voltage Ratio	600-208/120V, 600-600/347V (Lighting)	600:120/208 V	Y	600-208/120 V	VTS	See attached	VTS	600/347 V	Y
4.8.2.6	Rated Capacity	30 kVA minimum	30kVa	Y	30 kVA	VTS	See attached	VTS	30 kVA	Y
4.8.3	Distribution Panelboards		*Note: Two (2) 600-600/347V Transformers will be provided for lighting loads							
4.8.3.1	Manufacturer	VTS	Eaton	Y	Eaton	Y	ABB Eaton	Y	WESTINGHOUSE	Y
4.8.3.2	Model No.	VTS	POW-R-Line 3a	Y	ED3100	VTS	See attached Pow-R-Line	VTS	Later	N/A
4.8.3.3	Number per Hoist House	7	1 (5 total)	Y	2	VTS	See attached	VTS	HOIST 1 - 5	Y
4.8.3.4	Enclosure Type	Suitable for installed environment	NEMA 1	K	Nema 1	K	See attached Nema 1	K	NEMA 1	K
4.8.3.5	Voltage Ratio	208/120V 3P, 4W (distribution) 600/347V 3P, 4W (lighting)	120/208V	Y	208/120 V	VTS	See attached	VTS	600 / 347V	Y
4.8.3.6	Rated Capacity	100 A (42 cct) minimum	100A	Y	30 kVA	VTS	See attached	VTS	30 kVA	Y
4.8.3.7	Lighting Fixtures	VTS	TBA	N/A	See below	VTS	not answered	VTS	not answered	N/A
4.8.3.8	Manufacturer	VTS	TBA	N/A	Later	VTS	ABB	VTS	SURFACE	N/A
4.8.3.9	Model No.	VTS	TBA	N/A	Later	VTS	See attached	VTS	MTD Later	N/A
4.8.3.10	Number per Hoist House	VTS	TBA	N/A	Later	VTS	See attached	VTS	HOIST 1 - 5	N/A
4.8.3.11	Lamp Type	VTS	TBA	N/A	Later	VTS	See attached	VTS	MH	N/A
4.8.3.12	Lamp Output	VTS	TBA	N/A	Later_W	VTS	See attached	VTS	250 W	N/A
4.8.4	Radiant Heaters									
4.8.4.1	Manufacturer	VTS	CCI Thermal	Y	Chromalox	VTS	TBD	VTS	LATER	N/A
4.8.4.2	Model No.	VTS	OK3	Y	Star-F	VTS	TBD	VTS	LATER	N/A
4.8.4.3	Number per Hoist House	12	12 total	Y	3	VTS	TBD	VTS	HOIST 1 - 5	N/A
4.8.4.4	Voltage	600V/3P/60Hz	600V	Y	600 V	VTS	TBD	K	347V	N/A
4.8.4.5	Rating	10kW	10kW	Y	13.5 kW	Y	TBD	K	11 kW	N/A
4.9	SPILLWAY GATE - TOWERS AND HOIST HOUSE ENCLOSURE									
4.9.1	Overall tower height	VTS	29,94m	Y	28.00_m	Y	25.5 m	Y	28.130 m	Y
4.9.2	Tower width (c/c columns)	VTS	2,7 (stairs) / 2,1 (central towers) m	Y	2.50_m	Y	1,7 / 2.8 m	Y	1.400 m	N
4.9.3	Tower depth (c/c columns)	VTS	3,8m	Y	4.00_m	Y	4 m	Y	3.650 m	Y
4.9.4	Overall hoist house length	79.5 m	77,1m	VTS	12.00_m	VTS	72.5 m	VTS	79.390 m	VTS
4.9.5	Hoist house depth (inside)	VTS	~ 5,1m	VTS	4.50_m	VTS	4.5 m	VTS	3.700 m	VTS
4.9.6	Hoist house height (inside)	VTS	~ 3,0m	VTS	4.50_m	VTS	2.6 m	VTS	4.100 m	VTS
4.9.7	Total weight of towers (inc. stairs and hoist house)	660 000 kg	698300kg	Y	880,000_kg	Y	650 000 kg	Y	786,000 kg	Y
4.9.8	Material specification of steel	300WT	300WT or 350 WT	Y	A529Gr50 or Q345 or eqval.	N	350WT	Y	A529 Gr50	K
4.9.9	Number of embedded anchors per tower	6 min	24	VTS	2x4x4 = 32	VTS	4	VTS	14	VTS
4.9.10	Maximum length of embedded anchors	3 m approx.	1,35m	VTS	1_m	VTS	2.5 m	VTS	8.800 m	N
4.9.11	Weight of embedded anchors per tower	VTS	2600kg	VTS	~400_kg	VTS	4000 kg	VTS	150 kg	N
4.9.12	Main steel columns profile (columns)	VTS	W310 x (179, 129 or 118)	VTS	HEB500 or equivalent	VTS	W310x158	VTS	300 x 150	VTS
4.9.13	Typical steel profile (horizontal members)	VTS	W310 x 74 (Towers) / Custom Welded Profile (bridge)	VTS	HEA340 or equivalent	VTS	W250x89	VTS	300 x 150	VTS
4.9.14	Typical steel profile (bracing members)	VTS	2L (various dimensions)	VTS	HEA260 or equivalent	VTS	HSS152x152x12.7	VTS	130 x 130	VTS
4.9.15	Minimum thickness of structural parts	8 mm	8mm	VTS	10 mm	N	10 mm	VTS	Plate 10 mm	VTS
4.9.16	Maximum tower compression load (start gate opening)	VTS	374000 kg	VTS	265,300_kg	VTS	360 000 kg	VTS	320,000 kg	VTS
4.9.17	Maximum tower exceptional compression load (gate jammed)	VTS	767000 kg	VTS	453,600_kg	VTS	305 000 kg	VTS	960,000 kg	VTS
5	INTAKE									
5.1	INTAKE TRASHRACK - EMBEDDED PARTS									
5.1.1	Weight of embedded parts (without anchors)	90 000 kg ea. bay	13834kg	Y	37,140_kg	Y	231 648 kg	Y	33500kg	Y
5.1.2	Loaded support bumper path profile/depth/moment of inertia	mm4	Carbon steel: rectangular (12,5mm x 173mm) Stainless steel: rectangular (10mm x 60mm) / 47700mm / 92602mm4	Y	C/590mm/9E+08mm ⁴	Y	L / 178 mm / 19 x 10 ⁶ mm4	Y	300x200mm/9E+08mm ⁴	K
5.1.3	Guide support bumper path profile/depth/moment of inertia	VTS	See 5.1.4	VTS	Integral part of 5.1.2	VTS	N/A / N/A mm / N/A mm4	VTS	200/16mm/6.83x10 ⁶ 4mm4	VTS
5.1.4	Side guides profile/depth/moment of inertia	VTS	Carbon steel: rectangular (12,5mm x 130mm) Stainless steel: rectangular (10mm x 130mm) / 47700mm / 123398mm4	VTS	Integral part of 5.1.2	VTS	L / 178 mm / 19 x 10 ⁶ mm4	VTS	200/16mm/6.83x10 ⁶ 4mm4	VTS
5.1.5	Sill beam profile/depth/moment of inertia	mm4	I-beam (10 x 4-5/8)/1060mm/51400000 mm4	VTS	I/140mm/1W+07mm ⁴	VTS	W/ 206mm / 53 x 10 ⁶ mm4	VTS	200/270mm/2.05x10 ⁷ mm4	VTS
5.1.6	Loaded support bumper path anchors/vertical spacing	450 mm A-307	22mm C/ 300 mm	K	20 mm C/ 600 mm	K	25 mm C/ 600 mm	Y	22mm C/ 300 mm	K
5.1.7	Guide support bumper path anchors/vertical spacing	600 mm A-307	22mm C/ 300 mm	K	20 mm C/ 600 mm	K	N/A mm C/ N/A mm	Y	22mm C/ 300 mm	K
5.1.8	Side guides anchors/vertical spacing	600 mm A-307	22mm C/ 300 mm	K	20 mm C/ 600 mm	K	25 mm C/ 600 mm	Y	22mm C/ 300 mm	K
5.1.9	Sill beam anchors/ horizontal spacing	450 mm A-307	22mm C/ 300 mm	K	20 mm C/ 600 mm	K	22 mm C/ 600 mm	Y	22mm C/ 300 mm	K
5.1.10	Material specification of embedded parts	300W	Carbon steel plates: CSA G40.21-04 300 WT Cat.2 Carbon steel I-beam: ASTM A36 Stainless steel: ASTM A-276 type 304	Y	A529Gr50 or Q345 or eqval.	N	CSA G40.21 300W / 350 W	Y	ASTM A276 Type 304, ASTM A36	Y
5.1.11	Second stage concrete volumes	1 232 m3	131 m ³	Y	108 m ³ / bay; 1296 m ³ total (AH-Q9)	Y	1-247 m ³ - Q9 clarification answer - 106m3 per trashrack slot.	Y	126m ³	Y
5.2	INTAKE TRASHRACKS									
5.2.1	Number of trashrack sections per water passage	8	10	K	16x3 May be revised to 8 x3 during detail design	K	9 x 3	K	8	Y
5.2.2	Material specification - trashrack bars	300W/350W	CSA G40.21-04 350 WT	Y	A529Gr50 or Q345 or equivalent	N	CSA G40.21 300W	Y	CSA G40	K
5.2.3	Material specification - trashrack frame	300W	CSA G40.21-04 350 WT	Y	A529Gr50 or Q345 or equivalent	N	CSA G40.21 300W / 350W	Y	CSA G40	K
5.2.4	Profile of trashrack bars	FB Rounded edge	rectangular, rounded nose	Y	rectangular with rounded nose	Y	rectangular and rounded at both ends	Y	Square	N
5.2.5	Thickness of trashrack bars	10-16 mm	12,5mm	Y	20_mm	K	13 mm	Y	12mm	Y
5.2.6	Depth of trashrack bars	100-150 mm	110mm	Y	120_mm	Y	110 mm	Y	120mm	Y
5.2.7	Spacing between trashrack bars	> 100 mm	100mm	Y	100_mm	Y	100 mm	Y	110mm	N
5.2.8	Weight of each upper trashrack section	16 000 kg	8325kg	K	5,450_kg Will increase to reduce operation sequence	K	7 630 kg	K	13,100kg	Y
5.2.9	Weight of each lower trashrack section	15 000 kg	7573kg	K	5,450_kg	K	7 070 kg	K	13,000kg	Y
5.2.10	Height of each upper trashrack sections	3 700 mm	2987mm	Y	1,805_mm	K	2 985 mm	Y	3495mm	Y
5.2.11	Height of each lower trashrack sections	3 600 mm	2987mm	Y	1,805_mm	K	3 222 mm	Y	3625mm	Y
5.2.12	Hoist load required to lift Trashrack top section	18 000 kg	11400kg	Y	6,000_kg	K	12 595 kg	Y	16,100kg	Y
5.2.13	Hoist load required to lift Trashrack lower section	18 000 kg	10500kg	Y	6,000_kg	K	12 004 kg	Y	16,000kg	Y
5.2.14	Bumper loading - normal operating conditions	VTS	23MPa	VTS	20_N/mm ²	VTS	N/A	VTS	0.6 MPa	N/A
5.2.15	Maximum Passage Obstruction (MAX)	26.7%	no line item	N	30%	Y	no line item	N	no line item	N
5.2.16	Maximum Unsupported distance of bars (mm)	720 mm	no line item	N	451	Y	no line item	N	no line item	N
5.2.17	Maximum Head Loss thru trash racks at rated load (mm)	50 mm	no line item	N	60	Y	no line item	N	no line item	N
5.3	INTAKE TRASHRACK - LIFT BEAM									
5.3.1	Height of Lift Beam	500 mm	2367mm	Y	1.70_m	Y	2.2 m	Y	1.2m	Y
5.3.2	Weight of Lift Beam	3000 kg	2043kg	Y	2,800_kg	Y	2 900 kg	Y	3000kg	Y

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Technical Bid Evaluation			Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment				Revision No.: 01				
			Package No.: CH0032		Project Title: LCP-MUSKRAT FALLS		Rev. Date.: 2013-06-13				
			Tag No.:		Client: NALCOR		Project No.: 505573				
Bidder:			HABS		SENS		LEAFS		JETS		
Item Number	Description	Specified Value or Reference	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	
5.8.5	Number of gate sections	4 - 5	8 (eight)	Y	5	Y	5	Y		Y	
5.8.6	Lintel seal Elevation	14.05 m	14,05m	Y	14.05_m	Y	14.05 m	Y	EL.(+)-14.05m	Y	
5.8.7	Overall width of gate	7 500 mm	7952mm	Y	7.500_mm	Y	7683 mm	Y	7500mm	Y	
5.8.8	Overall depth of gate (seal face to back of gate)	1 200 mm	1570mm	Y	1.850_mm. A gate depth of 1,600mm can be confirmed without any change to the offered price.	Y	1550 mm	Y	1085mm	K	
5.8.9	Side seal distance between seal centres	6 800 mm	6750mm	Y	6.600_mm Will be increase to fit seals with SS path	K	6700 mm	Y	6700mm	Y	
5.8.10	Material specification of wheel and BHN	ASTM A504-C 321/363 BHN	ASTM A504 Classe C, 321 363 HB	Y	ASTM A-504 Class C_321 BHN	Y	ASTM, A504, CLASS C, 321 TO 363 BHN	Y	ASTM A504,CLASSC and 363	Y	
5.8.11	Wheel path centre distance	7 100 mm	7120mm	Y	7.400_mm	Y	7120 mm	Y	7200mm	Y	
5.8.12	Number of wheels each gate section (TOTAL)	50 Total	4 (four)	Y	4	Y	#1:8/ #2:8/ #3:4/ #4:4/ #5:4 (24 TOTAL)	Y	30	Y	
5.8.13	Wheel diameter	500 mm	750mm	Y	700 mm (Flat Roll Wheel) is not acceptable	N	813 mm	Y	800mm	Y	
5.8.14	Wheel shaft diameter	200 mm	280mm	Y	300 mm	Y	260 mm	Y	200mm	Y	
5.8.15	Wheel bearing make/model number	TIMKEN/SKF	SKF 32056 X/ DF	Y	SKF or equiv 723052 X/DF33 (Spherical bearing are not acceptable)	N	SKF/32052	Y	FAG / 23040-E1	Y	
5.8.16	Wheel loading – normal operating conditions	100 000 kg	149205kg	Y	139 700 kg (Wheels to be equally spaced)	N	197 869 kg	Y	130000kg	N	
5.8.17	Wheel loading – unusual operation conditions	105 000 kg	175235kg	Y	160 000 kg	N	242 938 kg	Y	100000kg	N	
5.8.18	Material specification of bumpers	VTS	ASTM A514 Gr. F	VTS	ASTM A473 Type 420 or equiv.	VTS	N/A	VTS	ASTM B21	VTS	
5.8.19	Bumper loading – normal operating conditions	VTS	400MPa	VTS	30kN	VTS	N/A	VTS	10.6MPa	VTS	
5.8.20	Bumper loading – unusual operation conditions	VTS	Not applicable **contact pressures need not to be verified under exceptional conditions	VTS	194kN	VTS	N/A	VTS	14.2MPa	VTS	
5.8.21	Weight of each gate section with seats		**8 sections	VTS		VTS		VTS		VTS	
5.8.21.1	Lower Section (Sill)	VTS	1 – 15312,13_kg 2 – 15554,13kg 3 – 15830,13kg 4 – 16151,13kg 5 – 16529,13kg 6 – 16943,13kg 7 – 17508,13kg 8 – 22933,09kg	VTS	26000kg	VTS	21 400 kg	VTS	44,300 kg	VTS	
5.8.21.2	Intermediate Section 1	VTS		VTS	25000kg	VTS	19 300 kg	VTS	32,300 kg	VTS	
5.8.21.3	Intermediate Section 2	VTS		VTS	25000kg	VTS	17 300 kg	VTS	32,400 kg	VTS	
5.8.21.4	Intermediate Section 3	VTS		VTS	25000kg	VTS	21 600 kg	VTS	21,500 kg	VTS	
5.8.21.5	Upper Section (Top)	VTS		VTS	24000kg	VTS	23 100 kg	VTS	21,500 kg	VTS	
5.8.22	Combined static weight of gate	125 000 kg	136761kg	Y	125,500_kg (May be raised during detail design)	K	102 700 kg (Q13 - Gate weight : 108 000 kg - Sheave blocks weight : 108 kN)	Y	152,000kg	Y	
5.8.23	Maximum hoist load required to open gate	290 000 kg	225000kg	Y	220,000_kg (May be raised during detail design)	K	181 700 kg (Q12 - 2024 kN = 206 500 kg)	Y	220,000kg	N	
5.8.24	Maximum exceptional hoist load (with gate jammed)	VTS	405000kg	K	440,000_kg	K	579 400 kg	Y	630,000kg	Y	
5.8.25	Maximum load applied to hoist during emergency closure	VTS	136761kg	Y	220,000_kg	K	102 700 kg	Y	50,000kg	N	
5.8.26	Minimum residual closing force during emergency closure	VTS	18258kg	K	930_kg (Not enough and not compliant)	N	30 650 kg	K	25,000kg	Y	
5.8.27	Lift pin diameter	VTS	200mm	Y	180 mm	Y	356 mm	Y	220mm	Y	
5.8.28	Material and type of seals	Elastomer PTFE	Lintel: SBR 60-70 shore A/Elastomeric bulb J-stem bulb seals with PTFESides:SBR 60-70 shore A/Elastomeric bulb J-seals with PTFEBottom (between sections):SBR 60-70 shore A/Elastomeric bulb J-sealsBottom (between sections):SBR 50 shore A/Elastomeric flat seal	Y	SBR+PTFE/ J-Type__	Y	SINGLE/DOUBLE STEM, SOLID BULB, PTFE COATED	Y	500_kg	N	
5.8.29	Maximum hydrostatic load on gate	5 000 000 kg	518kPa	VTS	0.663_N/mm²	Y	502 kPa	Y	450kPa	N	
5.8.30	Force required to start gate opening	260 000 kg	225000kg	K	220,000_kg (May be raised during detail design)	K	181 700 kg	K	63000kg	N	
5.9 INTAKE GATE - EMBEDDED PARTS											
5.9.1	Weight of primary embedded anchors and template steel/gate	VTS	9855kg	Y	42,800_kg- Q3 Clarifications - The primary anchors for the Intake Gate: 9,500 kg, Intake Bulkeads: 5,400 kg, Intake Trashrack: 6,500 kg. All are per bay.	Y	5800 kg Q2 Clarifications - 15 500 kg per intake bay.	Y	2400kg	Y	
5.9.2	Number of embedded anchors per lower lined side guide	VTS	196	N	33,600_kg	Y	413	Y	490	Y	
5.9.3	Number of embedded anchors per upper side guide	VTS	196	Y	77	Y	256	Y	292	Y	
5.9.4	Number of embedded anchors per sill beam	VTS	58	Y	24	Y	36	Y	40	Y	
5.9.5	Number of embedded anchors per lintel beam	VTS	58	Y	24	Y	36	Y	21	Y	
5.9.6	Weight of embedded parts (without anchors) per gate	85 000 kg	69033kg	Y	20,000_kg	N	63 620 kg	Y	72500kg	Y	
5.9.7	Loaded roller paths profile/depth/moment of inertia	mm4	Carbon steel: I-beam made of plates(57mm x 250mm, 300mm x 25mm, 25mm x 260mm)Stainless steel: rectangular (35mm x 230mm)/ 29080mm / 607813465mm4	Y	1/300mm/3.1E+06mm4 (Seems not large enough to be tested during detail design)	K	WT/500 mm/1887X106 mm4	Y	300/540mm/3.28x1 0^8mm4	Y	
5.9.8	Guide roller paths profile/depth/moment of inertia	VTS	See 5.9.10	VTS	T/150mm/1.7E+07mm4	VTS	N/A/N/A mm/ M/A mm4	VTS	200 /90mm/3.49x10^6m m4	VTS	
5.9.9	Back guide paths profile/depth/moment of inertia	VTS	Carbon steel: rectangular (25mm x 150mm) Stainless steel: rectangular (10mm x 200mm) / 29080mm / 611436 mm4	VTS	--	VTS	L/203mm/18 X10^6 mm4	VTS	200 / 294mm/1.32x10^7m m4	VTS	
5.9.10	Side guides profile/depth/moment of inertia	VTS	Carbon steel: I-beam made of plates (25mm x 150mm, 120mm x 22,4mm, 25mm x 150mm) Stainless steel: rectangular (10mm x 130mm) / 51580mm / 36397405mm4	VTS	1/120mm/4.5E+06mm4	VTS	WT/300 mm/136 X10^6 mm4	VTS	200 /90mm/3.49x10^6m m4	VTS	
5.9.11	Sill beam profile/depth/moment of inertia	mm4	Carbon steel: I-beam (10 x 4-5/8) Stainless steel: rectangular (10mm x 148,8mm) / 9120mm / 51400000 mm4	VTS	1/150mm/1.7E+07mm4	VTS	S/2500 mm/62 X10^6 mm4	VTS	200/270mm/2.05x1 0^7mm4	VTS	

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Technical Bid Evaluation			Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment				Revision No.: 01				
			Package No.:	CH0032	Project Title:	LCP-MUSKRAT FALLS					
			Tag No.:		Client:	NALCOR					
			Bidder:		NALSOR		Project No.: 505573				
Item Number	Description	Specified Value or Reference	HABS		SENS		LEAFS		Jets		
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	
5.9.12	Lintel beam profile	mm4	Carbon steel: rectangular (16mm x 650mm) Stainless steel: rectangular (10,0mm x 150mm)	VTS	I-shape, bended plate	VTS	FLAT BAR	VTS	DWG. No. A-M-03	VTS	
5.9.13	Loaded roller path anchors/vertical spacing	300 mm A-325	22mm Ø/ 500mm	N	25 mm Ø/600 mm anchors type not compliant to be proposed	N	30mm Ø/650 mm	K	25mm Ø/ 600mm	N	
5.9.14	Guide roller path anchors/vertical spacing	600 mm A-307	22mm Ø/ 500mm	K	30 mm Ø/500 mm	K	40mm Ø/600 mm	K	22mm Ø/ 600mm	K	
5.9.15	Back guide path anchors/vertical spacing	600 mm A-307	22mm Ø/ 500mm	K	30 mm Ø/600 mm	K	25mm Ø/600 mm	K	22mm Ø/ 600mm	K	
5.9.16	Side guides anchors/vertical spacing	600 mm A-307	22mm Ø/ 500mm	K	30 mm Ø/400 mm	K	30mm Ø/600 mm	K	22mm Ø/ 600mm	K	
5.9.17	Sill beam anchors/horizontal spacing	450 mm A-307	22mm Ø/ 500mm	K	20 mm Ø/600 mm	K	22mm Ø/600 mm	K	22mm Ø/ 600mm	K	
5.9.18	Lintel beam anchors/ horizontal spacing	450 mm A-307	22mm Ø/ 500mm	K	20 mm Ø/600 mm	K	25mm Ø/600 mm	Y	22mm Ø/ 600mm	K	
5.9.19	Material specification of sealing faces	A-240 SS-304	ASTM A276 type 304	Y	A276-304 or 00Cr19Ni or equiv.	Y	A276 gr 304L	Y	ASTM A276 Type 304	Y	
5.9.20	Thickness of sealing faces	A-240 SS-304	10mm	Y	10 mm	Y	10 mm	Y	16mm	Y	
5.9.21	Material specification of wheel tracks	ASTM A514-F/Q	A514 A502 type 500 F or Q	N	ASTM A240-UNS-S41500 or equ. Track material will be A514 grade F as specified.	Y	A514, gr. Q	Y	ASTM A514, Grade F or Q	Y	
5.9.22	Width of wheel tracks	VTS	230mm	Y	200 mm	Y	135 mm	Y	320mm	Y	
5.9.23	Thickness of wheel tracks	VTS	38,1mm	Y	15 mm	N	80 mm	Y	20mm	Y	
5.9.24	Hardness of wheel tracks	235 - 270 BHN	360-650 HR	N	BHN 275	Y	271 TO 315	Y	413	Y	
5.9.25	Material specification of backing members	VTS	Not applicable	VTS	A529Gr50 or Q345 or equivalent.	VTS	CSA G40.21 - 300 / 350W	VTS	ASTM A36	VTS	
5.9.26	Second stage concrete volumes	1 343 m3	362 m³	Y	119 m³ /bay; 1428 m³ total (AH-Q11)	Y	2076 m³ - Q11 clarification answer - 108m3 per intake gate slot	Y	150m³	Y	
5.10 INTAKE GATE - DOGGING DEVICES											
5.10.1	Dogging devise Weight - each	VTS	562,28kg	Y	400 kg	Y	200 kg	Y	3000kg	Y	
5.10.2	Dogging devise guide Weight - each	VTS	Not applicable	VTS	300 kg	VTS	N/A	VTS	1500kg	VTS	
5.10.3	Dogging beam profile/depth/moment of inertia	VTS	I-beam made of plates, (19mm x 200mm, 900mm x 12,5mm, 19mm x 200mm) / 2791mm/ 2364269533mm4	VTS	I/300mm/3.0E+08mm⁴	VTS	W/310mm/128 X10*6 mm4	VTS	300/400mm/1.33x1 0*8mm4	VTS	
5.10.4	Block-out profile	VTS	Not applicable	N/A	Rectangular	N/A	N/A	N/A	N/A	N/A	
5.10.5	Locking mechanism	VTS	Mechanical	VTS	Mechanical Pin	VTS	MANUALLY PINNED	VTS	N/A	VTS	
5.10.6	Operation description		Manual	VTS	Cranking System	VTS	THE DOGGING BEAM IS RETATING AROUND A SHAFT	VTS	Manual	VTS	
5.11 INTAKE GATE - HOISTS											
5.11.1	Overall height	VTS	3,35m	Y	~2.5_m	Y	3.11 m	Y	3100m	Y	
5.11.2	Overall length	< 8000 mm	8,0m	N	~8.0_m	Y	7.11 m	Y	8300m	N	
5.11.3	Overall width	< 3200 mm	3,73m	N	~4.0_m	Y	3,556 mm	K	4200m	N	
5.11.4	Total weight of hoist (inc. ropes and sheave blocks)	25 000 kg	65000kg	Y	35000 kg	Y	65000 kg	Y	70,000kg	Y	
5.11.5	Rated capacity	290 000 kg	275000kg	Y	262500 kg (Q31 Clarification - Rated Cap (incl. Kh) = 250 MT)	Y	198000 kg (Q14 Rated Cap : 232 300 kg)	Y	210 000kg	K	
5.11.6	Rope drum										
5.11.6.1	Material	300/350W	350W plate rolled	Y	Steel S235/S355	Y	50W	Y	SS304/304	K	
5.11.6.2	Diameter to bottom of grooves	30 x Rope diam.	2492mm	Y	1994 mm	Y	1924 mm	Y	2362mm	Y	
5.11.6.3	Rope drum length	VTS	2310mm	Y	2080 mm	Y	4009 mm	Y	2000mm	Y	
5.11.6.4	Grooved length (Left hand/ right hand)	VTS	2085mm	VTS	2080 mm	VTS	2305/2305 mm	VTS	3600(1800+1800)m	VTS	
5.11.6.5	Type of bearings	VTS	Spherical Roller Bearing	VTS	Zollern ZHP 4.36	VTS	Sperical Roller	VTS	Metal	VTS	
5.11.6.6	Bearing capacity	VTS	5400 KN	VTS	Load plus Safety	VTS	1,780 KN (Static)	VTS	20000kg	VTS	
5.11.7	Wire Ropes	CSA G4-M									
5.11.7.1	Type of material	IPS Galv. w/SFC	Cold Drawn Galv. Steel (Fiber core)	Y	steel 1960N/mm² zinc coated	Y	Galvanized Steel	Y	SS304	K	
5.11.7.2	Country of manufacture	CANADA / US / EUR	N/A	N	Austria	Y	not answered - CANADA /US-22 COH	Y	KOREA	Y	
5.11.7.3	Factor of safety	5/0.5 to Design Load	Normal = 8,15	Y	5.2_	Y	8.0:1 at nominal CAP	Y	5.13	Y	
5.11.7.4	Construction	6 x 19 - 6 x 37	6 x 19	Y	6x19FC	Y	6 X 19 Fibre Core	Y	6 x19	Y	
5.11.7.5	Rope diameter	mm	57,2mm	Y	36 mm (Q31 Clarification - Rope Diameter: 52 mm)	Y	32 mm	Y	38mm	N	
5.11.7.6	Breaking load	kg	181346kg	Y	85,423 kg Rope revised to 2"	K	70000 kg	Y	64000kg	N	
5.11.7.7	Number of falls	VTS	Total = 16	Y	8	Y	2 X 12	Y	8+8	Y	
5.11.7.8	Wire Rope Dead Ends	2		VTS		VTS	no line item	VTS	no line item	VTS	
5.11.8	Hoist drive										
5.11.8.1	Motor rating	75 kW @ 1.2 m/min	61,1kW	Y	55 kW	Y	41 kW May be revised during detail design	K	75 kW	Y	
5.11.8.2	Motor rated full load speed	1200 rpm	890rpm	Y	~1180 rpm	Y	1170	Y	1160 rpm	Y	
5.11.8.3	Motor rated emergency lower speed	2400 rpm	N/A	N	~2400 rpm shall be 3600 rpm	K	3510 rpm	Y	N/A rpm	Y	
5.11.8.4	Rated voltage/# phase/frequency	575V/3P/60Hz	575 / 3 / 60V/Ph/Hz	Y	575/3/60_V/Ph/Hz	Y	600/3/60V/Ph/Hz	Y	600/3/ 60 V/Ph/Hz	Y	
5.11.8.5	Starting current	VTS	N/A	N/A	_A	VTS	TBC	VTS	620.2 A	VTS	
5.11.8.6	Rated full load current	VTS	N/A	N/A	68.6_A	VTS	not answered	N/A	91.2 A	VTS	
5.11.8.7	Motor manufacturer	VTS	N/A	N/A	WEG	VTS	Reuland	VTS	HYOSUNG	VTS	
5.11.8.8	Motor Class	VTS	F	N/A	IE2 Nema EPACT	VTS	CMM"B" Service	VTS	IP44	K	
5.11.8.9	Locked-rotor current	VTS	N/A	N/A	419A	N/A	TBC	N/A	620	N/A	
5.11.8.10	Code letter	G	N/A	N/A	V	N/A	TBC	N/A	H	N/A	
5.11.8.11	Design letter	Design B	C Modified	Y	B C	N	TBC C Modified	Y	B	N	
5.11.8.12	Rated temperature rise	Class B	N/A	N/A	80°C	Y	B	Y	80 deg C	Y	
5.11.8.13	Insulation system class	Class: F	N/A	N/A	F	Y	F	Y	F	Y	
5.11.8.14	Rated ambient temperature	40 Degree C	N/A	N/A	(-20°C - +40°C) -20°C - +40°C	Y	40 deg-C -20_C - +40°C	Y	40 deg C	K	
5.11.8.15	Time rating	Continuous	N/A	N/A	60 min/Continuous	Y	Continuous	Y	60min	K	
5.11.8.16	Secondary volts/# phase/full load current (for wound-rotor induction motor)	VTS	N/A	N/A	Later_V/Ph/A	VTS	not answered	VTS	322/ 3 /144.8 V/Ph/A	K	
5.11.8.17	Motor Thermally protected (Yes or no)	VTS	N/A	N/A	Yes	Y	YES	Y	Yes	Y	
5.11.8.18	Motor Space Heater- rated voltage/#phase/watts	120V/1P/VTS	N/A	N/A	No Yes	K	240/1/25 V/Ph/W; 120V/150W	Y	220/ 1 /200 V/Ph/W	K	
5.11.8.19	Gear Box Space Heater- rated voltage/#phase/watts	120V/1P/VTS	N/A	N/A	No	K	240/1/50 V/Ph/W	K	600/ 3 /3000 V/Ph/W	K	
5.11.8.20	Motor full load efficiency	Premium high efficiency	N/A	N/A	93.60%	Y	TBC	K	91%	Y	
5.11.8.21	Power factor	VTS	N/A	N/A	0.86	VTS	TBC	VTS	0.87	Y	
5.11.8.22	Service factor	1.15	1,25	Y	1.1 25	Y	1.15	Y	1.00	N	
5.11.8.23	Enclosure type	TEFC	TEFC	Y	TEFC	Y	TEFC	Y	Totally Enclosed	Y	
5.11.8.24	NEMA Frame type	NEMA MG-1	N/A	N/A	40415T	VTS	405T	VTS	50XX	N/A	
5.11.8.25	NEMA Design	VTS	N/A	N/A	B C	Y	C Modified	Y	B	N	
5.11.8.26	Inverter Duty (yes/no)	VTS	N/A	N/A	Yes	N/A	No	N/A	No	N/A	
5.11.9	Gearbox										
5.11.9.1	Gearbox manufacturer	SEW EURODRIVE	Brevini	Y	Zollern	Y	COH 222	Y	WOORIM	Y	
5.11.9.2	Gearbox drive ratio	Fully enclosed	800	Y	983	Y	736.1	Y	1 / 1000	Y	
5.11.10	Brakes										
5.11.10.1	Holding brake manufacturer	ELEVANJA	Mondel	Y	SHB	Y	Mondel	Y	CHANGWON	Y	
5.11.10.2	Holding brake type	Magnetic Drum	Electromechanical Drum	Y	drum brake	Y	Shoe type	Y	Drum Type	Y	
5.11.10.3	Holding brake rated torque	VTS	0,984kN-m	VTS	0.2-1.6_kN-m	VTS	0.542 kN-m	VTS	1.29 kN-m	VTS	
5.11.10.4	Fan Brake	Power absorption		VTS	See below	VTS	not answered	VTS		VTS	
5.11.10.5	Fan brake manufacturer	SHELDONS	Sheldon Engineering	Y	Sheldons Engineering	Y	Sheldon	Y	Later	N	
5.11.10.6	Fan brake rated torque	VTS	0,271kN-m	VTS	0.32_kN-m	VTS	.162 @ 2340 RPM_kN-m	VTS	Later	N	
5.11.10.7	Fan brake speed during emergency lower	2 400 rpm	1800rpm	VTS	~2400 rpm	VTS	2340 rpm	VTS	Later rpm	N	
5.11.10.8	Fan brake maximum rated speed	3 600 rpm	2700rpm	VTS	>2400 rpm	VTS	3510 rpm	VTS	Later rpm	N	
5.11.11	Controls										
5.11.11.1	PLC (Programmable Logic Controller) (Make)	Schneider	Schneider / Modicon	Y	Omnion Schneider Electric	Y	SCHNEIDER ELECTRIC	Y	SIEMENS	K	
5.11.11.2	PLC (Programmable Logic Controller) (Model)	Modicon Quantum	Quantum 140 Series	Y	CPU-CPU-34 Quantum	Y	QUANTUM 140CPU65150	Y	S7-300 SIPLUS	K	
5.11.11.3	HMI (Human Machine Interface) display (Make)	Nematron	Schneider / Telemecanique	Y	Gamma Schneider Electric	Y	SCHNEIDER ELECTRIC	Y	SIEMENS	K	



Technical Bid Evaluation			Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment				Revision No.: 01			
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			Tag No.:			Client:	NALCOR			
			Bidder:		Client:		Project No.: 505573			
Item Number	Description	Specified Value or Reference	HABS		SENS		LEAFS		JETS	
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant
5.11.11.4	HMI (Human Machine Interface) display (Model)	VTS	Magelis XBTGT6340	Y	NS40	VTS	HMIPCCP172CB46T14 N	VTS	MP377 PRO15	K
5.11.11.5	Rotary limit switch manufacturer and model	VTS	Gemco #1980-1208	Y	Stromag GETS Series	VTS	Stromag RLS51-75-SP	VTS	SCHNEIDER / XCMD2145L	Y
5.11.11.6	Control cabinet manufacturer	VTS	TBA	N/A	Gantner	VTS	Hoffman (Junction Box)	VTS	PROTECH	Y
5.11.11.7	Control power	dual 125 Vdc pwr supplies	120 / 1 / 60V/Ph/Hz	N	144-DE Dual 125 V dc	Y	115V-V/R/Hz Dual 125 V dc	Y	110 / 1 / 60 V/Ph/Hz	N
5.11.11.8	General Arrangement drawing of the hoist assembly.	VTS	TBA	-	See attachment	-	See attached	-	DWG.No.A-M-09	-
5.11.11.9	Details of fan brake	VTS	TBA	-	-	-	3120	-	Later	-
5.11.11.10	Details of motor	VTS	TBA	-	-	-	3120	-	DWG.No.A-M-09	-
5.11.11.11	Details of holding brake operation	VTS	TBA	-	-	-	3120	-	DWG.No.A-M-09	-
5.11.11.12	Extreme upper limit switch make and model	VTS	Telemecanique XF9 F115	N/A	Stromag GETS Series	VTS	Square-D 9007CLS1-3120	VTS	SCHNEIDER/XCM D2145L	N/A
5.11.11.13	Details of drum dogging device limit switch	VTS	TBA	N/A	-	VTS	Turck Induction Type 3120	VTS	SCHNEIDER/XCM D2145L	N/A
5.11.11.14	Continuous position indicator make and model	VTS	Rittmeyer MGIM	N/A	Stromag GETS Series/Kübler	VTS	Posital ODDS101G1212T120P RL-3120	VTS	WONILLEVEL/WTG 200	N/A
5.11.11.15	Maintenance upper limit switch make and model	VTS	Allen Bradley 802T	N/A	Stromag GETS Series	VTS	Obtained by use of rotary limit-3120	VTS	SCHNEIDER/XCM D2145L	N/A
5.11.11.16	Hoist load cell make and model	VTS	PIAB LKVE Custom	N/A	W&H 5B Series	VTS	Strainsert SPA-75-3120	VTS	BONGSHIN LOADCELL/CWFK-30	N/A
5.11.11.17	Slack rope detection make and model	VTS	Allen Bradley 802T	N/A	Bernstein GC-5U1Z	VTS	Through use of hoist load cell-3120	VTS	SCHNEIDER/XCM D2145L	N/A
5.11.11.18	Unbalance wire rope load detector make and model	VTS	Allen Bradley 802T	N/A	W&H 5B Series	VTS	Through use of hoist load cell-3120 If Required not answered	VTS	N/A	N/A
5.11.11.19	Horn make and model	VTS							no line item	
5.12 INTAKE GATE MOTOR CONTROL CENTRES										
5.12.1	Manufacturer	VTS	Eaton	Y	Eaton	Y	ABB Inc	Y	PROTECH	K
5.12.2	Model No.	VTS	Freedom	Y	Freedom MCC 2100	Y	MNS-MCC	Y	N/A	N/A
5.12.3	Rated Voltage	600V/3P/60Hz	600V	Y	600 V	Y	600 V	Y	600V	Y
5.12.4	Rated Bus Current	800 A min	NEMA 1A	K	1200 A	Y	800 A	Y	180A	N
5.12.5	Enclosure Type	Indoor CSA 1 Gasketed Enclosure, Class 1 Type B (Suitable for installed environment)	65	Y	NEMA 1B	K	NEMA 1A	K	Universal Enclosure	N/A
5.12.6	Bus Bracing	42kA	Circuit Breaker	Y	42 kA	Y	42	Y	8 kA	N
5.12.7	Disconnecting Means (Fused Switch or Circuit Breaker)	MCCB, MCP	Solid State	Y	Circuit Breaker	Y	Circuit Breakers	Y	MCCB	Y
5.12.8	Overload relay Type	VTS	0		TBA Electronic	N/A	Electronic	Y	EOCR	Y
6 POWERHOUSE DRAFT TUBE										
6.1 POWERHOUSE DRAFT TUBE STOPLOGS - EMBEDDED PARTS										
6.1.1	Number of stoplog sections	N/A	4 (four)	N	16	Y	4 x 4 (Q19 Clarification)	Y	4	N
6.1.2	Weight of embedded parts (without anchors)	69 500 kg ea.bay	23727kg	Y	23,000_kg	Y	6245-kg 22500 kg (Q3 Q18 Clarification)	Y	26,600kg	Y
6.1.3	Loaded support bumper path profile/depth/moment of inertia	mm4	200x16mm Carbon steel rectangular (15mm x 200mm)/Stainless steel rectangular (10mm x 200mm)/4035mm / 606483 mm4/STEEL SECTION Carbon steel rectangular (10mm x 120mm)/Stainless steel rectangular (10mm x 200mm)/6015mm / 209473 mm4	K	1/150_mm/1.3E+07mm ⁴	Y	WT/230 mm/33 X10*6 mm4	Y	200x160mm/1.60x10 ⁶ mm ⁴	N
6.1.4	Guide support bumper path profile/depth/moment of inertia	VTS	_See 6.1.5	VTS	T/120_mm/3.5E+06mm ⁴	VTS	N/A/N/Amm/ N/A mm4	VTS	200 /90mm/3.49x10 ⁶ mm ⁴	VTS
6.1.5	Back guide/roller paths profile/depth/moment of inertia	VTS	Carbon steel: rectangular (12.5mm x 300mm) Stainless steel: rectangular (10mm x 250mm) /33950mm / 259505 mm4	VTS	T/120_mm/3.6E+06mm ⁴	VTS	L/203 mm/16 X10*6 mm4	VTS	200 / 200mm/3.69x10 ⁶ mm ⁴	VTS
6.1.6	Side guides profile/depth/moment of inertia	VTS	Carbon steel: U-beam (4 x 1-5/8) /33950mm / 131000mm4	VTS	T/100_mm/3.6E+06mm ⁴	VTS	FB/203mm/ 27 X10*6 mm4	VTS	100 /15mm/5.63x10 ⁴ mm ⁴	VTS
6.1.7	Sill beam profile/depth/moment of inertia	mm4	Carbon steel: I-beam (15 x 5 1/2) Stainless steel: rectangular (10mm x 110mm) /14463mm / 18580000mm4	Y	T/150_mm/2.0E+07mm ⁴	Y	S/250 mm/ 51 X10*6 mm4	Y	200/ 294mm/1.32x10 ⁷ mm ⁴	Y
6.1.8	Lintel beam profile	mm4	Carbon steel: rectangular (12,5mm x 600mm) Stainless steel: rectangular (10mm x 200mm)	Y	I-shape, bended plate	Y	FLAT BAR	Y	DWG. No. A-M-04	N
6.1.9	Loaded support bumper path anchors/vertical spacing	600 mm A-307	22mm Ø/ 500mm	K	25 mm Ø/600 mm Anchor Type not compliant, to be revised	N	32 mm □/300 mm	Y	22mm Ø/ 600mm	N
6.1.10	Guide support bumper path anchors/vertical spacing	600 mm A-307	_See 6.1.9	K	25 mm Ø/600 mm	K	mm □/ mm	Y	22mm Ø/ 600mm	Y
6.1.11	Back roller/guide paths anchors/vertical spacing	600 mm A-307	22mm Ø/ 500mm	K	30 mm Ø/500 mm	K	22 mm □/600 mm	Y	22mm Ø/ 600mm	Y
6.1.12	Side guides anchors/vertical spacing	600 mm A-307	22mm Ø/ 500mm	K	30 mm Ø/500 mm	K	mm □/ mm	Y	22mm Ø/ 600mm	Y
6.1.13	Sill beam anchors/ horizontal spacing	450 mm A-307	22mm Ø/ 500mm	K	20 mm Ø/600 mm	K	22 mm □/600 mm	Y	22mm Ø/ 600mm	Y
6.1.14	Lintel beam anchors/ horizontal spacing	450 mm A-307	22mm Ø/ 500mm	K	20 mm Ø/600 mm	K	22 mm □/600 mm	Y	22mm Ø/ 600mm	Y
6.1.15	Material specification of sealing faces	A-240 SS-304	ASTM A-276 TYPE 304	Y	A276-304 or 00Cr19Ni or equiv.	Y	ASTM A276, gr 304L	Y	ASTM A276 Type 304	Y
6.1.16	Thickness of sealing faces	10 mm	10mm	Y	10 mm	Y	10 mm	Y	16mm	Y
6.1.17	Material specification of bumper tracks	300/350W	ASTM A36	Y	A276-304 or 00Cr19Ni or equiv.	Y	CSA G40.21 300W / 350W	Y	ASTM A276 Type 304	Y
6.1.18	Thickness of bumper tracks	12 mm	8mm	N	15 mm	Y	10 mm (To be revised to 12 mm)	K	16mm	Y
6.1.19	Hardness of bumper tracks	92-107 BHN	120-160 HB	Y	BHN 170	Y	128 BHN	Y	187	Y
6.1.20	Material specification of backing members	300W	Not applicable	N	A299-50 or 0345 or equal	N	CSA G40.21 300W / 350W	Y	ASTM A36	Y
6.1.21	Second stage concrete volumes	388 m3	152m ³	Y	151_m ³ /bay; 1812 m ³ total (AH-Q12)	Y	170-m ³ - Q12 clarification answer - 62m3 per draft tube stoplog slot	Y	167m ³	Y
6.2 POWERHOUSE DRAFT TUBE STOPLOGS										
6.2.1a	Number of stoplog sections	4 ea. bay	4 (four)	N	16	Y	4 x 4 (Q19 Clarification)	Y	4	N
6.2.1	Material specification	300W	CSA G40.21-04 350 WT	Y	A300-50 or 0345 or equal	N	CSA G40.21 300W / 350W	Y	CSA G40	K
6.2.2	Thickness of skin plate	22 - 55 mm	25mm	Y	24 mm	Y	29 mm	Y	28 mm	Y
6.2.3	Minimum thickness of structural parts	10 mm	12,5mm	Y	10 mm	Y	10 mm	Y	10 mm	Y
6.2.4	Height of top gate sections (seals compressed)	2650 mm	2.596m	Y	2.625_m	Y	3 m	Y	2.6m	Y
6.2.5	Height of intermediate gate sections (seals compressed)	2 600 mm	2.596m	Y	2.625_m	Y	2.5 m	Y	2.6m	Y
6.2.6	Height of bottom gate sections (seals compressed)	2 600 mm	2.596m	Y	2.625_m	Y	2.4 m	Y	2.6m	Y
6.2.7	Weight of top gate section	13 500 kg	25558kg	Y	26,000_kg	Y	20 635 kg	Y	26600kg	Y
6.2.8	Weight of intermediate gate section	13 000 kg	25558kg	Y	26,000_kg	Y	19 290 kg	Y	27400kg	Y
6.2.9	Weight of bottom gate section	13 000 kg	25558kg	Y	26,000_kg	Y	19 705 kg	Y	32800kg	Y
6.2.10	Material and type of seals	Elastomer Solid J	_SBR/_Elastomeric bulb J	Y	SBR/_J-Type_	Y	RUBBER /BULB J- SEAL/FLAT SEAL FOR SILL CONTACT	Y	CR/ "J", "I"	Y
6.2.11	Side seal distance between seal centres	11 500 mm	11822m	Y	11.42_m	Y	11.6 m	Y	11.5125m	Y
6.2.12	Lintel seal Elevation – bottom seals compressed	-17.08 m	-17,08m	Y	-17.08_m	Y	10.4 m HEIGHT	K	10.35m	N
6.2.13	Overall width of gates	11 700 mm	12315m	Y	11.82_m	Y	11.9 m	Y	12.252m	Y



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			Package No.: CH0032	Project Title: LCP-MUSKRAT FALLS		Client: NALCOR					
			Bidder: HABS		SENS		LEAFS		Jets		
Item Number	Description	Specified Value or Reference	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	
6.2.14	Overall depth of gates (seal face to back of stoplog)	1 400 mm ??	1312 mm	K	2,680 mm- 1470 mm (Q33 Clarifications - We confirm that we can accommodate this final depth of the stoplogs without any price adjustment)	Y	1 535 mm	Y	1559mm	Y	
6.2.15	Load bearing guides centre distance	11 700 mm	12088m	Y	11.790_m	Y	11.8 m	Y	12.112m	Y	
6.2.16	Load bearing guides loading – normal operating conditions	VTS	272MPa	VTS	67 N/mm²	VTS	652 MPa (HERTZ CONTACT STRESS)	VTS	19.2MPa	VTS	
6.2.17	Load bearing guides loading – unusual operation conditions	VTS	286MPa	VTS	70 N/mm²	VTS	708 MPa (HERTZ CONTACT STRESS)	VTS	22.5MPa	VTS	
6.2.18	Material specification of bumpers	VTS	ASTM B584-C92300	VTS	A276-304 or 00Cr19Ni or equiv.	VTS	BRONZE	VTS	ASTM B21	VTS	
6.2.19	Bumper loading – normal operating conditions	VTS	286MPa	VTS	2 N/mm²	VTS	N/A	VTS	1.1 MPa	VTS	
6.2.20	Bumper loading – unusual operation conditions	VTS	Not applicable**contact pressures need not to be verified under exceptional conditions	VTS	20 N/mm²	VTS	N/A	VTS	1.4 MPa	VTS	
6.2.21	Description of spring-loaded rollers	VTS	Not applicable	VTS	Rubber Spring	VTS	LEAF SPRINGS (UPSTREAM/DOWNSTREAM)	VTS	N/A	VTS	
6.2.22	Hoist load required to lift top stoplog section:										
6.2.22.1	At balanced pressure	18 000 kg	4000kg	Y	28,100_kg	Y	26 770	Y	41000kg	Y	
6.2.22.2	At 2.0 m differential pressure	32 000 kg	46000kg	Y	49,000_kg	Y	N/A	Y	57000kg	Y	
6.2.23	Hoist load required to lift heaviest gate section	32 000 kg	4000kg	Y	28,100_kg	Y	26 770	Y	33000kg	N	
6.3	POWERHOUSE DRAFT TUBE STOPLOGS - LIFT BEAM										
6.3.1	Height of Lift Beam	1000 mm	2945m	Y	1.50_m	Y	2.2 m	Y	1.2m	Y	
6.3.2	Weight of Lift Beam	5 000 kg	6067,2kg	Y	3,000_kg (Q4 Clarifications)	Y	3250 kg	Y	9200kg	Y	
6.3.3	Latching mechanism description		Lifting Spec (from HNA)	Y	Hook, mechan. engaged	Y	TORQUE MOTOR DRIVEN CUBLE RELEASE MECHANISM. COUNTER-WEIGHT TO ENGAGE	Y	Balance weight	Y	
6.4	POWERHOUSE DRAFT TUBE STOPLOGS – DOGGING / STORAGE DEVICES										
6.4.1	Dogging devise Weight - each	VTS	83,3kg	Y	510_kg	Y	60 kg	Y	2000kg	Y	
6.4.2	Dogging devise Weight - each	VTS	Not applicable	Y	----_kg	Y	N/A	Y	1000kg	Y	
6.4.3	Dogging beam profile/depth/moment of inertia	VTS	Rectangular (63mm x 63mm) / 582mm / 1312746,75 mm4	Y	1/260mm/5x10E07mm4	Y	HSS / 152_mm/14 X 10*6 mm4	Y	300/200mm/7.23x1 0*6mm4	Y	
6.4.4	Block-out profile	VTS	Height: 365mm Width: 680mm (direction of panel span) Depth: 500mm (direction of flow)	VTS	no block out, HILTI	VTS	N/A	VTS	N/A	VTS	
6.4.5	Top support mechanism	VTS	Trestle	VTS	Stoplogs are standing free	VTS	SLIDING BEAM WITH LOCK PIN	VTS	N/A	VTS	
6.4.6	Operation description	VTS	Manual	VTS	Cradles, no operation	VTS	SLIDING BEAM LOKABLE IN BOTH EXTENDED OR RETRACTED POSITION	VTS	manual(hinge)	VTS	
6.5	POWERHOUSE DRAFT TUBE OVERHEAD CRANE										
6.5.1	Overall height (from top of rail)	< 1150 mm	1 500mm	N	1.8_m (Q34 Clarification - Andritz to comply with the 1150 mm)	Y	1.8-m 1150mm OK	Y	1.1m	Y	
6.5.2	Overall length	VTS	7.800m	Y	8.3_m	Y	9.480 m	Y	11.084m	Y	
6.5.3	Overall width	VTS	8.500m	Y	~ 8.0_m	Y	8.194 m	Y	8.5m	Y	
6.5.4	Crane rail centre distance	7 800 m	7 500mm	N	7.8_m	Y	7.800 m	Y	7.8m	Y	
6.5.5	Total weight of crane (inc. trolley, ropes and sheave blocks)	24 000 kg	15000kg	Y	~15,000_kg	Y	30800 kg	Y	13000kg	Y	
6.5.6	Total weight of trolley (inc. ropes and sheave blocks)	VTS	5681kg	Y	~5,000_kg	Y	19300 kg	Y	10000kg	Y	
6.5.7	Rated capacity	32 000 kg	40000kg	Y	50,000_kg (Q35 Clarification - Crane Cap = 30 MT + Kh)	Y	34800 kg	Y	30000kg	K	
6.5.8	Rope drum(s)										
6.5.8.1	Material	300W	Steel	K	S355	K	Steel A106 Gr. B	Y	ASTM A36	Y	
6.5.8.2	Diameter to bottom of grooves	30 x Rope diam.	431mm	Y	22 mm	N	581 mm	Y	570mm	Y	
6.5.8.3	Rope drum length	VTS	TBA	VTS	5000_mm	VTS	4862 mm	VTS	2000mm	VTS	
6.5.8.4	Grooved length (Left hand/ right hand)	VTS	TBA	VTS	2000/2000_mm	VTS	2224/2224 mm	VTS	1500(750+750)mm	VTS	
6.5.8.5	Type of bearings	VTS	SKF	VTS	22218	VTS	Spherical Roller	VTS	Ball bearing	VTS	
6.5.8.6	Bearing capacity	VTS	TBA	VTS	1000046 N	VTS	515 KN(Static)	VTS	52245 kg	VTS	
6.5.9	Wire ropes	CSA G4-M									
6.5.9.1	Type of material	IPS Galv. w/SFC	Steel	N	1960N/mm2 galvanized	Y	Galvanized Steel	Y	CSA G4	Y	
6.5.9.2	Country of manufacture	CANADA / US / EUR	USA	Y	EU	Y	TBC	Y	KOREA	Y	
6.5.9.3	Factor of safety	5/0.5 to Design Load	5/1	Y	4 Revised to 5 or + veropower8 or similar	K	5.5:1	Y	5.19	Y	
6.5.9.4	Construction	6 x 19 - 6 x 37	6PD x 9/16	Y	20_mm	Y	6 X 19 Fibre Core	Y	6 x 19	Y	
6.5.9.5	Rope diameter	VTS	9/16 mm	Y	20_mm	Y	16 mm (Q17 - 22mm 7/8")	Y	30mm	Y	
6.5.9.6	Breaking load	VTS	32100kg	N	400.3_kN Revised to larger rope diam.	K	17,909 kg (Q17 - 32 200 kg for EIPS fibre core 6x19 wire rope)	Y	52960kg	Y	
6.5.9.7	Number of falls	VTS	2 x 4	Y	8-. Q35 Clarifications - There are 2 ropes with 8 falls each.	Y	2 X 6	Y	4+4	Y	
6.5.10	Hoist drive										
6.5.10.1	Motor rating	20 kW @ 3 m/min	22,5kW	Y	30_kW	Y	22.4 kW	Y	30kW	N	
6.5.10.2	Motor rated full load speed	1200 rpm	1150rpm	Y	1800_rpm	Y	1750 rpm	Y	1160rpm	Y	
6.5.10.3	Rated voltage /# phase/frequency	575V/3P/60Hz	575 / 3 / 60V/Ph/Hz	Y	460/3/60_V/Ph/Hz	Y	600/3/60 V/Ph/Hz	Y	600/3/60 V/Ph/Hz	Y	
6.5.10.4	Starting current	VTS	TBAA	VTS	301.14_A	VTS	TBC	N/A	680A	VTS	
6.5.10.5	Rated full load current	VTS	31A	VTS	47.8_A	VTS	TBC	N/A	112A	VTS	
6.5.10.6	Motor manufacturer	VTS	Reuland	Y	Siemens, ABB, GH, Leroy Somer or equivalent	VTS	Marathon	VTS	HYUNDAI	Y	
6.5.10.7	Motor Class	VTS	TBA	N/A	F/B	VTS	CMAA"B"	VTS	IP44	K	
6.5.10.8	Locked-rotor current	VTS	TBA	VTS	419A	VTS	TBC	VTS	680	VTS	
6.5.10.9	Code letter	G	TBA	N/A	G	Y	TBC	VTS	K	K	
6.5.10.10	Design letter	Design B	TBA	N/A	324T	N/A	TBC	N/A	B	Y	
6.5.10.11	Rated temperature rise	Class B	B	Y	100	Y	B	Y	80 deg C	Y	
6.5.10.12	Insulation system class	Class: F	H	Y	F/B	Y	F	Y	F	Y	
6.5.10.13	Rated ambient temperature	40 Degree C	40	Y	45	Y	40 DEG. C	Y	40 deg C	Y	
6.5.10.14	Time rating	Continuous	30 min	K	40%	K	Continuous	Y	30min	K	
6.5.10.15	Secondary volts/# phase/full load current (for wound-rotor induction motor)	VTS	N/A	N/A	no V/Ph/A	N/A	TBC	N/A	600/3/112V/Ph/A	N/A	
6.5.10.16	Motor Thermally protected (Yes or no)	VTS	Yes	Y	yes	Y	Yes	Y	Yes	Y	
6.5.10.17	Motor Space Heater- rated voltage/#phase/watts	120V/1P/VTS	No	K	120V/1Ph/40W	VTS	240/1/100 V/Ph/W	VTS	600/3/3000 V/Ph/W	K	
6.5.10.18	Gear Box Space Heater- rated voltage/#phase/watts	120V/1P/VTS	No	K	defined during detail	VTS	240/1/50 V/Ph/W	VTS	600/3/3000 V/Ph/W	K	
6.5.10.19	Motor full load efficiency	Premium high efficiency	TBA	N/A	90%	Y	TBC	K	74%	K	
6.5.10.20	Power factor	VTS	TBA	N/A	0.86	Y	TBC	VTS	65%	K	
6.5.10.21	Service factor	1.15	1,0	N	1.15	Y	1.15	Y	1.0/30min	N	
6.5.10.22	Enclosure type	TEFC	TENV	Y	totally enclosed (IP54)	Y	TEFC	Y	TENV	Y	
6.5.10.23	NEMA Frame type	NEMA MG-1	TBA	N/A	324T	N/A	286 TD	N/A	A193 Gr.2H	N/A	
6.5.10.24	NEMA Design	VTS	B	N/A	MG1	N/A	TBC	N/A	B	N/A	
6.5.10.25	Inverter Duty (yes/no)	VTS	Yes	N/A	yes	N/A	Yes	N/A	No	N/A	
6.5.11	Gearbox										
6.5.11.1	Gearbox manufacturer	SEW EUR. (Equiv.)	ZENAR	Y	GH, Siemens, Nord SEW or equiv.	Y	COH???	K	HYUNDAI	Y	
6.5.11.2	Gearbox drive ratio	Fully enclosed	TBA	VTS	~264	VTS	186.9	VTS	1/100	VTS	
6.5.12	Brakes										



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			Package No.:	CH0032	Project Title:	LCP-MUSKRAT FALLS					
			Tag No.:		Client:	NALCOR					
			Bidder:		LEAFS		JETS				
Item Number	Description	Specified Value or Reference	HABS		SENS		LEAFS		JETS		
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	
6.5.12.1	Holding brake manufacturer	ELEVANJA	ZENAR	Y	Siebre, Stromag, Antec or equiv.	Y	Mondel	Y	BANDOHIOSTCRANE	Y	
6.5.12.2	Holding brake type	Magnetic Drum	SHOE	VTS	electrohydraulic disc brake	VTS	Electromechanical shoe type	VTS	DC	VTS	
6.5.12.3	Holding brake rated torque	VTS	TBA	VTS	5.5_kN-m	VTS	0.203 kN-m	VTS	2.8kN-m	VTS	
6.5.13	Gantry drives										
6.5.13.1	Gantry travel speed	30 m/min	30m/min	Y	30 m/min	N	30 m/min	Y	30m/min	Y	
6.5.13.2	Number of gantry drives	4	2	Y	2	Y	2	Y	2	Y	
6.5.13.3	Motor rating	VTS	2 x 7,5kW	VTS	2,0_kW	VTS	2.24	VTS	2.2kW	VTS	
6.5.13.4	Motor rated full load speed	VTS	1750rpm	VTS	~1800_rpm	VTS	1750 rpm	VTS	1160rpm	VTS	
6.5.13.5	Rated voltage /# phase/frequency	575V/3P/60Hz	575 / 3 /60V/Ph/Hz	Y	575/3/60_V/Ph/Hz	Y	600/3/60 V/Ph/Hz	Y	600/3/60 V/Ph/Hz	Y	
6.5.13.6	Starting current	VTS	TBA	N/A	5,3_A	N/A	Sew Eurodrive	N/A	30A	N/A	
6.5.13.7	Rated full load current	VTS	8,5A	N/A	3,0_A	N/A	TBC	N/A	5A	N/A	
6.5.13.8	Motor manufacturer	VTS	Reuland	N/A	SEW, Nord, Flender	N/A	TBC	N/A	BANDO HOIST CRANE	N/A	
6.5.13.9	Motor Class	VTS	TBA	N/A	IE1	N/A	TBC	N/A	IP44	N/A	
6.5.13.10	Locked-rotor current	VTS	TBA	N/A	26A	N/A	TBC	N/A	30	N/A	
6.5.13.11	Code letter	G	TBA	N/A	not defined	N/A	TBC	N/A	M	N/A	
6.5.13.12	Design letter	Design B	TBA	N/A	CSA C22.2	N/A	TBC	N/A	B	Y	
6.5.13.13	Rated temperature rise	Class B	B	Y	60°C	K	B	Y	80 deg C	Y	
6.5.13.14	Insulation system class	Class: F	H	Y	F/B	Y	F	Y	F	Y	
6.5.13.15	Rated ambient temperature	40 Degree C	40	K	-40 - 30°C	K	40 Deg. C	K	40 deg C	K	
6.5.13.16	Time rating	Continuous	30 min	K	S3, ED 60	K	60 min.	K	30min	K	
6.5.13.17	Secondary volts/# phase/full load current (for wound-rotor induction motor)	VTS	N/A	N/A	no_V/Ph/A	N/A	TBC	N/A	600/ 3 /60 V/Ph/A	N/A	
6.5.13.18	Motor Thermally protected (Yes or no)	VTS	Yes	Y	Yes	Y	Yes	Y	Yes	Y	
6.5.13.19	Motor Space Heater- rated voltage/#phase/watts	120V/1P/VTS	No	K	120V/1Ph/40W	Y	240/1/50 V/Ph/W	K	600/ 3/2200 V/Ph/W	K	
6.5.13.20	Gear Box Space Heater- rated voltage/#phase/watts	120V/1P/VTS	No	K	no	K	240/1/50 V/Ph/W	K	600/ 3/2200 V/Ph/W	K	
6.5.13.21	Motor full load efficiency	Premium high efficiency	TBA	N/A	90%	Y	TBC	N/A	74%	K	
6.5.13.22	Power factor	VTS	TBA	N/A	0,86	Y	TBC	N/A	64%	K	
6.5.13.23	Service factor	1.15	1,0	N	1,15	Y	1.1	N	1.0/30min	N	
6.5.13.24	Enclosure type	TEFC	TENV	Y	IP 54	K	TBC	N/A	TENV	Y	
6.5.13.25	NEMA Frame type	NEMA MG-1	TBA	N/A	not defined	N/A	DR 100	N/A	A193 Gr.2H	N/A	
6.5.13.26	NEMA Design	VTS	B	Y	not defined	N/A	TBC	N/A	B	Y	
6.5.13.27	Inverter Duty (yes/no)	VTS	Yes	N/A	yes	N/A	Yes	N/A	No	N/A	
6.5.13.28	Gearbox manufacturer	SEW EUR. (Equiv.)	ZENAR	Y	SEW, Flender Nord	Y	Sew Eurodrive	Y	BANDO HOIST CRANE	Y	
6.5.13.29	Gearbox drive ratio	VTS	TBA	VTS	~100	VTS	55.27:1	VTS	1/22	VTS	
6.5.13.30	Wheel diameter/spacing	VTS	431 mm Ø/mm	VTS	315_mm Ø/mm	VTS	305 mm □/1524 mm	VTS	600mm Ø/1000mm	VTS	
6.5.13.31	Wheel width inside flanges	VTS	TBA	VTS	80_mm	VTS	90 mm	VTS	90mm	VTS	
6.5.13.32	Wheel flange height	VTS	TBA	VTS	15_mm	VTS	19 mm	VTS	20mm	VTS	
6.5.13.33	Number of wheels per corner	VTS	1	VTS	1	VTS	2	VTS	3	K	
6.5.13.34	Maximum vertical load per wheel	VTS	TBA	VTS	21000_kg	VTS	11900 kg	VTS	300kg	K	
6.5.13.35	Maximum lateral load per wheel	VTS	TBA	VTS	5000_kg	VTS	1200 kg	VTS	300kg	K	
6.5.13.36	Maximum braking load per wheel	VTS	TBA	VTS	47000_kg	VTS	BETH104	VTS	300kg	K	
6.5.13.37	Required gantry rail size	Beth 175#	CR104	VTS	A65	VTS	not answered	VTS	50	VTS	
6.5.13.38	Gantry rail centres	7800mm	7800mm	Y	8500_mm	N	7800	Y	7800mm	Y	
6.5.13.39	Allowable rail centre tolerance	VTS	+/- 9,5mm	VTS	+/-_5_mm	VTS	+/-12	VTS	+/-1mm	VTS	
6.5.13.40	Gantry spacing	VTS	TBAmm	VTS	8500_mm	VTS	TBC	VTS	9184mm	VTS	
6.5.14	End Stops										
6.5.14.1	End Stops mounting length along crane beam	VTS	TBAmm	VTS	~300_mm	VTS	1750 mm	VTS	350mm	VTS	
6.5.14.2	End stop description/mounting details	VTS	TBA	VTS	Steel profile attached to rail	VTS	Bolted	VTS	DWG. No. A-M-12	VTS	
6.5.15	Power conductor										
6.5.15.1	Construction	Busbar	TBA	N/A	insulated bus bar	Y	Box Type	Y	Trolley		
6.5.15.2	Type	heated	TBA	N/A	not defined yet	N/A	AKAPP		Bus bar	Y	
6.5.15.3	Length	VTS	TBA	N/A	160_m	N/A	155 m	N/A	155.8m		
6.5.15.4	Incoming cable size	VTS	TBA	N/A	4x16mm²	N/A	TBC	N/A	4x16		
6.5.16	Controls										
6.5.16.1	Control type	Pendant	VFD	K	frequency inverter Yes	Y	TBC	K	Remote	K	
6.5.16.2	Rotary limit switch manufacturer	VTS	GEMCO	N/A	SEW, Nord Flender	N/A	Stromag-RLS51-75-SP	N/A	BANDO HOIST CRANE	N/A	
6.5.16.3	Control cabinet manufacturer	VTS	TBA	N/A	Rittal or equivalent	N/A	Eurobex	N/A	BANDO HOIST CRANE	N/A	
6.5.16.4	Control power	VTS	120V/Ph/Hz	N/A	24 or 110_V/Ph/Hz	N/A	110/1/60 V/Ph/Hz	N/A	100/1 /60 V/Ph/Hz	N/A	
6.5.16.5	General Arrangement drawing of the hoist assembly.	VTS	Supplied	N/A	acc. attachment__	N/A	See attached	N/A	DWG. No. A-M-12	N/A	
6.5.16.6	Details of motor	VTS	TBA	N/A	ABB, SEW, Nord	N/A	Eurodrive Std. catalogue	N/A	DWG. No. A-M-12	N/A	
6.5.16.7	Details of holding brake operation	VTS	Shoe Brake	N/A	Siebre, Stromag, Antec or equiv.	N/A	Mondel Std. catalogu	N/A	DWG. No. A-M-12	N/A	
6.5.16.8	Extreme upper limit switch make and model	VTS	TBA	N/A	SEW, Siemens, Schneider	N/A	Allen Bradley-802 ATP	N/A	BANDO HOIST CRANE LS-1,IIA	N/A	
6.5.16.9	Details of drum dogging device limit switch	VTS	Geared	N/A	N/A	N/A	Turck	N/A	BANDO HOIST CRANE	N/A	
6.5.16.10	Normal upper limit switch make and model	VTS	Geared	N/A	SEW, Siemens, Schneider	N/A	Stromag-RLS51-75-SP	N/A	BANDO HOIST CRANE	N/A	
6.5.16.11	Lower limit switch make and model	VTS	GEMCO	N/A	SEW, Siemens, Schneider	N/A	Stromag-RLS51-75-SP	N/A	Kg auto/ KG-L001	N/A	
6.5.16.12	Hoist load cell make and model	VTS	TBA	N/A	Tecsis	N/A	Omega- RLS51-75-SP	N/A	Kg auto/ KG-L001	N/A	
6.5.16.13	Slack rope detection make and model	VTS	TBA	N/A	Not defined yet	N/A	Omega- RLS51-75-SP	N/A	BANDO HOIST CRANE	N/A	
6.5.16.14	Unbalance wire rope load detector make and model	VTS	TBA	N/A	Tecsis	N/A	Load cell if required	N/A	BANDO HOIST CRANE	N/A	
6.5.16.15	Proximity switches make and model (for end of travel)	VTS	TBA	N/A	Siemens, telemechanic, Schneider or equivalent	N/A	Flip Flop Switch see spec sheet	N/A	BANDO HOIST CRANE	N/A	
6.5.16.16	Overspeed detector make and model	VTS	TBA	N/A	SEW, Nord	N/A	TBC	N/A	BANDO HOIST CRANE	N/A	
7	TRASH CLEANING SYSTEM										
7.1	TRASH CLEANER										
	Max. Intake Face Water Flow Velocity	1.1 m/s									
	Max. Side Velocity at Rack Bars' Face	0.5 m/s									
7.1.1	Weight of trash cleaner	100 000 kg	~165000kg	Y	~165,000_kg	Y	165,000 kg	Y	165,000kg	Y	
7.1.2	Gantry structure rail centre distance	9 050 mm	9,05m	Y	9,05_m	Y	9.05 m	Y	9.05m	Y	
7.1.3	Length of gantry structure at upstream rail	VTS	~11,00m	Y	~11,00_m	Y	11 m	Y	11m	Y	
7.1.4	Length of gantry structure at downstream rail	VTS	~13,50m	Y	~13,50_m	Y	13.5 m	Y	13.5m	Y	
7.1.5	Height of machinery deck above gantry rails	VTS	~10,00m	Y	~10,00_m	Y	10 m	Y	10m	Y	
7.1.6	Height of raised trash rake above gantry rails	VTS	~5,00m	Y	~5,00_m	Y	5 m	Y	5m	Y	
7.1.7	Depth of extended trash rake below gantry rails	EL- -3.70	~2,20m	K	~2,20_m	K	~2,20_m	K	~2,20_m	K	
7.1.8	Depth of extended trash buckets below gantry rails at 10 m upstream of intake	EL- -3.70	~2,20m	K	~2,20_m	K	~2,20_m	K	~2,20_m	K	
7.1.9	Rated debris load of trash rake at 10 m upstream of intake	2 500 kg	~3500kg	Y	~3,500_kg	Y	3500 kg	Y	3500 kg	Y	
7.1.10	Rated debris load of trash buckets at 10 m upstream of intake	2 500 kg	~3500kg	Y	~3,500_kg	Y	3500 kg	Y	3500 kg	Y	
7.1.11	Cycle: water surface to trashrack base to water surface	20 min	~260sec	Y	~260_sec	Y	260 sec	Y	260 sec	Y	
7.1.12	Cycle: water surface to debris trap to 10 m upstream and back to water surface	20 min	~270sec	Y	~270_sec	Y	270 sec	Y	270 sec	Y	
7.1.13	Cycle: water surface to trash receptacle to water surface	5 min	~100sec	Y	~100_sec	Y	100 sec	Y	100 sec	Y	
7.1.14	Height of trash cleaner arm above gantry rails when raised	VTS	~32,00m	Y	~32,00_m	Y	32 m	Y	32 m	Y	
7.1.15	Cleaner rake manufacturer/model no./width	MUHR M-7000	_Muhr/_M-7000/_~2400mm	Y	Muhr/_M-7000/_~2,400mm	Y	MUHR/ M-7000 / 2.4 m	Y	Muhr/ M-7000 /2,400mm	Y	
7.1.16	Cleaner rake capacity	600 mm - 5 000 kg	_1,00/_3500m³/kg	Y	_1/_3500_m³/kg	Y	1.00/3500 m³/kg	Y	1/3500m³/kg	Y	
7.1.17	Cleaner clam bucket manufacturer/model no./width	2 m W x 1.2 m D	_Kinshofer/_D27H/_2142mm or similar	Y	Kinshofer/_D27H/2142m m or equivalent	Y	Kinshofer/D27H/2142 mm or similar	Y	Kinshofer/D27H/2,1 42mm(or similar)	Y	
7.1.18	Cleaner clam bucket capacity	5 000 kg	_0,80/_3500m³/kg	Y	0.80/_3,500_m³/kg	Y	0.80/3500 m³/kg	Y	0.8/3500m³/kg	Y	
7.1.19	Cleaner closed bucket manufacturer/model no./width	2.4 m W	_Terex/_TMG08/_2520 mm	Y	Terex/_TMG08/2520mm	Y	Terex/ TMG08/ 2520 mm	Y	Terex/TMG08/2,520 mm	Y	
7.1.20	Cleaner closed bucket capacity	5 000 kg	_0,80/_3500m³/kg	Y	0.80/_3,500_m³/kg	Y	0.80/3500 m³/kg	Y	0.8/3500m³/kg	Y	
7.1.21	Machinery deck rotation speed	1 rpm	~0 - 1rpm	Y	~0-1rpm (variable)	Y	-0-1 rpm, variable	Y	0 - 1 rpm, variable	Y	
7.1.22	Minimum radius of trash cleaner retracted	VTS	~11,00m	Y	~11,00_m	Y	-11.00 m	Y	11m	Y	
7.1.23	Radius of trash cleaner counterweight	VTS	~8,00m	Y	~8,00_m	Y	-8.00 m	Y	8m	Y	
7.1.24	Maximum radius of trash cleaner empty	16 m	~30m	Y	~30_m	Y	-30 m	Y	30m	Y	
7.1.25	Maximum radius of trash cleaner 5000 kg load	10 m	16m	Y	16_m	Y	16 m	Y	16m	Y	
7.1.26	Maximum radius of trash cleaner 9000 kg load	N/A	11m	Y	11_m	Y	11 m	Y	11m	Y	

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Technical Bid Evaluation			Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment				Revision No.: 01			
			Package No.: CH0032		Project Title: LCP-MUSKRAT FALLS		Rev. Date.: 2013-06-13			
			Tag No.:		Client:		Project No.: 505573			
Item Number	Description	Specified Value or Reference	Bidder: HABS		SENS		LEAFS		JETS	
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant
7.1.27	Height of underside hoist beam above gantry rails	7 500 mm	~5,50m	VTS	~5.50_m	VTS	~5.50 m	VTS	5.5m	VTS
7.1.28	Height of hoist/lift beam connections in raised position	VTS	~7,50m	VTS	~7.50_m	VTS	~7.5 m	VTS	7.5m	VTS
7.1.29	Power cable									
7.1.29.1	Reel diameter	VTS	~1,5 / 3,5m	VTS	~1.5/3.5_m	VTS	~1.5/3.5 m	VTS	1.5 / 3.5 m	VTS
7.1.29.2	Cable length	VTS	~160 (180)m	VTS	~160 (180)_m	VTS	~160(180) m	VTS	160(180)m	VTS
7.1.29.3	Cable type	VTS	3x70 + 3x35 / 3 mm2	N/A	3x70+3x35/3mm2	N/A	3X70+3X35/3 mm2	N/A	3x70+3x35/3mm2	N/A
7.1.29.4	Cable manufacturer	VTS	TKD or similar	N/A	TKD or similar	N/A	TKD of similar	N/A	TKD or similar	N/A
7.1.30	Gantry drives									
7.1.30.1	Gantry travel speed	30 m/min	~2,5 - 20m/min	Y	~2.5-20_m/min	Y	~2.5-20 m/min	Y	2.5 - 20 m/min	Y
7.1.30.2	Number of gantry drives	4	4	Y	4	Y	4	Y	4	Y
7.1.30.3	Motor rating	VTS	6,60kW	VTS	6.60_kW	VTS	6.60 kW	VTS	6.6kW	VTS
7.1.30.4	Motor rated full load speed	VTS	1755rpm	VTS	1755_rpm	VTS	1755 rpm	VTS	1755rpm	VTS
7.1.30.5	Rated voltage /# phase/frequency	575V/3P/60Hz	575V / 3ph / 60Hz	Y	575/3/60_V/Ph/Hz	Y	575V/3Ph/60Hz	Y	575V / 3Ph / 60Hz	Y
7.1.30.6	Starting current	VTS	15,70A	N/A	15.70_A	N/A	15.70 A	N/A	15.7A	N/A
7.1.30.7	Rated full load current	VTS	9,0 / 60Hz	N/A	9_A	N/A	9.0 A/60 Hz	N/A	9.0A / 60Hz	N/A
7.1.30.8	Motor manufacturer	VTS	Demag Cranes	N/A	DEMAG	N/A	Demag Cranes	N/A	Demag Cranes	N/A
7.1.30.9	Motor Class	VTS	IE 1 Standard Efficiency	N/A	IE 1 Standard Efficiency	N/A	IE 1 Standard Efficiency	N/A	IE 1 Standard Efficiency	N/A
7.1.30.10	Locked-rotor current	VTS	78 A	N/A	78A	N/A	78 A	N/A	78A	N/A
7.1.30.11	Code letter	G	Not defined	N/A	Not defined	N/A	Not defined	N/A	Not defined	N/A
7.1.30.12	Design letter	Design B	CSA, Specification C22.2	Y	CSA, Specification C22.2	Y	CSA, Specification C22.2	Y	CSA, Specification C 22.2	Y
7.1.30.13	Rated temperature rise	Class B	Motor 60oC, Gearbox 50oC	Y	Motor 60°C, Gearbox 50°C	Y	Motor 60 deg C, Gearbox 50 deg C	Y	Motor 60°C, Gearbox 50°C	Y
7.1.30.14	Insulation system class	Class: F	Temperature Class F	Y	Temperature Class F	Y	Temperature Class F	Y	Temperature Class F	Y
7.1.30.15	Rated ambient temperature	40 Degree C	-40...30oC (max. 60o)	Y	-40 +30°C (max. +60°C)	Y	-40...30 deg C (Max 60 deg C)	Y	-40...30°C (max. 60?)	Y
7.1.30.16	Time rating	Continuous	S3,60% ED, Inverter operation	Y	S3, 60% ED, inverter operation	Y	S3.60% ED, Inverter operation	Y	S3.60%ED, Inverter operation	Y
7.1.30.17	Secondary volts/# phase/full load current (for wound-rotor induction motor)	VTS	NoV/Ph/A	N/A	No_V/Ph/A	N/A	No V/Ph/A	N/A	NoV/Ph/A	N/A
7.1.30.18	Motor Thermally protected (Yes or no)	VTS	Yes - 3 PTC Thermistors	N/A	Yes - 3 PTC Thermistors	N/A	Yes - 3 PTC Thermistors	N/A	Yes - 3 PTC Thermistors	N/A
7.1.30.19	Motor Space Heater- rated voltage/#phase/watts	120V/1P/VTS	110-120 or 220-250V/1~/40V/Ph/W	Y	110-220 or 220-250V/1~/40_V/Ph/W	Y	110-120 or 220-250V/1~/40 W	Y	110-120 or 220-250V / 1- /40W	Y
7.1.30.20	Gear Box Space Heater- rated voltage/#phase/watts	120V/1P/VTS	TBD	N/A	Later_V/Ph/W	N/A	rated voltage/#phase/watts tbd	N/A	LATERV/Ph/W	N/A
7.1.30.21	Motor full load efficiency	Premium high efficiency	-	N/A	90%	N/A	-	N/A	LATER	N/A
7.1.30.22	Power factor	VTS	-	N/A	0.89	N/A	-	N/A	LATER	N/A
7.1.30.23	Service factor	1.15	-	N/A	1.15	Y	-	K	LATER	N/A
7.1.30.24	Enclosure type	TEFC	IP 65	Y	IP65	Y	IP 65	Y	IP 65	Y
7.1.30.25	NEMA Frame type	NEMA MG-1	No	N/A	No	N/A	No	N/A	No	N/A
7.1.30.26	NEMA Design	VTS	No	N/A	No	N/A	No	N/A	No	N/A
7.1.30.27	Inverter Duty (yes/no)	VTS	Yes	N/A	Yes	N/A	Yes	N/A	Yes	N/A
7.1.30.28	Gearbox manufacturer	VTS	Demag Cranes	Y	Demag Cranes	Y	Demag Cranes	Y	Demag Cranes	Y
7.1.30.29	Gearbox drive ratio	VTS	140	VTS	140	VTS	140	VTS	140	VTS
7.1.30.30	Wheel diameter/spacing	VTS	_630mm/_170mm	VTS	630_mm Ø/_170_mm	VTS	630mm diam/ 170 mm	VTS	630mm /170mm	VTS
7.1.30.31	Wheel width inside flanges	VTS	110mm	VTS	110_mm	VTS	110 mm	VTS	110mm	VTS
7.1.30.32	Wheel flange height	VTS	25mm	VTS	25_mm	VTS	25 mm	VTS	25mm	VTS
7.1.30.33	Number of wheels per corner	2	2	Y	2	Y	2	Y	2	Y
7.1.30.34	Maximum vertical load per wheel	VTS	~35000kg dynamic	VTS	~35,000_kg (dynamic)	VTS	~35000 kg dynamic	VTS	35000kg dynamic	VTS
7.1.30.35	Maximum lateral load per wheel	VTS	7000kg	VTS	~7,000_kg	VTS	~7000 kg	VTS	7000kg	VTS
7.1.30.36	Maximum braking load per wheel	VTS	60000kg static	VTS	60,000_kg	VTS	60000 kg static	VTS	60000kg static	VTS
7.1.30.37	Required gantry rail size	175#	175-lb preferred	VTS	175 lb preferred	VTS	175-lb preferred	VTS	175 - lb preferred	VTS
7.1.30.38	Gantry rail centres	9050 mm	9050mm	VTS	9050_mm	VTS	9050 mm	VTS	9050mm	VTS
7.1.30.39	Allowable rail centre tolerance	VTS	+/- 2mm	VTS	+/-_2_mm	VTS	+/-2mm	VTS	+/-2mm	VTS
7.1.30.40	Gantry pivot spacing along upstream rail	VTS	~9000mm	VTS	~9,000_mm	VTS	~9000 mm	VTS	9000mm	VTS
7.1.30.41	Gantry pivot spacing along downstream rail	VTS	~11500mm	VTS	~11,500_mm	VTS	~11500 mm	VTS	11500mm	VTS
7.1.31	End Stops									
7.1.31.1	End Stops mounting length along crane beam	VTS	~2 x 166mm	VTS	~2x166_mm	VTS	~2X166 mm	VTS	2 x 166mm	VTS
7.1.31.2	End stop description/mounting details	VTS	Buffer (rubber)	VTS	Buffer (rubber)	VTS	Buffer (rubber)	VTS	Buffer (rubber)	VTS
7.1.32	Power conductor									
7.1.32.1	Construction	VTS	Motor Cable Drum	VTS	Motor Cable Drum	VTS	Motor Cable Drum	VTS	Motor Cable Drum	VTS
7.1.32.2	Type	VTS	LTM or similar	VTS	LTM or equivalent	VTS	LTM or similar	VTS	LTM or similar	VTS
7.1.32.3	Length	VTS	~160 (180)m	VTS	~160 (180)_m	VTS	~160(180) m	VTS	160 (180)m	VTS
7.1.32.4	Incoming cable size	VTS	D = 42mm	VTS	D=42mm	VTS	D=42 mm	VTS	D = 42 mm	VTS
7.1.33	Trash Cleaner hydraulic power unit (HPU)									
7.1.33.1	Nominal pressure	4000 psi	27500kPa	Y	27500_kPa	Y	27500 kPa (275 bar)	Y	27500kPa(275bar)	Y
7.1.33.2	Design pressure	6000 psi	30000kPa	Y	30000_kPa	Y	30000 kPa (300 bar)	Y	30000kPa(300bar)	Y
7.1.33.3	Minimum operating pressure	VTS	< 27500kPa	VTS	< 27500_kPa	VTS	<27500 kPa (<275 bar)	VTS	<27.500kPa(<275 bar)	VTS
7.1.33.4	HPU manufacturer	Rexroth (Equiv.)	Bosch - Rexroth	Y	Bosch Rexroth	Y	Bosch-Rexroth	Y	Bosch - Rexroth	Y
7.1.33.5	Number of hydraulic pumps	4	4	VTS	4	VTS	4	VTS	4	VTS
7.1.33.6	Pump discharge	400 L/sec approx.	~6,53L/sec	VTS	~6.53_L/sec	VTS	~6.53L/sec	VTS	6.53L/sec	VTS
7.1.33.7	Pump motor speed rated	rpm	1800rpm	VTS	1800_rpm	VTS	1800 rpm	VTS	1800rpm	VTS
7.1.33.8	Gantry travel speed	> 20 m/min	~0-20m/min	Y	~0-20_m/min	Y	~0-20 m/min, variable	Y	0 -20m/min, variable	Y
7.1.33.9	Number of gantry drives	4	4	Y	4	Y	4	Y	4	Y
7.1.33.10	Motor rating	VTS	4 x 37kW	VTS	4x37_kW	VTS	4X37 kW	VTS	4 x 37kW	VTS
7.1.33.11	Motor rated full load speed	VTS	1800rpm	VTS	1800_rpm	VTS	1800 rpm	VTS	1800rpm	VTS
7.1.33.12	Rated voltage /# phase/frequency	575V/3P/60Hz	600V / 3Ph / 60HzV/Ph/Hz	Y	600/3/60_V/Ph/Hz	Y	600V/3Ph/60Hz	Y	600V / 3PH /60Hz	Y
7.1.33.13	Starting current	VTS	~135A	N/A	~135_A	N/A	~135 A	N/A	135A	N/A
7.1.33.14	Rated full load current	VTS	~45A	N/A	~45_A	N/A	~45 A	N/A	45A	N/A
7.1.33.15	Pump Motor manufacturer	VTS	Bosch-Rexroth Standard	Y	Bosch-Rexroth	Y	Bosch-Rexroth Standard	Y	Bosch - Rexroth Standard	Y
7.1.33.16	Pump Motor Class	VTS	B	N/A	B	N/A	B	N/A	B	N/A
7.1.33.17	Locked-rotor current	VTS	~225 A	N/A	~225A	N/A	~225 A	N/A	225A	N/A
7.1.33.18	Code letter	G	V	N/A	V	N/A	V	N/A	V	N/A
7.1.33.19	Design letter	Design B	A	N/A	A	N/A	A	N/A	A	N/A
7.1.33.20	Rated temperature rise	Class B	70	N/A	70	N/A	70	N/A	70	N/A
7.1.33.21	Insulation system class	Class: F	F (DT=80K)	N/A	F (DT=80K)	N/A	F(DT=80k)	N/A	F (DT = 80K)	N/A
7.1.33.22	Rated ambient temperature	40 Degree C	40oC	N/A	40°C	N/A	40 deg C	N/A	40°C	N/A
7.1.33.23	Time rating	Continuous	60 min/h	N/A	60min/h	N/A	60min/h	N/A	60 min/h	N/A
7.1.33.24	Secondary volts/# phase/full load current (for wound-rotor induction motor)	VTS	Actual not draftedV/Ph/A	N/A	Actual not drafted_V/Ph/A	N/A	Actual not drafter V/Ph/A	N/A	Actual not drafteV/Ph/A	N/A
7.1.33.25	Motor Thermally protected (Yes or no)	VTS	Yes	N/A	Yes	N/A	Yes	N/A	Yes	N/A
7.1.33.26	Motor Space Heater- rated voltage/#phase/watts	120V/1P/VTS	110 - 127V/Ph/W	Y	110-127/1_V/Ph/W	Y	110-127V/Ph/W	Y	110 -127V/Ph/W	Y
7.1.33.27	Oil Reservoir Heater- rated voltage/#phase/watts	120V/1P/VTS	120V/Ph/W	Y	120/1_V/Ph/W	Y	120V-Ph/W	Y	120V/Ph/W	Y
7.1.33.28	Motor full load efficiency	Premium high efficiency	~94,5	Y	~94.5	Y	~94.5	Y	94.5	Y
7.1.33.29	Power factor	VTS	0,89	VTS	0.89	VTS	0.89	VTS	0.89	VTS
7.1.33.30	Service factor	1.15	1,15	Y	1.15	Y	1.15	Y	1.15	Y
7.1.33.31	Enclosure type	TEFC	Casting	Y	Casting	Y	Casting	Y	Casting	Y
7.1.33.32	NEMA Frame type	NEMA MG-1	405S / 444 or similar	Y	405S/444 or Equivalent	Y	405S/444 or similar	Y	405S / 444 or similar	Y
7.1.33.33	NEMA Design	VTS	B	Y	B	Y	B	Y	B	Y
7.1.33.34	Inverter Duty (yes/no)	VTS	No	N/A	No	N/A	No	N/A	No	N/A
7.1.33.35	Sump tank dimensions: L/W/H	VTS	~2,0m/_1,3m/_0,6m	VTS	~2.0_m/_1.3_m/_0.6_m	VTS	~2.0m/1.3m/0.6m	VTS	2m/1.3m/0.6m	VTS
7.1.33.36	Sump tank reservoir volume	VTS	~1500 LL	VTS	~1500_L	VTS	~1500L	VTS	1500L	VTS
7.1.33.37	Total oil volume of high pressure oil system	VTS	~1300 LL	VTS	~1300_L	VTS	~1300L	VTS	1300L	VTS
7.1.33.38	Schematic drawing	VTS	Muhr	VTS	Muhr	VTS	Muhr	VTS	Muhr	VTS
7.1.34	Machine room dimensions: L/W/H	m x m x m	~4,0m/_4,0m/_2,2m	VTS	~4_m/_4_m/_2.2_m	VTS	~4.0m/4.0m/2.2m	VTS	4m/4m/2.2m	VTS
7.1.35	Trash Cleaner slewing drives									
7.1.35.1	Slewing rotation speed	< 1 rpm	~0 - 1 rpm	Y	~0-1_rpm, variable	Y	~0-1 rpm variable	Y	0 - 1rpm, variable	Y
7.1.35.2	Number of hydraulic motors	VTS	2	VTS	2	VTS	2	VTS	2	VTS
7.1.35.3	Hydraulic slewing motor rating	VTS	_See main pump 7.1.33 kW	VTS	see main pump 7.1.33.	VTS	see main pump 7.1.33	VTS	See main pump 7.1.33.	VTS
7.1.35.4	Motor speed rated	VTS	See main pump 7.1.33rpm	VTS	see main pump 7.1.33.	VTS	see main pump 7.1.33	VTS	See main pump 7.1.33.	VTS
7.1.35.5	Voltage	575V/3P/60Hz	See main pump 7.1.33V/Ph/Hz	Y	see main pump 7.1.33.	Y	see main pump 7.1.33	Y	See main pump 7.1.33.	Y
7.1.35.6	Starting current	VTS	See main pump 7.1.33A	N/A	see main pump 7.1.33.	N/A	see main pump 7.1.33	N/A	See main pump 7.1.33.	N/A



Bid Evaluation Plan Appendix 5



Technical Bid Evaluation			Title: Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment				Revision No.: 01			
			Package No.: CH0032		Project Title: LCP-MUSKRAT FALLS		Rev. Date.: 2013-06-13			
			Tag No.:		Client: NALCOR		Project No.: 505573			
Bidder:			HABS		SENS		LEAFS		Jets	
Item Number	Description	Specified Value or Reference	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant
7.1.35.7	Full load current	VTS	See main pump 7.1.33A	N/A	see main pump 7.1.33.	N/A	see main pump 7.1.33	N/A	See main pump 7.1.33.	N/A
7.1.35.8	Motor manufacturer	VTS	See main pump 7.1.33	N/A	see main pump 7.1.33.	N/A	see main pump 7.1.33	N/A	See main pump 7.1.33.	N/A
7.1.35.9	Motor Class	VTS	See main pump 7.1.33	N/A	see main pump 7.1.33.	N/A	see main pump 7.1.33	N/A	See main pump 7.1.33.	N/A
7.1.35.10	Gearbox manufacturer	VTS	Dinamic Oil	Y	Dinamic Oil	Y	Dinamic Oil	Y	Dinamic Oil	Y
7.1.35.11	Gearbox drive ratio	VTS	~112	VTS	~112	VTS	~112	VTS	112	VTS
7.1.36	Controls									
7.1.36.1	PLC (Programmable Logic Controller) (Make)	Schneider	Siemens	K	Siemens	K	Siemens	K	Siemens	K
7.1.36.2	PLC (Programmable Logic Controller) (Model)	Modicon Quantum	S7-314C	K	S7-314C	K	S7-314C	K	S7-314C	K
7.1.36.3	HMI (Human Machine Interface) display (Make)	Nematron	Siemens	K	Siemens	K	Siemens	K	Siemens	K
7.1.36.4	HMI (Human Machine Interface) display (Model)	VTS	OP-77A	K	OP-77A	K	OP-77A	K	OP-77A	K
7.1.36.5	Control cabinet manufacturer	VTS	Rittal	K	Rittal	K	Rittal	K	Rittal	K
7.1.36.6	Detail of the control and instrumentation redundancy	VTS	Second PLC as spare	K	Second PLC as spare	K	Second PLC as spare	K	Second PLC as spare	K
7.1.36.7	Detail of the manual control system	VTS	Joystick, Buttons	K	Joystick, Buttons	K	Joystick, Buttons	K	Joystick, Buttons	K
7.2	TRASH CLEANER HOIST									
7.2.1	Hoist rail height above road deck	VTS	~8,25m	VTS	~8.25_m	VTS	~8.25m	VTS	8.25m	VTS
7.2.2	Hoist rail length	VTS	~7,50 travel distance m	VTS	~7.50_m (travel distance)	VTS	~7.5m (travel distance)	VTS	7.50 m (travel distance)	VTS
7.2.3	Hoist width	VTS	~8,80m	VTS	~8.80_m	VTS	~8.80m	VTS	8.8m	VTS
7.2.4	Hoist rail centre distance	5 500 mm	~9,25m	VTS	~9.25_m	VTS	~9.25m	VTS	9.25m	VTS
7.2.5	Total weight of hoist (inc. trolley, ropes and sheave blocks)	VTS	~9000kg	VTS	~9000_kg	VTS	~9000 kg	VTS	9000kg	VTS
7.2.6	Hoist rated capacity	50 000 kg	40000kg	Y	~40000_kg	Y	40000 kg	Y	40000kg	Y
7.2.7	Rope drum(s)									



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			Tag No.:		Client: NALCOR		Project No.: 505573	
Item Number	Description	Specified Value or Reference	Bidders:		LEAFS		JETS	
			HABS	SENS	Proposed	Compliant	Proposed	Compliant
7.2.7.1	Number of ropes	2	2	Y	2	Y	2	Y
7.2.7.2	Material	300WT	Steel (S235 / S355)	Y	Steel (S235/S355)	Y	Steel (S235 / S355)	Y
7.2.7.3	Diameter to bottom of grooves	VTS	~500mm	VTS	~500mm	VTS	500mm	VTS
7.2.7.4	Rope drum length	VTS	~2200mm	VTS	~2200mm	VTS	2200mm	VTS
7.2.7.5	Grooved length (Left hand/ right hand)	VTS	~2000mm	VTS	~2000mm	VTS	2000mm	VTS
7.2.7.6	Type of bearings	VTS	Hinge Bearing	VTS	Hinged Bearing	VTS	Hinge Bearing	VTS
7.2.7.7	Bearing capacity	VTS	Load plus safety	VTS	Load plus safety	VTS	Load plus safety	VTS
7.2.8	Wire ropes							
7.2.8.1	Type of material	IPS Galv. w/SFC	Galvanised steel	Y	Galvanised Steel	Y	Galvanised Steel	Y
7.2.8.2	Country of manufacture	CANADA / US / EUR	Europe	Y	Europe	Y	Europe	Y
7.2.8.3	Factor of safety	5/0.5 to Design Load	~5	Y	~5	Y	5	Y
7.2.8.4	Construction	6 x 19	Warrington Seale	VTS	Warrington Seale	VTS	Warrington Seale	VTS
7.2.8.5	Rope diameter	VTS	24mm	VTS	24mm	VTS	24mm	VTS
7.2.8.6	Breaking load	VTS	~50000kg	VTS	~50000kg	VTS	50000kg	VTS
7.2.8.7	Number of falls	VTS	4	VTS	4	VTS	4	VTS
7.2.9	Hoist drive							
7.2.9.1	Motor rating	55 kW @ 6 m/min	230kW (alternative hydraulic)	N	230 kW (alternative hydraulic)	N	230kW (alternative hydraulic)	N
7.2.9.2	Motor rated full load speed	1 200 rpm	~1800rpm	VTS	~1800rpm	VTS	1800rpm	VTS
7.2.9.3	Rated voltage /# phase/frequency	575V/3P/60Hz	600V / 3Ph / 60 HzV/Ph/Hz	Y	600/3/60_V/Ph/Hz	Y	600V/ 3Ph/ 60Hz	Y
7.2.9.4	Starting current	VTS	~88A	N/A	~88_A	N/A	88A	N/A
7.2.9.5	Rated full load current	VTS	29,5A	N/A	~29.5_A	N/A	29.5A	N/A
7.2.9.6	Motor manufacturer	VTS	Getriebebau Nord / SEW	N/A	Getriebebau Nord / SEW	N/A	Getriebebau Nord / SEW	N/A
7.2.9.7	Motor Class	VTS	B	N/A	B	N/A	B	N/A
7.2.9.8	Locked-rotor current	VTS	~150 A	N/A	~150	N/A	150A	N/A
7.2.9.9	Code letter	G	F	N/A	F	N/A	F	N/A
7.2.9.10	Design letter	Design B	A	N/A	A	N/A	A	N/A
7.2.9.11	Rated temperature rise	Class B	70	N/A	70	N/A	70	N/A
7.2.9.12	Insulation system class	Class: F	A	N/A	A	N/A	A	N/A
7.2.9.13	Rated ambient temperature	40 Degree C	105oC	N/A	105°C	N/A	105 deg C	N/A
7.2.9.14	Time rating	Continuous	60 min/h	N/A	60min/h	N/A	60 min/h	N/A
7.2.9.15	Secondary volts/# phase/full load current (for wound-rotor induction motor)	VTS	Actual not draftedV/Ph/A	N/A	not drafted yet_V/Ph/A	N/A	Actual not drafted V/Ph/W	N/A
7.2.9.16	Motor Thermally protected (Yes or no)	VTS	Yes	Y	Yes	Y	Yes	Y
7.2.9.17	Motor Space Heater- rated voltage/#phase/watts	120V/1P/VTS	120 V / .Ph/.WV/Ph/W	Y	120/1_V/Ph/W	Y	120V/Ph/W	Y
7.2.9.18	Gear Box Space Heater- rated voltage/#phase/watts	120V/1P/VTS	120 V / .Ph/.WV/Ph/W	Y	120/1_V/Ph/W	Y	120V/Ph/W	Y
7.2.9.19	Motor full load efficiency	Premium high efficiency	~94	Y	~94	Y	94	Y
7.2.9.20	Power factor	VTS	0,89	Y	0.89	Y	0.89	Y
7.2.9.21	Service factor	1.15	1,15	Y	1.15	Y	1.15	Y
7.2.9.22	Enclosure type	TEFC	Casting	Y	Casting	Y	Casting	Y
7.2.9.23	NEMA Frame type	NEMA MG-1	365 / 404 or similar	Y	365/404 or. Equ.	VTS	365 / 404 orsimilar	Y
7.2.9.24	NEMA Design	VTS	D	N/A	D	N/A	D	N/A
7.2.9.25	Inverter Duty (yes/no)	VTS	Yes	Y	Yes	Y	Yes	Y
7.2.10	Gearbox							
7.2.10.1	Gearbox manufacturer	SEW ERO. (Equiv.)	Getriebebau Nord / SEW	Y	_Getriebebau Nord / SEW_	Y	Getriebebau Nord/SEW	Y
7.2.10.2	Gearbox drive ratio	VTS	~900	VTS	~900_	VTS	900	VTS
7.2.11	Brakes							
7.2.11.1	Holding brake manufacturer	ELEVANJA	Getriebebau Nord/SEW	Y	Getriebebau Nord / SEW	Y	Getriebebau Nord/SEW	Y
7.2.11.2	Holding brake type	Magnetic Drum	Spring-Magnetic incl. Switch	Y	Spring-magnetic incl. Switch	Y	Spring-Magnetic incl. Switch	Y
7.2.11.3	Holding brake rated torque	VTS	~100 kN-m	N/A	~100_kN-m	N/A	100kN-m	N/A
7.2.12	Trolley drive							
7.2.12.1	Trolley travel speed	VTS	~0-5m/min	VTS	~0-5_m/min	VTS	0 - 5m/min	VTS
7.2.12.2	Number of trolley drives	VTS	2	VTS	2	VTS	2	VTS
7.2.12.3	Motor rating	VTS	2,2kW	VTS	2.2_kW	VTS	2.2kW	VTS
7.2.12.4	Motor rated full load speed	VTS	~1800rpm	VTS	~1800_rpm	VTS	1800rpm	VTS
7.2.12.5	Rated voltage /# phase/frequency	575V/3P/60Hz	575V / 3Ph / 60Hz	Y	575/3/60_V/Ph/Hz	Y	575V/ 3Ph/ 60Hz	Y
7.2.12.6	Starting current	VTS	~5,3A	N/A	~5.3_A	N/A	5.3A	N/A
7.2.12.7	Rated full load current	VTS	~3A	N/A	~3_A	N/A	3A	N/A
7.2.12.8	Motor manufacturer	VTS	Demag / Nord / SEW	N/A	DEMAG Nord / SEW	N/A	Demag/Nord/SEW	N/A
7.2.12.9	Motor Class	VTS	IE 1 Standard Efficiency	Y	IE 1 Standard Efficiency	Y	IE 1 Standard Efficiency	Y
7.2.12.10	Locked-rotor current	VTS	~26 A	N/A	~26A	N/A	26A	N/A
7.2.12.11	Code letter	G	Not defined	N/A	not defined	N/A	Not defined	N/A
7.2.12.12	Design letter	Design B	CSA, Specification C22.2	Y	CSA, Specification C22.2	Y	CSA, Specification C 22.2	Y
7.2.12.13	Rated temperature rise	Class B	Motor 60oC, Gearbox 50oC	Y	Motor 60°C, Gearbox 50°C	Y	Motor 60°C, Gearbox 50°C	Y
7.2.12.14	Insulation system class	Class: F	Temperature Class F	Y	Temperature Class F	Y	Temperature Class F	Y
7.2.12.15	Rated ambient temperature	40 Degree C	-40....30oc (max.60oC	Y	-40°C - +30°C (max. +60°C)	Y	-40....30°C (max. 60°C)	Y
7.2.12.16	Time rating	Continuous	_S3,60% ED, Inverter operation	Y	S3, 60%ED, Inverter Operation	Y	S3, 60%ED, Inverter operation	Y
7.2.12.17	Secondary volts/# phase/full load current (for wound-rotor induction motor)	VTS	Actual not draftedV/Ph/A	N/A	Not drafted_V/Ph/A	N/A	Actual not drafted V/Ph/A	N/A
7.2.12.18	Motor Thermally protected (Yes or no)	VTS	Yes - 3PTC Thermistors	Y	Yes - 3PTC Thermistors	Y	Yes - 3 PTC Thermistors	Y
7.2.12.19	Motor Space Heater- rated voltage/#phase/watts	120V/1P/VTS	110-120 or 220-250V / 1~/40 W	Y	110-120 or 220-250_V/~1Ph/40W	Y	110-120 or 220-250V/ 1~/ 40W	Y
7.2.12.20	Gear Box Space Heater- rated voltage/#phase/watts	120V/1P/VTS	tbd	N/A	120V~1/Ph/1000W	Y	tbdV/Ph/W	N/A
7.2.12.21	Motor full load efficiency	Premium high efficiency	-	N/A	-	N/A	-	N/A
7.2.12.22	Power factor	VTS	-	N/A	0.89	N/A	-	N/A
7.2.12.23	Service factor	1.15	-	N/A	1.15	N/A	-	N/A
7.2.12.24	Enclosure type	TEFC	IP 65	Y	IP65	Y	IP 65	Y
7.2.12.25	NEMA Frame type	NEMA MG-1	No	N/A	No	N/A	No	N/A
7.2.12.26	NEMA Design	VTS	No	N/A	No	N/A	No	N/A
7.2.12.27	Inverter Duty (yes/no)	VTS	Yes	Y	Yes	Y	Yes	Y
7.2.12.28	Gearbox manufacturer	VTS	Demag Cranes	Y	Demag Cranes	Y	Demag Cranes	Y
7.2.12.29	Gearbox drive ratio	VTS	~285	Y	~285	Y	285	Y
7.2.12.30	Wheel diameter/spacing	VTS	250mm Ø/~110mm	Y	~250mm Ø/~110mm	Y	250mm /110mm	Y
7.2.12.31	Wheel width inside flanges	VTS	~60mm	Y	~60mm	Y	60mm	Y
7.2.12.32	Wheel flange height	VTS	~16mm	Y	~16mm	Y	16mm	Y
7.2.12.33	Number of wheels per corner	VTS	1	Y	1	Y	1	Y
7.2.12.34	Maximum vertical load per wheel	VTS	~12500kg	Y	~12500kg	Y	12500kg	Y
7.2.12.35	Maximum lateral load per wheel	VTS	~2000kg	Y	~2000kg	Y	2000kg	Y
7.2.12.36	Maximum braking load per wheel	VTS	~20000kg	Y	~20000kg	Y	20000kg	Y
7.2.13	End Stops							
7.2.13.1	End Stops mounting length along crane beam	VTS	~130mm	VTS	~130mm	VTS	130mm	VTS
7.2.13.2	End stop description/mounting details	VTS	Buffer (rubber)	VTS	Buffer (rubber)	VTS	Buffer(rubber)	VTS
7.2.14	Power conductor							
7.2.14.1	Construction	VTS	Cableway	Y	Cableway	Y	Cableway	Y
7.2.14.2	Type	VTS	Wampfler, Vahle	Y	Wampfler, Vahle	Y	Wampfler, Vahle	Y
7.2.14.3	Length	VTS	~13m	Y	~13m	Y	13m	Y
7.2.14.4	Incoming cable size	VTS	~4 x 16 mm ²	Y	~4x16mm ²	Y	4 x 16mm ²	Y
7.2.15	Controls							
7.2.15.1	Control type	control panel & radio remote	Siemens S7	Y	Siemens S7	Y	Siemens S7	Y
7.2.15.2	Rotary limit switch manufacturer	VTS	Getriebebau Nord / SEW	Y	Getriebebau Nord / SEW	Y	Getriebebau Nord / SEW	Y
7.2.15.3	Control cabinet manufacturer	VTS	Rittal	Y	Rittal	Y	Rittal	Y
7.2.15.4	Control power	VTS	24 VV/Ph/Hz	Y	24V	Y	24V	Y
7.2.15.5	General Arrangement drawing of the hoist assembly	VTS	Muhr design	Y	Muhr Design	Y	Muhr design	Y
7.2.15.6	Details of motor	VTS	Getriebebau Nord / SEW	Y	Getriebebau Nord / SEW	Y	Getriebebau Nord / SEW	Y



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			Tag No.:		Client: NALCOR		Project No.: 505573				
Item Number	Description	Specified Value or Reference	Bidder: HABS		SENS		LEAFS		JETS		
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	
7.2.15.7	Details of holding brake operation	VTS	Spring-Magnetic incl. Switch	Y	Spring Magnetic incl. Switch	VTS	Spring-Magnetic Incl. Switch	VTS	Spring-Magnetic incl. Switch	Y	
7.2.15.8	Extreme upper limit switch make and model	VTS	Stromag	Y	Stromag	VTS	Stromag	VTS	Stromag	Y	
7.2.15.9	Details of drum dogging device limit switch	VTS	Stromag	Y	Stromag	VTS	Stromag	VTS	Stromag	Y	
7.2.15.10	Normal upper limit switch make and model	VTS	Stromag	Y	Stromag	VTS	Stromag	VTS	Stromag	Y	
7.2.15.11	Lower limit switch make and model	VTS	Stromag	Y	Stromag	VTS	Stromag	VTS	Stromag	Y	
7.2.15.12	Hoist load cell make and model	VTS	Tecsis	Y	Tecsis	VTS	Tecsis	VTS	Tecsis	Y	
7.2.15.13	Slack rope detection make and model	VTS	Ifm	Y	Ifm	VTS	Ifm	VTS	Ifm	Y	
7.2.15.14	Unbalance wire rope load detector make and model	VTS	Tecsis	Y	Tecsis	VTS	Tecsis	VTS	Tecsis	Y	
7.2.15.15	Overspeed detector make and model	VTS	Getriebebau Nord / SEW	Y	Getriebebau Nord /SEW	VTS	Getriebebau Nord/SFW	VTS	Getriebebau Nord / SEW	Y	
7.2.15.16	Radio remote control make and model	VTS	HBC / Funke und Huster	Y	HBC / Funke und Huster	VTS	HBC/Funke und Huster	VTS	HBC / Funke und Huster	Y	
8	SPILLWAY ELECTRICAL BUILDING										
8.1	BUILDING STRUCTURAL STEEL										
8.1.1	Weight of building steel	VTS	17300kg	VTS	~16 900 kg	VTS	TBC	VTS	14000kg	VTS	
8.1.2	Weight of exterior and interior architectural finishes	VTS	15000lb	VTS	~40 000 kg	VTS	TBC	VTS	930kg	VTS	
8.1.3	Manufacturer:	VTS	TBD	VTS	Construction Grimard Inc.	VTS	TBD	VTS	LATER	VTS	
8.1.4	Autres	VTS		VTS		VTS	no line item	VTS	no line item	VTS	
9	SPILLWAY ELECTRICAL BUILDING – ELECTRICAL AUXILIARIES										
9.1	ELECTRICAL DISTRIBUTION SYSTEM FOR DIVERSION PHASE										
9.1.1	600 kW Diesel Generator										
9.1.1.1	Unit Rating & Performance Data:										
9.1.1.1.1	Manufacturer:	VTS	MTU Onsite Energy		Cummins Power Generation	Y	CAT	Y	LATER	N/A	
9.1.1.1.2	Duty to ISO 8528:	VTS	Prime Power with Variable Load		Prime Power		MEETS		MEET		
9.1.1.1.3	Prime Running Power (PRP) in accordance with ISO 8528 (brake)	VTS	615kWe		680 kWe in accordance with ISO 8528 (brake)	K	680 kWe	K	680kWe		
9.1.1.1.4	Limited Time Running Power (LTP) in accordance with ISO 8528 (brake)	VTS	650kWe		N/A kWe		750 kWe		776kWe		
9.1.1.1.5	Continuous Operating Power (COP) in accordance with ISO 8528 (brake)	600 kW	500kWe	K	N/A kWe	K	--- kWe	K	510 kWe	K	
9.1.1.1.6	Rated speed	VTS	1800rpm		1800 rpm	VTS	1800 rpm	VTS	1800rpm		
9.1.1.1.7	Rated power factor:	0.8		Y	80%	Y	80.00%	Y	80%	Y	
9.1.1.1.8	Rated voltage:	600V, 3P 4W	347/600	Y	600 V	Y	600 V	Y	600/346V	Y	
9.1.1.1.9	Rated frequency:	60 Hz	60	Y	60 Hz	Y	60 Hz	Y	60Hz	Y	
9.1.1.1.10	Overload Rating to ISO 3046-1, 1 out of 12 hours:	10%	650kWe	K	748 kWe	Y	10%	Y	680kWe	K	
9.1.1.2	Engine Basic Data										
9.1.1.2.1	Manufacturer	VTS	MTU 12V2000G45TB		Cummins inc.	Y	CAT	Y	LATER		
9.1.1.2.2	Fuel Stop Power in accordance with ISO 3046-1 (brake)	VTS	780		808 kW in accordance with ISO 3046-1 (brake)		776 kW		776kW		
9.1.1.2.3	Speed	VTS	1800		1800 rpm	VTS	1800 rpm	VTS	1800rpm		
9.1.1.2.4	Aspiration (natural or turbo charged)	VTS	Turbo Charged Aftercooled		Turbo charged	VTS	TURBO ASPIRATION	VTS	TA		
9.1.1.2.5	Number of cylinders	VTS	12			6	12	VTS	12		
9.1.1.2.6	Minimum recommended light load	VTS	130		225 kWe	VTS	204 kWe	VTS	LATER kWe		
9.1.1.2.7	Duration light load can be applied per 24 hr period	VTS	24			VTS	UNLIMITED	VTS	24hr		
9.1.1.2.8	Maximum sound level@ 1 m	105 dBA	101	Y	95 dBA	Y	101.6 dBA	Y	110dBA	N	
9.1.1.2.9	Fuel consumption at PRP rating	VTS	176		181.7 L/hr	VTS	183.1 L/hr	VTS	183.1L/hr		
9.1.1.3	Engine Fuel System										
9.1.1.3.1	Fuel type	Diesel	Diesel	Y	Diesel #2	Y	DIESEL	Y	MEU(DIESEL)	Y	
9.1.1.3.2	Day tank type	VTS	Double Wall ULC-S602		Double wall steel fabrication		N/A		DI		
9.1.1.3.3	Day tank capacity	To be sized for 8 hrs at 75% Load	1135 L	K	1382 L	Y	N/A 1360 L	N	7000L	K	
9.1.1.3.4	Day tank run time at PRP rating		6.5 hr	Y	Later: 13 hrs	Y	N/A 7 hrs	N	24hr	K	
9.1.1.4	Engine Starting System										
9.1.1.4.1	Battery type	Heavy Duty Lead Acid	Sealed	VTS	8D	VTS	CAT 1300 CCA	VTS	LATER	N/A	
9.1.1.4.2	Starting system voltage	24 V DC	24	Y	24 Vdc	Y	24 Vdc	Y	24Vdc	Y	
9.1.1.4.3	Number of batteries	VTS	4	VTS		2	2	VTS	2	VTS	
9.1.1.4.4	Battery capacity	VTS	860		1400 CCA Ahf	VTS	190 Ahf	VTS	200Ahr		
9.1.1.5	Generator Data										
9.1.1.5.1	Manufacturer	VTS	Marathon		Cummins Power Generation	VTS	CAT	VTS	LATER		
9.1.1.5.2	Rated full load current	VTS	741 at Prime Power Rating		902 A	VTS	817.9 A	VTS	817.9A		
9.1.1.6	Excitation System										
9.1.1.6.1	Manufacturer	VTS	Marathon		Cummins Power Technologies	VTS	PM	VTS	LATER		
9.1.1.6.2	Voltage regulator manufacturer	VTS	Marathon by Basler DVR2000		Cummins	VTS	CAT	VTS	LATER		
9.1.1.6.3	Steady State voltage regulation(±)	+/- 0.5%	0.25	Y	± 0.5 %	Y	LESS THAN +/- 1 - 2 %	K	±0.5%	Y	
9.1.1.6.4	Descriptive information for Excitation systems and voltage regulator to be provided	Brushless Type with rotating rectifier & with PM exciter. Solid state fail safe AVR	PMG	Y	PMG + Digital PI/IIM AVR	Y	YES	Y	±5% FULL LOAD 36.07V/6.34A	N/A	
9.1.1.7	Governor										
9.1.1.7.1	Manufacturer	Woodward or equivalent	MTU ADEC	K	Cummins	Y	CAT	Y	LATER	N/A	
9.1.1.7.2	Frequency regulation(±)	VTS	0.25		± 0.25 %	VTS	0.20%	VTS	±0.5%		
9.1.1.7.3	Confirm that governor is capable of operation in Island mode (Isochronous): Yes/No	Yes	yes		Yes	VTS	yes	VTS	YES		
9.1.1.7.4	Confirm that governor is capable of operation in parallel with Utility grid (Droop): Yes/No	VTS	Yes		Yes, ILSI	VTS	yes	VTS	No		
9.1.1.7.5	Provide descriptive information for Governor	VTS	Electronic fuel injection (ECM) system		CM2150 – Electronic Isochronous Governor	VTS	MODEL ADEM A4	VTS	A DEM A4 TYPE		
9.1.1.8	Control Panel										
9.1.1.8.1	Manufacturer	VTS	MTU by Basler #DGC2020		Cummins	VTS	CAT	VTS	LATER		
9.1.1.8.2	NEMA Enclosure type	VTS	12		Nema 1	VTS	Equivalent to NEMA 1	VTS	NEMA 1(EMCP4)		
9.1.1.8.3	Control power supply by Supplier (yes/no)	VTS	yes		Cummins	VTS	yes	VTS	NO		
9.1.1.8.4	Automatic Synchroniser Manufacturer	N/A	Basler		Cummins	N/A	n/a	N/A	LATER		
9.1.1.8.5	Suitable for paralleling with Utility grid: Yes/No	VTS	Yes		No	N/A	yes	N/A	NO		
9.1.1.9	Genset Dimensions										
9.1.1.9.1	Length	<4500	4318 mm		4395 mm	VTS	4141.6 mm	VTS	4140mm		
9.1.1.9.2	Width	<1800	1600 mm		1715 mm	VTS	1823,3 mm	VTS	1820mm		
9.1.1.9.3	Height	<2300	2197 mm		2061 mm	VTS	2210,5 mm	VTS	2210mm		
9.1.1.9.4	Weight	VTS	7300 kg		6518 kg	VTS	6031 kg	VTS	5950kg		
9.1.1.10	Diesel Genset Main Fuel Tank And Transfer System										
9.1.1.10.1	Manufacturer	VTS	Desjardens		Industries Desjardins inc.		see-attached		LATER		
9.1.1.10.2	Tank type	VTS	ULCS601 Double Wall		Above ground with double wall		see-attached		DI		
9.1.1.10.3	Tank capacity	20,000 L	18200 L	K	19 230 L	K	see-attached 25 000 L	K	25000L	Y	
9.1.1.10.4	Main fuel tank run time with Spillway and similar rated Powerhouse generating units, operating at PRP rating	72 hrs	53.5 hr	N	Later: 3 days	Y	TBC	K	75% LOAD 32hr	N	
9.1.1.10.5	Transfer Pump Capacity	VTS	454 L/hr		14 000 L/hr	VTS	1736 L/hr	VTS	488.3L/hr		
9.1.1.10.6	Transfer Piping Design	double wall	NA		Double traee Omega Flex	Y	2"	K	LATER		
9.1.1.10.7	Transfer Pipe Material	VTS	Carbon Steel		Nylon 12 and Stainless Steel	VTS	TBD	VTS	ASTM A53/A53M		
9.1.1.10.8	Transfer Pipe Class	VTS	A53 Sch 40 ERW		UL97 1A	VTS	TBD	VTS	150		
9.1.1.10.9	Motor Rating	VTS	250 W		560 W	VTS	0.75HP	VTS	7500W		
9.1.1.10.10	Motor speed rated	VTS	TBD		3450 rpm	VTS	1160 rpm	VTS	1800rpm		
9.1.1.10.11	Voltage	600 Vac	120 V		120 V	K	600 V	Y	600V		
9.1.1.10.12	Starting current	VTS	TBD		30 A	VTS	7.08 HP	VTS	27A		
9.1.1.10.13	Full load current:	VTS	TBD		8A	VTS	1.18 A	VTS	9A		
9.1.1.10.14	Motor manufacturer	VTS	TBD		Fe Petro (Franklin fueling system)	VTS	WEG	VTS	LATER		
9.1.1.10.15	Motor Insulation Class	Class: F	B		Later	VTS	TEFC	VTS	LATER		
9.1.1.10.16	Motor Environmental Protection	VTS	Open drip proof		Later	VTS	IP55	VTS	LATER		
9.1.1.10.17	NEMA Frame Size	NEMA MG-1	TBD		Later	VTS	D56	VTS	LATER		



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			Package No.: CH0032		Project Title: LCP-MUSKRAT FALLS		Rev. Date.: 2013-06-13			
			Tag No.:		Client: NALCOR		Project No.: 505573			
Item Number	Description	Bidder: Specified Value or Reference	HABS		SENS		LEAFS		JETS	
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant
9.1.1.10.18	NEMA Design	VTS	TBD		Later		VTS	A	VTS	LATER
9.1.1.10.19	Inverter Duty (yes/no)	VTS	No		Later		VTS	NO	VTS	NO
9.1.2	25 kV Load Break Switch									
9.1.2.1	Manufacturer	VTS	Eaton		Dual-ADE		VTS	ABB Powercon	VTS	GENENAL ELECTRIC not answered
9.1.2.2	Model	VTS	no line item		313-027-100		VTS	see attached		
9.1.2.3	Rated voltage	25 kV 3P 60Hz	27kV	Y	27 kV	Y	see attached 27 kV	Y	Y	27kV
9.1.2.4	Rated current	600 A	600A	Y	600 A	Y	see attached 600 A	Y	Y	200A
9.1.2.5	Current Interrupting Rating	600 A	16.8 kA	Y	16.8 kA	Y	see attached 40 kA	Y	Y	12kA
9.1.2.6	Lightning Impulse Withstand (BIL)	125 kV	125kV	Y	125 kV	Y	see attached 125 kV	Y	Y	16kV
9.1.2.7	Width	<1200	2134 mm		2236 mm		VTS	see attached	VTS	LATER mm
9.1.2.8	Depth	<1500	2470 mm		2400 mm		VTS	see attached	VTS	LATER mm
9.1.2.9	Height	<2300	2413 mm		2590 mm		VTS	see attached	VTS	LATER mm
9.1.3	Dry Type Power Transformer With OLTC									
9.1.3.1	Manufacturer	VTS	Rex Power Magnetics		REX Power Magnetix		VTS	ABB	VTS	LATER
9.1.3.2	Model	VTS			N/A		VTS	see attached VPI	VTS	LATER
9.1.3.3	Voltage Ratio	24.94 kV-0.6 kV	24940 - 600/347	Y	24940 Delta/600Y347 V	Y	see attached 24940-600/347	Y	Y	25KV/600V
9.1.3.4	Rated current	VTS	1200 A	Y	28/1202.8 A	Y	see attached TBA	K	Y	1500A
9.1.3.5	Winding Configuration	Dyn11	Delta:Wye	Y	Delta/Wye	Y	see attached Delta-Y	Y	Y	DELTA - WYE
9.1.3.6	Rating Capacity	1250 kVA ANN	1250 kVA	Y	1250 kVA	Y	see attached 1250 kVA	Y	Y	1250kVA
9.1.3.7	HV Winding Lightning Impulse Withstand (BIL)	125kV	125 kV	Y	125 kV	Y	see attached 125 kV	Y	Y	125kV
9.1.3.8	HV Winding Lightning Impulse Withstand (BIL)	10kV	10 kV	Y	10 kV	Y	see attached 10 kV	Y	Y	10kV
9.1.3.9	OLTC Range - Number and size of steps	+2 x 2.5% to -4 x 2.5%	TBD	N/A	8 x 1.25% (+2, -6)	Y	see attached +2, -6 @ 2.5%	Y	Y	8x1.25%(+2, -6)
9.1.3.10	Width	<2800	2795 mm		2794 mm		VTS	see attached 2744 mm	VTS	LATER mm
9.1.3.11	Depth	<2500	1525 mm		2794 mm		VTS	see attached 2286 mm	VTS	LATER mm
9.1.3.12	Height	<2600	2794 mm		3302 mm		VTS	see attached 2286 mm	VTS	LATER mm
9.1.4	600 V Switchgear									
9.1.4.1	Manufacturer	VTS	Eaton		Dual-ADE		VTS	ABB	VTS	WESTINGHOUSE
9.1.4.2	Model	VTS			313-028-100		VTS	see attached Max-SG	VTS	LATER
9.1.4.3	Rated voltage	600V, 3P 3W	600 V	Y	600 V	Y	see attached 600 V	Y	Y	600V
9.1.4.4	Rated current	1600 A	1200 A	N	1600 A	Y	see attached 2000 A	Y	N	1200A
9.1.4.5	Interrupting Current Rating	42 kA	42 kA	Y	35 kA	Y	see attached 50 kA	Y	Y	42kA
9.1.4.6	Electronic Overload Relay Manufacturer and Model	VTS	Eaton		Schweitzer SEL 751A		VTS	see attached N/A	K	SQUARE - D
9.1.4.7	Air Circuit Breaker Manufacturer and Model	VTS	Eaton Mangdum DS		Merlin Gerin		VTS	see attached ABB Emox	N/A	SQUARE - D
9.1.4.8	Air Circuit Breaker Frame Rating	1600 A	1600AF and 800AF		1600 A	Y	see attached 1200 A	K	N	1200A
9.1.4.9	Width	<800	2657.35 mm		1220 mm		VTS	see attached 1199 mm	VTS	LATER mm
9.1.4.10	Depth	<1700	1219.2 mm		1651 mm		VTS	see attached 1753 mm	VTS	LATER mm
9.1.4.11	Height	<2300	2324.1 mm		2342 mm		VTS	see attached 2209 mm	VTS	LATER mm
9.1.5	Motor Control Centre									
9.1.5.1	Manufacturer	VTS	Eaton		EATON		VTS	ABB	VTS	SQUARE - D
9.1.5.2	Model	VTS			Freedom MCC 2100		VTS	see attached MNS-MCC	VTS	LATER
9.1.5.3	Rated voltage	600V, 3P 3W	600v, 3 Phase, 3 Wire	Y	600 V	Y	see attached 600 V	Y	Y	600V
9.1.5.4	Main bus rated current	1600 A	1600 kA		800 A	K	see attached 800-1600 A	K	N	800A
9.1.5.5	Vertical Bus rated current	VTS	600A and 800A		42 kA	Y	see attached 42 kA	Y	Y	42kA
9.1.5.6	Withstand Current Rating	42 kA	65 kA	Y	65 rms kA	Y	see attached	K	Y	42kA
9.1.5.7	Unit disconnect (switch or MCCB/MCP)	Feeder-MCCB, MCP	HMCP/Thermal-mag breaker	Y	Circuit Breaker	Y	see attached ABB Tmax MCCB	Y	Y	MCCB
9.1.5.8	Overload Relay Manufacturer and Model	VTS	Eaton C440 solid state		Later		VTS	see attached AB Electronic OR	VTS	SQUARE - D
9.1.5.9	No. of Vertical Sections	VTS	8 total (4 front & rear)		9	VTS	see attached	VTS		800A
9.1.5.10	Width	500 (each vertical section)	2032 mm		4597 mm		see attached	VTS		LATER mm
9.1.5.11	Depth	500 (each vertical section)	2134 (Front & Back) mm		536 mm	Y	see attached 500 mm	Y		LATER mm
9.1.5.12	Height	<2300	2286 mm		2324 mm	Y	see attached 2300 mm	Y		LATER mm
9.1.6	600 V Busway									
9.1.6.1	Manufacturer	VTS	Eaton		EATON		VTS	ABB	VTS	WESTINGHOUSE
9.1.6.2	Model	VTS	POW-R-WAY III		Pow-R-Way III		VTS	TBD	VTS	LATER
9.1.6.3	Enclosure Type	CSA Enclosure 1	NEMA 1	K	Indoor IP56	Y	Y	TBD	Y	NEMA 1
9.1.6.4	Rated voltage	600V 3P 60 Hz	600 V	Y	600 V	Y	Y	TBD	Y	600V
9.1.6.5	Rated current	1600A	1200 A	N	1200 A	N	TBD	N	N	1200A
9.1.6.6	Width	VTS	149.3 mm		N/A mm		VTS	TBD		LATER mm
9.1.6.7	Height	VTS	111.3 mm		N/A mm		VTS	TBD		LATER mm
9.1.6.8	Length	VTS	8230 mm		N/A mm		VTS	TBD		LATER mm
9.1.7	Manual Transfer Switch For Mobile Genset									
9.1.7.1	Manufacturer	VTS	Eaton		Caterpillar		VTS	CAT	VTS	WESTINGHOUSE
9.1.7.2	Model	VTS	Heavy Duty Double Throw switch		CTGM		VTS	see attached CTGM	VTS	LATER
9.1.7.3	Enclosure Type	VTS	NEMA 4X		Nema 1		VTS	see attached NEMA 1	VTS	NEMA 1
9.1.7.4	Rated voltage	600V 3P 4W 60 Hz	600 V	Y	600 V	Y	see attached 600 V	Y	N/A	600V
9.1.7.5	Rated current	800 A	800 A	Y	800 A	Y	see attached 800 A	Y	Y	1000A
9.1.7.6	Width	VTS	612 mm		1016 mm		VTS	see attached TBD	VTS	LATER mm
9.1.7.7	Height	VTS	1702 mm		1880 mm		VTS	see attached TBD	VTS	LATER mm
9.1.7.8	Depth	VTS	357 mm		495 mm		VTS	see attached TBD	VTS	LATER mm
9.1.8	Receptacle For Mobile Genset									
9.1.8.1	Manufacturer	VTS	Eaton		Cooper Crouse-Hinds		VTS	TBC		METRIC CORPERATION DSN 200
9.1.8.2	Model	VTS	Heavy Duty Quick Connect Switches		Posi-Max		VTS	TBC		LATER
9.1.8.3	CSA Configuration	VTS	CSA cert. file # LR68743, meets CSA22.2, no.4		Posi-Lock/Cam-Lock		VTS	TBC		LATER
9.1.8.4	Enclosure Type	NEMA 4	Receptacles 3R, Enclosure NEMA 4X, Assembly 3R	Y	Nema 1	N	TBC		Y	NEMA 4X
9.1.8.5	Rated voltage	600V 3P 4W 60 Hz	600 kV	Y	0.6 kV	Y	TBC		Y	0.6kV
9.1.8.6	Rated current	800 A	800 A	Y	800 A	Y	TBC		N	200A
9.1.8.7	Width	VTS	828.4 mm		500 mm		VTS	TBC		LATER mm
9.1.8.8	Height	VTS	2160 mm		1000 mm		VTS	TBC		LATER mm
9.1.8.9	Length	VTS	551.94 mm		250 mm		VTS	TBC		LATER mm
9.1.9	Dry Type Distribution Transformers									
9.1.9.1	Manufacturer	VTS	Rex Power Magnetics		Rex Power Magnetics		VTS	ABB Rex Power Magnetics	VTS	WESTINGHOUSE
9.1.9.2	Model	VTS	BCxxJ-M/Z (xx is kVa Rating)		Various		VTS	see attached Dry Type	VTS	P60G28T15M
9.1.9.3	Enclosure Type	CSA C 22.2 No. 94.2 (Suitable for installed environment)	NEMA1	K	Nema 2	K	see attached NEMA 3R	K	K	NEMA 1
9.1.9.4	Rated voltage	VTS	600V		0.6 kV Class		VTS	see attached 600 V	VTS	0.6kV
9.1.9.5	Voltage Ratio	600-600/347 V, 600-208/120V	600-600/347V and 600-120/208V	Y	600:208 or 600:600	Y	see attached 600-208/120, 600-600/347	Y	Y	208/120V
9.1.9.6	No. of Phases	3	3	Y	3	3	see attached 3	Y	Y	3 PHASE
9.1.9.7	Rated Capacity (list number and sizes of all distribution transformers)	45kVA 600-600/347V 2 no, 30kVA 600-208/120V-2 nos	15, 30 and 45 KVA. *Dimensions below for 45kVa	Y	15 kVA 30 kVA	K	see attached 15 kVA, 30 kVA	K	K	15 kVA
9.1.9.8	Width	VTS	572* mm		521 521 mm		VTS	see attached 609 mm	VTS	LATER mm
9.1.9.9	Height	VTS	673* mm		406 528 mm		VTS	see attached 558 mm/685 mm	VTS	LATER mm
9.1.9.10	Depth	VTS	470* mm		464 667 mm		VTS	see attached 406 mm/533 mm	VTS	LATER mm
9.1.10	Panel Boards									
9.1.10.1	Manufacturer	VTS	Eaton		Eaton		VTS	ABB Eaton	VTS	WESTINGHOUSE
9.1.10.2	Model	VTS	Pow-R-Line 1a/3a		Pow-R-Line 3a		VTS	see attached Pow-R-Line	VTS	LATER
9.1.10.3	Rated voltage	600/347, 208/120V	120/240, 120/208, 347/600, and 600 V up to 1200 A	Y	600 V	K	see attached 600/347 V, 208/120 V	Y	Y	600V
9.1.10.4	Rated bus current	225A, 100A		K	250 A	Y	see attached 100 A, 250 A	Y	Y	200A
9.1.10.5	No. of phases/wires	3P 4W	single/3 wire, 3 phase/3 wire and 4 wire	Y	3Ph 3W	K	see attached 3P, 4W	Y	Y	3 PHASE4 WIRE
9.1.10.6	Withstand Current Rating	600V -18kA, 208V-14kA	42 bus rating kA	Y	14 kA	Y	see attached 14 kA, 18 kA	Y	N	8kA
9.1.10.7	Circuit breaker interrupting current	600V -18kA, 208V-14kA	as requested	Y	10 kA	K	see attached TBD	K	Y	18kA
9.1.10.8	Circuit Breaker Manufacturer	VTS	Eaton		Eaton		VTS	see attached TBD	VTS	SQUARE - D
9.1.10.9	Circuit Breaker Model	VTS	Moulded case - Series C		FDB		VTS	see attached TBD	VTS	LATER
9.1.10.10	Main Circuit Breaker Rating	225A, 100A	as requested	Y	200 A	Y	see attached TBD	K	Y	200A
9.1.10.11	No. of branch circuit pole positions	42P				42	see attached TBD	K		LATER
9.1.10.12	Width	VTS	610 mm		508 mm		VTS	see attached 508 mm	VTS	LATER mm



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			Package No.: CH0032		Project Title: LCP-MUSKRAT FALLS		Rev. Date.: 2013-06-13				
			Tag No.:		Client: NALCOR		Project No.: 505573				
Item Number	Description	Specified Value or Reference	HABS		SENS		LEAFS		JETS		
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	
9.1.10.13	Height	VTS	Varies on # of CCTs		915 mm		VTS	see attached 1219, 1524, 1828 mm	VTS	LATER mm	
9.1.10.14	Length	VTS	290 (depth) mm		146 mm		VTS	see attached 146, 139, 146 mm	VTS	LATER mm	
9.1.11	Safety Switch For Trash Cleaner										
9.1.11.1	Manufacturer	VTS	Eaton		Eaton		VTS	TBD	VTS	WESTINGHOUSE	
9.1.11.2	Model	VTS	Heavy Duty Window Switches		DH364NRK		VTS	TBD	VTS	LATER	
9.1.11.3	Enclosure Type	CSA Enclosure 1	NEMA4X	Y	Nema 3R		K	TBD		NEMA 3R	
9.1.11.4	Rated voltage	600V 3P 4W 60Hz	600 kV	Y	0.6 kV		Y	TBD		0.6kV	
9.1.11.5	Rated current	200 A minimum	200 A	Y	200 A		Y	TBD		300A	
9.1.11.6	Width	VTS	430 mm		406.4 mm		VTS	TBD	VTS	LATER mm	
9.1.11.7	Height	VTS	899 mm		701.8 mm		VTS	TBD	VTS	LATER mm	
9.1.11.8	Length	VTS	295 mm		285.8 mm		VTS	TBD	VTS	LATER mm	
9.1.12	125 V DC Batteries And Rack										
9.1.12.1	Manufacturer	VTS	Gentec		Marathon		VTS	WESGO EnerSys	VTS	SQUARE - D	
9.1.12.2	Model	VTS	T-160HP		M12V155FT		VTS	TBD PowerSafe DDM-25	VTS	LATER	
9.1.12.3	Type	VTS	valve regulated lead acid		Lead Acid (AGM)		VTS	TBD AGM VRLA	VTS	NEMA 1	
9.1.12.4	Voltage	125 V DC	125V	Y	125 VDC		Y	TBD 125 Vdc	Y	2	
9.1.12.5	Current rating	70 Ahr minimum, bidder to complete the DC load list submitted with clarification	160Ahr	Y	155 Ahr		K	TBD 1200 Ahr	K	240Ahr	
9.1.12.6	No. of cells	60 Cells	72	Y	10 blocks of 12 V		K	TBD 60	Y	12	
9.1.12.7	Width	VTS	425 +/- 5 mm		124 mm		VTS	TBD 252 mm	VTS	LATER mm	
9.1.12.8	Height	VTS	1022 +/- 8 mm		283 mm		VTS	TBD 155 mm	VTS	LATER mm	
9.1.12.9	Length	VTS	1660 +/- 10 mm		559 mm		VTS	TBD 590 mm	VTS	LATER mm	
9.1.13	125 V DC Battery Chargers										
9.1.13.1	Manufacturer	VTS	Gentec		Primax		VTS	TBD		SQUARE - D	
9.1.13.2	Model	VTS	RS Series		P4500F-3-125-75		VTS	TBD		LATER	
9.1.13.3	Rated input voltage	600V 3P 3W 60 Hz	600 V	Y	600 VAC +/- 10%		Y	TBD		600V	
9.1.13.4	Rated output voltage	125 V DC	125 V DC	Y	125 VDC		Y	TBD		DC 125V	
9.1.13.5	Rated output current	20 A minimum (bidder to complete the DC load list submitted with clarification)	50 A	Y	75 A		Y	TBD		100A	
9.1.13.6	Battery recharge time	12hrs	TBD	K	TBA hr		K	TBD		12hr	
9.1.13.7	Width	VTS	600 mm		610 mm		VTS	TBD		LATER mm	
9.1.13.8	Height	VTS	1613 mm		1295 mm		VTS	TBD		LATER mm	
9.1.13.9	Length	VTS	600 mm		508 mm		VTS	TBD		LATER mm	
9.1.14	125 V DC Panelboards 'A' And 'B'										
9.1.14.1	Manufacturer	VTS	Eaton		Eaton		VTS	TBD		SQUARE - D	
9.1.14.2	Model	VTS	Pow-R-Line 4		EBZ2036RC		VTS	TBD		LATER	
9.1.14.3	Rated voltage	125 V DC	125 Vdc	Y	125 V		Y	TBD		125V	
9.1.14.4	Rated bus current	VTS	250 A		225 A		VTS	TBD		100A	
9.1.14.5	No. of phases/wires	2W	single / 2 wire	Y	2Pole 2W		Y	TBD		1 PHASE2 WIRE	
9.1.14.6	Withstand Current Rating	VTS	42 kA		10 kA		VTS	TBD		6kA	
9.1.14.7	Circuit breaker interrupting current	VTS	22 kA		14 kA		VTS	TBD		10kA	
9.1.14.8	Circuit Breaker Manufacturer	VTS	eaton		Eaton		VTS	TBD		SQUARE - D	
9.1.14.9	Circuit Breaker Model	VTS	Series C (HJD/HFD)		GBH		VTS	TBD		LATER	
9.1.14.10	Main Circuit Breaker Rating	40 A minimum (bidder to complete the DC load list submitted with clarification)	250 A	K	40 A		Y	TBD		100A	
9.1.14.11	No. of branch circuit pole positions	42P	36 - 2p, 15A, totaling 72	K			42	Y	TBD	18	
9.1.14.12	Width	VTS	610 mm		508 mm		VTS	TBD		LATER mm	
9.1.14.13	Depth	VTS	285 mm		915 mm		VTS	TBD		LATER mm	
9.1.14.14	Height	VTS	2286 mm		140 mm		VTS	TBD		LATER mm	
9.1.15	High Voltage Power Cable										
9.1.15.1	Manufacturer	VTS			Prysmian			General Cable		LATER	
9.1.15.2	CSA Type	Teck 90 3C+ G	C22.2 No. 68.3 and No. 174	Y	C68.3		Y	See attached HV Teck	Y	LATER	
9.1.15.3	Rated voltage	25 kV	25kV	Y	28,000 V		Y	See attached 28 kV	Y	28000V	
9.1.15.4	Conductor Material	Stranded, annealed soft bare Cu	copper	Y	Copper		Y	See attached Cu (copper)	Y	COPPER	
9.1.15.5	Insulation Material	XLPE 100%	TR-XLPE	Y	TRXLPE		Y	See attached TR-XLPE	Y	PVC	
9.1.15.6	Armour Material	Interlocked Al armour	Aluminum	Y	AIA		Y	See attached AIA	Y	XLPE	
9.1.15.7	Jacket Material	-40 Deg C PVC jacket	PVC	Y	PVC-Polyvinyl Chloride		Y	See attached PVC	Y	PVC	
9.1.16	Low Voltage Power Cable										
9.1.16.1	Manufacturer	VTS	Nexans		Prysmian			General Cable		LATER	
9.1.16.2	CSA Type	FR Teck 90 3C+ G	C22.2 No. 131 and No. 174	Y	TEK90, CSA C22.2		Y	See attached Teck 90	Y	CSA-C22.2 NO 38	
9.1.16.3	Rated voltage	VTS	600 V		1000 V		Y	See attached 1000 V	Y	600V	
9.1.16.4	Conductor Material	Stranded, annealed soft bare Cu	copper	Y	Copper		Y	See attached Cu (copper)	Y	COPPER	
9.1.16.5	Insulation Material	XLPE	XLPE	Y	XLPE		Y	See attached XLPE	Y	PVC	
9.1.16.6	Armour Material	Interlocked Al armour	Aluminum	Y	Aluminum AIA		Y	See attached AIA	Y	XLPE	
9.1.16.7	Jacket Material	-40 Deg C PVC jacket	PVC	Y	PVC		Y	See attached PVC	Y	PVC	
9.1.17	Control Cables										
9.1.17.1	Manufacturer	VTS	Nexans		Prysmian			General Cable		LATER	
9.1.17.2	CSA Type	FR Teck Shielded multiconductor	C22.2 No. 131 and No. 174	Y	TEK 90, CSA C22.2		Y	See attached Teck 90	Y	CSA-C22.2 NO 35	
9.1.17.3	Rated voltage	600V	600 V	Y	600 V		Y	See attached 600 V	Y	300V	
9.1.17.4	Conductor Material	Stranded, annealed soft bare Cu	copper	Y	Copper		Y	See attached Cu (copper)	Y	COPPER	
9.1.17.5	Insulation Material	XLPE	XLPE	Y	XLPE		Y	See attached XLPE	Y	PVC	
9.1.17.6	Armour Material	Al armour	Aluminum	Y	Aluminum AIA		Y	See attached AIA	Y	XLPE	
9.1.17.7	Jacket Material	-40 Deg C PVC jacket	PVC	Y	PVC		Y	See attached PVC	Y	PVC	
9.1.18	Fire Alarm System										
9.1.18.1	Fire Alarm Panel Manufacturer	VTS	Edwards		MIRCOM		VTS	MIRCOM	VTS	EDWARDS	
9.1.18.2	Model	VTS	IO500GD		FX2000		VTS	FX-2001-6K	VTS	LATER	
9.1.18.3	Type	VTS	4 Class B or 2 Class A		Addressable		VTS	n/a	VTS	NEMA 1	
9.1.18.4	Rated input voltage	120 V 1P 60 Hz	120 Supply - CCT 24	Y	120 V		Y	120 V	Y	120V	
9.1.18.5	Width	VTS	385 mm		635 mm		VTS	see attached	VTS	LATER mm	
9.1.18.6	Depth	VTS	158 mm		165 mm		VTS	see attached	VTS	LATER mm	
9.1.18.7	Height	VTS	280 mm		825 mm		VTS	see attached	VTS	LATER mm	
10	SPILLWAY ELECTRICAL BUILDING - MECHANICAL AUXILIARIES										
10.1	HVAC SYSTEM										
10.1.1	Vibration and Seismic Control Manufacturer		TBD	VTS	Vibro-Acoustics		VTS	TBD	VTS	Vibron Model SRH, Kortund, Vibro-Acoustics, or accented equal	
10.1.2	Operating Dampers										
10.1.2.1	Manufacturer		Alumavent	Y	Vibro-Acoustics		VTS	TAMCO	Y	Tamco	
10.1.2.2	Damper Model (Insulated)		3965BFSS	Y	Later		VTS	9000ECT	Y	9000ECT	
10.1.2.3	Damper Model (Non-insulated)		3165	Y	Later		VTS	1000	Y	1000	
10.1.3	Fire Dampers										
10.1.3.1	Manufacturer		Alumavent	Y	Roskin		Y	RUSKIN	Y	Ruskin	
10.1.3.2	Damper Model		BV	Y	DIBD2		Y	DIBD2	Y	DIBD2	
10.1.4	Emergency Generator Room Ventilation Fan										
10.1.4.1	Manufacturer		PennBarry	Y	Greenheck		Y	Greenheck	Y	Greenheck	
10.1.4.2	Model		SX125BHC	Y	BSQ-130HP-7		Y	BSQ-130HP-7	Y	BSQ-130HP-Z	
10.1.4.3	Airflow	L/s	400 L/s	Y	400 L/s		Y	400 L/s	Y	400L/s	
10.1.4.4	Static Pressure	Pa	390 Pa	Y	372 Pa		Y	372ESP + 16.2 Filter	Y	372ESP+16.2 FilterPa	
10.1.4.5	Motor	HP	3/4	Y	0.75 HP		Y	3/4 HP	Y	3/4 HP	
10.1.4.6	Octave Band Center Sound Power	dB	67 dB	Y	+/- 64 dB		Y	see attached	Y	83dB	
10.1.4.7	Inlet Filter MERV Rating		8	Y	8		Y	MERV 8	Y	MERV8	
10.1.4.8	Inlet Filter Static Pressure Drop	Pa	TBD	Y	16.2 Pa		Y	see attached	Y	51Pa	
10.1.5	Electrical Room Wall Exhausters										
10.1.5.1	Manufacturer		PennBarry	Y	Greenheck		Y	GREENHECK	Y	Greenheck	
10.1.5.2	Model		WFX12BH	Y	CWB-161HP-10		Y	CWB-161HP-10	Y	CWB-161HP-10	

Handwritten initials/signature



Bid Evaluation Plan Appendix 5



Technical Bid Evaluation			Supply / Install Powerhouse and Spillway Hydro-Mechanical Equipment				Revision No.: 01			
			Package No.: CH0032	Project Title: LCP-MUSKRAT FALLS		Rev. Date.: 2013-06-13				
			Client: NALCOR		Project No.: 505573					
Item Number	Description	Specified Value or Reference	Bidder: HABS		SENS		LEAFS		JETS	
			Proposed	Compliant	Proposed	Compliant	Proposed	Compliant	Proposed	Compliant
10.1.5.3	Airflow (each)	L/s	800 L/s	Y	800 L/s	Y	800 L/s	Y	800L/s	Y
10.1.5.4	Static Pressure	Pa	434 Pa	Y	434 Pa	Y	434 Pa	Y	434Pa	Y
10.1.5.5	Motor (each)	HP	1.5 HP	Y	1 HP	Y	1 HP	Y	1HP	Y
10.1.5.6	Octave Band Center Sound Power	dB	69 dB	Y	68 dB	Y	see attached	Y	77dB	Y
10.1.6	Engine Exhaust System									
10.1.6.1	Manufacturer		Security Chimney International	Y	Nelson	Y	CAT	Y	SelkirkMetalbestos	Y
10.1.6.2	Model		CIX Secure Stack	Y	FRD6540	Y	see attached	Y	IPS	Y
10.1.6.3	Temperature Rating	oC	1000 continuous deg C	Y	460 °C	Y	see attached	Y	540 deg C	Y
10.1.6.4	Insulation Rating			VTS	Later	VTS	see attached	Y	Double wall with 100 mm insulation	Y
10.1.7	Louvers									
10.1.7.1	Manufacturer		Ventex	Y	Ruskin	Y	Construction Specialities	Y	Construction Specialities	Y
10.1.7.2	Model		Wind driven 5" deep # 2590	Y	EmE 420DD	Y	RS-4300	Y	RS-4300	Y
10.1.7.3	Material Finish		Kinar	Y	Duracron	Y	Kynar 500 / Hylar 5000	Y	Kynar500/Hylar5000	Y
10.1.7.4	Performance Requirments		TBD	VTS	Vary with the size of the louver	Y	see attached	Y	Maxmum Airflow(L/s) 1600, 20853	Y
10.1.7.5	Free Area		TBD	VTS	Vary with the size of the louver	Y	see attached	Y	2.84, 3.17	Y
10.1.7.6	Static Pressure Drop	Pa	TBD	VTS	Vary with the size of the louver	Y	see attached	Y	27.4, 34.5 Pa	Y
10.1.8	Electrical Room Inlet Air Filter									
10.1.8.1	Manufacturer		G&F/Hardy Filtration	Y	Camfil Farr	Y	CAMFIL FARR	Y	Camfil Farr	Y
10.1.8.2	Model				V-Bank Glide Pack	Y	V-Bank Glide Pack	Y	V-Bank Glide Pack	Y
10.1.8.3	Thickness	mm	51 mm	Y	51 mm	Y	51 mm	Y	51 mm	Y
10.1.8.4	Airflow	L/s	1600 L/s	Y	1600 L/s	Y	1600 L/s	Y	1600L/s	Y
10.1.8.5	Filter Face Velocity	m/s	1.44 m/s	Y	1.44 m/s	Y	1.44 m/s	Y	1.44m/s	Y
10.1.8.6	Static Pressure Drop (Initial)	Pa	32 Pa	Y	32 Pa	Y	32 Pa	Y	32Pa	Y
10.1.8.7	Static Pressure Drop (Final)	Pa	248 Pa	Y	248 Pa	Y	248 Pa	Y	248Pa	Y
10.1.8.8	Filter MERV Rating		8	Y	8	Y	MERV 8	Y	MERV 8	Y
10.1.9	Duct Mounted Electric Heater									
10.1.9.1	Manufacturer		Thermolec	Y	Thermolec	Y	THERMOLEC	Y	Thermolec	Y
10.1.9.2	Model		Thermo-V	Y	Slip in	Y	THERMO-V	Y	Thermo-V	Y
10.1.9.3	Coil Material		Nickel chrome alloy	Y	Nickel chrome Alloy	Y	Nickel Chrome Alloy	Y	Nickel Chrome Alloy	Y
10.1.9.4	Airflow	L/s	400 L/s	Y	400 L/s	Y	400 L/s	Y	400L/s	Y
10.1.9.5	Capacity / Output	kW	12 kW	Y	12 kW	Y	12 kW	Y	12kW	Y
10.1.9.6	Control Type		SCR	Y	SCR	Y	SCR	Y	SCR	Y
10.1.9.7	Control Signal		0-10Vac	Y	0-10v dc	Y	0-10 VDC	Y	0-10 VDC	Y
10.1.10	HVAC Control System									
10.1.10.1	PLC (Programmable Logic Controller) Manufacturer		Omron	VTS	Delta	VTS	ALLEN-BRADLEY	VTS	SIEMENS	VTS
10.1.10.2	PLC (Programmable Logic Controller) Model		RP Sigma	VTS	Delta	VTS	1756-L32BWA	VTS	89-800-SIPLUS	VTS
10.1.10.3	HMI (Human Machine Interface) display Manufacturer		Schneider	Y	Delta	Y	ALLEN-BRADLEY	Y	SIEMENS	Y
10.1.10.4	HMI (Human Machine Interface) display Model			Y	Delta	VTS	2711P-T7C4D8	Y	MP377 PRO 15	Y
10.1.10.5	Control Panel Manufacturer		HMI/PCP170BB33K04 N00	Y	ControlPro Distributors	Y	HAMMOND	Y	not answered	VTS
10.1.10.6	Instrumentation / Sensor Manufacturer		ACI	Y	Delta	Y	GREYSTONE/AUTOTRON/JOHNSON	Y	not answered	VTS
10.1.10.7	Damper Actuator Manufacturer		Johnson Controls	Y	Belimo	Y	TBD AMI	VTS	not answered	VTS
10.1.10.8	Damper Actuator Model		M9208	Y	Various models	Y	TBD AMI	VTS	not answered	VTS

Specification Compliance Summary

Bidder:	1	2	3	4	5				
Compliant	Y	564	565	543	544	584	583	513	0
Technically Acceptable with Negotiated and Approved Deviations	K	77	94	94	73	120	120	120	0
Non Compliant and Not Acceptable	N	52	51	54	53	12	13	82	0
Not applicable to evaluation	N/A	167	101	101	107	107	107	154	0
Vendor to Specify	VTS	235	436	436	410	410	410	226	0

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13-06-2013

Approvals	Signature	Date	Remarks	Remarks	Remarks	Remarks	Remarks
Lead Engineer		2013-06-13	Mechanical design: Minor review for compliance. Mechanical compnents manufactured in Brasil: Will need to be surveyed.	Mechanical design: Technical acceptable but need to review several items for compliance (Overall gate and bulkhead diemnsions, hoist ropes, gate wheels, primary anchors). Main mechanical structures, welding, painting and assembling are done in Chinese facilities: Will need to be surveyed permanently.	Mechanical design: Minor review for compliance (steel plat thickness, service hoist). All mechanical components are fully manufactured in Canadian well known facilities.	Mechanical design: Insufficient information to review design approach for compliance (Most of equipment is quite oversized). All mechanical components are manufactured in Korea.	
Mechanical Lead		13-06-2013					
Electrical Lead		13-06-2013					
Engineering Manager		13-06-2013					
Package Lead		13-06-2013		Acceptable.	Acceptable	Insufficient information provided to obtain passing score	
C1 Manager							
Recommendation:			Not Acceptable	Tecnically Acceptable	Tecnically Acceptable	Not Acceptable	

PMV/ME ENJ.

RFP Name: S/I Powerhouse Hydro/Mechanical Equipment		Weight	Max Score	Sens			Leafs			Sens			Leafs		
				Score	Weighted Score	Comments	Score	Weighted Score	Comments	Score	Weighted Score	Comments	Score	Weighted Score	Comments
1i) - Bidder's quality policy statement and - list of current quality objectives.	0.7	5.0	4.5	0.18	0.00	policy statement and objectives issued	2.5	0.10	Ganotec-MUGA Fab Policy statement received. No objectives received.	0.00			0.00		
1ii) - Bidder's Master Documents List or the Table of Contents of your policy and procedures manual.	0.5	5.0	4.0	0.40	0.00	No procedures list provided	3.0	0.30	Canmec's QM TOC received Ganotec QM rec'd. Bidder clarified which manual applies. No apparent traceability between manual, QMS and certificate. See clarification question no. 92	0.00			0.00		
1iii) Bidder's current - Internal Audit Schedule. - External Audit Schedule	1.0	5.0	3.2	0.64	0.00	Audit schedules combined, previous years implementation suspect	3.0	0.60	Canmec Internal Audit schedule received. Ganotec's Audit schedule received.	0.00			0.00		
1iv) Bidder's third party ISO 9001:2008 registration, if available.	0.5	5.0	5.0	0.50	0.00	Very detailed scope definition specific to our scope of work.	2.0	0.20	Very confusing presentation of certificates across many companies. ISO 9001 certificate presented for Ganotec is a Integrated Management System between Ganotec and Muga Fab Inc., yet Execution Plan indicates that the QMS of Ganotec will serve as the foundation of their program.	0.00			0.00		
1v) Most Recent Management Review Minutes of Meeting.	1.0	5.0	3.0	0.60	0.00	Only Table of contents provided	2.5	0.50	Canmec Management Review minutes submitted. Ganotec submitted a Quality presentation when asked for Mgmt Review minutes.	0.00			0.00		
1vi) If ISO 9001:2008 registration is held, a copy of last third party surveillance report.	0.3	5.0	5.0	0.30	0.00		2.5	0.15	Audit report was conducted on a Project JV of three different organizations of which Ganotec was joint ventured with Muga Fab Inc.	0.00			0.00		
2) Briefly describe any processes employed to plan the activities related to the requested products / services. If available, provide typical examples of - Quality Plans and / or - Inspection and Test Plans.	0.4	5.0	5.0	0.40	0.00	Good submission of ITP's	3.0	0.24	Myriad of QP & ITP submissions submitted between Ganotec and Canmec	0.00			0.00		
3) Describe how this work relates to the total annual productive capacity of Bidder's company and that of Bidder's main suppliers.	0.5	5.0	3.5	0.35	0.00		2.0	0.20		0.00			0.00		
4) Briefly describe the processes used to control the design of the products / services to be supplied. Include references to the following processes: * Design Planning * Design Review * Design Verification * Design Validation * Design Changes	1.0	5.0	4.0	0.80	0.00		1.0	0.20		0.00			0.00		
5) Briefly describe the Bidder's Supplier / Sub-contractor selection process and any processes employed to monitor continued performance against contract requirements. In Bidder's response include a list of any services associated with the scope of work that would be sub-contracted out and where appropriate, the contract details for that Sub-Contractor.	1.0	5.0	4.5	0.90	0.00	List of subcontracted services provided in A16 as part of Commercial response. Supplier Assessment and Selection procedure included with response to questionnaire	2.0	0.40	List of subcontracted services provided in response to A16 question	0.00			0.00		
6) What techniques does the Bidder employ to verify that the product / service have been delivered appropriately and in accordance with the contract requirements? What verification records are generated?	0.4	5.0	4.0	0.32	0.00	Answer is acceptable and ITP's submitted are acceptable.	2.0	0.16		0.00			0.00		
7) Briefly describe the Bidder's records retention system and the normal records retained (or supplied to the client) as part of this product / service delivery. Bidder's response should make reference to records such as Material Test Reports, Non-destructive examination records, in process inspections and Factory Acceptance tests.	0.2	5.0	3.0	0.12	0.00		2.5	0.10		0.00			0.00		
8) What processes does the Bidder employ to ensure that inspection is performed and Measuring and Test Equipment is fully calibrated and functioning appropriately?	0.5	5.0	4.0	0.40	0.00		2.0	0.20		0.00			0.00		
9) When products / services do not meet requirements, what processes are employed to ensure timely resolution of the problem? If so, what records of the problem and solution are generated?	0.2	5.0	4.0	0.16	0.00	NCR procedure submitted	2.5	0.10		0.00			0.00		
10) Does the Bidder employ any continuous improvement processes or other methods to monitor evaluate and improve the quality of products / services provided? If so, briefly describe them. Include in your response details on the following: * Processes to monitor and measure effects of continuous improvement changes. * Processes for the evaluation and implementation of innovative and cost reduction ideas.	0.5	5.0	4.0	0.40	0.00		2.5	0.25		0.00			0.00		
11) Does the Bidder employ any processes to monitor internal / external activities to ensure conformance to procedures? If so, briefly describe them.	0.5	5.0	3.5	0.35	0.00		2.5	0.25		0.00			0.00		
12) Briefly describe the Bidder's Training Policy and any controls used to ensure personnel are competent to perform their defined functions and responsibilities.	0.5	5.0	3.5	0.35	0.00		2.0	0.20		0.00			0.00		
13) Briefly describe any servicing and / or product support required / recommended as part of the delivery of this equipment / service.	0.5	5.0	3.0	0.30	0.00		0.0	0.00		0.00			0.00		
14) Briefly describe any processes employed to monitor Customer Satisfaction and how these processes will be applied to the proposed scope of work.	0.2	5.0	4.0	0.16	0.00		2.0	0.08		0.00			0.00		
15) The Bidder shall confirm that it has reviewed and can comply with any Quality Assurance requirements outlined in the contract agreement and that the responses to this questionnaire are true and accurate.	0.1	5.0	5.0	0.10	0.00	QM Sign off	2.0	0.04	President sign off. Requested to have QM sign off but request was denied.	0.00			0.00		
Total Weighted Score With Design	10.0			7.73			0.00	4.27		0.00			0.00		
Preliminary evaluation scores based on requested objective documentary evidence submissions only as depicted by the colour blue.			77%				0%		43%				0%		0%
Desk Top Study Score-Based Recommendation									Canmec-Design & Manufacturing Ganotec - Construction Exec & PM						

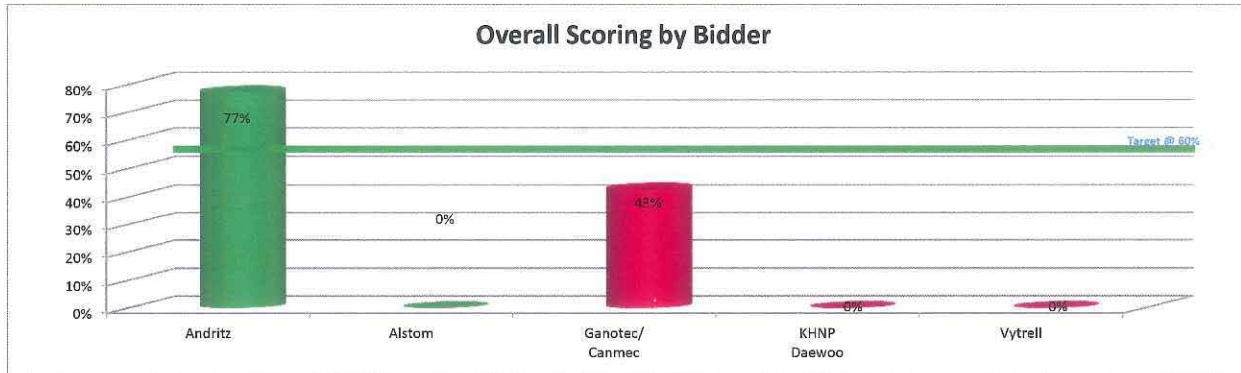
**Proponent must achieve a minimum Total Weighted Score of 60 percent to be considered acceptable.

Comments: (Overall impression of the Bidder and how the evaluation relates to the recommendation)
 Sens: Andritz Hydro's Quality submission was acceptable with responses provided by their Quality Manager who was able to provide appropriate details to applicable questions. The response to the questionnaire was supplemented with supporting QA procedures.
 Bidder 2:
 Leafs: The collaboration of players and required interface management represents a risk to the project. There is no sound evidence of coherent implementation of Quality Assurance. This is concerning regarding design control and associated interface between all parties.
 Bidder 4:
 Bidder 5:

Evaluation Rating	
Recommended	Green
Clarification / Pre Award Audit (Desk Top and/or Site) Recommended	Yellow
Not Recommended	Red

Scoring Guide:	
0 - Question not answered or no relevant information provided in response	
1 - Response does not meet key criteria	
2 - Response only meets a few of the key criteria	
3 - Response meets a majority of the key criteria	
4 - Response meets all key criteria	
5 - Response meets and exceeds key criteria	

Quality Representative: **P. REID**
 Date: **12 JUN 13**



Health and Safety Scoring Guide:													
0 - Question not answered or no relevant information provided in response 1 - Response does not meet key Criteria 2 - Response only meets a few of the key criteria 3 - Response meets a majority of the key criteria 4 - Response meets all key criteria 5 - Response meets and exceeds key criteria							Package Name: Supply and Install Powerhouse and spillway Mechanical Package No.: CH0032 Project: Lower Churchill Project						
Question Weight (%)	Ganotec		Alstom		Andritz		Vytrel		KHNP / Daewood		Bidder		
	Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score	
Health and Safety													
2.0 HEALTH AND SAFETY MANAGEMENT PERFORMANCE - Please provide the following safety statistics, referencing the attached incident definitions and frequency calculation.													
10	4	8	3	6	1	2		0		0		0	
3.0 WORKER'S COMPENSATION - Indicate the jurisdiction where you are registered. List your overall Worker's Compensation industry rating for the current year and past three (3) years. Attach a WCB clearance letter and experience rating statements for the past three years.													
3	4	2.4	4	2.4	4	2.4		0		0		0	
4.1 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Do you have a certificate of recognition or is your health and safety management system certified by an outside agency? (DHSAS 18001, CSA Z-1000 etc.) If yes, provide a copy of the certificate.													
2	5	2	4	1.6	3	1.2		0		0		0	
4.2 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Does your health and safety program have a policy statement that clearly outlines the Company's commitment to health and safety?													
3	4	2.4	4	2.4	4	2.4		0		0		0	
4.3 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Has your company received an occupational health and safety stop work order, charges or equivalent from any regulator in the last three (3) years? If yes, provide details.													
3	3	1.8	4	2.4	1	0.6		0		0		0	
4.4 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Please list the highest ranking safety professional in your organization; (attach résumé). Do you plan to have a safety representative(s) for this Work full time or part time (Y or N)? If "Yes", provide a résumé(s).													
3	3	1.8	3	1.8	4	2.4		0		0		0	
4.5 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Does your health and safety management system address the following key elements? Management leadership and commitment; hazard/risk identification, evaluation and control; risk assessments on all critical and non-routine jobs/job functions; a permit to work system; ongoing inspection. If yes to any of these, reference appropriate Health and Safety manual section(s).													
8	4	6.4	4	6.4	4	6.4		0		0		0	
4.6 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Does your health and safety management system include work practices and procedures, such as: Lockout and tagout; traffic control; excavation and trenching; confined space entry; hoisting and rigging; working near power lines; handling and transporting hazardous substances; unloading large/long materials (such as piles); vehicle recovery. If yes to any of these, reference appropriate Health and Safety manual section(s).													
8	4	6.4	4	6.4	4	6.4		0		0		0	

Question Weight (%)	Ganotec		Alstom		Andritz		Vytrell		KHNP / Daewood		Bidder	
	Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score
Health and Safety												
4.7 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Do you have written programs for the following? Duty to refuse work; fall protection; noise management; workplace violence; working alone; personal protective equipment (PPE); WHMIS (Workplace Hazardous Materials Information System); respiratory protection. If yes to any of these, reference appropriate Health and Safety manual section(s). In regards to respiratory protection, have your employees been: trained? fit tested? medically approved?	8	4	6.4	4	6.4	4	6.4	0	0	0	0	0
4.8 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Do you conduct medical exams for the following? Pre-employment; replacement job capacity; pulmonary; respiratory. If yes to any of these, reference appropriate Health and Safety manual section(s).	2	0	0	3	1.2	4	1.6	0	0	0	0	0
4.9 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Do you have a drug and alcohol program? If "Yes", does it include the following? Pre-employment testing; testing for cause; post incident testing; formalized arrangements with a collection and testing agency (if "Yes", provide testing agency information); does your drug and alcohol policy follow the guidelines as laid out in The Canadian Model for Providing A Safe Workplace – Alcohol and Drug Guidelines and Work Rule Version 2 – Effective October 1, 2010? If yes to any of these, reference appropriate Health and Safety manual section(s).	3	3	1.8	3	1.8	4	2.4	0	0	0	0	0
4.10 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Equipment (Tools, Supplies, Machinery and Sanitary Facilities): Do you have a written list of equipment requiring pre-use inspections? Do you have a documented list of equipment requiring scheduled servicing in accordance with manufacturer's recommendations, legislated requirements, and industry standards? Is frequency of equipment inspections and maintenance identified? Are corrections of deficiencies documented? Do you have follow-up mechanism for corrective actions? If yes to any of these, reference appropriate Health and Safety manual section(s).	4	4	3.2	4	3.2	4	3.2	0	0	0	0	0
4.11 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Orientation Program: Do you have a health and safety orientation program? Does the program include new, transferred and temporary workers? Does the program provide instruction on the following: employer health and safety responsibilities; employee health and safety responsibilities; obligation to refuse imminent danger work; progressive discipline policies and procedures; safe work practices and/or procedures; emergency response procedures; first-aid procedures; incident/near miss reporting; does your orientation program include a quiz? If yes to any of these, reference appropriate Health and Safety manual section(s).	5	4	4	4	4	4	4	0	0	0	0	0
4.12 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Incident Investigation: Do you have a written procedure for incident reporting and investigation? Do you utilize a root cause determination process such as "Tap-Root"? If yes to any of these, reference appropriate Health and Safety manual section(s).	5	4	4	4	4	4	4	0	0	0	0	0
4.13 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Do you have an emergency response plan related to activities and specific locations? If yes reference appropriate Health and Safety manual section(s).	4	4	3.2	4	3.2	4	3.2	0	0	0	0	0

	Question Weight (%)	Ganotec		Alstom		Andritz		Vytrell		KHNP / Daewood		Bidder	
		Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score
Health and Safety													
4.14 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Do you have a policy pertaining to prohibited items on (e.g. knives, firearms)? Are all employees made aware of the prohibited items policy and is it enforced? If yes to any of these, reference appropriate Health and Safety manual section(s).	1	3	0.6	4	0.8	4	0.8		0		0		0
4.15 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Do you make reference to following legislative requirements where work is being performed?; violence policies and procedures; harassment policies and procedures. If yes to any of these, reference appropriate Health and Safety manual section(s).	1	4	0.8	4	0.8	4	0.8		0		0		0
4.16 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Do you have a policy or specific rules with respect to the use of personnel protective equipment (PPE)? Do you have a formal process in place for determining PPE requirements? If yes to any of these, reference appropriate Health and Safety manual section(s).	3	4	2.4	4	2.4	4	2.4		0		0		0
4.17 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Contractor Management: Do you pre-qualify subcontractors? Do you include subcontractors in: orientations, health and safety meetings, inspections, audits. If yes to any of these, reference appropriate Health and Safety manual section(s).	5	4	4	4	4	4	4		0		0		0
4.18 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Communications: Do you inform employees and subcontractors on Health and Safety alerts, programs, practices, procedures, rules, revisions and related information? Do you have a joint Health and Safety committee? Do you hold scheduled safety meetings, such as weekly general safety meetings for all crew and weekly departmental meetings for each department at all worksites? Are Health and Safety meeting minutes and attendance recorded? If yes to any of these, reference appropriate Health and Safety manual section(s).	5	4	4	4	4	4	4		0		0		0
4.19 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Does your Health and Safety program outline the requirements for supervisors and employees to conduct regular Health and Safety inspections of equipment and work conditions at all worksite(s)? If yes reference appropriate Health and Safety manual section(s).	3	4	2.4	4	2.4	4	2.4		0		0		0
4.20 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Does your Health and Safety program require the prompt reporting of hazardous conditions at all worksite(s)? If yes reference appropriate Health and Safety manual section(s).	5	4	4	4	4	4	4		0		0		0
4.21 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Health and Safety Training: Have your employees received the required Health and Safety training and retraining? Do you have a specific Health and Safety training program for supervisors? If yes to any of these, reference appropriate Health and Safety manual section(s).	3	4	2.4	4	2.4	4	2.4		0		0		0
4.22 HEALTH AND SAFETY SUPPLEMENTARY QUESTIONS - Training Records: Do you have Health and Safety training records for your employees? How do you verify competency of the training (job monitoring? written test? competency check? oral test? other?). Are all training records available upon request? If yes to any of these, reference appropriate Health and Safety manual section(s).	3	3	1.8	4	2.4	4	2.4		0		0		0
Score	100		76.20		76.40		71.80		0.00		0.00		0.00
Percentage			76.20%		76.40%		71.80%		0.00%		0.00%		0.00%
PASS/FAIL			PASS		PASS		PASS						

Minimum Pass Score is 70%

	Question Weight (%)	Ganotec		Alstom		Andritz		Vytrel		KHNP / Daewood		Bidder	
		Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score

Health and Safety


Evaluated By	Sean Lee 
Reviewed By	
Review Date	25-Apr-13

Health and Safety Scoring Guide: 0 - Question not answered or no relevant information provided in response 1 - Response does not meet key Criteria 2 - Response only meets a few of the key criteria 3 - Response meets a majority of the key criteria 4 - Response meets all key criteria 5 - Response meets and exceeds key criteria		Package Name: Supply and Install Powerhouse and spillway Mechanical Package No.: CH0032 Project : Lower Churchill Project
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Question Weight (%)	Ganotec		Alstom		Andritz		Vytrell		KHNP / Daewood	
	Answer	Score	Answer	Score	Answer	Score	Answer	Score	Answer	Score

Health and Safety											
PASS/FAIL	PASS		PASS		PASS		Could Not Complete		Could Not Complete		
	No further clarification required. H&S Management System provided meets the requirements of the evaluation criteria to obtain a pass mark.		H& Management System provided meets the requirements for a passing rate.		H& Management System provided meets the requirements for a passing rate.		Only provided a table of contents and did not provide a copy of the H&S Management System		Could not evaluate, the documents provided were not robust enough to provide adequate evaluation.		
	OHSAS 18001 Registered and certificate provided.		Over the last 3 years Alstrom has had 20 Lost Time Injuries. What actions has been taken to ensure this trend does not continue. Have the trends determined that these incidents occurred on site during installation or during manufacturing.		Over the last 2 years Andritz has had 16 Lost Time Injuries and 22 medical aids. What actions has been taken to ensure this trend does not continue. Have the trends determined that these incidents occurred on site during installation or during manufacturing.						
					In a period of just over a year Andritz had 2 stop work orders and a fine, what actions have been taken to ensure that this does not happen on the LCP? What improvements have been made to your H&S Management System?						

Minimum Pass Score is 70%

Evaluated By	Sean Lee 
Reviewed By	
Review Date	25-Apr-13

RFP - Environmental Evaluation											
RFP #: CH0032		RFP Name: S/I Powerhouse Hydro/Mechanical Equipment									
	Weight	Max Score	Alstom Vytrel		KHP Daewoo		Ganotec/Canmec		Andritz		Scoring Instructions
Evaluation Plan Appendix 10			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	(Pass Mark 70%)
MANAGEMENT INVOLVEMENT, LEADERSHIP AND ADMINISTRATION											
1.1 Environmental Management System (ISO or Not)?	3.0	5.0	5.0	3.00	5.0	3.00	5.0	3.00	5.0	3.00	If ISO Score 5, If not ISO Score 3, If No System score 0
1.1a Adequacy of TOC (if provided)	3.0	5.0	4.0	2.40	0.0	0.00	5.0	3.00	5.0	3.00	Rank adequacy 1 - 5; If not provided Score 0
1.1b Adequacy of Environmental Policy (if provided)	3.0	5.0	4.0	2.40	0.0	0.00	5.0	3.00	5.0	3.00	Rank adequacy 1 - 5; If not provided Score 0
1.3 Are environmental targets developed and reviewed on a regular basis?	3.0	5.0	5.0	3.00	5.0	3.00	5.0	3.00	5.0	3.00	Yes = 5; No = 0
1.3a Adequacy of Environmental targets	3.0	5.0	3.0	1.80	3.0	1.80	4.0	2.40	4.0	2.40	Rank adequacy 1 - 5; If not provided Score 0
1.4 Has a formal system, including the use of audits and inspections, been developed to define responsibilities for verifying that environmental performance objectives are met?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
1.4a Adequacy of audit and inspection information	1.5	5.0	4.0	1.20	3.0	0.90	4.0	1.20	4.0	1.20	Rank adequacy 1 - 5; If not provided Score 0
2. ENVIRONMENTAL HAZARD IDENTIFICATION AND RISK MANAGEMENT											
2.1 Does the Bidder conduct formal risk assessments when planning and implementing operations and activities?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
2.2 If "Yes", does that risk assessment include environmental risks?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
2.2a adequacy of risk management system	1.5	5.0	5.0	1.50	3.0	0.90	5.0	1.50	4.0	1.20	Rank adequacy 1 - 5; If not provided Score 0
2.3 Has a formal hazard observation program been implemented at the Bidder's worksites?	0.5	5.0	5.0	0.50	5.0	0.50	5.0	0.50	4.0	0.40	Yes = 5; No = 0
2.3a Adequacy of hazard observation program	0.5	5.0	3.0	0.30	3.0	0.30	4.0	0.40	4.0	0.40	Rank adequacy 1 - 5; If not provided Score 0
3. ORGANIZATIONAL RULES AND WORK PROCEDURES											
3.1 Does the Bidder have documented environmental protection plans for all jobs/work activities?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
3.1a adequacy of EPP	2.5	5.0	4.0	2.00	5.0	2.50	5.0	2.50	4.0	2.00	Rank adequacy 1 - 5; If not provided Score 0
3.2 Does the Bidder have environmental contingency plans?	1.5	5.0	5.0	1.50	3.0	0.90	5.0	1.50	5.0	1.50	Yes = 5; No = 0
3.2a adequacy of contingency plans/Does the plan outline responsibilities, available resources and actions to be taken in the event of an environmental incident?	1.5	5.0	4.0	2.00	5.0	2.50	4.0	2.00	4.0	2.00	Rank adequacy 1 - 5; If not provided Score 0
4. EMPLOYEE KNOWLEDGE, TRAINING AND AWARENESS											
4.1 Does the Bidder have an environmental awareness program?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
4.1a Adequacy of Program?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Rank adequacy 1 - 5; If not provided Score 0
4.2 Does the Bidder provide environmental awareness training to supervisory staff?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
4.3 What is frequency of environmental awareness training?	2.0	5.0	1.0	0.40	3.0	1.20	3.0	1.20	1.0	0.40	Score 1-5. If monthly score 5; If bimonthly score 4; if quarterly score 3; if biannually score 2; if annually score 1
4.3a Adequacy of content environmental awareness training	2.0	5.0	4.0	1.60	2.0	0.80	3.0	1.20	3.0	1.20	Rank adequacy 1 - 5; If not provided Score 0
5. PERSONAL COMMUNICATIONS AND ENVIRONMENTAL MEETINGS											
5.1 Are personal communications conducted to impart environmental awareness with other workers and thereby reducing the likelihood of non-compliances or environmental incidents?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
5.2 Is there a system for sharing best practices and procedures, incidents and other information across the Bidder's organization?	1.0	5.0	5.0	1.00	5.0	1.00	5.0	1.00	5.0	1.00	Yes = 5; No = 0
5.3 Is there an environment committee in place?	1.0	5.0	5.0	1.00	5.0	1.00	5.0	1.00	5.0	1.00	Yes = 5; No = 0

RFP - Environmental Evaluation											
RFP #: CH0032		RFP Name: S/I Powerhouse Hydro/Mechanical Equipment									
	Weight	Max Score	Alstom Vytrel		KHNP Daewoo		Ganotec/Canmec		Andritz		Scoring Instructions
Bid Evaluation Plan Appendix 10			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	(Pass Mark 70%)
Are regular (minimum monthly) environmental meetings held at all facilities to maintain effective communication of environmental information throughout the organization and with Bidder's contractors?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
5.4a Adequacy of content and frequency of environmental meetings?	1.5	5.0	3.0	0.90	5.0	1.50	5.0	1.50	5.0	1.50	Rank adequacy 1 - 5; if not provided Score 0
5.5 Are minutes and records of attendance of these meetings maintained?	0.5	5.0	5.0	0.50	5.0	0.50	5.0	0.50	5.0	0.50	Yes = 5; No = 0
5.5a Adequacy of meeting minutes	0.5	5.0	4.0	0.40	4.0	0.40	3.0	0.30	3.0	0.30	Rank adequacy 1 - 5; if not provided Score 0
5.6 Does the Bidder respond in writing to environmental concerns raised at environmental meetings?	1.0	5.0	4.0	0.80	4.0	0.80	4.0	0.80	3.0	0.60	Yes = 5; No = 0
6. ENVIRONMENTAL MONITORING AND REPORTING											
6.1 Has the Bidder developed specific procedures for environmental monitoring and reporting on incidents that occur at its worksites?	1.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
6.1a Adequacy of monitoring and incident procedure	1.5	5.0	4.0	1.20	3.0	0.90	5.0	1.50	4.0	1.20	Rank adequacy 1 - 5; if not provided Score 0
6.2 Does the Bidder use an EMS system to establish standards, reporting and follow up and corrective action?	1.5	5.0	0.0	0.00	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
6.2a Adequacy of this process	1.0	5.0	0.0	0.00	3.0	0.60	4.0	0.80	3.0	0.60	Rank adequacy 1 - 5; if not provided Score 0
6.3 Does the Bidder have dedicated environmental personnel?	1.0	5.0	0.0	0.00	4.0	1.60	5.0	2.00	5.0	2.00	Yes = 5; No = 0
6.3a Adequacy of personnel and responsibilities	0.5	5.0	3.0	0.30	3.0	0.30	5.0	0.50	5.0	0.50	Rank adequacy 1 - 5; if not provided Score 0
Are supervisors formally trained in accident/investigations?	1.0	5.0	5.0	1.00	5.0	1.00	5.0	1.00	4.0	0.80	Yes = 5; No = 0
6.4a Adequacy of training program and frequency	0.5	5.0	4.0	0.40	4.0	0.40	4.0	0.40	4.0	0.40	Rank adequacy 1 - 5; if not provided Score 0
7. ENVIRONMENTAL INCIDENT ANALYSIS											
7.1 Does the Bidder have in place a formal system for the collection, analysis, trending and evaluation of environmental incident data and statistical analysis?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
7.2 Does the Bidder develop monthly environmental incident analysis reports, which are reviewed during management review meetings?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
7.3 Does senior management review and comment on serious and significant environmental incidents?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
7.4 Are all incident reports followed through from recommendations to completion and closure?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
8. LEADERSHIP TRAINING											
8.1 Does Bidder's management receive formal environmental management training which provides a thorough understanding of the philosophies and principles behind environmental management?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
8.1a Adequacy of environmental management training	2.0	5.0	4.0	1.60	2.0	0.80	5.0	2.00	4.0	1.60	Rank adequacy 1 - 5; if not provided Score 0
8.2 Does the Bidder's management receive an orientation to the Bidder's Environmental Management System that includes an introduction to individual accountabilities and responsibilities?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
8.2a Adequacy of orientation	2.0	5.0	3.0	1.20	3.0	1.20	4.0	1.60	5.0	2.00	Rank adequacy 1 - 5; if not provided Score 0
9. ENVIRONMENTAL AUDITS, INSPECTIONS AND PREVENTATIVE MAINTENANCE											
9.1 Is there a documented process for performing environmental audits?	2.5	5.0	5.0	2.50	5.0	2.50	5.0	2.50	5.0	2.50	Yes = 5; No = 0
9.2 Has a formal process been developed to ensure routine environmental monitoring?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
9.3 Does the Bidder have planned preventative measures in place to prevent environmental incidents?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
10. CRITICAL OPERATION AND TASK ANALYSIS											

RFP - Environmental Evaluation											
RFP #: CH0032			RFP Name: S/I Powerhouse Hydro/Mechanical Equipment								
	Weight	Max Score	Alstom Vytrel		KHNP Daewoo		Ganotec/Canmec		Andritz		Scoring Instructions
Bid Evaluation Plan Appendix 10			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	(Pass Mark 70%)
Has a systematic approach been developed to identify and inventory tasks based on mandatory rules, regulations and applicable codes, guidelines and standards?	2.0	5.0	5.0	2.00	5.0	2.00	5.0	2.00	5.0	2.00	Yes = 5; No = 0
10.2 Is there a formal process to assess the environmental requirements associated with the tasks and to mitigate the risk to ensure compliance with the requirements?	2.0	5.0	4.0	1.60	4.0	1.60	5.0	2.00	5.0	2.00	Yes = 5; No = 0
11. SYSTEM REVIEW AND EVALUATION											
11.1 Do the Bidder's senior management conduct regular reviews of the Environmental Management System, at least annually or at more frequent intervals, as the organization may deem necessary?	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	Yes = 5; No = 0
11.1a Adequacy of reviews	1.5	5.0	4.0	1.20	5.0	1.50	5.0	1.50	4.0	1.20	Rank adequacy 1 - 5; if not provided Score 0
11.2 Do these reviews include environmental management policies and procedures and other inputs such as the results and recommendations from environmental audits, monitoring and surveys and analysis of incident investigations?	1.0	5.0	5.0	1.00	5.0	1.00	5.0	1.00	5.0	1.00	Yes = 5; No = 0
12. STATISTICS											
12.1 Number and type of directives from clients or regulators	1.0	5.0	5.0	1.00	5.0	1.00	5.0	1.00	3.0	0.60	For 3 yr period: >= 5 score 0; 4 score 1; 3 score 2; 2 score 3; 1 score 4; 0 score 5
12.2 Oil spill incidents;	1.5	5.0	5.0	1.50	5.0	1.50	0.0	0.00	3.0	0.90	For 3 yr period: >= 5 score 0; 4 score 1; 3 score 2; 2 score 3; 1 score 4; 0 score 5
12.3 Waste management incidents;	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	For 3 yr period: >= 5 score 0; 4 score 1; 3 score 2; 2 score 3; 1 score 4; 0 score 5
12.4 Hazardous materials incidents;	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	For 3 yr period: >= 5 score 0; 4 score 1; 3 score 2; 2 score 3; 1 score 4; 0 score 5
12.5 Water degradation incidents;	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	For 3 yr period: >= 5 score 0; 4 score 1; 3 score 2; 2 score 3; 1 score 4; 0 score 5
12.6 Air degradation incidents; and	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	For 3 yr period: >= 5 score 0; 4 score 1; 3 score 2; 2 score 3; 1 score 4; 0 score 5
12.7 Soil degradation incidents.	1.5	5.0	5.0	1.50	5.0	1.50	5.0	1.50	5.0	1.50	For 3 yr period: >= 5 score 0; 4 score 1; 3 score 2; 2 score 3; 1 score 4; 0 score 5
12.8 Total Environmental Incidents	1.0	5.0	5.0	1.00	5.0	1.00	5.0	1.00	5.0	1.00	For 3 yr period: >= 5 score 0; 4 score 1; 3 score 2; 2 score 3; 1 score 4; 0 score 5
Total Weighed Scores	100.0			86.20		84.40		94.30		91.90	

Comments:

Provided by e-mail to Contract procurement representative.

Environmental Manager: David Haley
 Date: 05-May-13

David Haley 17 June 2013

Appendix 15

Schedule and Execution Plan Evaluation Matrix
 Package # 505573-CH0032 (Component C1)
 Hydro - Mechanical

Contract Administrator: R. Anderson
 Lead Technical: Bruce Drover
 Lead Commercial: Ed Over
 Lead Planner: Tony Scott
 Senior Planner - C1: Marvin Zylber
 Area Managers: Luc Turcotte
 Construction: Laird Paton

Date: 10-Jun-13

NOTE: Each subsection is rated on a scale 1 - 10 (rating) then multiplied by the weighted value (weighting) for the item (within the evaluation subsection) to get the item value.

Section 3 Schedule & Execution Plan

Weighted value:		10%		Habs		Sens		Leafs		Jets		Bidder 5		Comments:
Criteria:	Item wgtg	Rating 0-10	Item value	Rating 0-10	Item value	Rating 0-10	Item value	Rating 0-10	Item value	Rating 0-10	Item value	Rating 0-10	Item value	
1	Work Schedule Milestones	30%	x	10	3.00	10	3.00	10	3.00	10	3.00	0	0.00	All reflected in their HFP's that they met the milestones
2	Site Staff Schedule	10%	x	6	0.60	9	0.90	9	0.90	6	0.60	0	0.00	Senators and Leafs optimized staffing plans and matched MFL to schedule
3	Payment Schedule (against deliverables)	10%	x	6	0.60	9	0.90	9	0.90	6	0.60	0	0.00	Issue for Commercial. Some bidders did not define clearly match their payment schedule (to deliverables)
4	SLHL Compliant with Schedule	10%	x	6	0.60	9	0.90	9	0.90	7	0.70	0	0.00	Senators and Leafs were compliant with schedule
5	Schedule Quality	20%	x	5	1.00	10	2.00	10	2.00	5	1.00	0	0.00	Senators had a better quality schedule in terms of presentation and logic. Habs & Jets schedule was hard-to-follow
6	Execution Plan / Strategy	20%	x	4	0.80	8	1.60	8	1.60	5	1.00	0	0.00	Leafs will manufacture locally. Senators need to ship parts worldwide. Logistics risk. Issue for Commercial per cost/benefit
			x		0.00		0.00		0.00		0.00	0	0.00	Leafs have VERY good manufacturing approach, but concerns with site construction - SCHEDULE / FLOAT 30 4/18
			x		0.00		0.00		0.00		0.00	0	0.00	
		100%		##	37.00	6.60	55.00	9.30	55.00	9.30	39.00	6.90	0.00	0.00
						X	X	X	X	X	X	X	X	
						10%	10%	10%	10%	10%	10%	10%	10%	
						Points value	0.66	0.93	0.93	0.69	0.69	0.00	0.00	

SUMMARY OF RESULT

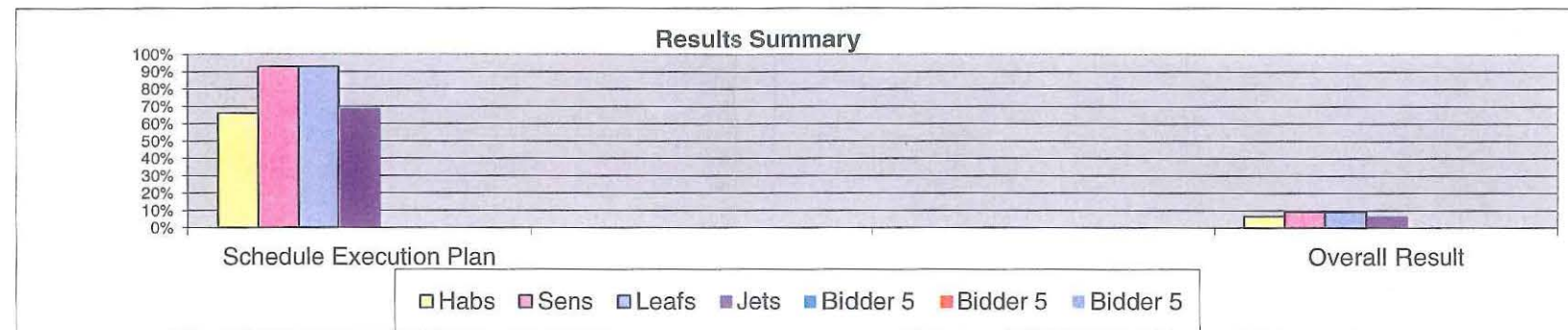
Points value of Section 3 Schedule & Execution Plan
 OVERALL RATING OF PROPOSALS

	Habs	Sens	Leafs	Jets	Bidder 5
Points value of Section 3 Schedule & Execution Plan	66%	93%	93%	69%	0%
OVERALL RATING OF PROPOSALS	7%	9%	9%	7%	0%

Overall Comments:

No bidder 5. Only met Senators and Leafs in pre-bid meetings to-date
 Senators team already contractors on CH0030 turbine project. Thus LCP is familiar with their team and quality of work.

	Habs	Sens	Leafs	Jets	Bidder 5
Schedule Execution Plan	66%	93%	93%	69%	0%
Overall Result	7%	9%	9%	7%	0%



Signature
 miz

Provincial Benefits (including INNU Content) - Labour RFP Evaluations
(for use on Civil, Supply & Install, and Services RFPs)

RFP #: Ch0032 Title:

Section	Description / Expectation	Weighting Assigned	Sens		incomplete questionnaire		jets		Leafs		Score Given	Weighted Score	Comments	Score Given	Weighted Score	Comments	Bidder 6		Bidder 7		
			Score Given	Weighted Score	Score Given	Weighted Score	Score Given	Weighted Score	Score Given	Weighted Score							Score Given	Weighted Score			
2.1	Contracting and Procurement (7.5%)																				
2.1 a)	Describe Bidder's experience with implementing local benefits strategies and agreements, including Aboriginal agreements	2.5		0			0	0	no canadian experience	5	2.5	projects listed		0			0	0		0	0
2.1 b)	Describe Bidder's procurement policies and procedures that will ensure reasonable advance notice to NL supply community of all procurement opportunities	2.5		0			2	1	ystem for international pr	5	2.5	direct contacts		0			0	0		0	0
2.1 c)	Describe Bidder's familiarity with NL contractor/supply capabilities. If Bidder is not currently familiar with these capabilities, describe proposed steps to ensure familiarity	2.5		0			5	2.5	orking with M&M and Cal	5	2.5			0			0	0		0	0
2.2	Employment (5%)																				
2.2 a)	Describe Bidder's familiarity with Newfoundland & Labrador workforce	2.5		0			5	2.5	orking with M&M and Cal	5	2.5	long harbour		0			0	0		0	0
2.2 b)	Describe Bidder's human resource policies that will optimize Newfoundland and Labrador employment benefits	1.5		0			5	1.5	local partners	5	1.5			0			0	0		0	0
2.2 c)	Describe Bidder's human resource policies that will optimize Innu employment benefits for work in Labrador	1.0		0				0		5	1	work with innu nation		0			0	0		0	0
2.3	Gender Equity and Diversity (5%)																				
2.3 a)	Does Bidder have gender equity and diversity plans? If so, describe Bidder's policies, including harassment and discrimination policies that support gender equity and diversity	1.5		0				0	none indicated	5	1.5	provided		0			0	0		0	0
2.3 b)	Does Bidder's human resource policies enable the voluntary identification of members of under represented groups? If so, describe these policies	1.5		0				0			0			0			0	0		0	0
2.3 c)	Is the Bidder a woman-owned business?	1.0						0													
2.3 d)	List any intended subcontractors / suppliers that are woman-owned business	1.0						0													
2.4	NL Benefits Reporting (5%)																				
2.4 a)	Indicate Bidder's previous experience at capturing employment and expenditure data as they relate to local benefits monitoring	2.5		0				0	none	5	2.5	vale		0			0	0		0	0
2.4 b)	Indicate who, within Bidders organization, will be responsible for benefits monitoring and reporting	2.5		0			5	2.5	admin manager	5	2.5	hr		0			0	0		0	0
	Scoring Grid																				
	5	Response meets and exceeds all key criteria																			
	4	Response meets all key criteria																			
	3	Response meets a majority of all key criteria																			
	2	Response meets only a few of the key criteria																			
	1	Response meets none of the key criteria																			
3.0	Provincial and Innu Content																				
3.0 a)	Is Bidder a registered Innu Company with IBDC?	Yes = 5 No = 0	5.0	0				0			0	0		0	0		0	0		0	0
3.0 b)	Use of registered Innu subcontractors?	Yes = 5 No = 0	2.5	0				0			0	0		0	0		0	0		0	0
3.0 c)	Is Bidder an NL Company	Yes = 5 No = 0	5	0				0			0	0		0	0		0	0		0	0
3.0 d)	Use of NL Subcontractors	Yes = 5 No = 0	2.5	5	2.5	listed	5	2.5	listed		0	0		0	0		0	0		0	0
3.0 e)	Bidder has experience working with aboriginal IBAs	Yes = 5 No = 0	2.5	0				0		5	2.5			0	0		0	0		0	0
4.0 a)	NL BENEFITS CONTENT - PERSON HOUR ESTIMATE by Residency (25.0)	25	5	25				0		4	20			0	0		0	0		0	0
	Score = 5 If NL percentage of total hours is > 80%																				
	Score = 4 If NL percentage of total hours is 60 to 80 %																				
	Score = 3 If NL percentage of total hours is 40 to 60 %																				
	Score = 2 If NL percentage of total hours is 20 to 40 %																				
	Score = 1 If NL percentage of total hours is < 20%																				
4.0 b)	NL BENEFITS CONTENT - PERSON HOUR ESTIMATE by Location of Work (10.0)	10	5	10				0		4	8			0	0		0	0		0	0
	Score = 5 If NL percentage of total hours is > 80%																				
	Score = 4 If NL percentage of total hours is 60 to 80 %																				
	Score = 3 If NL percentage of total hours is 40 to 60 %																				
	Score = 2 If NL percentage of total hours is 20 to 40 %																				
	Score = 1 If NL percentage of total hours is < 20%																				
5.0	NL BENEFITS CONTENT - EXPENDITURE ESTIMATE (25%)	25	2	10				0		4	20			0	0		0	0		0	0
	Score = 5 If NL percentage of total expenditures is > 80%																				
	Score = 4 If NL percentage of total expenditures is 60 to 80 %																				
	Score = 3 If NL percentage of total expenditures is 40 to 60 %																				
	Score = 2 If NL percentage of total expenditures is 20 to 40 %																				
	Score = 1 If NL percentage of total expenditures is < 20%																				

Scored By:	Maria Moran	Total	100	47.5	12.5	69.5	0	0	0	0
Date:		Sectional Weighting Ranking	2.5%	1.1875	0.3125	1.7375	0	0	0	0

Maria Moran

BID EVALUATION PLAN
COMMENT SHEETS

Package Number: CH0032
Package Name: Supply and Install Powerhouse Hydro-Mechanical Equipment

Bidder Name: Andritz **Percentage** 71.50%

Comments: Bidder has performed multiple Hydro projects throughout Canada in northern remote loations. Bidder has appropriate expertise and experience for this type of work and demonstrates good understanding of remote cold weather locations. However, the production facilities are dissiminated across the world with the major ones in China. On-site quality monitoring of manufacturing will be required. Detailed logistics plan will need to be implemented and monitored closely.
Bidder emphasizes on quality of MF accomodations as mitigation measure for labour attraction and retention.

Bidder Name: Ganotec-Canmec **Percentage** 67.80%

Comments: Bidder has performed multiple Hydro projects of similar nature throughout Canada in northern remote loations. Canmec has manufactured similar equipment for multiple Canadian owners, and is familiar with Canadian standards. However, as the scope of CH0032 is very large and as Canmec will be the only manufacturer of the main components, dedicating 100% of its production capacity to CH0032, its ability to meet production requirements should be investigated and monitored closely.
Bidder emphasizes on quality of MF accomodations as mitigation measure for labour attraction and retention.

Bidder Name: KHNP-Deawoo **Percentage** 50.10%

Comments: Bidder is not a manufacturer but a Project manager only. Bidder does not demonstrate having prior experience with this type of work in Canada and would have to start building relationships with local partners from "scratch" upon contract award. Responses indicate poor knowledge of local labour availability conditions. Bidder does not demonstrate having experience in remote cold weather location. There is no mention of sheltering work areas with heated enclosures but rather having heated "warm-up" facilities and workbreaks for workers to warm-up. Many supporting documents are provided in Korean and those provided in English are substandard, suggesting potential communication challenges during contract execution. Saint-John's seems to be considered as the proper location for setting up project offices, suggesting poor knowledge of local geography having a direct impact on logistical assumption and plans.

Bidder Name: Alstom-Not **Percentage** #VALUE!
evaluated

Comments:

Scored By: Jean-Daniel Tremblay-Interface Manager & Risk Coordinator

Date: JUNE 13, 2013



BID EVALUATION
DISCIPLINE SCORE SHEETS

RFP - Risk Management Questionnaire Evaluation

Package Number: CH0032	Package Name: Supply and Install Powerhouse Hydro-Mechanical Equipment
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Scoring Guide:

- 0 - Question not answered or no relevant information provided in response
- 1 - Response does not meet key Criteria
- 2 - Response only meets a few of the key criteria
- 3 - Response meets a majority of the key criteria
- 4 - Response meets all key criteria
- 5 - Response meets and exceeds key criteria

Item	Risk Management	Question Weight (%)	Andritz			Ganotec-Canmec			KHNP-Deawoo			Alstom-Not evaluated		
			Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments
1	Risk Management system in place.	5	3	3	Bidder states Corporate Risk Management document titles without providing samples. Risk management system not aimed at proactively managing Project Risks with LCP Team but rather managing bidder's own risks.	3	3	Informal Risk management conducted by Partnership estimators at bidding phase. Risks, mitigating measures and associated costs transferred to Project management team upon Contract award. Risks under the control of client noted and identified for Client action.	2	2	No risk management system currently in place but to be implemented for this Contract.		0	
2	Risk Management Plan sample	5	1	1	No sample provided. Stated as being proprietary and confidential.	3	3	No sample provided. Major Risks identified with associated mitigation measures.	2.5	2.5	Sample of intended Risk Management plan provided. Management plan somewhat generic and incomplete.		0	
3	Top 5 Risks - Identification	5	4	4	1-Delay of approval process of design-Intense communication with client 2-Shortage of Raw Material on the world market-Timely placement of POs 3-Shortage of components of special sub-suppliers (like gear boxes, etc.)-Timely placement of POs 4-Bad work planning of manufacturer-Site supervision 5-Weather conditions influencing transport-Local transporter experience	4	4	1-Delay with Contract award without extension of milestone dates 2-Delay with drawings approval by LCP team 3-Readiness of camp accommodations 4-Delay in spillway availability 5-Delay in Powerhouse availability for all these risks mitigation measure stated to be proactive communication of technical info and drawings for approval.	2	2	1-Weather conditions 2-Permissions and licenses 3-HSE Policy 4-Local Labor 5-Inspection and testing As mitigation measure, Bidder states the they will set up new Risk Management plan for the Project. Stated Risks seem to relate mostly to limited knowledge of local conditions and acquisition of visas (Permissions and licenses)		0	

BID EVALUATION
DISCIPLINE SCORE SHEETS

RFP - Risk Management Questionnaire Evaluation

Package Number: CH0032	Package Name: Supply and Install Powerhouse Hydro-Mechanical Equipment
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<p>Scoring Guide:</p> <p>0 - Question not answered or no relevant information provided in response 1 - Response does not meet key Criteria 2 - Response only meets a few of the key criteria 3 - Response meets a majority of the key criteria 4 - Response meets all key criteria 5 - Response meets and exceeds key criteria</p>
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	Question Weight (%)	Andritz			Ganotec-Canmec			KHNP-Deawoo			Alstom-Not evaluated			
		Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments	
4	Magnitude of Scope	10	4	8	Bidder states having all required financial, human and manufacturing resources to execute contract according to schedule and budget	4	8	All scope of work has been considered and an execution plan developed accordingly	4	8	Stated as not affecting their capacity to deliver the work.		0	
5	Loss Control Plan	3	2	1.2	Bidder does not provide details of plan in the event of disruption or loss of major production facility	2	1.2	No formal Loss Control plan but contingency plan needed to mitigate identified will be developed upon award.	3	1.8	Nationwide Emergency action Plan in place for disaster and loss.		0	
6	Involvement of Subs in Risk Management	3	4	2.4	Subs stated as being part of overall execution plan	4	2.4	Major Supplier, Canmec part of the Joint Venture	1	0.6	Subs currently not involved but will be in new Risk management to be implemented for CH0032.		0	
7	Historical Records-Successful delivery	2	2	0.8	Four project international names stated but with no details substantiating similarity with scope of CH0032	4	1.6	Multiple other Canadian hydro projects stated as similar in nature but of smaller scope.	2	0.8	KHNP states they are not a manufacturer. Provides list of Hydro-mechanical Projects performed by its major subs.		0	
8	Report and root cause of unsuccessful deliveries	2	4	1.6	"Lessons Learned" stated as being part of company wide corporate process	4	1.6	No significant delays to report. However, the following are identified as having potential impact on Project delivery: delay in award of contract delay in issuing construction drawings Limited availability of qualified labor Provision of first class accommodations	1	0.4	Stated as N/A		0	

BID EVALUATION
DISCIPLINE SCORE SHEETS

RFP - Risk Management Questionnaire Evaluation

Package Number: CH0032	Package Name: Supply and Install Powerhouse Hydro-Mechanical Equipment
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<p>Scoring Guide:</p> <p>0 - Question not answered or no relevant information provided in response 1 - Response does not meet key Criteria 2 - Response only meets a few of the key criteria 3 - Response meets a majority of the key criteria 4 - Response meets all key criteria 5 - Response meets and exceeds key criteria</p>

Question Weight (%)	Andritz			Ganotec-Canmec			KHNP-Deawoo			Alstom-Not evaluated		
	Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments
9	10	4	8	3.5	7	Critical fabrication performed by Canmec. Milestone dates imposed on all supplier and fabricators with close follow up and monitoring.	1	2	Critical path stated as being the "preparation of local skilled labor". KHNP to open office in St Jones (sic) to manage the delivery of labor and equipment".		0	
10	10	3.5	7	4	8	Main manufacturing facility for Gates Trashrack and stop logs in Tianbao China, guides in Portugal, Spain Italy and Slovakia. Production capacity stated as far exceeding CH0032 needs, but no details provided.	3.5	7	Canmec's production workload is 90% CH0032 for Q3 and Q4 of 2013 and 100% for 2014.		0	Currently not much work to supply hydro-mechanicals in Korea. Keumjeon and Kumsung identified as major subs for this project which have sufficient capacity.
11	5	3	3	3	3	Bidder states there is sufficient time for mobilization. Team experienced with cold weather. Installation team involved in design.	2	2	Bidder response as follow: "Foreign: Selection of engineering company, start of design and manufacturing Local: open local office, manager dispatched upon contract award"		0	
12	5	4	4	4	4	Scaffolding towers enclosure along gate slots. Insulated cladding and roofing on towers and heated. Certain float considered in project schedule to account for extreme weather conditions. Heated enclosures for most of the work. High wind is major condition for which work could not proceed.	2	2	Trailers located close to work areas to avoid down time. Heated enclosures for performing work in winter conditions.		0	Overtime and added personnel identified as measure to catch-up schedule.

BID EVALUATION
DISCIPLINE SCORE SHEETS

RFP - Risk Management Questionnaire Evaluation

Package Number: CH0032	Package Name: Supply and Install Powerhouse Hydro-Mechanical Equipment
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<p>Scoring Guide:</p> <p>0 - Question not answered or no relevant information provided in response 1 - Response does not meet key Criteria 2 - Response only meets a few of the key criteria 3 - Response meets a majority of the key criteria 4 - Response meets all key criteria 5 - Response meets and exceeds key criteria</p>

Question Weight (%)	Andritz			Ganotec-Canmec			KHNP-Deawoo			Alstom-Not evaluated		
	Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments
13	4	4	One shift time table considered in project schedule. Additional shifts introduced if required. Additional manpower not contemplated as workspace is confined.	4	4	Bidder states extensive experience in all northern areas of Canada.	2	2	Suspension of work in severe weather. Overtime and work on off days to catch-up schedule.		0	
14	3.5	3.5	Most of equipment manufactured in medium scaled privately owned companies in Europe and China where risks of strikes are considered limited.	2	2	Bidder states that CLRA-NL Building Trades agreement will be used. Silent on main manufacturers strike history	4	4	No strikes to report at Keumjeon and Kumsung facilities.		0	
15	5	2	Provided in Appendices A5 and A6	5	2	Provided in Appendices A5	5	2	Provided in Appendices A5		0	
16	5	2	Provided in Appendices A7	5	2	Provided in Appendices A7	5	2	Provided in Appendices A7		0	
17	3	3	Generic listing provided. Limited details regarding critical skills required. However, bidder states available resources from various Canadian and European business units having a generally low turnover.	3	3	Specialized skilled in-house personnel to provide training to Train to less experienced workers for alignment of embedded parts.	2	2	Limited generic response .		0	
18	5	5	Bidders demonstrates good understanding and experience with remote site conditions and provides reasonable retention strategy. Emphasis on Camp conditions.	3	3	Refers to CLRA-NL Trades agreement with emphasis on good camp accommodations	2	2	Bidder does not demonstrate adequate understanding of local labor condition as provided response can be summarized as follow: "use of skilled workers until end of Contract. Provide temporary house to skilled worker. Replace skilled worker instantly if one leaves the project"		0	


BID EVALUATION
DISCIPLINE SCORE SHEETS

RFP - Risk Management Questionnaire Evaluation

Package Number: CH0032	Package Name: Supply and Install Powerhouse Hydro-Mechanical Equipment
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<p>Scoring Guide:</p> <p>0 - Question not answered or no relevant information provided in response 1 - Response does not meet key Criteria 2 - Response only meets a few of the key criteria 3 - Response meets a majority of the key criteria 4 - Response meets all key criteria 5 - Response meets and exceeds key criteria</p>

	Question Weight (%)	Andritz			Ganotec-Canmec			KHNP-Deawoo			Alstom-Not evaluated		
		Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments	Answer	Score	Comments
19	10	3.5	7	All logistical aspect under the direct responsibility of the bidder. Testing in accordance with technical specification.	2	4	Refers to Appendix A9 control schedule, no other details provided	2	4	Will do their best to solve problems if any.		0	
20	1	5	1	Provided	5	1	Provided	5	1	Provided		0	
Score - transfer to Technical Summary		100	71.50		67.80			50.10			0.00		
		Total Percentage	71.50%		67.80%			50.10%			0.00%		

Scored By: Jean-Daniel Tremblay - Interface & Risk Coordinator 

Date: June 13, 2013

Appendix 3

Overall Evaluation Scoring Matrix

Contract Administrator: R Anderson
 Lead Technical: Bruce Drover
 Lead Commercial: Ed Over
 Area Manager: Luc Turcotte

Package # 505573-CH0032: S/I Powerhouse Hydro/Mechanical Equipment

NOTE: Each subsection is rated on a scale 1 - 10 (rating) then multiplied by the weighted value (weighting) for the item (within the evaluation subsection) to get the item value.

Section 1 Commercial

Lead: Ed Over

Weighted value: **60%**

Criteria:

Criteria	item wgtg	Alstom		Andritz		Ganotec/Canmec		KHNP/Daewoo	
		Rating 0-10	item value	Rating 0-10	item value	Rating 0-10	item value	Rating 0-10	item value
1 Total Evaluated Cost comprising :	65%	0	0.00	10	6.50	0	0.00	0	0.00
Proposal Price - A & B	x		0.00		0.00		0.00		0.00
Terms of Payment	x		0.00		0.00		0.00		0.00
Net Present Value	x		0.00		0.00		0.00		0.00
Milestone Payment Schedule	x		0.00		0.00		0.00		0.00
Delivery Schedule	x		0.00		0.00		0.00		0.00
Currency Exchange Costs	x		0.00		0.00		0.00		0.00
Estimated Inspection & Expediting Costs	x		0.00		0.00		0.00		0.00
2 Terms & Conditions comprising:	35%	0	0.00	8.43	2.95	8.66	3.03	0	0.00
Limitation of Liability	x		0.00		0.00		0.00		0.00
Liquidated Damages	x		0.00		0.00		0.00		0.00
Title Transfer	x		0.00		0.00		0.00		0.00
Insurance	x		0.00		0.00		0.00		0.00
Performance Security	x		0.00		0.00		0.00		0.00
Ownership of I.P	x		0.00		0.00		0.00		0.00
Default	x		0.00		0.00		0.00		0.00
Exceptions	x		0.00		0.00		0.00		0.00
Overall compliance	x		0.00		0.00		0.00		0.00
	100%								
Weighted value		0.00	0.00	18.43	9.45	8.66	3.03	0.00	0.00
Points value			X 60%		X 60%		X 60%		X 60%
			0.00		5.67		1.82		0.00

Comments:

Section 2 Technical

Lead: Bruce Drover

Weighted value: **27.5%**

Criteria:

Criteria	item wgtg	Alstom		Andritz		Ganotec/Canmec		KHNP/Daewoo	
		Rating 0-10	item value	Rating 0-10	item value	Rating 0-10	item value	Rating 0-10	item value
1 Spillway Hydro- Mechancial Acceptability	25%	9.2	2.30	8.8	2.20	10.0	2.50	7.0	1.75
2 Spillway Electrical Building Acceptability	20%	0.0	0.00	9.5	1.90	8.0	1.60	0.0	0.00
3 Intake Hydro-Machancial Acceptability	25%	8.8	2.20	8.8	2.20	10.0	2.50	7.0	1.75
4 Draft Tube Hydro-Mechancial Acceptability	15%	10.0	1.50	8.7	1.31	10.0	1.50	7.7	1.16
5 Trash Cleaner Acceptability	15%	9.3	1.40	9.3	1.40	9.3	1.40	9.3	1.40
	100%								
Weighted value		n/c	7.40	45.10	9.00	47.30	9.50	n/c	6.05
Points value			X 27.5%		X 27.5%		X 27.5%		X 27.5%
			n/c		2.48		2.61		n/c

Comments:

Alstom & KHNP-Daewoo were considered incomplete as they scored '0' in this category

Section 3 Schedule & Execution Plan

Lead: **Bruce Drover**

Weighted value:

10%

Criteria:

item wtg

1	Work Schedule Milestones	30%	x
2	Site Staff Schedule	10%	x
3	Payment Schedule (against deliverables)	10%	x
4	SDRL Compliant with Schedule	10%	x
5	Schedule Quality	20%	x
6	Execution Plan / Strategy	20%	x

100%

Weighted value

Points value

Alstom		Andritz		Ganotec/Canmec		KHNP/Daewoo	
Rating 0-10	item value	Rating 0-10	item value	Rating 0-10	item value	Rating 0-10	item value
10	= 3.00	10	= 3.00	10	= 3.00	10	= 3.00
6	= 0.60	9	= 0.90	9	= 0.90	6	= 0.60
6	= 0.60	9	= 0.90	9	= 0.90	6	= 0.60
6	= 0.60	9	= 0.90	9	= 0.90	7	= 0.70
5	= 1.00	10	= 2.00	10	= 2.00	5	= 1.00
4	= 0.80	8	= 1.60	8	= 1.60	5	= 1.00
37.00	6.60	55.00	9.30	55.00	9.30	39.00	6.90
	X		X		X		X
	10%		10%		10%		10%
	0.66		0.93		0.93		0.69

Comments:

All reflected in their proposal that they met the milestones
 Andritz & Ganotec optimized staffing plans & matched MFL to Schedule
 Issue for Commercial. Some Bidders did not clearly match payment schedules to deliverables.
 Andritz & Ganotec were compliant with schedule
 Andritz had a better quality schedule in terms of presentation & logic. Alstom & Daewoo schedules were hard to follow
 Ganotec will mfr locally. Andritz need to ship parts worldwide. Logistics risk. Issue for Commercial re cost/benefit
 Ganotec have VERY good mfr'g approach, but concerns with site construction - schedule/float

Section 4 NL Benefits

Lead: **Maria Moran**

Weighted value:

2.5%

Criteria:

item wtg

1	Refer to Bid Eval Plan Appendix 8	100%	x
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100%

Weighted value

Points value

Alstom		Andritz		Ganotec/Canmec		KHNP/Daewoo	
Rating 0-10	item value	Rating 0-10	item value	Rating 0-10	item value	Rating 0-10	item value
	= 0.00	4.75	= 4.75	6.95	= 6.95	1.25	= 1.25
	= 0.00		= 0.00		= 0.00		= 0.00
	= 0.00		= 0.00		= 0.00		= 0.00
	= 0.00		= 0.00		= 0.00		= 0.00
	= 0.00		= 0.00		= 0.00		= 0.00
	= 0.00		= 0.00		= 0.00		= 0.00
	= 0.00		= 0.00		= 0.00		= 0.00
0.00	0.00	4.75	4.75	6.95	6.95	1.25	1.25
	X		X		X		X
	2.5%		2.5%		2.5%		2.5%
	0.00		0.12		0.17		0.03

Comments:

Andritz was missing some information and will have to submit missing information
 Alstom was not evaluated

SUMMARY OF PROPOSAL RESULTS

Overall Comments:

Points value of Section 1 Commercial
 Points value of Section 2 Technical
 Points value of Section 3 Schedule & Execution Plan
 Points value of Section 4 NL Benefits

Alstom		Andritz		Ganotec/Canmec		KHNP/Daewoo	
0%	0.00	95%	5.67	30%	1.82	0%	0.00
n/c	n/c	90%	2.48	95%	2.61	n/c	n/c
66%	0.66	93%	0.93	93%	0.93	69%	0.69
0%	0.00	5%	0.12	7%	0.17	1%	0.03
7%	0.7	92%	9.2	55%	5.5	7%	0.7

OVERALL RATING OF PROPOSALS

	Alstom	Andritz	Ganotec/Canmec	KHNP/Daewoo
1 Commercial	0%	95%	30%	0%
2 Technical	n/c	90%	95%	N/C
3 Schedule Execution Plan	66%	93%	93%	69%
4 NL Benefits	0%	5%	7%	1%
Overall Result	7%	92%	55%	7%
5 Risk Management	F	P	P	F
7 Health & Safety	F	P	P	F
8 Quality Assurance	F	P	F	F
9 Environmental	P	P	P	P

