

CI 39406

U&U Dickie Brook Unit #1

REDACTED

November 24, 2010

NOVA SCOTIA
POWER
An Emera Company

UARB APPROVAL SHEET

Project Title: **U&U Dickie Brook Unit #1**

CI Number: 39406

☒ Capital Project Authorization

Head Office Use:

☐ ATO

Project Number:

☐ Final Cost

Date: November 24, 2010

Location:			Division:	
Expenditure Profile			Schedule	
YEAR	Budget Estimate	Project Estimate		
2010		601,706	Start Date	2010-09
			Estimated In-Service Date	2010-12
			Estimated Close Date	2010-12
Total	\$0	\$601,706		

COMMENTS

This item is submitted pursuant to section 35

Submitted on behalf of NOVA SCOTIA POWER INCORPORATED

Approved on behalf of NOVA SCOTIA UTILITY AND REVIEW BOARD

M/S *S*

Nov 22/2010

Authorized Signatory

DATE

DATE

Mark Savory

VP Technical and Construction

Project Number

CI Number : 39406

Parent CI Number :

Budget Version - 2010 Q3 for depreciation

Cost Centre : 407 - 407-Dickie Brook Hydro

Forecast

Start : 09/23/2010
 Operational : 12/01/2010
 Final Cost : 12/30/2010
 2010 \$601,705.57
 Total : \$601,705.57
 Original Cost : \$0.00

This project is for repairs to Unit #1 at the Dickie Brook Generating Station and repairs to sections of the penstock and draft tube.

Summary of related CI's +/- 2 years.

No other projects in 2008,2009,2010,2011 and 2012.

CI Number : 39406

Project Number

Parent CI Number :

Approved Date

Cost Centre : 407

- 407-Dickie Brook Hydro

Budget Version 2010 Q3 for depreciation

Capital Item Accounts

Acct	Actv	Account	Activity	Forecast Amount	Amount	Variance
094		094 - Interest Capitalized		4,923	0	4,923
095		095-Thermal & Hydro Contracts AO		32,619	0	32,619
095		095-Hydro Regular Labour AO		974	0	974
001	025	001 - HYDRO Regular Labour	025 - HGP - Generator	5,000	0	5,000
002	025	002 - HYDRO Overtime Labour	025 - HGP - Generator	0	0	0
004	025	004 - HYDRO Term Labour	025 - HGP - Generator	0	0	0
010	025	010 - Office Supplies	025 - HGP - Generator	0	0	0
011	025	011 - Travel Expense	025 - HGP - Generator	0	0	0
012	025	012 - Materials	025 - HGP - Generator	29,000	0	29,000
041	025	041 - Meals & Entertainment	025 - HGP - Generator	0	0	0
066	025	066 - Other Goods & Services	025 - HGP - Generator	0	0	0
013	085	013 - POWER PRODUCTION Contracts	085 Design	498,000	0	498,000
028	085	028 - Consulting	085 Design	31,190	0	31,190
Total Cost:				601,706	0	601,706
Original Cost:						

CI Number : 39406	- HYD U&U Dickie Brook Unit # 1	Project Number
Parent CI Number :	-	Approved Date
Cost Centre : 407	- 407-Dickie Brook Hydro	

Capital Item Justification

Justification Criteria : Hydro
 Sub-Criteria : Maintenance
 Name of Report :
 Document Location :
 Person Responsible :

Why do this project?

The Dickie Brook powerhouse was flooded with brackish water/seawater as a result of a storm surge in early January, 2010. Unit # 1 was running at the time of the storm/flood event, and the partially submerged flywheel sprayed the generator housing and other parts with salt-water causing damage to the rotor, stator, shafts, bearings and related moving parts. As a result of this flooding, the Unit was rendered not fit for service. Since January, 2010, a detailed inspection of the Unit has been completed and the project scope and estimated costs have been confirmed.

Repairs to the penstock and draft tube are not related to the flood. With the Unit out of service, the opportunity was taken to complete an inspection of the penstock and draft tube.

Why do this project now?

Unit 1 cannot generate in its current damaged condition. It must be refurbished before returning to service. If it is not returned to service before winter, a considerable volume of water will be spilled at Tom's Lake headpond, resulting in lost generation and replacement energy costs.

Why do this project this way?

Repairing the Unit is the only option. Refurbishing the stator, rotor, bearings and shaft will return the Unit to service.

39406 - U&U Dickie Brook Unit #1

Account

001 - HYDRO Regular Labour
 012 - Materials
 013 - POWER PRODUCTION Contracts
 028 - Consulting
 094 - Interest Capitalized
 095-Hydro Regular Labour AO
 095-Thermal & Hydro Contracts AO

Current Submission

5,000
 29,000
 498,000
 31,190
 4,923
 974
 32,619

③

①

②

601,706

U&U Dickie Brook Unit #1
Reference Notes

Budget Year	2010	Date	Nov 1st, 2010
Division	Power Production	CI number	39406
Department	Hydro		

Note 1	Power Production Contracts	The \$498,000 for Power Production Contracts is broken down as follows: \$214,205 for refurbishment per the Weir quote attached, [REDACTED] for the stator and rotor refurbishment as per the Siemens quote attached (Option B for [REDACTED] + [REDACTED] for cleaning, inspection and testing of the rotor + [REDACTED] in contingency to cover unforeseen costs once inspection and testing is complete), and [REDACTED] for penstock and draft tube repairs (based on NSPI engineering staff experience). The remaining [REDACTED] is for bearing and shaft inspection [REDACTED], line boring of bearings [REDACTED], coating repairs [REDACTED], anchor bolt supply and installation [REDACTED], stop log installation to complete repairs [REDACTED], shipping to / from Weir shop [REDACTED], Misc inspection [REDACTED] and contingency [REDACTED]. Any items for which quotations have not been included are based on NSPI engineering staff experience.
Note 2	Consulting	This includes \$10K for engineering consulting, and \$21,190 for scroll case, butterfly valve, governor tank, draft tube and penstock inspections.
Note 3	Materials	This includes \$28K for miscellaneous items and consumables required to complete a refurbishment of this type. This is based on NSPI engineering staff experience. The remaining \$1,000 is the estimated cost for supply of timber for the stoplogs.

Weir Canada, Inc.
Weir Power & Industrial

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H8N 1V1
Canada

Tél.: 514.366.5907
Fax : 514.366.2067

www.weirpowerindustrial.com

Excellent
Engineering
Solutions



LaSalle, August 19, 2010

NOVA SCOTIA POWER CORP

Hydro division

25 Lake Side Park Drive
Lakeside, NS, B3T 1M9
Canada

Attention

Tel: (902) [REDACTED]
Cell: (902) [REDACTED]

Fax. : (902) 428-7564

Email : [REDACTED]

Subject : Dickie Brook - Refurbishment of Turbine Components

Ref. : Our quotation No. 7096588

Dear [REDACTED]

Listed bellow is the scope of work we proposed in our quotation no.7096588 with more details and component pictures.

Weir Canada Inc provides technical and engineering expertise in the assessment and repair of mechanical equipment based on training and experience of our staff

We have conducted a condition assessment of the Nova Scotia Power, Dickie Brook Generating Station, hydro turbine mechanical components in August of 2010 and based on our observations, measurements, testing and examination, our technical team and experts are recommending that the following repairs be performed.

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Line 20 – (1) Turbine shaft

Weir technical experts believe, based on observations, measurements, testing and examination that the following repairs are required.

Remove shaft from the runner

Remove stainless steel sleeve by machining

Make new centers, redo tapped hole on runner end

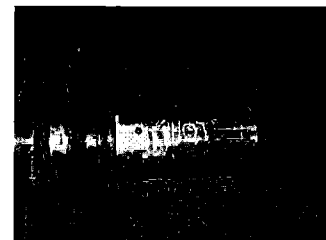
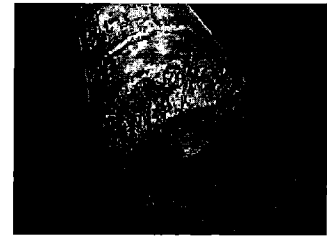
Premachine 5.000" & 5.500" dia's (runner & st.stl sleeve)

Metallize both diameters (st.stl 410)

Machine two diameters as per drawing

Minimum machine 6.500" dia. (bearing), polish all over

Clean keyway (min. material removal), make new key



Supply material for new st.stl sleeve and locking key

Machine new sleeve as per original drawing

Machine runner locking key

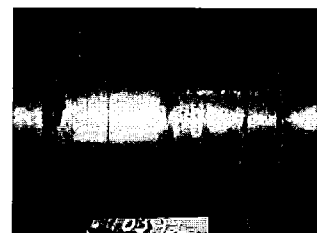
Install new sleeve on the shaft, machine O.D. if required

Inspection and report

Put away until ready for the assembly with the runner.



Our price



Note: 5.002" dia. will be metallized and machined to fit remachined runner bore after minimum clean-up.

5.500" dia. (st. stl sleeve) cannot be reduced because of the sleeve installation over the locking key shoulder.

6.500" dia. (main bearing) will be machined (minimum clean-up) and the inside diameter of the bearing will be machined smaller for proper clearance.

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Line 30 – (1)Turbine Runner

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Pre-machine runner band and crown

Weld build-up both diameters and stress relieve

Sandblast

Grind smooth excessive welds in water passage

Grind radii on blades inlet edges

NDE (LPI) – entire part

Machine band and crown (diameters to be confirmed)

Clean center bore, (machine minimum)

Inspection and report

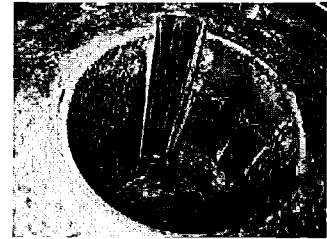
Apply ceramic coating to all non-machined surfaces

Assemble runner and shaft

Dynamically balance the unit to ISO standard 1940/G2.5

Inspection and report

Prepare for shipping.



Our price [REDACTED]

Note: Weld overlay on crown and band is required to reduce the gap between runner and "wearing rings" (head cover/bottom ring) which are machined oversize.

Ceramic coating proposed for "water passage" will be CIBA 8518

Excessive "bumps" and old welds will be removed by grinding to prevent cavitation.

The runner inlet opening will be slightly modified – please see "wicket gates".

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Line 40 – (1) Bottom ring

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Remove wicket gate bushings

Machine (minimum clean-up) wicket gate bores

Machine minimum wear plate

Supply material for new wicket gate bushings (oilless)

Machine new gate bushings

Supply new seals (ref. wicket gate stems)

Assemble bushings and seals

Final inspection and report

Paint non-machined surfaces (2 coats) zinc rich epoxy

Put away until final assembly

Our price

Note: Wicket gate bores will be machined, minimum clean-up, and verified for proper alignment with head cover bores.

Wear plate is machined/cleaned up @ 95% and the existing patch bolt counterbore gaps filled with ceramic epoxy.

We have no objection to use Orcott material for bushings and have NS Power supply.

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Line 50 – (1) Head cover

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Remove (32) wicket gate bushings and studs item # 15

Machine, minimum clean-up, wicket gate bores

Machine minimum wear plate

Supply material for new wicket gate bushings (oilless) and sliding rings for gate operating ring

Machine new gate bushings, drill and countersink sliding rings

Supply new seals (ref. wicket gate stems)

Assemble bushings, seals and sliding rings

Machine sliding rings to new diameter (ref. Gate Operating Ring)

Final inspection and report

Paint non machined surfaces (2 coats) zinc rich epoxy

Put away until required for trial assembly.

Our price



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Line 60 – (16) Wicket gates

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Measure gate profile (blade)

Fabricate machining/measuring jig

Weld build-up lower gate face (short stem)

Weld build-up contact points

Repair patched surfaces (bump)

Redo centers

Machine end face (blade) and packing area on longer stem

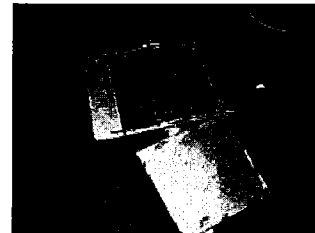
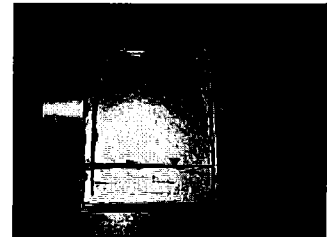
Machine contact points

Inspection and report

Grind smooth non-machined surfaces

Apply ceramic coating on non-machined surfaces

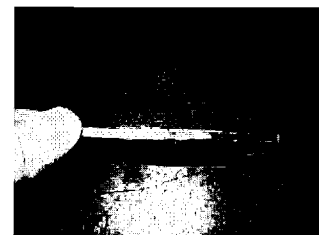
Put away until required for trial assembly



Our price



Note: Weld overlay on lower gate face (bottom ring side) will make gate longer but this will compensate for material removal on the head cover and bottom ring. Runner inlet opening is also modified for slightly longer gate. Contact points will be welded and remachined. Surface bumps will be repaired, ground smooth and covered with ceramic coating CIBA 8518. Gate stems will be polished only.



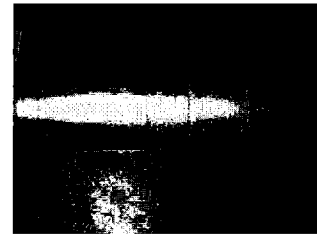
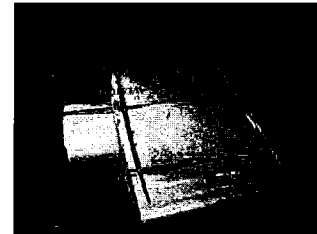
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Line 60 – (16) Wicket gates, Option # 1

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

- Measure gate profile (blade)
- Make machining and measuring jig
- Pre-machine both gate stems (0.030"/rad.)
- Weld build-up lower gate face and both stems
- Weld build-up contact points
- Repair patched surfaces (bumps)
- Redo centers
- Machine end face (blade) and both stems
- Machine contact points
- Inspection and report
- Grind smooth non-machined surfaces
- Apply ceramic coating on non-machined surfaces
- Put away until required for trial assembly



Our price [REDACTED]

Notes: This is proposed as an option which will include weld overlay on both gate stems and machining to the original dimensions.

** NSPI did not use this option*

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Line 70 – (1) Gate operating ring

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Remove bronze bushings

Minimum machine inside diameter and record

Supply material for new self lubricating bushings

Machine and install new bushings

Paint non-machined surfaces (2 coats)

Final inspection and report

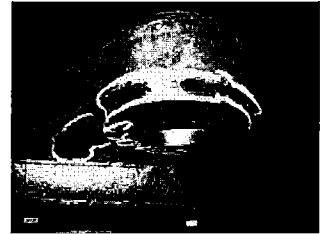
Put away until until required for trial assembly

Grind linear indication (found during MPI)



Our price

Notes: Surface linear indications have been removed



Line 80 – (16) of each Levers & shear links

Levers

Clean and degrease

Paint (original colour)

Supply new anti-friction washers

Inspect

Shear links

Supply material for new links (bronze SAE 660)

Machine links as per original drawing

Supply material for link bushings (self lubricating)

Machine and assemble new bushings

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Inspect and make final report
Put away until trial assembly

Our price [REDACTED]

*Note: Anti-friction washers will be installed between the levers and head cover.
Shear links will all be replaced as per original drawing.*

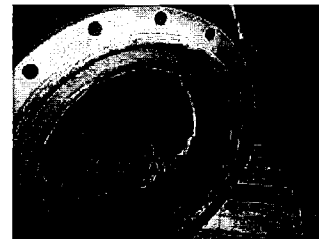
Line 90 – (1) Draft Tube

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Remove only the outer st.stl ring
Inspect 2 bores and record
Machine minimum bores (if out of round)
Supply material for new ring (st.stl 316L)
Machine new ring with the proper shrink fit
Assemble new ring to the draft tube



Grind and remove damaged coating
Repair surface with metal filler and apply new top coating
Supply new o-ring
Grit blast and repaint
Prepare for shipment



Our price [REDACTED]

Note: item # 2 hand hole cover was not received with the original shipment.

The outer st.stl ring was in contact with the runner (rubbing marks) on both face and diameter. We are proposing to replace the ring.



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Line 100 - (1) Main bearing

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Bearing shell

Make the sketch of the existing part

Melt babbitt

Pre-heat both halves to 800 deg. F for 8 hours
to burn the remaining oil.

Sand blast

Magnetic particle inspection

Prepare (fabricate) a jig for pouring of babbitt



Re-babbitt ASTM B23 Gr.2

Machine joints to +0.005"

Assemble and pre-machine inside diameter

Verify babbitt adherence

Pre-machine spherical diameter (-0.020"/Rad)

Metallize spherical diameter

Final machine joint faces (minimum clean-up)

Machine oil grooves

Assemble and machine inside diameter and faces

Machine spherical diameter

Inspection and report

Dressing

Paint non-machined surfaces with Glyptal 1201

Bearing housing

Machine minimum bottom face (parallel to brg axis)

Machine o-ring grooves (3 planes)

Clean labyrinth grooves

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Assemble and machine spherical diameter
Inspect and prepare report
Trial assembly of bearing shell
Paint inner surfaces with Glyptal # 1201
Paint outside surfaces with corrosion resistant paint
Assemble all the components removed prior to repairs
Prepare for shipment



Our price

Note: Above price is for both pieces, bearing shell and housing.

To prevent oil leaks, we will have o-ring grooves machined in 3 places.

Spherical diameter on the bearing housing will be machined, minimum clean-up, and the spherical diameter of the shell will be metallized and machined accordingly.

Line 110 – (2) Pedestal bearings

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Bearing shells

Prepare sketch of the existing parts
Melt babbitt
Pre-heat 4 halves to 800 deg. F during 8 hours
to burn the remaining oil.
Sand blast
Magnetic particle inspection
Prepare (fabricate) a jig for pouring of babbitt
Re-babbitt ASTM B23 Gr.2
Machine joints to +0.005"
Assemble and pre-machine inside diameters
Verify babbitt adherence



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Pre-machine outside diameters (3) (-0.020"/Rad.)

Metallize outside diameters (3)

Final machine joint faces (min. clean-up)

Machine oil grooves

Assemble and machine inside diameters and faces

Machine outside diameters (3)

Inspection / report

Dressing

Paint non-machined surfaces with Glyptal 1201

Bearing housings

Machine minimum bottom faces (parallel to bearing axis)

Machine o-ring grooves

Assemble and machine bearing shell seats

Inspect and prepare report

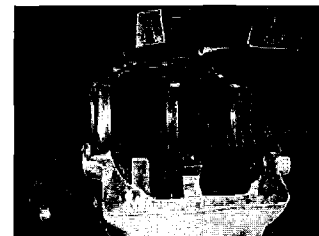
Trial assembly of bearing shells

Paint inner surfaces with Glyptal # 1201

Paint outside surfaces with corrosion resistant paint

Assemble all the components removed prior to repairs

Prepare for shipment



Our price

Note: The above price is for (2) bearing shells and 2 housings.

Inside diameters (3) on the bearing housings will be machined, minimum clean-up, and the outside diameters (3) of the shell assembly will be machined accordingly.

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Weir Power & Industrial

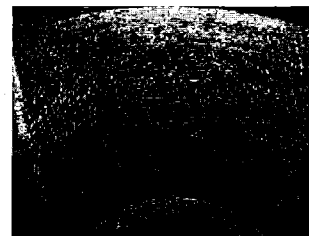
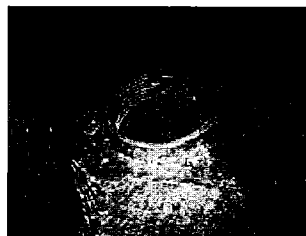
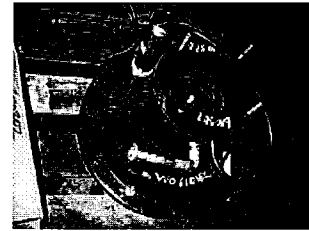


Line 120 – (1 lot) Misc. components

Weir Canada Inc, technical experts are recommending , based on our observations, measurements, testing and examination that the identified and listed repairs are required.

Stuffing box

We wanted to compare the cost of repairing versus a new casting. This part is badly corroded inside and NPT threads are damaged. Unfortunately we are still awaiting price for the casting and our estimate for this part is not completed. However we have put a budgetary price for miscellaneous components that will cover stuffing box, thrust bearing, thrust plate, bearing housing support blocks and the shop trial assembly.



Our budgetary price... [REDACTED]

Our total price including line # 120 \$214,205.00 – ①
* does not include Line 60

Note: We have built this proposal based on our understanding to deliver a unit which we would like operate free of problems for several years. However, during the rehabilitation process, we will be vigilant in considering some options that may lead to a discounted price if ever possible.

Although you requested we provide you with an estimated service life after this reconditioning, it remains extremely hard to set a number considering the life expectancy is also based on other aspects of the work which may have an important impact on the longevity e.g site installation, alignment, balancing, etc.

Our warranties on repair work are as per Weir Canada Inc.'s Standard Terms and Conditions of Sale.

We are looking forward to discuss this proposal further with you as you may feel required.

Weir Canada, Inc.
Weir Power & Industrial



F.O.B.: LaSalle, QC
TERMS: Net 30 days
TAXES: Extra as applicable
DELIVERY: 8 Weeks ORO, To Be Discussed

Best Regards

[REDACTED]

[REDACTED]
Weir Power & Industrial
8600 St Partick Street
Lasalle, Quebec, H8N 1V1

Tel. : [REDACTED]
Fax.: 514-336-8612

Email [REDACTED]

CC: [REDACTED]

SIEMENS

Siemens Canada Limited, Industrial Services
80 Enterprise St., Moncton, NB E1E 3P7
Phone: (506) 857-8457 Fax: (506) 858-9483

**BUDGET PRICING
 QUOTATION**

ATTENTION: [REDACTED] NUMBER OF PAGES : 1
 CC: [REDACTED]
 COMPANY: NS POWER, DICKIE BROOK YOUR REFERENCE: DICKIE BROOK GENERATOR
 DATE: MARCH 15, 2010 OUR REFERENCE: Q00088393
 NAMEPLATE DATA: 1 MW, 900 RPM, HYDRO-ELECTRIC GENERATOR
 WE ARE PLEASED TO QUOTE: PLEASE SEE BELOW FOR NORMAL DELIVERY

CLEANING, DRYING AND TESTING OF STATOR

- PICKED UP BY SIEMENS.
 - STEAM CLEANING, CONTROLLED TEMPERATURE DRYING AND TESTING OF STATOR
 NOTE: ONCE TESTING IS DONE RESULTS WILL BE IMMEDIATELY PROVIDED TO KENNY PUBLICOVER AND NO FURTHER WORK DONE BY SIEMENS. ADDITIONAL REPAIR WORK WILL BE QUOTED FOR YOUR APPROVAL AT THIS STOP POINT.
 PRICE: [REDACTED] ①
 DELIVERY 1 WEEK

CLEANING AND REPAIRS TO ROTOR COILS, TWO OPTIONS:

NOTE: ROTOR PRICING IS BASED ON THE COILS BEING APPROXIMATELY 20" LONG X 14" WIDE X 9.5" DEEP

OPTION A /

PRICE OF CLEANING AND REPAIRS TO ROTOR COILS
 - PICKED UP BY SIEMENS.
 - PRICE WITH COIL REPAIRS WITH EXISTING COPPER WINDINGS (NEW WASHERS AND CELLS)
 DISMANTLING COILS AND CHANGE WASHERS
 PRICE [REDACTED]
 DELIVERY 2 TO 2½ WEEKS

NOTE: WE DON'T RECOMMEND THIS OPTION 'A' AS MOST OF THE TIME WE END WITH REWIND AFTER SPENDING LOT OF TIME TRYING TO PATCH-UP COILS.

OPTION B /

PRICE WITH COIL REPAIRS WITH NEW COPPER WINDINGS, NEW WASHER AND CELLS.
 - PICKED UP BY SIEMENS.
 - PRICE FOR REWIND 8 ROTOR POLES WITH NEW WASHERS WITH EPOXY,
 DISMANTLING POLES, REWIND, ASSEMBLE, AND BALANCE
 PRICE [REDACTED] ①
 DELIVERY 3½ TO 4½ WEEKS

NOTE: ALL ADDITIONAL ELECTRICAL AND MECHANICAL REPAIRS AND ALL ADDITIONAL REPLACEMENT PARTS ARE EXTRA TO THE ABOVE BUDGET PRICING.

ALL WORK PERFORMED IN ACCORDANCE WITH ISO 9001 QUALITY CONTROL SYSTEM
 SUBJECT TO TERMS AND CONDITIONS PER OUR FORM 1410 (AVAILABLE BY REQUEST)
 PAYMENT NET 30 DAYS - TAXES ARE NOT INCLUDED IN ABOVE PRICES

WE APPRECIATE THIS OPPORTUNITY TO QUOTE - REGARDS, ROYDEN WEIR _____

+PROCEED WITH REPAIRS AS ABOVE () +RETURN UNREPAIRED () +SCRAP ()

REPLACE WITH NEW AS ABOVE () PURCHASE ORDER # _____ SUPPLY GOODS AS QUOTED ABOVE ()

IF SPECIAL DELIVERY REQUESTED SPECIFY DATE _____

SIGNATURE: _____ DATE _____

Pages 22-37 have been removed due to confidentiality.



DICKIE BROOK UNIT #1 Summary of Alternatives

Budget Year : 2010
 Division : POWER PRODUCTION
 Department : HYDRO PRODUCTION
 Originator :

Date : 9-Nov-10
 CI Number: 39406
 Project No. :

Alternative	After Tax WACC	PV of EVA / NPV	Rank	IRR	Disc Pay
A DICKIE BROOK UNIT #1	6.55%	1,668,642	1	16.35%	10.8 years
0	NA	NA	NA	#NUM!	0.0 years
0	NA	NA	NA	#NUM!	0.0 years
0	NA	NA	NA	#NUM!	0.0 years

Recommendation :

Proceed with the repairs to Unit #1 at the Dickie Brook Generating Station based on a NPV of \$1.595M.

Notes/Comments :

DICKIE BROOK UNIT #1

Capital costs include the major capital expenditures to be carried out over the 25 year economic life of the Dickie Brook development. Operating costs are the costs associated with the day to day operation of the development. The avoided energy costs are estimated at \$337,500 in 2010 and \$369,000 in 2011 . The annual generation from Unit #1 at Dickie Brook is 4,500 MWh.

0

0

0

DICKIE BROOK UNIT #1
DICKIE BROOK UNIT #1

Year	Total Revenue	Operating Costs	Capital	CCA	UCC	CFBT	Applicable Taxes	CFAT	Discount Factor	PV of CF	CNPV
2010	337,500.0	(75,000.0)	(601,705.6)	24,068.2	577,637.3	(339,205.6)	(81,543.4)	(420,748.9)	1.000	(420,748.9)	(420,748.9)
2011	369,000.0	(76,500.0)	-	46,211.0	531,426.4	292,500.0	(80,313.0)	212,187.0	0.939	199,143.2	(221,605.8)
2012	376,380.0	(78,030.0)	(1,500,000.0)	87,514.1	1,943,912.3	(1,201,650.0)	(65,694.5)	(1,267,344.5)	0.881	(1,116,317.6)	(1,337,923.3)
2013	383,907.6	(79,590.6)	-	126,413.0	1,817,499.3	304,317.0	(55,150.2)	249,166.8	0.827	205,982.2	(1,131,941.1)
2014	391,585.8	(81,182.4)	-	118,045.9	1,699,453.3	310,403.3	(59,923.9)	252,479.4	0.776	194,338.2	(937,602.9)
2015	399,417.5	(82,806.1)	-	110,243.5	1,589,209.8	316,611.4	(63,974.0)	252,637.4	0.728	183,962.9	(753,640.0)
2016	407,405.8	(84,462.2)	-	102,966.8	1,486,243.0	322,943.6	(68,192.8)	254,750.8	0.683	174,098.4	(579,541.6)
2017	415,553.9	(86,151.4)	-	96,179.6	1,390,063.4	329,402.5	(72,299.1)	257,103.4	0.641	164,904.9	(414,636.6)
2018	423,865.0	(87,874.5)	-	89,848.5	1,300,214.9	335,990.6	(76,304.0)	259,686.6	0.602	156,322.6	(258,314.0)
2019	432,342.3	(89,631.9)	-	83,942.0	1,216,272.9	342,710.4	(80,218.2)	262,492.2	0.565	148,298.0	(110,016.0)
2020	440,989.2	(91,424.6)	-	78,431.1	1,137,841.8	349,564.6	(84,051.4)	265,513.2	0.530	140,783.4	30,767.4
2021	449,808.9	(93,253.1)	-	73,288.9	1,064,552.9	356,555.9	(87,812.8)	268,743.1	0.498	133,736.3	164,503.7
2022	458,805.1	(95,118.1)	-	68,490.1	996,062.8	363,687.0	(91,511.0)	272,175.9	0.467	127,118.4	291,622.1
2023	467,981.2	(97,020.5)	-	64,011.3	932,051.5	370,960.7	(95,154.3)	275,806.4	0.438	120,895.3	412,517.4
2024	477,340.8	(98,960.9)	-	59,830.8	872,220.7	378,379.9	(98,750.2)	279,629.7	0.411	115,036.3	527,553.7
2025	486,887.7	(100,940.1)	-	55,928.4	816,292.3	385,947.5	(102,305.9)	283,641.6	0.386	109,513.6	637,067.3
2026	496,625.4	(102,958.9)	-	52,285.1	764,007.2	393,666.5	(105,828.2)	287,838.2	0.362	104,302.1	741,369.5
2027	506,557.9	(105,018.1)	-	48,883.4	715,123.9	401,539.8	(109,323.5)	292,216.3	0.340	99,379.3	840,748.7
2028	516,689.1	(107,118.5)	-	45,706.9	669,417.0	409,570.6	(112,797.7)	296,772.9	0.319	94,724.4	935,473.2
2029	527,022.9	(109,260.8)	-	42,740.5	626,676.4	417,762.0	(116,256.7)	301,505.4	0.300	90,319.1	1,025,792.2
2030	537,563.3	(111,446.1)	-	39,970.1	586,706.3	426,117.3	(119,705.6)	306,411.6	0.281	86,146.2	1,111,938.4
2031	548,314.6	(113,675.0)	-	37,382.3	549,324.0	434,639.6	(123,149.8)	311,489.8	0.264	82,190.5	1,194,128.9
2032	559,280.9	(115,948.5)	-	34,965.0	514,359.1	443,332.4	(126,593.9)	316,738.5	0.248	78,437.7	1,272,566.6
2033	570,466.5	(118,267.4)	-	32,706.6	481,652.4	452,199.1	(130,042.7)	322,156.4	0.232	74,875.1	1,347,441.7
2034	581,875.8	(120,632.8)	-	30,596.6	451,055.8	461,243.0	(133,500.4)	327,742.6	0.218	71,490.8	1,418,932.5
2035	593,513.3	(123,045.4)	-	(90.8)	451,146.6	1,427,663.1	(145,873.2)	1,281,789.9	0.205	262,410.1	1,681,342.5
2036	-	-	-	(28,926.2)	480,072.8	-	(8,967.1)	(8,967.1)	0.192	(1,722.9)	1,679,619.6
2037	-	-	-	(27,305.5)	507,378.3	-	(8,464.7)	(8,464.7)	0.180	(1,526.4)	1,678,093.2
2038	-	-	-	(25,772.9)	533,151.3	-	(7,989.6)	(7,989.6)	0.169	(1,352.2)	1,676,741.0
2039	-	-	-	(24,323.9)	557,475.1	-	(7,540.4)	(7,540.4)	0.159	(1,197.7)	1,675,543.4
2040	-	-	-	(22,953.9)	580,429.0	-	(7,115.7)	(7,115.7)	0.149	(1,060.8)	1,674,482.6
2041	-	-	-	(21,659.0)	602,088.1	-	(6,714.3)	(6,714.3)	0.140	(939.4)	1,673,543.2
2042	-	-	-	(20,435.2)	622,523.3	-	(6,334.9)	(6,334.9)	0.131	(831.8)	1,672,711.4
2043	-	-	-	(19,278.8)	641,802.1	-	(5,976.4)	(5,976.4)	0.123	(736.5)	1,671,974.9
2044	-	-	-	(18,186.2)	659,988.4	-	(5,637.7)	(5,637.7)	0.116	(652.1)	1,671,322.8
2045	-	-	-	(17,154.0)	677,142.4	-	(5,317.7)	(5,317.7)	0.109	(577.2)	1,670,745.6
2046	-	-	-	(16,179.1)	693,321.5	-	(5,015.5)	(5,015.5)	0.102	(511.0)	1,670,234.6
2047	-	-	-	(15,258.2)	708,579.7	-	(4,730.1)	(4,730.1)	0.096	(452.3)	1,669,782.4
2048	-	-	-	(14,388.7)	722,968.4	-	(4,460.5)	(4,460.5)	0.090	(400.3)	1,669,382.1
2049	-	-	-	(13,567.6)	736,536.0	-	(4,206.0)	(4,206.0)	0.084	(354.2)	1,669,027.9
2050	-	-	-	(12,792.4)	749,328.4	-	(4,876.5)	(4,876.5)	0.079	(385.5)	1,668,642.4
Total	12,156,680.6	(2,525,317.9)	(2,101,705.6)	1,362,377.1	34,553,208.2	8,486,852.3	(2,579,617.7)	5,907,234.6	15.1	1,668,642.4	32,559,642.6

* The \$1.5M in capital spend in 2012 is for Donohoe Lake Dam Refurbishment.

