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Nova Scotia
Utility and Review Board

CI 38110

2010 Transmission Line Insulator Replacement

REDACTED

October 15, 2010

NOVA SCOTIA
POWER
An Emera Company

UARB APPROVAL SHEET

Project Title: **2010 Transmission Line Insulator Replacement**

CI Number: 38110

☒ Capital Project Authorization

Head Office Use:

☐ ATO

Project Number:

☐ Final Cost

Date: October 5, 2010

Location:

Division:

Expenditure Profile

Schedule

YEAR

Budget Estimate

Project Estimate

2010

2,962,648

2,236,168

Start Date

2010-06

Estimated In-Service Date

2010-12

Estimated Close Date

2010-12

Total

\$2,962,648

\$2,236,168

COMMENTS

Submitted on behalf of NOVA SCOTIA POWER INCORPORATED

Approved on behalf of NOVA SCOTIA UTILITY AND REVIEW BOARD

M/S [Signature]

Oct 5/2010

Authorized Signatory

DATE

DATE

Mark Savory

VP Technical and Construction

CI Number : 38110

- 2010 Transmission Line Insulator Replacement

Project Number

Parent CI Number :

Cost Centre : 800

- 800-Services - Admin.

Budget Version - 2010 09/03 Forecast

	<u>Forecast</u>
Start :	06/01/2010
Operational :	12/30/2010
Final Cost :	12/30/2010
2010	\$2,236,168.21
Total :	\$2,236,168.21
Original Cost :	\$1,212,934.00

This project provides for costs associated with the replacement of insulators on six 69 kV circuits in 2010. Insulators targeted for replacement have a known failure mechanism resulting from cement growth with lead to unplanned transmission outages and customer outages. This CI only covers the replacement of insulators in 2010. NSPI intends to submit separate CI's for insulator replacements in years 2011-2013.

Summary of Related CI's +/- 2 years

2009 - 33464 2009 Transmission Line Insulator Replacement \$977,146
2008 - 28621 2008 L5027 Insulator Replacement \$1,049,592
2011 - CI TBD 2011 Transmission Line Insulator Replacement \$TBD
2012 - CI TBD 2012 Transmission Line Insulator Replacement \$TBD

CI Number : 38110

- 2010 Transmission Line Insulator Replacement

Project Number

Parent CI Number :

-

Approved Date

Cost Centre : 800

- 800-Services - Admin.

Budget Version 2010 09/03 Forecast

Capital Item Accounts

Acct	Actv	Account	Activity	Forecast Amount	Amount	Variance
092		092-Vehicle T&D OT Labour AO		25	0	25
092		092-Vehicle T&D Reg. Labour AO		28,689	0	28,689
095		095-COPS Regular Labour AO		99,089	0	99,089
095		095-COPS Overtime Labour AO		87	0	87
095		095-COPS Contracts AO		224,890	0	224,890
012	035	012 - Materials	035 - TP - Wood Poles	77,506	0	77,506
013	035	013 - COPS Contracts	035 - TP - Wood Poles	91,942	0	91,942
014	035	014 - Overtime Meals	035 - TP - Wood Poles	1,021	0	1,021
012	038	012 - Materials	038 - TP - Insulators	542,543	0	542,543
013	038	013 - COPS Contracts	038 - TP - Insulators	643,593	0	643,593
012	039	012 - Materials	039 - TP - O/H Cond.	155,012	0	155,012
013	039	013 - COPS Contracts	039 - TP - O/H Cond.	183,884	0	183,884
001	087	001 - T&D Regular Labour	087 Field Super.& Ops.	125,223	0	125,223
002	087	002 - T&D Overtime Labour	087 Field Super.& Ops.	221	0	221
011	087	011 - Travel Expense	087 Field Super.& Ops.	5,000	0	5,000
041	087	041 - Meals & Entertainment	087 Field Super.& Ops.	57,443	0	57,443
Total Cost:				2,236,168	0	2,236,168
Original Cost:				1,212,934		

CI Number : 38110 - 2010 Tx Line Insulator Replacement
Parent CI Number : -
Cost Centre : 800 - 800-Services - Admin.

Project Number

Approved Date

Capital Item Justification

Justification Criteria : TRANSMISSION PLANT

Sub-Criteria : <Select a value>

Name of Report :

Document Location :

Person Responsible :

Why do this project?

The failure mechanism is known and previously replaced insulators have been performing well.

Why do this project now?

This project is required because the type of insulator on these circuits has failed due to cement growth.

Why do this project this way?

Replacing the existing defective insulators with a new type of improved insulator is the only option.

The majority of work is being completed by an affiliate. The NSPI labour is for the cost of supervision.

CI Number : 38110

- 2010 Tx Line Insulator Replacement

Project Number

Parent CI Number :

-

Approved Date

Cost Centre : 800

- 800-Services - Admin.

Reason for Variance / Over Expenditure / Final Costing

14721159

The variance between the current submission and ACE 2010 is due to less contract work and associated AO being required than originally estimated. This is slightly offset by additional NSPI labour and associated AO being used compared to the ACE 2010 submission.

There is less contract work required as NSPI decided that there will be five lines with insulator replacements done in 2010 as opposed to the six that were originally estimated in the ACE 2010 submission. These five lines are included in the response to IR-T4 (f).

CI 38110 – 2010 Transmission Line Insulator Replacement

The following is a breakdown of costs associated with the 2010 Transmission Line Insulator Replacement

• Administrative Overheads and Interest	\$352,780
• Labour	\$125,444
• Materials	\$775,061
• Contracts	\$919,419
• Other	\$63,464
• Total	\$2,236,168

The major costs for this project include Materials at an estimate of \$775,061. This includes the cost of the insulators. The Contract estimate of \$919,419 is based on a rate of [REDACTED]/hour.

38110 - 2010 Transmission Line Insulator Replacement

Account	ACE 2010	Current Submission	Variance
001 - T&D Regular Labour	35,000	125,223	90,223
002 - T&D Overtime Labour	-	221	221
011 - Travel Expense	-	5,000	5,000
012 - Materials	700,000	775,061	75,061
013 - COPS Contracts	1,726,800	919,419	(807,381)
014 - Overtime Meals	-	1,021	1,021
041 - Meals & Entertainment	-	57,443	57,443
092-Vehicle T&D OT Labour AO	-	25	25
092-Vehicle T&D Reg. Labour AO	8,018	28,689	20,670
094 - Interest Capitalized	42,759	-	(42,759)
095-COPS Contracts AO	422,375	224,890	(197,485)
095-COPS Overtime Labour AO	-	87	87
095-COPS Regular Labour AO	27,696	99,089	71,393
	2,962,648	2,236,168	(726,480)

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Transmission Responses

Request IR-T4:

With respect to page 193, CI# 38110, 2010 Transmission Line Insulator Replacement,

- a) Please update the list of projects provided in response to 2009 ACE Plan (IR-T3) showing the work actually completed in 2009 and outlining the work planned to the end of the Insulator Replacement Project.**
- b) Provide, as in 2009, short descriptions identifying year of change-out, line number, line lengths, terminal points, number of insulator string replacements, number of insulator disc replacements, and percent replacements.**
- c) For clarity, were the dead-end insulator strings on all transmission lines previously changed out in past years leaving only the suspension strings to be replaced?**
- d) Please elaborate on the transmission line insulator replacement program as it has been on- going for some time, outlining how lines are selected for insulator replacement and the performance criteria that make replacement necessary in a particular year.**
- e) Please provide a report on the status of this replacement program, including performance levels improvements resulting from previous change-outs of disc insulators experiencing cement growth.**
- f) Please provide a cost breakdown, by transmission line, of the \$2,962,648 project total cost estimate showing the budgeted amount for NSPI labour, contracted labour, consultants, material, interest, and overhead.**

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NSPI Responses to UARB Information Requests

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Response IR-T4:

(a) The following table provides a summary of the work completed in 2009 regarding the insulator replacement program:

Year	Line Number	Length (km)	Terminal Points	Status
2009	L-5003	13.04	Sackville/Farrell St.	75% Complete
	L-5004	13.06	Sackville/Geizer's Hill	92% complete
	L-5014	10.62	St. Croix/Burlington	Complete
	L-5023	1.13	Waterville/Waterville Tap	Complete
	L-5039	4.91	Geizer's Hill/Spryfield	Complete
	L-5502	5.95	Trenton/Abercrombie	Complete
	L-5508	1.45	Abercrombie/Mill	Complete
	L-5521	4.42	Onslow/Willow Lane	90% Complete
	L-5551	9.81	Lunenburg/Riverport	Complete
	L-5573	12.97	Lingan/Lingan Mine	20% Complete

Note: L-5573 was substituted for L-5576. L-5573 runs parallel to L-5576.

Please refer to Attachment 1 – An update to information filed in response to ACE 2009 IR-T3(a) and work completed to date for 2010.

(b) The information for 2009 change-out information is included in the table below. Insulator changeout information associated with this program was provided for years prior to 2009 in response to IR-3(a) pertaining to ACE 2009. The percentage of replacements is included in response to part (a).

Year	Line Number	Length (km)	Terminal Points	Discs	Strings
2009	L-5003	13.04	Sackville/Farrell St.	954	162
	L-5004	13.06	Sackville/Geizer's Hill	360	72
	L-5014	10.62	St. Croix/Burlington	30	6
	L-5023	1.13	Waterville/Waterville Tap	105	21
	L-5039	4.91	Geizer's Hill/Spryfield	177	33
	L-5502	5.95	Trenton/Abercrombie	591	90
	L-5508	1.45	Abercrombie/Mill	312	39
	L-5521	4.42	Onslow/Willow Lane	330	66

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NSPI Responses to UARB Information Requests

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	L-5551	9.81	Lunenburg/Riverport	525	105
	L-5573	12.97	Lingan/Lingan Mine	125	25

Response IR-T4: (cont'd)

(c) The majority of dead-end insulators were previously changed out; however any dead-end insulators that were not changed out previous to 2009 were captured in the 2009 program.

(d) Specific lines were selected based on the type of insulator installed on the line. This type of insulator has experienced cement growth problems. The prioritization process is based on customer reliability and system security issues related to unplanned outages to the Backbone Transmission circuits and the resultant risk to the remainder of the system.

(e) The insulator replacement program continues to address insulators with cement growth issues. There have been no insulator failures on circuits where the insulators have been changed out. The following is list of circuit outages from 2003 to the present due to insulator failures specific to circuits included in the 2010 program:

L-5028 – 0

L-5040 – 0

L-5053 – 0

L-5560 – 2

L-5563 - 3

(f) The project cost breakdown for 2010 is as follows:

Account	Total (\$)
Administrative Overheads and Interest	500,848
Materials	700,000
Contracts	1,726,800
Labour	35,000
Total	2,962,648

NSPI - 2010 Annual Capital Expenditure Plan (2010-2014) - P-128.09
NSPI Responses to UARB Information Requests

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1 Response IR-T4: (cont'd)

2

3 The percentage cost breakdown by transmission line for 2010 is as follows;

4

5 L-5028 30%

6 L-5040 29%

7 L-5053 20%

8 L-5560 11%

9 L-5563 10%

Insulator Replacement Program										
Update pertaining to ACE 2009 IR-T3 (a)						Work to Date 2010				
Year	Line Number	Length (km)	Terminal Points	Status	Estimated Yearly Cost (\$)	Year	Line Number	Length (km)	Terminal Points	Estimated Yearly Cost (\$)
2010	L-5028	28.66	Onslow/Stewiacke	2010 Completion		2010	L-5028	28.66	Onslow/Stewiacke	2010 Completion
	L-5040	42.8	Onslow/Tatamagouche	2010 Completion			L-5040	42.8	Onslow/Tatamagouche	2010 Completion
	L-5510	69.54	Stellarton/Malay Falls	Cancelled			L-5053	25.38	Michelin/Tremont	2010 Completion
	L-5531	24.78	Bear River/Sissiboo	Cancelled			L-5560	6.6	VJ/Townsend	2010 Completion
							L-5563	7.95	VJ/Townsend	2010 Completion
Total					1,989,360	Total				2,962,648
2011	L-6004	72.89	Sackville/Canaan Road	-		2011	L-6004	72.89	Sackville/Canaan Road	-
	L-6538	34.44	Glen Tosh/Gannon Road	-			L-6538	34.44	Glen Tosh/Gannon Road	-
	L-6539	35.73	Gannon Road/Victoria Jct.	-			L-6539	35.73	Gannon Road/Victoria Jct.	-
Total				-	2,002,840	Total				2,002,840
2012	L-6515	50.69	Antigonish/Pt. Hastings	-		2012	L-6515	50.69	Antigonish/Pt. Hastings	-
	L-7009	91.78	Brushy Hill/Bridgewater	-			L-7009	91.78	Brushy Hill/Bridgewater	-
Total				-	3,004,160	Total				3,004,160
2013	L-5535	64.14	Sissiboo/Tusket	-		2013	L-5535	64.14	Sissiboo/Tusket	-
	L-6002	19	Gold River/Bridgewater	-			L-6002	19	Gold River/Bridgewater	-
Total					1,035,680	Total				1,035,680